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# THE MEANING OF BEAUTY: WHEN THE PROBLEM IS WITH BODY IMAGE.

## PREVALENCE, CLINICAL FEATURES, AND AT RISK POPULATIONS OF BODY DYSMORPHIC DISORDER IN THE ITALIAN CONTEXT

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# Abstract

Body Dysmorphic Disorder (BDD) is a psychological disorder characterized by the persistent preoccupation with one or more perceived defects in physical appearance that are not observable or appear slight to others (American Psychiatric Association [APA], 2013), which is currently included into the "Obsessive-Compulsive and Related Disorders" category of the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5; APA, 2013). Although any body part can be the focus of concerns, the most common areas of concern in people with BDD are the skin (presence of acne or scars), the hair (hair loss, thinning, or excessive facial or body hair), and the nose (shape or size; Phillips 2006; Phillips & Diaz 1997; Phillips, McElroy, Keck, Pope, & Hudson, 1993; Veale et al., 1996), and individuals with BDD may be concerned with multiple body parts at the same time (Phillips et al., 1993; 2005). In response to the appearance concerns, individuals with BDD engage in repetitive and time-consuming behaviors and mental actions focused on examining, being reassured about, and hiding perceived defects (Phillips & Diaz, 1997; Phillips, Menard, Fay, & Weisberg, 2005). The most common are: camouflaging (e.g., with hair, makeup, body position, or sunglasses), checking the perceived defect in mirrors or other reflecting surfaces (e.g., windows), excessively grooming (e.g., applying makeup or styling hair), seeking reassurance from family and friends about the defect, repeatedly touching the disliked areas, and comparing one's appearance with that of other people (Phillips, 2009; Phillips & Diaz, 1997; Phillips et al., 2005; Veale & Riley, 2001). Behaviors are unlimited (Phillips, 1998) and can include seeking plastic surgery or cosmetic medical treatments in order to reduce the perceived defects (Crerand, Phillips, Menard, & Fay, 2005; Phillips, Grant,

Siniscalchi, & Albertini, 2001); these procedures, however, are not beneficial (Crerand et al., 2005; Phillips et al., 2001) and do not typically result in a decrease of BDD symptoms severity (Crerand et al., 2005; Phillips et al., 1993; Phillips et al., 2001). Rather, some patients with BDD experience symptoms exacerbation and development of new appearance concerns (Crerand et al., 2005; Phillips et al., 2001; Veale, 2000; Veale et al., 1996). In addition to core concerns about appearance, BDD is characterized by low self-esteem, high perfectionism, and high comorbidity rate (Phillips, 2006; Phillips et al., 1993; Phillips et al., 2005). The most common associated disorders are: Major Depressive Disorder (MDD), Social Anxiety Disorder (SAD), Obsessive Compulsive Disorder (OCD), and Anorexia Nervosa (AN; Dingemans, van Rood, de Groot, & van Furth, 2012; Grant, Kim, & Eckert, 2002; Gunstad & Phillips, 2003). Despite increased awareness of BDD in recent years, it continues to be an under-studied disorder (Buhlmann & Winter, 2011; Buhlmann et al., 2010), particularly in the Italian context. Indeed, little is known about BDD prevalence and phenomenology in Italy, and no data are available on BDD prevalence rates using DSM-5 criteria (APA, 2013) in the Italian general population. Therefore, the current dissertation aimed at assessing BDD prevalence, phenomenology, associated clinical features, and at risk populations through three studies.

The first study aimed at exploring the prevalence and the phenomenology of BDD in an Italian community sample and its associated clinical features such as self-esteem, perfectionistic traits, social anxiety, depressive, and obsessive-compulsive symptoms. Six hundred and fifteen community individuals completed a battery of self-report questionnaires assessing the above-mentioned clinical features. Results showed that 10 (1.63%) individuals met DSM-5 criteria (APA, 2013) for BDD. Hair ($n$ = 4; 4%), nose

(*n* = 4; 4%), and teeth (*n* = 4; 4%) were the most common areas of concern. With respect to the associated clinical features, individuals who satisfied BDD diagnostic criteria reported lower levels of self-esteem, more severe social anxiety symptomatology, general distress, depression, and obsessive-compulsive features than people without BDD. These findings outlined that, within the Italian context, BDD is a relatively common psychological disorder associated with significant morbidity.

The second study of the current dissertation focused on the shared clinical features between BDD and AN. Indeed, both the psychopathologies are severe body image disorders (Rosen, Reiter, & Orosan, 1995) characterized by body image disturbance and dissatisfaction, intrusive thoughts about appearance, and by an overemphasis on appearance in the evaluation of self-worth (Rosen & Ramirez, 1998). Furthermore, both BDD and AN are characterized by low self-esteem (Phillips, Pinto, & Jain, 2004; Rosen & Ramirez, 1998) and high levels of perfectionism (Bardone-Cone et al., 2007; Buhlmann, Etcoff, & Wilhelm, 2008; Bulik et al., 2003; Veale, 2004). Many studies underlined the high comorbidity between BDD and AN (Dingemans et al., 2012; Fenwick & Sullivan, 2011; Grant et al., 2002; Kollei, Schieber, Zwaan, Svitak, & Martin, 2013; Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006), and patients with AN frequently report nonweight-related body image concerns (Dingemans et al., 2012; Grant et al., 2002; Kollei et al., 2013). Furthermore, patients with AN and comorbid BDD report greater body image dissatisfaction and clinical symptomatology than those without comorbid BDD (Dingemans et al., 2012; Grant et al., 2002). Therefore, the first aim of this study was to assess the prevalence of BDD and the presence of nonweight-related body image concerns in patients with AN. Secondly, the study aimed at comparing patients with AN and nonweight-related body image concerns, patients with

weight-related body image concerns only and a healthy control group with respect to body image and psychological and psychopathological features. For these purposes, 61 patients with AN were divided in two groups: 39 with nonweight-related body image concerns and 22 with weight-related body image concerns only. Furthermore, a group of 61 healthy controls was recruited. Main results of this study showed that 16 (26.23%) patients with AN had probable comorbid BDD. The most common nonweight-related body image concerns were: hair (41.02%), nose (30.77%), skin (30.77%), teeth (25.64%), and height (20.51%). Moreover, patients with AN and nonweight-related body image concerns reported greater levels of psychopathology not related to eating disorder than patients with weight-related body image concerns only, in accordance with previous studies (Dingemans et al., 2012; Grant et al., 2002). In conclusion, patients with AN and nonweight-related body image concerns showed a more severe body image disturbance unrelated to a more severe eating disorder.

Lastly, the third study of the current dissertation aimed at assessing the prevalence of Muscle Dysmorphia (MD), its associated psychological features and possible predictors among 3 groups (N = 125) of Italian recreational athletes. MD is a subtype of BDD characterized by the preoccupation with the idea that one's body is not sufficiently lean and muscular (APA, 2013; Pope, Gruber, Choi, Olivardia, & Phillips, 1997); however, individuals with MD have a normal-looking body or are even very muscular, much more than the average of people (Pope et al., 1997). The first aim of this study was to explore the prevalence and the phenomenology of MD in 3 groups of Italian participants who trained regularly for recreational purposes: 42 bodybuilders, 61 strength trainers, and 22 fitness wellness trainers. Secondly, we aimed at investigating MD related behaviours and psychological features such as self-esteem, perfectionistic traits, social

anxiety and orthorexia nervosa symptoms, and general distress among groups. Lastly, we aimed at assessing the presence of associations between MD and related psychological features among the 3 groups and, with exploratory purposes, possible MD predictors among groups. Results revealed a MD prevalence of 6.4%: 4 participants (9.52%) in the bodybuilding group, 2 participants (3.28%) in the strength group, and 2 participants (9.09%) in the fitness/wellness group satisfied Pope et al. (1997) diagnostic criteria for MD. With respect to MD associated cognitive and behavioural symptoms, the bodybuilding group reported more frequently to think about taking anabolic-androgenic steroids (AAS), to assume more than 2 daily grams of proteins, and to experience more beliefs about being smaller and weaker than desired or wishes to be more muscular than the other groups, whereas this group reported more MD general symptomatology only with respect to the fitness/wellness group. Moreover, the strength group reported to set higher standards for themselves than the other two groups. Finally, different correlational patterns among group emerged, as well as different MD predictors. Specifically, social anxiety symptoms resulted significant predictors of MD symptomatology for both the bodybuilding and the strength group, whereas no predictors emerged for the fitness/wellness group. In conclusion, results of this study underlined that the pursuit of a lean and muscular physique in bodybuilding is not always associated with MD and related psychological features.

To conclude, this dissertation provides clinical hints as far as concern both preventive strategies and psychological treatment implications for BDD across at risk populations.

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# Part I- Literature review

# Chapter 1

# Body Dysmorphic Disorder

## 1.1 Description and diagnostic criteria of Body Dysmorphic Disorder

Body Dysmorphic Disorder (BDD) is a psychological disorder characterized by the persistent preoccupation with one or more perceived defects in physical appearance that are not observable or appear slight to others (American Psychiatric Association [APA], 2013). BDD was described for the first time in 1886 by Morselli (Phillips, 1991); the psychiatrist described patients who were obsessed about their ugliness even though their physical appearance was objectively normal (Allen & Hollander, 2000; Phillips, 1991). Morselli defined such condition "*dysmorphophobia*", a term coming from the word *dysmorphia,* which refers to "ugliness" (Phillips, 1991). A century after its first description, this condition was introduced in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; APA, 1980) and categorized as an atypical somatoform disorder until the 1987; indeed it was recognized as a distinct disorder and relabeled as BDD in the third revised edition of the DSM (DSM-III-TR; APA, 1987). Given that the presence of defects in physical appearance was the focus of concern, BDD was categorized as a somatoform disorder within the DSM-III-TR (1987); however, in light of the low comorbidity with others somatoform disorders and the shared clinical features with the obsessive-compulsive disorder (OCD), new theories about its classification were formulated (Neziroglu & Yaryura-Tobias, 1993; Phillips,

1998; Phillips & Diaz, 1997; Phillips, McElroy, Hudson, & Pope, 1995). Indeed, both BDD and OCD are characterized by persistent and recurrent obsessions and compulsions (Hollander, Neville, Frenkel, Josephson, & Liebowitz, 1992), and the relation between thoughts and behaviors in BDD appears similar to the relation between obsessions and compulsions in OCD (Bjornsson, Didie, & Phillips, 2010; Phillips, 2009; Phillips & Kaye, 2007). Compulsive behaviors arise in response to obsessive thoughts about appearance and they are meant to reduce anxiety (Phillips & Kaye, 2007). Moreover, the comorbidity between BDD and OCD is high (Brawman-Mintzer et al., 1995; Hollander, Cohen, & Simeon, 1993), and many studies have reported similar gender ratio, onset, and course of illness for these disorders (Phillips, 1991). These evidences led to a new classification of BDD, which is currently included into the "Obsessive-Compulsive and Related Disorders" category of the DSM-5 (APA, 2013) along with DOC, trichotillomania, hoarding disorder, and excoriation disorder.

The diagnostic criteria for BDD are the following (APA, 2013):

A. Preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others.

B. At some point during the course of the disorder, the individual has performed repetitive behaviors (e.g., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g., comparing his or her appearance with that of others) in response to the appearance concerns.

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

D. The appearance preoccupation is not better explained by concerns with body fat or weight in an individual whose symptoms meet diagnostic criteria for an eating disorder.

***Specify if:***

With muscle dysmorphia: The individual is preoccupied with the idea that his or her body build is too small or insufficiently muscular. This specifier is used even if the individual is preoccupied with other body areas, which is often the case.

***Specify if:***

Indicate degree of insight regarding body dysmorphic disorder beliefs (e.g., "I look ugly" or "I look deformed").

With good or fair insight: The individual recognizes that the body dysmorphic disorder beliefs are definitely or probably not true or that they may or may not be true.

With poor insight: The individual thinks that the body dysmorphic disorder beliefs are probably true.

With absent insight/delusional beliefs: The individual is completely convinced that the body dysmorphic disorder beliefs are true.

Individuals with BDD are concerned about the presence of one or more physical flaws that are not observable or appear slight to others (Criterion A). The most common areas of concern are the skin (e.g., scarring, acne, color), hair (e.g., going bald, excessive facial or body hair), and the nose (e.g., size or shape), although any body part can be the focus of concern (Phillips 2006; Phillips & Diaz 1997; Phillips, McElroy, Keck, Pope, & Hudson, 1993; Veale, Boocock et al., 1996). Concerns about appearance are intrusive, time-consuming, and usually difficult to resist or control (APA, 2013).

Repetitive behaviors or mental acts are performed in response to the appearance concerns (Criterion B) in order to reduce anxiety. Common behaviors are: checking perceived defects in mirrors or other reflecting surfaces; excessive grooming (e.g., combing, styling, shaving, plucking); camouflaging (e.g., covering disliked areas with clothing or makeup); seeking reassurance about the look of perceived flaws; and seeking cosmetic procedures (APA, 2013; Hollander et al., 1993; Phillips et al., 1993; Schieber, Kollei, De Zwaan & Martin, 2015). The most common mental act is to compare one's appearance with that of other individuals (APA, 2013; Neziroglu, Khemlani-Patel, & Veale, 2008; Phillips, Menard, Fay, & Weisberg, 2005). Criterion B was introduced in the DSM-5 (APA, 2013) in order to underline the shared features between BDD and OCD (Phillips et al., 2010).

The preoccupation must cause significant distress or impairment in social, occupational, or other important areas of functioning (Criterion C). BDD has a devastating impact on a patient's life, with hours being consumed by worry and efforts to camouflage the perceived defects (Allen & Hollander, 2000). As a result, patients with BDD are frequently unable to work, attend school or have relationships (Didie, Menard, Stern, & Phillips, 2008; Phillips, 2009).

The preoccupation is not better explained by concerns with body fat or weight in individuals whose symptoms meet diagnostic criteria for an eating disorder (ED; Criterion D). In particular, Criterion D indicates that a diagnosis of BDD cannot be provided if appearance concerns are better explained by concerns with body fat or weight in individuals whose symptoms meet diagnostic criteria for EDs (APA, 2013). However, the comorbidity of BDD and EDs is high (Dingemans, van Rood, de Groot, &

van Furth, 2012; Fenwick & Sullivan, 2011; Grant, Kim, & Eckert, 2002; Kollei, Schieber, Zwaan, Svitak, & Martin, 2013; Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006) and, in case of comorbidity, both disorders should be diagnosed (Ruffulo et al., 2006).

Finally, the DSM-5 criteria (APA, 2013) ask to specify the presence of Muscle Dysmorphia (MD) and the degree of insight. MD is a form of BDD characterized by concerns about the idea that one's body is too small or insufficiently muscular (Pope, Gruber, Choi, Olivardia, & Phillips, 1997). MD occurs almost exclusively in males, and individuals with this form of BDD actually have a normal-looking body or are even very muscular (Pope et al., 1997). As a result, individuals with MD may neglect important social or occupational activities because of the shame or the need to attend rigid diet and time-consuming workout (Olivardia, Pope, & Hudson, 2000; Phillips, O'Sullivan, & Pope, 1997; Pope et al., 1997). A majority of individuals with MD lift weights and work out excessively, sometimes causing body damage (Pope, Phillips, & Olivardia, 2000). People with MD can also use anabolic-androgenic steroids (AAS) in an attempt to make their body bigger and more muscular (Olivardia, 2001; Pope et al., 2000).

With respect to the degree of insight, it can range from good to absent; on average, insight in BDD is poor (Phillips, Menard, Pagano, Fay, & Stout, 2006). In other words, patients with BDD are convinced that their beliefs about appearance are accurate (Phillips, 2006). Moreover, patients with BDD are usually characterized by fluctuations in insight; they can be completely convinced about their ugliness at some times but not convinced in other moment (Phillips, 2005). Studies comparing patients suffering from delusional and nondelusional BDD have shown more similarities than differences

between these two groups; the primary differences were related to symptoms severity and suicidal attempts (APA, 2013; Mancuso, Knoesen, & Castle, 2010; Phillips, Menard, Pagano et al., 2006). Indeed, patients with delusional beliefs showed more severe BDD symptoms and were more prone to attempt suicide than patients with nondelusional BDD beliefs (Phillips, Menard, Pagano et al., 2006). Overall, delusional and nondelusional BDD may be considered presentations of the same disorder (Phillips, Menard, Pagano et al., 2006).

### 1.1.1 BDD by proxy

BDD by proxy (BDDBP) is a form of BDD in which the primary preoccupation involves perceived defects of another person who looks normal. Individuals with BDDBP are preoccupied with defects that they perceive in another person's appearance (APA, 2013; Bouman & Gofers, 2016; Greenberg et al., 2013). Therefore, the most salient discriminating feature between BDD and BDDBP is the focus of the preoccupation (oneself defects in BDD and another person's defects in BDDBP; Greenberg et al., 2013). BDDBP shares core phenomenological features with BDD, including the body parts focus of concerns (frequently skin and hair as in BDD), rituals, and avoidance behaviors; indeed, individuals with BDDBP engage in comparing, scrutinizing, and checking the other person's appearance, and most of them try to persuade the "person of concern" to perform excessive grooming, changing clothing, and camouflaging (Greenberg et al., 2013). The aim of these behaviors is to make the other person improving or beautifying his/her appearance in a way that matches the patient's desired image. Individuals with BDDBP may put a lot of pressure on the other person to conceal, inspect, or modify his/her perceived appearance flaws, or to seek medical consultations (e. g. with cosmetic surgeons and dermatologists; Greenberg et al.,

2013; Phillips, 2005); individuals with BDDBP may also insist that their loved one get unnecessary cosmetic surgery (Phillips, 2009).

### 1.2 Phenomenology

Individuals with BDD are concerned about the idea that some aspects of their appearance look defective, abnormal, or "not right" in some way (Phillips, 1998; 1999); they frequently describe their body areas focus of concern as unattractive and ugly or even disfigured and deformed (Phillips, 2004; 2005). Patients with BDD (approximately 2/3 of patients) “imagine” defects in the sense that they are concerned with something that other people do not perceive at all; therefore, the body areas focus of concern look normal to other people (Phillips, 2009). Sometimes, patients with BDD (approximately 1/3) may have a slight defect but they are excessively concerned with it and consider it ugly and clearly visible to others (Phillips, 2005). Therefore, individuals with BDD have a problem with their body image (i.e., with how they view their physical appearance) and not with how they actually look (Phillips, 2009).

Any body part can be the focus of concern, and frequently individuals with BDD may be concerned with multiple body parts at the same time (on average, with about five or six different body areas; Phillips et al., 1993; Phillips, Menard et al., 2005); these areas may also shift over time (Phillips & Diaz, 1997; Phillips, Menard et al., 2005). The perceived defects may be specific, such as a big nose, or general, such as being ugly (Veale, Boocock, et al., 1996). The most commonly areas focus of concern involve the face or hair, most often the skin (skin flaws, scars, blemishes, pallor, wrinkles and acne) or nose (Allen & Hollander, 2000; Phillips et al., 1993; Veale, Boocock, et al., 1996).

The majority of individuals with BDD have ideas of reference, believing that other people notice their perceived defects, react to such defects with disgust, and may humiliate them as a consequence of their ugliness (Phillips, McElroy, Keck, Pope, & Hudson, 1993). As a result, individuals with BDD limit social interactions and think about their perceived defects several hours each day (on average, 3-8 hours per day; Phillips, 1998). The obsessive thoughts about defects are distressing and associated with rejection sensitivity, low self-esteem, feelings of unworthiness and with anxiety and depression (Phillips, 2009; Rosen & Ramirez, 1998). In response to obsessive thoughts about appearance, individuals with BDD engage in repetitive and time-consuming behaviors linked to their appearance preoccupations and focused on examining, being reassured about, and hiding perceived defects (Phillips & Diaz, 1997; Phillips, Menard et al., 2005). Most of these behaviors (e. g. mirror checking and reassurance seeking) are considered compulsive because patients feel driven to perform them and find them hard to resist or control (Phillips, 2006; Phillips, Gunderson, Mallya, McElroy, & Carter, 1998). Other behaviors (e.g. camouflaging) may be defined as safety behaviors because they are performed in order to prevent something bad from happening, such as being humiliated or embarrassed by others (Phillips, 2009; Veale, 2004). Therefore, patients with BDD perform multiple compulsive and safety behaviors in order to reduce anxiety and other unpleasant emotions (Phillips & Diaz, 1997; Phillips & Kaye, 2007; Phillips, Menard et al., 2005); nevertheless, such behaviors usually increase anxiety and dysphoria (Neziroglu et al., 2008). The most common are: camouflaging (e. g., with hair, makeup, body position, or sunglasses), checking the perceived defects in mirrors or other reflecting surfaces (e. g., windows), excessively grooming (e. g., applying makeup or styling hair), seeking reassurance from family and friends about the defects and

repeatedly touching disliked areas (Phillips, 2009; Phillips & Diaz, 1997; Phillips, Menard et al., 2005; Veale & Riley, 2001; Veale, Boocock, et al., 1996). Moreover, patients with BDD may pick the skin in an attempt to improve defects; these behaviors, however, may cause damage such as skin infections (Grant, Menard, & Phillips, 2006; O'Sullivan, Phillips, Keuthen, & Wilhelm, 1999; Phillips & Taub, 1995). Behaviors are unlimited (Phillips, 1998) and can include seeking plastic surgery or cosmetic medical treatments in order to reduce the perceived defects (Crerand, Phillips, Menard, & Fay, 2005; Phillips, Grant, Siniscalchi, & Albertini, 2001); these procedures, however, are not beneficial (Crerand et al., 2005; Phillips et al., 2001). Individuals with BDD may also engage in mental actions such as comparing one's appearance with that of other people (Phillips, 2009; Phillips & Diaz, 1997; Phillips, Menard et al., 2005; Veale & Riley, 2001): they report to spend a lot of time comparing their body area of concern to the same area in other people. This mental act happens quite automatically, and can cause anxiety and difficulty to concentrate (Bjornsson et al., 2010).

Avoidance is another common behavior in BDD, and patients often engage in avoidance strategies in order to gain relief from BDD-related anxiety and distress (Kelly, Walters, & Phillips, 2010; Pinto & Phillips, 2005). For example, patients with BDD can avoid social situations because of the fear of being negatively judged by others as a consequence of their ugliness (Kelly et al., 2010). Avoidance, as well as compulsions, contributes to the chronicity and severity of BDD (Phillips, 2009; Veale, 2004).

### 1.3 Epidemiology and gender differences

Although BDD is thought to be a relatively common disorder (Crerand et al., 2005; Phillips et al., 2001; Veale, 2000; Veale, Boocock, et al., 1996), few prevalence studies exist, and prevalence rates appear to vary widely; this may be due to methodological differences between studies and by some limitations characterizing them (e.g., non-representative populations, different inclusion/exclusion criteria, and small sample sizes). Moreover, patients with BDD are secretive about their symptoms and reluctant to seek psychiatric treatment (Neziroglu & Yaryura-Tobias, 1993; Phillips, 1991) because they are afraid of drawing attention on their perceived defect or to appear vain (Fang & Wilhelm, 2015). As a consequence, they may not report BDD symptoms to clinicians (Bjornsson et al., 2010; Marques, Weingarden, LeBlanc, & Wilhelm, 2011); thus, BDD goes unrecognized and under-diagnosed (Bjornsson et al., 2010; Grant, Kim, & Crow, 2001; Marques et al., 2011; Phillips, 1998).

International studies based on general population reported prevalence rates ranging from 0.7% to 2.9% (Brohede, Wingren, Wijma, & Wijma, 2015; Buhlmann et al., 2010; Faravelli et al., 1997; Koran, Abujaoude, Large, & Serpe, 2008; Otto, Wilhelm, Cohen, & Harlow, 2001; Rief, Buhlmann, Wilhelm, Borkenhagen, & Brähler 2006; Schieber et al., 2015), and a recent review published by Veale, Gledhill, Christodoulou, & Hodsoll (2016) found an overall weighted prevalence of 1.9% in the community. In each studies both males and females were included, and the prevalence of BDD was found to be higher among females (2.1%) than males (1.6%), with a gender ratio of 1.27 (Veale et al., 2016). As far as concern nonclinical student samples, the prevalence of BDD ranges from 1.2% to 13% (Bartsch, 2007; Biby, 1998; Bohne, Whilelm et al., 2002; Boroughs, Krawczyk, & Thompson, 2010; Cansever, Uzun, Dönmez, & Özşahin 2003; Liao et al.,

2010; Sarwer et al., 2005; Taqui et al., 2008), whereas the overall weighted prevalence was 3.3%, with higher prevalence among females (3.6%) than males (2.2%) and a gender ratio of 1.64 (Veale et al., 2016). Given that patients with BDD frequently seek for cosmetic procedures (e.g. rhinoplasty, jaw surgery, collagen injections, and tooth whitening) in order to fix the perceived defects (Crerand et al., 2005; Crerand, Franklin, & Sarwer, 2006), many studies focused on BDD prevalence in cosmetic settings and found a wide range prevalence (from 6.3% to 53%; Altamura, Paluello, Mundo, Medda, & Mannu, 2001; Bellino et al., 2006; Dey et al., 2015; Pavan et al., 2006; Veale et al., 2014). In contrast with prevalence studies conducted on general and student populations, the prevalence of BDD in cosmetic settings is higher among males (15.3%) than females (10.9%), with a gender ratio of 0.71 (Veale et al., 2016). Focusing on specific cosmetic surgery, rhinoplastry is the surgical procedure with the highest prevalence rate of BDD, with rates ranging from 1.8% (Picavet et al., 2013) to 31.5% (Fathololoomi, Goljanian, Fattahi, Noohi, & Makhdoom, 2013), and a weighted prevalence of 20.1%. Within rhinoplastry settings, the prevalence of BDD is slightly higher among males (18.4%) than females (16.7%), with a gender ratio of 0.91 (Veale et al., 2016). Within dermatological settings the prevalence of BBD is high as well, with prevalence rates ranging from 4.2% (Dogruk Kacar et al., 2014) to 29.4% (Hsu, Ali Juma, & Goh, 2009), and a weighted prevalence of 11.3% (13.4% in females and 14.0% in males, with a gender ratio of 0.96; Veale et al., 2016).

With respect to gender prevalence, as reported, prevalence rates depend on the setting, with general and student populations studies reporting a slightly higher prevalence among females, whereas the opposite pattern has emerged in cosmetic settings (Veale et al., 2016). With respect to differences related to areas of concern, two studies

underlined that women were more likely to be concerned with skin, stomach, weight, breasts/chest, buttocks, legs, hips, and excessive body/facial hair than men (Phillips & Diaz, 1997; Phillips, Menard & Fay, 2006); moreover, women were excessively concerned with multiple body areas at the same time (Phillips & Diaz, 1997; Phillips, Menard & Fay, 2006). Women also performed more repetitive and safety behaviors compared to men (Phillips & Diaz, 1997; Phillips, Menard & Fay, 2006). In contrast, men were more likely to be concerned about their genitals, body build, and thinning hair/balding, and to engage in weight-lifting behaviors. With respect to comorbidity, women were more likely to suffer from an ED, whereas substance use disorder was more frequent in men (Phillips & Diaz, 1997; Phillips, Menard & Fay, 2006). The above mentioned gender differences reflect common concerns in our culture, suggesting that cultural norms and values may influence the content and the expression of BDD symptoms (Phillips & Diaz, 1997).

No gender differences has been reported in relation to age of onset; BDD usually begins during adolescence, with a mean age of onset of 16 years old (Coles et al., 2006) and a modal age of onset of 12-13 years old (Bjornsson et al., 2013). BDD may also be present in children; in these cases, symptoms consist in refusing to attend school and planning suicide (Albertini & Phillips, 1999). Early onset is associated with greater comorbidity (frequently anorexia nervosa [AN] or bulimia nervosa [BN]), and with a lifetime history of attempted suicide (Bjornsson et al., 2013). In both genders BDD presents a chronic and unremitting course, unless it is treated (Phillips & Diaz, 1997; Phillips, Menard, et al., 2005), with a low probability (20%) of full remission and high probability (42%) of relapse (Phillips, Menard, Quinn, Didie, & Stout, 2013). More severe BDD symptoms at pre-treatment, longer duration of BDD, and presence of one

or more comorbid personality disorders are relevant factors involved in BDD chronic course (Phillips, Pagano, Menard, Fay, & Stout, 2005).

### 1.4 Cosmetic procedures in BDD

Individuals with BDD frequently seek and receive cosmetic procedures and other related treatments to fix the perceived defects (Phillips et al., 2001); this means that, due to their poor insight (Phillips, Menard, Pagano et al., 2006), individuals with BDD seek cosmetic treatments for a psychological problem (Crerand et al., 2005; Phillips et al., 1993; Phillips, Dufresne, Wilkel, & Vittorio, 2000; Phillips et al., 2001; Sarwer, Wadden, Pertschuk, & Whitaker 1998; Uzun et al. 2003; Veale, Boocock et al., 1996). As mentioned above, a number of studies underlined the high prevalence of BDD in cosmetic settings (Aouizerate et al., 2003; Bellino et al., 2006; Castle, Molton, Hoffman, Preston, & Phillips, 2004; Dufresne, Phillips, Vittorio, & Wilkel, 2001; Ishigooka et al., 1998; Sarwer et al., 1998); dermatologists and plastic surgeons are the professionals most often consulted, even if any type of physician may be involved (e.g., endocrinologists to evaluate the excessive body hair or ophthalmologists to correct cross-eyed; Phillips, 1998). The most common cosmetic procedures required by patients with BDD are rhinoplasty, liposuction, and breast augmentation among surgical procedures; collagen injections and microdermabrasion among minimally invasive cosmetic procedures; and topical acne agents and hair treatment among dermatological treatments (Crerand et al., 2005). Despite the huge request of cosmetic treatments, several studies indicated that appearance-enhancing treatments do not typically result in a decrease of BDD symptoms severity (Crerand et al., 2005; Phillips et al., 1993;

Phillips et al., 2001). Rather, individuals with BDD are often dissatisfied with the results of cosmetic treatments, and some patients experience symptoms exacerbation and development of new appearance concerns (Crerand et al., 2005; Phillips et al., 2001; Veale, 2000; Veale et al., 1996). Given that BDD is a psychological condition, the area focus of concern may change over time, and this may explain why, after cosmetic surgery, the patient's focus of concern may shift to another body area (Veale, 2004). With respect to the small number of patients who reported improvement in perceived defects, some became anxious about how long the improvement would last (Crerand et al., 2005). Another issue is that patients with BDD can threaten or execute lawsuits against surgeons because of the dissatisfaction with their operations (Leonardo, 2001; Sarwer, 2002; Yazel, 1999); indeed, patients with BDD can feel angry with the surgeon for having make their appearance worse (Leonardo, 2001; Sarwer, 2002; Yazel, 1998) and may become violent (Phillips et al., 2001): indeed, several patients with BDD report fantasies about physically harming their surgeons (Phillips et al., 2001). The dissatisfaction related to the cosmetic procedures may also exasperate compulsive behaviours and the craving for more surgery (Phillips, 1998). In particular, Fukuda (1977) referred to patients with BDD as "polysurgery addicts". Is not uncommon that patients with BDD, when refused by a surgeon or when unable to afford a cosmetic treatment, engage in "Do It Yourself" ("DIY") surgery (Veale, 2000)."DIY" surgery is performed in order to alter dramatically one's physical appearance trying to achieve an unrealistic ideal by one's own hands (Veale, 2000). Therefore, "DIY" surgery is viewed as an extreme safety-seeking behaviour (Veale, 2000). Examples of "DIY" surgery described by Veale (2000) are: using a pair of pliers in an attempt to make the nose thinner, filed down teeth in order to alter the appearance of jaw-line, and use sandpaper

as a form of dermabrasion to remove scars and lighten the skin. Therefore, "DIY" surgery can be very extreme and dangerous for patients.

Because of the legal and personal safety issues associated with treating individuals with BDD and in light of the evidence that cosmetic treatments rarely improve BDD symptoms, there is growing consensus that BDD should be considered a contraindication for cosmetic treatments (Cotterill, 1996; Crerand et al., 2006; Honigman, Phillips, & Castle, 2004; Phillips, et al., 2001; Sarwer, 2002; Veale et al., 1996). Given that patients with BDD frequently seek cosmetic procedures, a psychological assessment is highly recommended for all patients requiring cosmetic procedures before undergoing treatment (Crerand et al., 2006); this assessment should avail of interviews and self-report questionnaires asking for the presence of BDD symptoms and cosmetic treatment-related expectations (Crerand et al., 2006). Many patients with BDD, indeed, have unrealistic expectations and believe that cosmetic treatments would change and improve their life (e. g. help them to obtain a new job or a partner; Veale, 2000).

### 1.5 Risky behaviours and quality of life in BDD

Suicidal ideation and attempts appear common in patients with BDD (Phillips, 1991; Phillips & Diaz, 1997; Phillips et al., 1993; Veale et al., 1996). Approximately the 80% of patients with BDD report past or current suicidal ideation, and about one quarter have attempted suicide due to BDD symptoms (Perugi et al., 1997). With respect to death by suicide, the study of Phillips and Menard (2006) documented 0.3% cases per year, a rate 45 times higher than the rate observed in the general population. Such an elevated rate

can be explained by BDD suicide risk factors, which include: high rates of psychiatric hospitalization; unemployment; being single or divorced; poor social supports; poor self-esteem; high levels of anxiety and depression; and feelings of shame and humiliation (Phillips, 2009; Phillips, Coles, et al., 2005). Therefore, patients with BDD must be carefully monitored for suicidality (Wilhelm, Phillips, & Steketee, 2013).

Approximately one third of patients with BDD show violent behaviors due to BDD symptoms (Phillips, 2009; Perugi et al., 1997). Violent behaviors may be elicited by anger about looking "deformed", inability to fix the defects, delusions of reference, feeling rejected by others because of the defects, and dissatisfaction with cosmetic procedures (Bjornsson et al., 2010; Leonardo, 2001; Sarwer, 2002; Yazel, 1999). Another concern is the use of alcohol or illegal substances in social situations in order to endure such situations (Veale & Neziroglu, 2010).

Although the level of functioning of patients with BDD varies, BDD nearly always causes marked functional impairment (Perugi et al., 1997; Phillips, 1991; Phillips et al., 1993). Most of the patients have impaired academic, occupational, or role functioning (such as being a parent) because of BDD obsessions and behaviors, that can diminish concentration and productivity (Phillips, 2009). Indeed, BDD can have a devastating impact on the patient's life with a number of hours per day consumed by worry, rituals, and efforts to camouflage (Allen & Hollander, 2000). As a consequence, patients frequently drop out of school or stop working (Phillips, 2009). A study by Phillips (2004) has shown that nearly the 30% of the patients with BDD had been completely housebound for at least one week, more than half had been psychiatrically hospitalized, and more than two thirds had experienced suicidal ideation due to BDD. Individuals with BDD also have markedly impaired psychosocial functioning. They may have few

or no friends, and may avoid situations such as dating, intimacy, and other social interactions that may expose or exacerbate the perceived defect or in which they feel particularly self-conscious about their appearance (Phillips, 1991). As a consequence, patients with BDD withdraw from interactions with others and have poor social lives, as well as social, school, and occupational performance (Allen & Hollander, 2000). Consequently, individuals with BDD usually report higher levels of perceived distress (Cotterill & Cunliffe, 1997; DeMarco, Li, Phillips, & McElroy, 1998) and markedly poorer quality of life than general population (Phillips, Quinn, & Stout, 2008). Moreover, patients with BDD appear to have poorer quality of life than either patients with major depression and dysthymia or patients with a medical condition such as type II diabetes or heart attack (Phillips et al., 2008).

### 1.6 Differential diagnosis and comorbidity

As reported above, BDD is usually missed or misdiagnosed as another disorder (Phillips, 2005; Phillips et al., 1993; Phillips, Nierenberg, Brendel, & Fava, 1996; Zimmerman & Mattia, 1998). A guiding principle for making a differential diagnosis of BDD is to assess whether the problem is due to one's perceived appearance defects (Fang & Wilhelm, 2015). Perhaps, the most important factor to consider in differential diagnosis is distinguishing BDD from normal concerns about appearance, given that the majority of the people are dissatisfied in some way with their appearances (Fitts, Gibson, Redding, & Deiter, 1989). Individuals with BDD are not only dissatisfied with some aspects of their appearance; rather, they are concerned about how they look (Phillips, 2005). Their concerns about appearance cause them extreme distress and functional

impairment and can lead to avoidance of many aspects of their life and to suicide attempts (Phillips et al., 2005). Moreover, patients with BDD describe this intense preoccupation as painful and tormenting (Allen & Hollander, 2000; Phillips, 2005). Therefore, BDD consists in an extreme body image distortion and dissatisfaction (Allen & Hollander, 2000), different from normal concerns about appearance.

Although BDD is often comorbid and share clinical features with other disorders such as Obsessive Compulsive Disorder (OCD), Major Depressive Disorder (MDD), Social Anxiety Disorder (SAD), and Anorexia Nervosa (AN; Gunstand & Phillips, 2003), it appears to be distinct from them (Phillips & Stout, 2006). Comorbidity is the rule, rather than the exception, in BDD (Gunstand & Phillips, 2003; Phillips, 2006; Phillips et al., 1993; Phillips et al., 2005), and the majority, and perhaps nearly all, patients with BDD have at least one comorbid condition (Hollander et al., 1993; Perugi et al., 1997; Phillips & Diaz, 1997). For example, the study of Zimmerman and Mattia (1998) found that patients with BDD were more likely than other psychiatric outpatients to have three or more comorbid axis I disorders. In one of the largest comorbidity studies ($n$ = 293) conducted in the US, the disorders most commonly associated with BDD were MDD (76%), SAD (37%), and OCD (32%; Gunstad & Phillips, 2003). Furthermore, many studies reported high comorbidity and shared clinical features with AN (Dingemans et al., 2012; Fenwick & Sullivan, 2011; Grant et al., 2002; Kollei et al., 2013; Ruffolo et al., 2006).

### *1.6.1 BDD and MDD*

Both BDD and MDD are disorders characterized by feelings of low self-esteem, shame, guilt, and unworthiness (Phillips, 1999; 2009; Phillips, Pinto, & Jain, 2004).

Furthermore, BDD and MDD share symptoms such as avoidance of social activities and being withdrawn (Veale & Neziroglu, 2010). Supporting the observed similarities, BDD and MDD are frequently comorbid; the study of Gustand and Phillips (2003) found, in a sample of patients with BDD, a current prevalence of 58% and a lifetime prevalence of 76% for MDD, and MDD was more than twice as common as any other Axis I disorder. Literature suggests that the onset of MDD most often occurs after the onset of BDD, consistently with clinical impressions that depression is often secondary to BDD (Phillips, 2005). In patients with MDD (especially the atypical subtype), a high lifetime prevalence of BDD ranging from 8% to 42% (Nierenberg et al., 2002; Perugi et al., 1997) has been observed. In this regard, the study of Phillips and Stout (2006) highlighted that improvements in BDD and MDD were closely linked in time, with significant associations in both directions: improvement in MDD predicted BDD remission, and improvement in BDD predicted MDD remission.

Although the shared features and the high comorbidity between BDD and MDD support the existence of an association between these disorders, important differences exist, suggesting that BDD is not simply a symptom of depression (Phillips, 1999). A notable difference is the presence of prominent obsessional preoccupations and repetitive compulsive behaviors related to appearance concerns in BDD (Phillips, 1991; 2006). On the contrary, patients with MDD do not perform time-consuming, repetitive, and compulsive behaviors (Phillips, 1991; 2006), and frequently neglect how they look rather than becoming obsessed about their appearance as patients with BDD. Additional differences include an earlier age of onset and more chronic illness in patients with BDD than patients with MDD (Phillips, 1991; 2006).

### *1.6.2 BDD and SAD*

Many studies documented a strong link between BDD and SAD in terms of demographic and clinical characteristics, course and onset, and treatment outcomes (Fang & Hofmann, 2010; Kelly et al., 2010). Specifically, BDD and SAD share similar gender ratio, onset in early adolescence, a chronic course, and common clinical features such as poor insight and risk for suicidal behaviors (Coles et al., 2006; Fang & Hofmann, 2010; Pinto & Phillips, 2005). BDD and SAD also share a bias for information processing, because in both disorders ambiguous social situations are interpreted in negative ways (Amin, Foa, & Coles, 1998; Buhlmann, McNally, Wilhelm, & Florin, 2002). Furthermore, either patients suffering from BDD and patients suffering from SAD appear to benefit from the same treatments: Cognitive Behavior Therapy (CBT) and Selective Serotonin Reuptake Inhibitors (SSRIs; Heimberg et al., 1998; Pinto & Phillips, 2005; Veale, Gournay, et al., 1996). Etiological models of BDD (Neziroglu et al., 2008; Veale, 2004; Veale & Gilbert, 2014) also show strong theoretical overlap with models of SAD (Clark & Wells, 1995; Rapee & Heimberg, 1997). For example, cognitive-behavioral models of BDD emphasize that the dysfunctional cognitive processes (such as self-focused attention and negative appraisals of body image processes) and maladaptive behaviors (such as compulsive and safety behaviors) that maintain BDD are consistent with processes that are proposed to maintain SAD (Fang, Sawyer, Aderka, & Hofmann, 2013; Hofmann, 2007; Rapee & Heimberg, 1997). In both BDD and SAD, the mental representation of the self (as an aesthetic object in BDD and as a social object in SAD) might be generated from both internal (e.g., physical symptoms) and external environmental (e.g., facial expressions) cues (Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997; Veale, 2004).

As a consequence, concerns about defects in physical appearance in BDD may be associated with the fear of negative evaluation by others, which is also the core feature of SAD (Fang & Hofmann, 2010). Indeed, both BDD and SAD are characterized by fear of negative evaluation in social situations (Buhlmann et al., 2002; Pinto & Phillips, 2005), avoidance of social interactions (Phillips & Diaz, 1997), as well as fear of embarrassment and social rejection (Wilhelm, Otto, Zucker, & Pollack, 1997). Given the above-mentioned similarities, BDD and SAD are commonly comorbid. In patients with SAD, BDD current prevalence ranges from 5% to 12% (Brawman-Mintzer et al., 1995; Wilhelm et al., 1997); in patients with BDD the current prevalence of SAD ranges from 31% to 34.3% (Coles et al., 2006; Gunstad & Phillips, 2003; Phillips & Stout, 2006), and the lifetime prevalence ranges from 12% to 69% (Gunstad & Phillips, 2003; Hollander et al., 1993; Phillips & Diaz, 1997; Phillips et al., 2005; Veale et al., 1996; Zimmerman & Mattia, 1998).

Despite the several similarities, BDD and SAD are distinct disorders. The reasons of concerns are different: patients with BDD are concerned about their perceived defects and, as a consequence, fear negative evaluation by others; patients with SAD are concerned about being negatively evaluated in social situations (Chosak et al., 2008; Moutier & Stein, 1999). Moreover, compulsive behaviors aimed at hiding, improving, or checking perceived defects are a prominent feature of BDD and not a diagnostic feature of SAD (Phillips, 2009). Understanding whether the fear of being negatively evaluated by others is specifically due to one's appearance rather than representing a more general concern about being embarrassed in social situations is the main issue to be taken into account for differential diagnosis (Fang & Wilhelm, 2015).

### *1.6.3 BDD and OCD*

BDD and OCD are related conditions presenting similar phenomenological features (Phillips et al., 2007; 2010). These disorders are both characterized by persistent and intrusive preoccupations that are obsessional in nature, accompanied by repetitive/ritualistic behaviors and, sometimes, by a desire to have things "just right" (Phillips et al., 1998). For example, individuals with BDD experience recurrent and intrusive preoccupations about their perceived physical defects, which are similar to the obsessions experienced by patients with OCD, followed by ritualistic behaviors (e.g. mirror checking and reassurance seeking; Phillips et al., 1993; Veale & Riley, 2001) that are similar to compulsions of OCD (Buhlmann et al., 2002; Perugi et al., 1997; Phillips et al., 1993). The similarity of BDD and OCD is also supported by comparable descriptive characteristics such as early onset, chronic course (Phillips, 1996; Phillips et al., 2007) and treatment response profiles (CBT and SSRIs; Hollander et al., 1999; McKay, Neziroglu, & Yaryura-Tobias, 1997; Neziroglu & Yaryura-Tobias, 1993; Phillips, 1998; Phillips, Kim, & Hudson, 1995; Veale, Gournay et al., 1996). In addition, symmetry concerns, perfectionism, and avoidance are observed in both patients with BDD and patients with OCD (Nakata et al., 2007; Phillips et al., 2007). Supporting the observed similarities, a number of studies have reported elevated comorbidity rates between BDD and OCD (Gunstad & Phillips, 2003); the current prevalence of BDD in patients with OCD ranges from 3.8% to 15.3% (mean = 9%; Brakoulias & Starcevic, 2011; Brawman-Mintzer et al., 1995; Stewart, Egan Stack, & Wilhelm, 2008), whereas the lifetime prevalence ranges from 3% to 16% (mean =10.4%; Bienvenu et al., 2000; Bienvenu et al., 2012; Costa et al., 2012; Jaisoorya, Reddy, & Srinath, 2003; Lochner & Stein, 2010; Phillips et al., 1998; Simeon, Hollander, Stein, Cohen, & Aronowitz, 1995;

Wilhelm et al., 1997). On the other hand, the current prevalence of OCD in patients with BDD ranges from 16.7% to 37% (mean = 25.7%; Gunstad & Phillips, 2003; Hollander et al., 1999; Zimmerman & Mattia, 1998), whereas the lifetime prevalence ranges from 14% to 43% (mean =27.5%; Altamura et al., 2001; Gunstad & Phillips, 2003).

Despite the above-mentioned similarities, BDD and OCD present also significant clinical differences (Frare, Perugi, Ruffolo, & Toni, 2004). Unlike compulsions in OCD, BDD rituals are performed in order to hide, improve, or check the perceived defects (Fang & Wilhelm, 2015): a diagnosis of BDD should be given if a patient's obsession is focused on appearance (Allen & Hollander, 2000). Moreover, patients with BDD have poorer insight and greater delusional endorsement (Labuschagne, Castle, Dunai, Kyrios, & Rossell, 2010) than patients with OCD (Frare et al., 2004; Phillips, McElroy et al., 1995), and are more likely than patients with OCD to present lifetime suicidal ideation, lifetime MDD and lifetime Substance Use Disorder (SUD; Phillips et al., 2007).

### *1.6.4 BDD and AN*

BDD and AN are both severe body image disorders (Rosen, Reiter, & Orosan, 1995) characterized by body image disturbance and dissatisfaction and by an overemphasis on appearance in the evaluation of self-worth (Rosen & Ramirez, 1998). Both disorders involve intrusive thoughts about appearance and are characterized by repetitive checking behaviors (e.g. mirror checking) and avoidance (e.g.. places, activities, and ways of dressing that might provoke self-consciousness about appearance; Phillips, Kim et al., 1995; Rosen & Ramirez, 1998). BDD and AN share common descriptive characteristics, such as early age of onset and chronic course, as well as personality

dimensions such as high harm avoidance, neuroticism, perfectionism, and low self-directedness (Hartmann, Greenberg, & Wilhelm, 2013). Furthermore, body image disturbance appears to be a crucial factor involved in both the disorders (Hartmann et al., 2013; Hrabosky et al., 2009; Kollei et al., 2013). With respect to comorbidity, the current prevalence of BDD in patients with AN ranges from 9.8% to 46% (Digenmans et al., 2012; Grant et al., 2002; Gupta & Johnson, 2000; Fenwick & Sullivan, 2011; Kollei et al., 2013), with a lifetime prevalence of 15.7% (Kollei et al., 2013). Concerning the prevalence of AN in patients with BDD, the study of Ruffolo and colleagues (2006) reported a current prevalence of 2% and a lifetime prevalence of 9%.

Despite BDD and AN have similarities as well as many areas of overlap, they also have important differences. Important differences regard, for example, demographic features: the 90% of patients with AN are females, whereas BDD is characterized by a more balanced gender ratio (Hartmann et al., 2013). Furthermore, patients with AN and patients with BDD differ with respect to reasons of concern about appearance: indeed, while individuals with AN are concerned about being too fat despite they are dangerously underweight, patients with BDD have appearance concerns with regard to their face, skin, or other specific body areas frequently unrelated to weight (Hartmann et al., 2013). Therefore differential diagnosis can be made, in the first place, by assessing the areas of concern and the presence of an eating pathology, which is more atypical in BDD (Fang & Wilhelm, 2015).

## 1.7 Etiology

The etiology of BDD is multifactorial and several key factors involved in its development have been identified: the disorder is the manifestation of multiple biological, psychological, and sociocultural factors playing a role in its etiology (Wilhelm, 2006). These factors probably interact in a complex way to produce BDD, and no one alone is sufficient to produce the disorder. First, genetic predisposition, neuroanatomical differences, and neurotransmitters alterations can contribute to the development of BDD. Furthermore, psychological factors such as early life experiences (e.g. teasing or bullying) and personality traits (e.g. perfectionism and aesthetic sensitivity) might also facilitate its development (Weiffenbach & Kundu, 2015). Lastly, society and media could be further crucial contributors (Phillips, 2009).

### *1.7.1 Biological factors*

#### *Genetics*

Genetic factors play an important role in the etiology of BDD, as evidenced by its pattern of heritability (Bienvenu et al., 2000). The eight percent of individuals with BDD have a family member with a lifetime diagnosis of BDD, which is 4 to 8 times the prevalence of BDD in the general population (Feusner, Yaryura-Tobias, & Saxena, 2008). The disorder is not caused by one single gene: many different genes act together to increase the chance of getting BDD (Phillips, 2009). Nonetheless, a preliminary genetic study has found that the gamma-aminobutyric acid (GABA) A-γ2 gene was more common in people with BDD than in those without BDD (Phillips et al., 2015).

***Neuroanatomy***

A complex interplay of dysfunctions in several neural regions and systems of the brain is involved in BDD (Phillips, 2009). Brain imaging studies have suggested that BDD may be characterized by an impairment of the frontal-striatal and temporo-parietal-occipital circuits which process facial images and emotional information. A preliminary volumetric magnetic resonance imaging (MRI) study found leftward shift in caudate volume asymmetry and greater total white matter volume in eight women with BDD than in eight female controls (Rauch et al., 2003). A functional imaging study of patients with BDD, using single photon emission computed tomography (SPECT), showed relative perfusion deficits in bilateral anterior-medial temporal and occipital regions and asymmetric perfusion in parietal lobes in individuals with BDD (Carey, Seedat, Warwick, van Heerden, & Stein, 2004). A functional imaging study compared patients with BDD to healthy controls in the visual information processing of faces (Feusner, Townsend, Bystritsky, & Bookheimer, 2007). Patients with BDD and healthy controls underwent functional magnetic resonance imaging (fMRI) while matching photographs of faces. Participants with BDD showed greater left hemisphere activity in the lateral prefrontal cortex and lateral temporal lobe than healthy controls; these areas are specialized for detail-focused visual processing and greater left-sided activity suggests a predominance of detail encoding and analysis (Feusner et al., 2007). These laterality patterns in participants with BDD suggest a bias for local, or detail-oriented, processing of faces than healthy controls. Another finding emerged in the group with BDD was an abnormal activation of the amigdala. The results of this fMRI study suggested that participants with BDD present differences from healthy controls in visual processing, with different laterality of activation patterns in areas representing an

extended visual processing network and abnormal amigdala activation (Feusner et al., 2007).

***Neurotransmitters***

Several studies have investigated the role of serotonin (5-HT) in BDD and found that individuals with BDD may have an imbalance in the brain chemical serotonin (Barr, Goodman, & Price, 1992; Marazziti et al., 1999; Phillips, 2009). Marazziti and colleagues (1999) studied platelet 5-HT transporter binding density in patients with BDD and found significantly lower platelet 5-HT transporter binding density in individuals with BDD than healthy controls. Additional indirect evidence of the involvement of serotonergic transmission in BDD comes from several open and controlled treatment studies that demonstrated that high-dose SSRIs (Phillips & Najjar, 2003; Phillips, Albertini, & Rasmussen, 2002) are effective for treating BDD.

### *1.7.2 Psychological*

***Early life experiences***

Extensive research has shown that childhood experiences may increase the risk of developing BDD (Phillips, 2009). The importance placed on physical appearance by family may increase the chance to develop BDD because the child learns that physical appearance is very important and to associate physical attractiveness with being desirable or successful, or with getting attention or other rewards for being pretty or cute (Phillips, 2009). Appearance-based teasing during childhood may be another risk factor for BDD (Feusner, Neziroglu, Wilhelm, Mancusi, & Bohon, 2010). Appearance-based teasing may have a long-term impact on an individual; once the negative association is made between one's appearance features and others' reactions, everyday

interactions and experiences may continue to imprint these thoughts and emotions, which may be theorized to contribute to symptoms of BDD (Wilhelm, 2006). Two studies have demonstrated that individuals with BDD retrospectively reported greater appearance-based teasing during childhood than healthy controls (Buhlmann, Cook, Fama, & Wilhelm, 2007). Trauma, abuse, and neglect may also represent possible risk factors for BDD. One study found that 38% of individuals with BDD reported some form of abuse during childhood (e.g. emotional abuse, sexual abuse, physical abuse; Neziroglu, Khemlani-Patel, & Yaryura-Tobias, 2006). Consistently, another study observed that the 78.7% of individuals with BDD reported a history of childhood maltreatment (e.g. emotional neglect, emotional abuse, physical abuse, physical neglect, and sexual abuse; Didie et al., 2006).

***Personality traits***

Specific personality traits may represent potential risk factors for BDD. Specifically, perfectionism and aesthetic sensitivity are considered vulnerability factors for BDD (Veale, 2004; Wilhelm, 2006). Research suggests that individuals with BDD often display perfectionistic thinking, including distorted beliefs about attractiveness (Buhlmann, Etcoff, & Wilhelm, 2008; Schieber, Kollei, de Zwaan, Müller, & Martin, 2013; Veale, Boocock et al., 1996). Perfectionism might increase selective attention to slight appearance defects and determine preoccupation and dissatisfaction thus leading to bad feelings and distress; therefore, individuals with BDD are unable to tolerate their imperfections (Wilhelm, 2006). Perfectionism may also increase BDD symptoms given the typical discrepancy in patients with BDD between their actual self and their ideal self (how they think they actually look and how they ideally would like to look; Veale, Kinderman, Riley, & Lambrou, 2003).

In addition to perfectionism, Veale (2004) considers aesthetic sensitivity as a specific risk factor for BDD. Aesthetic sensitivity is based on Harris' concept of "aestheticality" (Harris, 1982) and refers to awareness and appreciation of beauty and harmony (Veale & Neziroglu, 2010). The sense of "aestheticality" is inborn and varies among individuals; therefore, individuals differ in their view of beauty due to variability in the aesthetic sensitivity. Individuals with a high sense of aestheticality are more self-conscious of abnormalities of appearance (Harris, 1982), which can lead to feelings of irritation and, by focusing on these symptoms, even BDD. Individuals with BDD overemphasize the importance of appearance and aesthetic, are aesthetically sensitive, demonstrate great aesthetical skills and set high aesthetic standards (Veale & Lambrou, 2002). Furthermore, they view themselves as an aesthetics object (Veale & Riley, 2001).

### *1.7.3 Sociocultural*

Society's messages about the importance of appearance may contribute to the development of BDD (Phillips, 2009). Constantly, the media reinforce the importance of appearance and, at the same time, create unrealistic expectations about beauty (Veale & Neziroglu, 2010). As a result, about a quarter of people with BDD declared that the society's focus on appearance is one of the major reasons of their BDD symptoms (Phillips, 2009). Therefore, the media may enforce unrealistic beauty expectations and lead to the maintenance of BDD. However, sociocultural and media pressures are unlikely to be the only cause for BDD; BDD has been described since the 1800s, long before the media and advertising (Phillips, 2009). In addition, BDD occurs in societies where the media are less powerful or even absent (Phillips, 2005).

### *1.7.4 Cognitive-behavioral models of BDD*

Cognitive-behavioral models of BDD incorporate biological, psychological, and sociocultural factors in the development and maintenance of BDD (Neziroglu et al., 2008; Neziroglu, Roberts, & Yaryura-Tobias, 2004; Veale, 2004). Although the models of Veale (2004) and Neziroglu et al. (2008) are specific for BDD, they include many elements of Cash's (2002, 2008) model of body image disturbance.

#### *Veale's cognitive-behavioral model (2004)*

The model of BDD proposed by Veale (2004) focuses on the experience of patients when they are alone. Veale (2004) claimed that the cycle begins when an external representation of the individual's physical appearance (e.g. looking in a mirror or looking at an old photograph) or an intrusive thought activates a distorted mental image. The external representation or the intrusive thought may trigger a process of self-focused attention with the outcome of "self as an aesthetic object". Therefore, individuals with BDD view themselves as an aesthetic object. The self-focused attention increases awareness of the image and of specific features and body parts; the image is used to construct how the person looks and provides information about how the person appears to others from an observer perspective (Osman, Cooper, Hackmann, & Veale, 2004). An observer perspective consists of the individual looking at himself or herself from another person's perspective; patients with BDD may use the observer perspective in order to avoid emotions associated with negative evaluative experiences (as a sort of "detachment" strategy). Therefore, the observer perspective may become a maintaining factor given that it allows avoiding negative emotions. The process of selective attention appears to be focused on specific features and body parts, leading to a heightened

awareness and amplification of given features, which contribute to the development of a distorted body image. The next step is the negative appraisal and aesthetic judgment of the image, by activation of assumptions and values about the importance of physical appearance. In individuals with BDD, appearance is over-identified with the self and at the centre of a "personal domain" (Veale, 2002). At the centre of a personal domain there are a person's characteristics, her/his physical attributes, her/his goals and values. The idealized value in BDD is the importance of physical appearance but other values may include perfectionism, symmetry or youth; such values reinforce the view of herself/himself as an aesthetic object. The model predicts that the activation of the negative appraisals have a negative feedback and increase self-focused attention on the image and body parts. This leads to a negative aesthetic appraisal and comparisons of three different images: the external representation (mirror or photograph), the ideal body image, and the distorted body image. These repeated comparisons have a negative feedback and increase negative appraisals and self-focused attention on the image leaving the patient uncertain about his or her appearance, which encourages further mirror gazing. The patient's desire to see exactly how he or she looks is only rewarded by looking in the mirror. However, the longer the person looks, the worse he or she feels and the more the belief of ugliness and defect is reinforced.

Emotions in BDD are based on the appraisal of the situation. The most common emotions are shame (or self-disgust) when individuals compare and rank their appearance as lower than others; external shame and anticipatory social anxiety based on judgments about how others are likely to humiliate or reject them; depression and hopelessness due to the failure to reach the aesthetic standard; anger and frustration at oneself for damaging his or her appearance (e.g. skin-picking, cosmetic surgery) and

because others do not understand their concerns; guilt at damaging one's appearance either by oneself or seeking cosmetic surgery. Increases in emotional arousal increase the frequency or severity of negative appraisals of one's body image and increase self-focused attention in a negative feedback loop. Safety behaviors are performed to reduce the risk of danger aiming at damage-limiting self-presentations (Gilbert, 2000).

The model also claims the existence of another important negative feedback loop: safety behaviors may briefly decrease distress but are counter-productive and increase self-awareness, preoccupation, and negative appraisal. Furthermore, safety behaviors involve mental efforts which means less attention for external information; often lead to further monitoring (e.g. mirror checking to determine if the camouflage is "working"); may make one's appearance worse; and increase attention by others to one's appearance.

***Neziroglu et al. (2008)'s model***

Neziroglu et al. (2008)'s model emphasizes evaluative (classical) and operant conditioning in the development and maintenance of BDD. According to Neziroglu et al. (2008), early experiences may play an important role in the development of BDD. Early experiences that positively reinforce the individual for the importance of physical appearance (or for the importance of particular body parts) may reinforce the belief that appearance is very important. For a significant portion of individuals with BDD, appearance was one of the factors most frequently reinforced during their childhood (Neziroglu et al., 2004). Also aversive early experiences (for example teasing, neglect, bullying) may condition the individual to the negative affect when he/she observes his/her body parts in later life (Cash, Winstead, & Janda, 1986; Osman et al., 2004;

Rieves & Cash, 1996; Veale, 2004; Zimmerman & Mattia, 1998). Vicarious learning (Bandura, 1977) could also play a role because it gives further confirmation that appearance is an important trait valued in society. Indeed, a child can learn that physical attractiveness leads to rewards: besides the individual's socio-cultural environment, one's family can provide numerous learning opportunities as well.

BDD might begin with classical conditioning experiences. Aversive events involving one's physical appearance, such as being teased, may serve as unconditioned stimuli (UCS) because they cause an unconditioned emotional response (UCR) such as depression, anxiety, disgust, or shame. The UCS can cause an aversive reaction and then, when paired with a neutral stimulus (CS), elicits the same reaction. In other words, the teasing becomes associated with a word or body part (an aversive stimulus; CS) that is then also evaluated as negative. Therefore, both the UCS and CS evoke emotions such as anxiety, depression, and disgust. It can be hypothesized that a biological predisposition, early childhood reinforcement history, and vicarious learning are necessary for the development of BDD. The combination of these factors may cause an increased sensitivity to this type of classical conditioning events. BDD is then maintained though operant conditioning, specifically by negative reinforcement, because aversive emotions are reduced by avoidance and safety behaviors. These avoidance behaviors are self-regulatory processes that function as a dysfunctional coping mechanism to avoid, escape, or manage body image discomfort (Cash, 2008). Therefore, patients with BDD may engage in safety behaviors in order to reduce disgust, anxiety, or negative feelings. In conclusion, the model of Neziroglu and colleagues (2008) suggests that a biological predisposition paired with early learning experiences make individuals vulnerable to evaluative conditioning experiences that can lead to

BDD symptomatology. Moreover, according to the model, BDD behaviors are maintained via negative reinforcement.

# Part II: Empirical Research

# Chapter 2

# Prevalence of Body Dysmorphic Disorder and its associated psychological features in an Italian community sample

## 2.1 Introduction

Body Dysmorphic Disorder (BDD) is a psychological disorder characterized by preoccupation with one or more perceived defects in physical appearance that are not observable to others. To be diagnosed, the preoccupation must cause significant distress or impairment. Moreover, during the course of the disorder, individuals must perform repetitive behaviours or mental acts in response to the appearance concerns (American Psychiatric Association [APA], 2013). The most common areas of concern in people with BDD are the skin (presence of acne or scars), the hair (hair loss, thinning, or excessive facial or body hair) and the nose (shape or size; Phillips 2006; Phillips & Diaz 1997; Phillips et al., 1993; Veale, Boocock et al., 1996). Appearance concerns, however, may involve any body areas (Phillips, 2006; Phillips et al., 1993; Veale, 2000), and individuals with BDD may be concerned with multiple body parts at the same time (Phillips et al., 1993; Phillips et al., 2005).

In addition to core concerns about appearance, BDD is characterized by low self-esteem, high perfectionism, time-consuming repetitive behaviours (e.g., mirror checking,

camouflaging, reassurance seeking), avoidance (e.g., of social situations, mirrors) and high comorbidity (Phillips, 2006; Phillips et al., 1993; Phillips et al., 2004; Phillips et al., 2005). Low self-esteem is often implicated in body image disorders, and several studies found that low self-esteem is associated with poor body esteem (Biby, 1998), especially in females (Thompson & Altabe, 1991). Indeed, Rosen and Ramirez (1998) found lower levels of self-esteem in patients with body image disorders (e.g., eating disorders and BDD) compared to a control group. Conversely, Silberstein and colleagues (1988) did not find a relationship between self-esteem of women who wanted to be thinner and women that reported satisfaction with the shape of their body, and Bohne, Keuthen, Wilhelm, Deckersbach, & Jenike (2002) did not find significant differences in the level of self-esteem between people who met criteria for BDD and people who did not. It is therefore important to clarify the relation between self-esteem and body dissatisfaction.

Similarly to low self-esteem, perfectionism may be a risk factor for the development of body image disorders (Andreasen & Bardach, 1977; Bartsch, 2007; Hanstock & O'Mahony, 2002). In support of this association, Buhlmann, Etcoff and Wilhelm (2008) found higher levels of perfectionism in patients with BDD compared to healthy control participants. Moreover, there is anecdotal clinical evidence that BDD patients are often characterized by thoughts such as ''As long as I don't look perfect, I won't be able to be happy'' (Buhlmann, Etcoff, & Wilhelm, 2008) and "I have to have perfection in my appearance" (Veale, Boocock, et al., 1996). Several studies have attempted to investigate which components of perfectionism are implicated in BDD. A study conducted by Veale and colleagues (2003) revealed that BDD was related to high self-standards of perfectionism, whereas another study conducted by Hanstock and

O'Mahony (2002) found that dysmorphic concerns were associated with socially prescribed perfectionism.

With respect to comorbidity, in one of the largest comorbidity study ($n$ = 293) conducted in the US, the most common disorders associated with BDD were Major Depressive Disorder (MDD; 76%), Social Anxiety Disorder (SAD; 37%), and Obsessive Compulsive Disorder (OCD; 32%; Gunstad & Phillips, 2003). Notably, all of these disorders share clinical features with BDD. Feelings of low self-esteem, shame, guilt, and unworthiness are frequently reported by patients with both BDD and MDD, consistent with the association between these conditions (Phillips, 1999). Importantly, the study of Phillips and colleagues (1995) found, in a sample of patients with BDD, a current prevalence of 59% and a lifetime prevalence of 83% for MDD. BDD also shares clinical features with SAD: both disorders are characterized by fear of negative evaluation in social situations (Buhlman et al., 2002; Pinto & Phillips, 2005), as well as avoidance of social interactions (Phillips & Diaz, 1997). Furthermore, several studies observed that people with BDD report higher levels of social anxiety symptoms than nonclinical controls (Pinto & Phillips, 2005; Veale et al., 2003). Regarding similarities between BDD and OCD, both disorders are characterized by intrusive thoughts and ritualistic behaviours that cause distress and interference with the person's functioning (Hollander et al., 1992). Moreover, BDD and OCD have been found to often co-occur (Gunstad & Phillips, 2003).

Although BDD is thought to be a relatively common disorder (Crerand et al., 2005; Phillips et al., 2001; Veale, 2000; Veale, Boocock et al., 1996), few prevalence studies exist and the observed rates widely vary, which may be due to methodological differences and limitations (e.g., non-representative populations and small sample sizes).

International studies based on general population reported a BDD prevalence ranging from 0.7% to 2.9% (Brohede et al., 2015; Buhlmann et al., 2010; Faravelli et al., 1997; Koran et al., 2008; Otto et al., 2001; Rief et al., 2006; Schieber et al., 2015). Recently, Veale and colleagues (2016) published a review based on BDD prevalence and found an overall weighted prevalence of 1.9% in the community. Among nonclinical student samples, the prevalence of BDD ranges from 1.2% to 13% (Bartsch, 2007; Biby, 1998; Bohne, Whilelm et al., 2002; Boroughs et al., 2010; Cansever et al., 2003; Liao et al., 2010; Sarwer et al., 2005; Taqui et al., 2008).

Despite increased awareness of BDD in recent years, it continues to be an under-studied disorder (Buhlmann & Winter, 2011; Buhlmann et al., 2010), particularly in the Italian context. Indeed, to the Authors' knowledge, only one study has explored the prevalence of BDD in the Italian general population, and found a prevalence of 0.7% (Faravelli et al., 1997). This study, however, focused on the Diagnostic and Statistical Manual of Mental Disorders, third edition revised (DSM-III-R; APA, 1987) criteria, in which BDD was included in the somatoform disorders category (APA, 1987). Therefore, the main purpose of the present study was to explore the prevalence and the phenomenology of BDD in an Italian community sample. Little is known about BDD in the Italian context, and there are no data available on BDD prevalence rates using DSM-5 (APA, 2013) criteria. Shedding light on the prevalence of BDD in the Italian context might improve assessment and treatment methodologies, as well as raise awareness about this under-diagnosed disorder. Given that no Italian standardized measures to assess BDD were available, two *ad hoc* self-report instruments were developed. The *Body Dysmorphic Questionnaire* (BDQ) was developed as a screening tool to assess DSM-5 (APA, 2013) criteria for BDD; therefore, it was employ to identify participants with probable BDD.

In order to assess BDD clinical features we developed the *Questionario sul Dismorfismo Corporeo* (QDC). Therefore, before the assessment of BDD prevalence and phenomenology, a preliminary aim of the present study was to investigate the QDC psychometric properties and its sensitivity and specificity in identifying individuals with probable BDD.

The second aim of the present study was to investigate self-esteem, perfectionistic traits, social anxiety, depressive, and obsessive-compulsive symptoms in participants with probable BDD compared to participants without BDD. In accordance with previous results (Biby, 1998; Phillips et al., 1993), we expected lower levels of self-esteem and higher perfectionistic traits, as well as higher social anxiety and depressive features in participants with probable BDD relative to participants without BDD, since these features frequently co-occur with dysmorphic concerns. Moreover, we expected higher OCD features in people with probable BDD compared to participants without BDD due to the overlap in the clinical features between BDD and OCD.

## 2.2 Methods

### *2.2.1 Participants and procedure*

In response to newspaper advertisements for volunteers for psychological research, 615 community individuals (69.4% female; all Caucasian) were recruited from different towns across Northern and Southern Italy. All individuals participated on a voluntary basis and provided their written informed consent before entering the study. Participants were requested to individually complete a battery of self-report measures which was counter-balanced to control for order effects. The study was conducted in accordance

with the Declaration of Helsinki and was approved by the institutional board of the University of Padova. The mean age of the sample was 30.51 (SD = 13.26; range = 18-71) and the mean age of education was 13.45 (SD = 2.33; range = 3-26). Marital status was 62.28% married or cohabitating, 34.15% single, 3.25% separated or divorced, and 0.32% widowed. The employment profile of the total sample was: 59.35% student, 21.30% full-time employed, 7.15% part-time employed, 2.93% full-time homemaker, 1.79% unemployed, 1.30% retired, and 6.18% other. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### *2.2.2 Measures*

All participants completed a socio-demographic schedule including information about gender, age, education and occupation, as well as about the presence of any medical or mental disorder, in order to assess Criterion D of the DSM-5 (APA, 2013) for BDD. Because no Italian standardized measures assessing BDD were available, two *ad hoc* self-report instruments were developed: the Body Dysmorphic Questionnaire (BDQ) and the Questionario sul Dismorfismo Corporeo (QDC).

The *Body Dysmorphic Questionnaire* (BDQ) is a self-report questionnaire assessing DSM-5 (APA, 2013) diagnostic criteria for BDD. The questionnaire is made up of 5 dichotomous items. The first item assesses the presence of concerns with one or more perceived defects in physical appearance that are not observable or appear slight to others. If the answer is positive, the participant is required to list the areas of concerns and the degree of dissatisfaction. The second item evaluates the presence of repetitive behaviours (e.g. mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g. comparing appearance with that of others) in response to

the appearance concerns. Two positive answers are required to continue the questionnaire. The third question asks whether the main source of concern is not being thin enough or being too fat. The aim of this item is the exclusion of participants when an eating disorder might be a more accurate diagnosis. The fourth question assesses the presence of significant distress or impairment in social and occupational functioning and the presence of avoidant behaviours due to the appearance concerns. Finally, the last item measures the time daily spent thinking about supposed defects. Phillips (1998) suggested that the time spent by thinking about the perceived defects should be at least 1 hour every day. A positive screen for BDD is obtained if participants report positive answers to questions one, two and four. Moreover, a negative answer to question number three is required. Finally, in accordance with Phillips (1998) advice, participants should spend at least 1 hour per day thinking about perceived defects.

The *Questionario sul Dismorfismo Corporeo* (QDC) is a self-report questionnaire made up of 40 items assessing BDD clinical features. The QDC was developed based on BDD literature to capture BDD phenomenology, symptoms, and related clinical features. Notably, several international self-report questionnaires assessing BDD are currently available; nonetheless, they are characterized by some lacks. In particular, the most commonly used self-report questionnaires to assess BDD in the international context are the Body Dysmorphic Disorder Questionnaire (BDDQ; Phillips, 2005), the Body Image Disturbance Questionnaire (BIDQ; Cash, Phillips, Santos, & Hrabosky, 2004), and the Dysmorphic Concern Questionnaire (DCQ; Oosthuizen, Lambert, & Castle, 1998). The BDDQ (Phillips, 2005) is a brief self-report questionnaire to screen for BDD according to the DSM-IV diagnostic criteria (APA, 1994), comprising 4 items with a yes/no response format; therefore, since the primary function of the BDDQ is to screen

clinically for BDD, it does not provide a dimensional measure of BDD symptoms severity. In an attempt to overcoming this limitation, Cash and colleagues (2004) developed the BIDQ, which is made up of 7 items assessing a continuum of body image disturbance. However, the BIDQ lacks in the assessment of important areas related do BDD such as the requirement of aesthetical surgical procedures to fix the defects and the presence of repetitive behaviors or mental acts in response to the appearance concerns. Finally, the DCQ (Oosthuizen et al., 1998) is made up of 7 items assessing overconcern with physical appearance, without seeking to establish a diagnosis of BDD. In general, the DCQ attempts to capture the nature of dysmorphic concerns, as well as past attempts to deal with the problem. However, important areas of BDD such as repetitive behaviors and mental actions performed in response to the appearance concerns, suicidal thoughts related to the appearance concerns and impairment in social functioning are not investigated by DCQ.

The QDC was developed to overcome the limitations characterizing such measures and to broadly assess BDD symptomatology. Indeed, the QDC takes into account different aspects of BDD (e.g. mental actions and repetitive behaviors, suicidal thoughts, request for cosmetic procedures, impairment in different areas of functioning), whereas the other already available measures were designed to focus only on specific aspects of BDD or were developed in accordance with different conceptualizations of the disorder (Cororve & Gleaves, 2001). As a matter of fact, most of the available measures assessing BDD focus on the BDD features overlapping with OCD, EDs, and delusions and overvalued ideas (Cororve & Gleaves, 2001). Furthermore, such measures were developed before the new categorization of BDD as an OCD-related disorder within the DSM-5 (APA, 2013).

Items of the QDC are rated on a 7-point Likert scale (from 1 = "strongly disagree" to 7 = "strongly agree"), with higher scores representing more severe BDD symptomatology. As above-mentioned, the QDC evaluates the presence of typical behaviours associated with BDD, such as repetitive behaviours (e. g., mirror checking, excessive grooming, reassurance seeking), mental acts (e. g. comparing the "defective" body areas with the same body areas of other people), and avoidant behaviours related to appearance concerns. Finally, the QDC also assesses the request of cosmetic and surgical procedures and suicidal thoughts due to appearance concerns.

The *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965; Italian version by Prezza et al., 1997) consists of 10 items measuring global self-esteem. Items are rated on a 4-point Likert scale (from 1= "strongly disagree" to 4 = "strongly agree"), with higher scores representing positive self-esteem. Good internal consistency values have been reported for the original RSES, ranging between $\alpha = .77$ and $\alpha = .88$ (Dobson, Goudy, Keith, & Powers, 1979; Fleming & Courtney, 1984; Robinson et al., 1991). The Italian version also showed good psychometric properties: its internal consistency was $\alpha = .84$ and the 15-days test-retest reliability was $r = .76$ (Prezza et al., 1997). Internal consistency coefficient was excellent in the present sample ($\alpha = .90$).

The *Multidimensional Perfectionism Scale* (MPS; Hewitt & Flett, 1991) is a 45 items self-report questionnaire assessing three different domains of perfectionism: self-oriented, socially prescribed and other-oriented. Each sub-scale of the questionnaire contains 15 items evaluated on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7), with higher scores relating to greater levels of perfectionism. Good internal consistency values have been reported for the original MPS, ranging between $\alpha = .79$ and $\alpha = .89$ in a student sample (Hewitt & Flett, 1991). The Italian

validation of the MPS is not available to date, therefore an *ad hoc* translation was employed. In the present sample, the alpha coefficient was .90 for the self-oriented scale, .84 for the socially prescribed scale and .78 for the other-oriented perfectionism scale.

The *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998; Italian version by Sica et al., 2007) is a 19-item self-report measure designed to assess social interaction anxiety on a 5-point Likert scale ranging from 0 ("not at all characteristic of true of me") to 4 ("extremely characteristic of true of me"); higher scores indicate higher levels of social interaction anxiety. The SIAS showed strong psychometric properties (Mattick & Clarke, 1998), including high internal consistency ($\alpha$ = .94) and 1 month test-retest stability ($r$ = .92). The Italian version proved to be highly reliable and stable as well (Sica et al., 2007). In the present study, the alpha coefficient for the SIAS was excellent ($\alpha$ = .93).

The *Depression Anxiety Stress Scale* (DASS; Lovibond & Lovibond, 1995; Italian version by Bottesi et al., 2015) is a 21 items self-report questionnaire designed to assess depression, anxiety, and stress on a 4-point Likert scale (ranging from 0 to 3), with higher scores indicating greater levels of distress. Three subscale scores as well as a "general distress" total score can be computed (Bottesi et al., 2015). The original DASS-21 demonstrated adequate reliability, with coefficient alphas ranging from .73 to .81 in non-clinical samples (Lovibond & Lovibond, 1995). The Italian version proved to be highly reliable as well, with internal consistency ranging from $\alpha$ = .74 and $\alpha$ = .90 (Bottesi et al., 2015). Given that findings on the Italian version suggested that use of the total score, measuring a "general distress" factor, could be more appropriate than calculating the three subscale scores separately (Bottesi et al., 2015), for the purpose of

the presence research we focused only on the total score of the questionnaire and on depression subscale. The alpha coefficient for the total DASS was .94, whereas the alpha coefficients for the DASS depression subscales was α = .88.

The *Obsessive Compulsive Inventory-42* (OCI-42; Foa et al., 1998; Italian version by Sica et al., 2009) is a 42-item self-report questionnaire assessing the frequency and distress caused by OCD symptoms. Each item is rated on a 5-point Likert scale (0–4), and the questionnaire is made up of 7 subscales: washing, checking, ordering, obsessing, doubting, mental neutralizing, and hoarding. Internal consistency values of the original version were good (α = .86 to .95; Foa et al., 1998), as were those observed in an Italian clinical group (α = .77 to .94; Sica et al., 2009). In the present study only distress associated with obsessions and compulsions was taken into account since the two scales (frequency and distress) have been demonstrated to yield redundant information (e.g., Foa et al., 2002; Wu & Watson, 2003). The OCI was preferred over the shorter version composed by 18 items (OCI-R) because previous investigations showed that the brevity of the OCI-R scales may be of concern especially for an excessive restriction of score range (Ghisi et al., 2010; Sica et al., 2012). In the present study, the alpha coefficient for the total OCI distress was .95, whereas alpha coefficients for the OCI subscales ranged from .70 to .87.

*2.2.3 Statistical Analyses*

Preliminary, to test the factorial structure of the QDC, a principal components factor analysis (PCA) was conducted. The number of factors identified was based on an examination of eigen values greater than one and on the scree plot. Cronbach's alpha coefficient was computed to evaluate internal consistency; an alpha of .70 or above was

used as a cut point (Cronbach, 1951). Test-retest reliability was analyzed using Pearson's product-moment correlation. Subsequently, the Receiver Operating Characteristic (ROC) curve analysis was performed and specificity and sensitivity at each possible cut-off point were calculated in order to establish the optimal QDC cut-off value.

With respect to the main purposes of the study, participants were classified as ''probable BDD'' if they fulfilled the diagnostic criteria for BDD evaluated by the BDQ. For these participants, descriptive analyses (frequencies and percentages) were conducted in order to assess the most frequently areas of concern, distress experienced and avoidance behaviours. Then, participants with probable BDD were compared with participants without BDD on demographic variables, psychological and psychopathological features performing a non-parametric Mann-Whitney *U*-test. Individuals with probable BDD were significantly younger than those without BDD (see Results section), and Pearson's correlations between age and scores obtained on dependent variables were performed on the whole sample. Only one significant correlation emerged: Age was negatively correlated with the QDC ($r = -.36$, $p < .001$). Non-parametric Mann-Whitney *U*-tests were performed in order to compare the two groups (probable BDD vs. without BDD) on psychological and psychopathological measures. Furthermore, in light of correlational findings, a non-parametric Mann-Whitney *U*-test was performed on the QDC score considering only the 18-28 range for age.

Conventional significance levels were used ($p < .05$). All statistical analyses were conducted using IBM Statistical Package for Social Science, version 21, and MedCalc.

## 2.3 Results

### *2.3.1 Preliminary analyses: QDC psychometric properties*

*Exploratory factor analysis*

An exploratory factor analysis using the principle-axis factor extraction was conducted on the total sample (N = 615), to determine the factor structure of the QDC. Results revealed a one-factor solution to best explain the data. This factor accounted for the 36.7% of the variance, whereas the second factor explained only the 5% more of the total variance. Therefore, the one-factor solution was the best to explain the data.

*Internal consistency and test-retest reliability*

Reliability analysis on the total sample (N = 615) resulted in an internal consistency of Cronbach's $\alpha = .95$, indicating strong internal consistency. No item diminished the scale's overall reliability, thus indicating good to excellent internal consistency (Table 1). One hundred and sixty-three participants completed the QDC 1 month after the first administration; an excellent test-retest reliability value emerged ($r = .91$, $p < .001$; first administration: M = 105.86; SD =37.54; second administration: M = 100.62; SD = 38.73).

**Table 1.**

Internal consistency variations

| Item | Variation of internal consistency |
|---|---|
| QDC1 | .95 |
| QDC2 | .94 |
| QDC3 | .95 |
| QDC4 | .94 |
| QDC5 | .95 |
| QDC6 | .94 |
| QDC7 | .94 |
| QDC8 | .95 |
| QDC9 | .94 |
| QDC10 | .94 |
| QDC11 | .95 |
| QDC12 | .95 |
| QDC13 | .94 |
| QDC14 | .95 |
| QDC15 | .95 |
| QDC16 | .94 |
| QDC17 | .94 |
| QDC18 | .94 |
| QDC19 | .95 |
| QDC20 | .95 |
| QDC21 | .95 |
| QDC22 | .95 |
| QDC23 | .95 |
| QDC24 | .94 |
| QDC25 | .95 |
| QDC26 | .95 |
| QDC27 | .94 |
| QDC28 | .95 |
| QDC29 | .95 |
| QDC30 | .95 |
| QDC31 | .95 |
| QDC32 | .95 |
| QDC33 | .94 |
| QDC34 | .94 |
| QDC35 | .95 |
| QDC36 | .94 |
| QDC37 | .95 |
| QDC38 | .95 |
| QDC39 | .95 |
| QDC40 | .94 |

*ROC analysis and cut-off value*

The ROC curve for participants is represented in Figure 1. The Area Under the Curve (AUC) was 0.908 (95% CI = 0.881-0.930; $p < .001$) indicating that QDC is an accurate diagnostic test (Streiner & Cairney, 2007). In order to establish the optimal cut-off value, we analyzed both specificity and sensitivity at each possible cut-off point (Table 2). The best performance of the QDC in discriminating between participants with and without BDD is reached at the cut-off point of > 130 (specificity = 83.48; sensitivity = 90.00).

**Figure 1.**

ROC curve

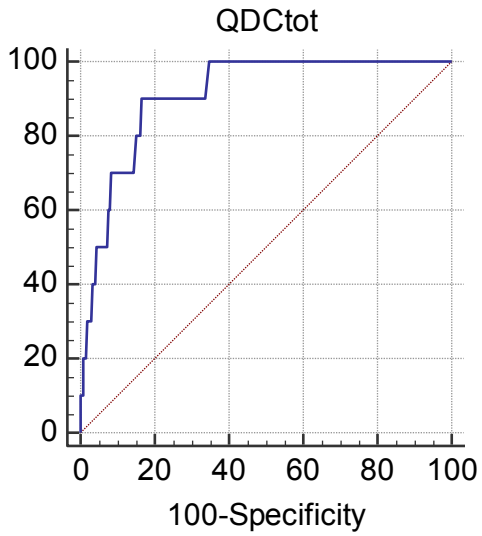

**Table 2.**

Criterion values and coordinates of the ROC curve for QDC

| Criterion | Sensitivity | 95% CI | Specificity | 95% CI | +LR | -LR | +PV | -PV |
|---|---|---|---|---|---|---|---|---|
| ≥ 40 | 100,00 | 69,2 - 100,0 | 0,00 | 0,0 - 0,6 | 1,00 | | 1,6 | |
| >105 | 100,00 | 69,2 - 100,0 | 65,20 | 61,1 - 69,1 | 2,87 | 0,00 | 4,5 | 100,0 |
| >106 | 90,00 | 55,5 - 99,7 | 66,08 | 62,0 - 70,0 | 2,65 | 0,15 | 4,2 | 99,7 |
| >130* | 90,00 | 55,5 - 99,7 | 83,48 | 80,2 - 86,4 | 5,45 | 0,12 | 8,3 | 99,8 |
| >131 | 80,00 | 44,4 - 97,5 | 83,83 | 80,5 - 86,8 | 4,95 | 0,24 | 7,6 | 99,6 |
| >132 | 80,00 | 44,4 - 97,5 | 84,71 | 81,5 - 87,6 | 5,23 | 0,24 | 8,0 | 99,6 |
| >133 | 70,00 | 34,8 - 93,3 | 85,41 | 82,2 - 88,2 | 4,80 | 0,35 | 7,4 | 99,4 |
| >151 | 70,00 | 34,8 - 93,3 | 91,74 | 89,2 - 93,9 | 8,47 | 0,33 | 12,3 | 99,5 |
| >152 | 60,00 | 26,2 - 87,8 | 92,09 | 89,6 - 94,2 | 7,59 | 0,43 | 11,2 | 99,3 |
| >153 | 60,00 | 26,2 - 87,8 | 92,44 | 90,0 - 94,5 | 7,94 | 0,43 | 11,6 | 99,3 |
| >154 | 50,00 | 18,7 - 81,3 | 92,62 | 90,2 - 94,6 | 6,77 | 0,54 | 10,1 | 99,1 |
| >169 | 50,00 | 18,7 - 81,3 | 95,43 | 93,4 - 97,0 | 10,94 | 0,52 | 15,3 | 99,1 |
| >170 | 40,00 | 12,2 - 73,8 | 95,78 | 93,8 - 97,3 | 9,48 | 0,63 | 13,6 | 99,0 |
| >181 | 40,00 | 12,2 - 73,8 | 96,66 | 94,8 - 98,0 | 11,98 | 0,62 | 16,6 | 99,0 |
| >182 | 30,00 | 6,7 - 65,2 | 96,84 | 95,0 - 98,1 | 9,48 | 0,72 | 13,6 | 98,8 |
| >191 | 30,00 | 6,7 - 65,2 | 97,89 | 96,3 - 98,9 | 14,23 | 0,72 | 19,1 | 98,8 |
| >192 | 20,00 | 2,5 - 55,6 | 98,24 | 96,8 - 99,2 | 11,38 | 0,81 | 15,9 | 98,7 |
| >207 | 20,00 | 2,5 - 55,6 | 99,12 | 98,0 - 99,7 | 22,76 | 0,81 | 27,4 | 98,7 |
| >208 | 10,00 | 0,3 - 44,5 | 99,12 | 98,0 - 99,7 | 11,38 | 0,91 | 15,9 | 98,5 |
| >215 | 10,00 | 0,3 - 44,5 | 99,65 | 98,7 - 100,0 | 28,45 | 0,90 | 32,0 | 98,5 |
| >218 | 0,00 | 0,0 - 30,8 | 99,65 | 98,7 - 100,0 | 0,00 | 1,00 | 0,0 | 98,4 |
| >228 | 0,00 | 0,0 - 30,8 | 100,00 | 99,4 - 100,0 | | 1,00 | | 98,4 |

*2.3.2 Prevalence of BDD*

Ten participants (1.63%) [95% confidence interval (CI) .63–2.63%] fulfilled all the diagnostic criteria for BDD. Among the 10 participants who met criteria for probable BDD, 9 were females. Participants with probable BDD were aged between 18 and 28 years old (M = 20.70; DS = 2.71), and the educational level ranged between 11 and 22 years (M = 14; DS = 2.98). Six participants with probable BDD were single, 3 were partnered and 1 was married. Nine participants with probable BDD were students and 1 had a part-time job. Two probable BDD participants indicated concern with one aspect of appearance. For the remaining 8 participants, the number of physical flaws ranged

from 2 to 6. Hair ($n$ = 4; 4%), nose ($n$ = 4; 4%) and teeth ($n$ = 4; 4%) were the most common areas of concern, followed by skin ($n$ = 2; 2%), legs ($n$ = 2; 2%), breasts ($n$ = 2; 2%), lips ($n$ = 1; 1%), ankles ($n$ = 1; 1%), stomach ($n$ = 1; 1%), height ($n$ = 1; 1%), chin ($n$ = 1; 1%), arms ($n$ = 1; 1%), hips ($n$ = 1; 1%), feet ($n$ = 1; 1%), and thighs ($n$ = 1; 1%). The most common consequence of preoccupation was significant distress, which was referred by 90% of the participants who fulfilled the BDD diagnostic criteria. Avoidant behaviours were reported by 50%, social impairment by 40% and occupational impairment by 30% of the participants. Nine participants reported to spend 1 to 3 hours per day thinking about the defects and 1 participant reported to spend more than 3 hours per day thinking about it. Two participants sought cosmetic surgery for their nose and one underwent to chemical peel treatments for skin.

### *2.3.3 Differences between participants who met the criteria for probable BDD and those who did not*

Differences in age were found between participants who met criteria for probable BBD and those who failed to meet the criteria ($U$ = 1370.50; $p$ = .003). Individuals with probable BDD were younger (M = 20.70; SD = 2.71) than individuals who did not meet criteria for BDD (M = 30.67; SD = 13.67). No other demographical differences emerged between the groups ($p$ > .05). With respect to psychological and psychopathological features, participants with probable BDD scored significantly higher than those without BDD on the QDC, $U$ = 1370.5, $p$ < .001. Conversely, participants with probable BDD scored significantly lower on the RSES than those without BDD, U = 1349.5, p = .003. With respect to perfectionistic traits, no differences between groups emerged on any of the MPS subscales (p > .05). The probable BDD respondents scored significantly higher than those without on the SIAS, $U$ = 1729, $p$ = .03, on the DASS-21

depression subscale, $U$ = 1406, $p$ = .02, and on the total score of the DASS-21, $U$ = 1288.5, $p$ = .01. Regarding the obsessive-compulsive symptomatology measured by the OCI-42, probable BDD respondents scored higher on the washing, $U$ = 1680.5, $p$ = .02, checking, $U$ = 1627.5, $p$ = .01, doubting, $U$ = 1928.5, $p$ = .04, ordering, $U$ = 1628, $p$ = .01, obsessing, $U$ = 1422, $p$ = .02, and neutralizing subscales, $U$ = 1795.5, $p$ = .03. Moreover, probable BDD participants scored higher also on total OCI-42 score, $U$ = 1003.5, $p$ = .002 (Table 3).

**Table 3.**

Comparison between individuals with probable BDD and individuals without BDD on psychological and psychopathological features

| | **Individuals with probable BDD (N = 10) M (SD)** | **Individuals without BDD (N = 605) M (SD)** |
|---|---|---|
| **QDC** | 164.60 (35.98) | 94.65 (37.41) |
| **RSES** | 25.60 (5.64) | 31.34 (5.59) |
| **MPS Self-Oriented** | 72 (19.63) | 60.89 (17.71) |
| **MPS Other-Oriented** | 55.60 (10.96) | 50.50 (12.57) |
| **MPS Socially Prescribed** | 55.40 (16.77) | 47.31 (13.64) |
| **DASS depression** | 8.22 (6.12) | 4.06 (3.97) |
| **DASS total score** | 24.22 (13.42) | 13.74 (10.45) |
| **SIAS** | 32.70 (16.38) | 21.93 (12.98) |
| **OCI washing** | 8.70 (7.63) | 3.90 (4.97) |
| **OCI checking** | 6.90 (4.70) | 3.95 (4.61) |
| **OCI doubting** | 2.60 (2.01) | 1.56 (2.21) |
| **OCI ordering** | 5.50 (4.17) | 3.06 (3.78) |
| **OCI obsessing** | 11.89 (8.78) | 5.31 (5.44) |
| **OCI hoarding** | 2.40 (2.12) | 1.84 (2.20) |
| **OCI neutralizing** | 4.20 (3.29) | 2.41 (2.74) |
| **OCI total score** | 43.44 (23.27) | 22.09 (20.43) |

## 2.4 Discussion

BDD is a debilitating disorder that is still under-recognized and often inadequately treated in Italian clinical settings, despite its severity and its growing prevalence. To our

knowledge, this is the first study assessing the prevalence and the phenomenology of BDD in an Italian community sample according to the DSM-5 criteria (APA, 2013).

With respect to the preliminary aim of the present study, the QDC showed one factorial structure and excellent internal consistency (α = .95), indicating that the items of the QDC converge to the same construct. Furthermore, the QDC demonstrated excellent one-month test-retest reliability (*r* = .91), indicating that the measure scores are stable after a month. The QDC also demonstrated high sensitivity and specificity with a cut-off point of > 130, indicating that individuals who score 130 or above should be referred for further assessment because may be at risk for developing BDD. In light of these findings, the QDC appears a reliable and valid measure to assess BDD in the Italian context.

With respect to the main aim of the present study, assessing BDD prevalence, the current study found a prevalence of 1.63%. Similar rates were obtained in previous studies conducted in Germany with a representative sample of the general population (1.7%, Rief et al., 2006; 1.8%, Buhlmann et al., 2010) and in Sweden within a representative sample of women (2.1%; Brohede et al., 2015). Moreover, we found a BDD prevalence closed to the overall weighted prevalence in the community found by Veale and colleagues (2016). Interestingly, we found a BDD prevalence rate slightly higher than the one emerged in Faravelli and colleagues (1997; 0.7%) among Italian general population. The slightly higher prevalence found in our study could be explained by methodological and sample differences. Specifically, Faravelli and colleagues (1997) utilized structured interview and applied DSM-III-TR (APA, 1987) criteria. Alternatively, this result could be explained by a higher interest in physical appearance in our contemporary culture relative to two decades ago when Faravelli and

colleagues (1997) conducted their study. On the other hand, our rate is slightly lower compared to studies conducted with students, for example, Biby (1998; 13%), Bohne, Keuthen et al. (2002; 4%), and Cansever et al. (2003; 4.8%). These differences may be explained, once again, by sampling and methodological variation. The high prevalence of BDD rates in students can be explain by the fact that young people are vulnerable with respect to the development of body image disorders, since adolescence is the time when individuals are most sensitive to their appearance (Phillips, Didie et al., 2006; Veale, Boocock et al., 1996). Consistent with this proposed vulnerability, participants who fulfilled diagnostic criteria for BDD were younger than people who did not and 9 of the 10 individuals who fulfilled BDD criteria were students.

Concerning gender prevalence in our study, the 90% of participants with probable BDD were female. This prevalence ratio is different compared to other studies that have reported an equal gender ratio (Phillips, 1991; Phillips & Diaz, 1997), but consistent with several other studies about BDD (Bartsch, 2007; Biby, 1998; Phillips et al., 1993; Phillips et al., 2005; Veale, Boocock et al., 1996) and with studies that underlined that women are generally more dissatisfied with their appearance than men (Cash, 1990; Davis & Cowles, 1991; Rozin & Fallon, 1988). To note, studies that found equal gender ratios assessed individuals seeking psychological treatment and not general population. Another possible (and presumably related) explanation for the difference in gender ratio, as reported by Phillips and Diaz (1997), might be the illness severity. It is possible that mild BDD might be closely related to normal appearance concerns, and that among individuals with milder BDD, women predominate.

With respect to phenomenology, people who satisfied BDD criteria reported multiple areas of concern, ranging between 2 to 6. The most disliked body parts were the hair, nose and teeth. These results are in accordance with studies conducted with general population and with clinical samples and reporting that head and face in general are the most common areas of concern in patients with BDD (Cansever et al., 2003; Phillips et al., 1993; Rief et al., 2006; Veale, Boocock et al., 1996). With respect to skin concerns, our study found a lower prevalence of dissatisfaction with the skin than other studies. This result may reflect a cross-cultural difference in the phenomenology of BDD, given that cultural-specific factors may influence the clinical expression of BDD (Phillips, 2005). Understanding cultural factors that influence the expression of BDD may have relevant implications for diagnosis and treatment of BDD (Perugi et al., 1997). Moreover, in accordance with other literature studies, participants who fulfilled BDD criteria reported significant distress (90%; Bjornsson et al., 2010) and social and occupational impairment (respectively, 40% and 30%; Didie et al., 2008). Finally, consistent with previous findings, participants reported spending many hours every day thinking about the presence of defects in physical appearance (Veale, 2004).

With respect to self-esteem, participants who satisfied BDD criteria were found to have lower self-esteem than people who did not. This result is in accordance with the study of Rosen and Ramirez (1998) that found low self-esteem in patients with body image disorders. Moreover, this result is in line with the study of Buhlmann, Teachman and colleagues (2008) that assessed explicit and implicit self-esteem in people with BDD, subclinical BDD and healthy controls. Buhlmann, Teachman and colleagues (2008) found that self-esteem represent a step-wise function of BDD status, with individuals with subclinical BDD scoring intermediate between healthy controls and patients with

BDD. Finally, many studies found that low self-esteem was correlated with poor body esteem (Biby, 1998; Bohne, Wilhelm et al., 2002). Therefore, a deficiency in self-esteem might be essential for the development and course of body image disorders (Grubb et al., 1993).

Given that perfectionism may play a key role in the development of body image disorders (Andreasen & Bardach, 1977; Bartsch, 2007; Hanstock & O'Mahony, 2002), we assessed the presence of differences in self-oriented, socially prescribed-oriented and other-oriented perfectionism. Results of our study showed no differences in terms of perfectionism between people who satisfied BDD criteria and people who did not. These results are different from previous studies reported in the literature, given that many studies indicated that at least one of the three dimensions of perfectionism is higher in people with BDD than in general population (Buhlmann, Etcoff, & Wilhelm, 2008; Veale, Boocock et al., 1996). These results, however, should be interpreted with caution given that the group of individuals who satisfied BDD criteria was small; furthermore, the questionnaire we used to assess perfectionism is still being validated in the Italian context. Lastly, given that no other studies about BDD psychological features in Italian population are available, cross-cultural differences related to perfectionism may explain this result and, therefore, perfectionism might not be such a relevant trait in the development and maintenance of BDD in the Italian population.

With respect to psychopathological features, as expected, people who satisfied BDD criteria reported higher levels of social anxiety characteristics than people who did not, in accordance with studies that underlined the presence of social anxiety symptomatology in people with BDD (Pinto & Phillips, 2005; Veale et al., 2003). Fang and Hofmann (2010) reported that concerns about defects in physical appearance in

BDD people may be likely associated with the fear of negative evaluation by others, which also is the core feature of social anxiety disorder. People who satisfied BDD criteria also reported greater levels of depressive features and general distress than people who did not, as expected and in accordance with literature studies (Biby, 1998; Phillips, 1999; Phillips et al., 1995). In fact, BDD is a severe condition impairing the individual's life in many domains (Phillips, 2004) and BDD and MDD frequently co-occur (Phillips, 1999). The study by Gunstad and Phillips (2003) revealed that MDD most often occurred after the onset of BDD, consistently with clinical impressions that depression could be often secondary to BDD. Finally, people who satisfied BDD criteria reported more OCD features than people who did not. This was expected and is consistent with studies that underlined the presence of higher OCD symptoms in patients with BDD (Bohne, Wilhelm et al., 2002; Gunstad & Phillips, 2003). This finding is in line with the new categorization of BDD in the fifth edition of the DSM as a disorder related to OCD (APA, 2013). BDD and OCD, in fact, share clinical features and the study by Biby (1998) and of Bohne, Wilhelm et al. (2002) showed that body image dissatisfaction was related to high obsessive-compulsive tendencies. Therefore, our study underscores that, also in the Italian context, BDD features are associated with low self-esteem and high levels of social anxiety, depression, distress and obsessive-compulsive characteristics.

The present study has several limitations. First, we used self-report questionnaires rather than clinical structured interviews (which are considered the gold standard for screening people with BDD; Brohede et al., 2015) to identify people with probable BDD. On the other hand, it is noteworthy that people with BDD are usually very ashamed about their symptoms (Phillips, 2006), and it might be easier for them to disclose their concerns

through a questionnaire rather than in an in-person interview (Buhlmann et al., 2010; Phillips, 2006; Rief et al., 2006); therefore, the employment of self-report instruments allowed us to reach a large number of individuals. The absence of psychometric information for some of our measures is another shortcoming of this research. Moreover, one of the exclusion criteria we used for identify people with BDD in our research was the absence of primary body concerns focused on body weight, in order to avoid the over-diagnosis of BDD when an eating disorder might have been the more accurate diagnosis. This criterion, however, can be very restrictive, because people who are concerned with body weight might present also dissatisfaction with other body parts, given that EDs and BDD frequently co-occur (Grant et al., 2002; Kollei et al., 2013; Ruffolo et al., 2006). Therefore, the exclusion of people with primary body weight concerns may lead to a risk of under-diagnosis of BDD in patients with weight concerns if interpreted too restrictively. Finally, the sampling strategy (participants were volunteers) and the high presence of students, as well as the relatively small sample size, limited the generalizability of our results. Future studies overcoming these limitations are recommended, especially focused on the relationship between BDD and EDs, because many studies underlined that the co-occurrence of the disorders confer additional severity in terms of body image disturbance and clinical symptomatology (Dingemans et al., 2012; Grant et al., 2002). Overall, despite the above-mentioned shortcomings, the present study represents the first study that assessed the prevalence and the phenomenology of BDD according to the new DSM-5 criteria (APA, 2013) in the Italian context. We found a prevalence of 1.63% and low self-esteem, higher social anxiety, distress and depressive and obsessive-compulsive features in people who satisfied BDD criteria compared to people who did not.

# Chapter 3

## Nonweight-Related Body Image Concerns and Body Dysmorphic Disorder Prevalence in Italian Patients with Anorexia Nervosa

### 3.1 Introduction

Body Dysmorphic Disorder (BDD) is a psychological condition included in the "Obsessive-Compulsive and Related Disorder" category of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association [APA], 2013). BDD is characterized by concerns regarding one or more perceived defects in physical appearance that are not observable to others (APA, 2013); the preoccupation is time-consuming and causes significant distress or impairment in the individual's functioning (Cororve & Gleaves, 2001). Appearance concern is often focused on skin, hair, and nose (Phillips, 2006; Phillips & Diaz, 1997; Phillips, McElroy, Keck, Pope, & Hudson, 1993; Veale, Boocock et al., 1996); however, it may involve any body areas (Phillips, 2006; Phillips et al., 1993; Veale, 2000) and individuals with BDD may be simultaneously concerned with multiple body parts (Phillips et al., 1993; Phillips, Menard, Fay, & Weisberg, 2005).

Because the essential pathology of BDD is a disturbance in body image (Rosen & Ramirez, 1998), it has been suggested that BDD might be better clustered under an encompassing 'body image disorder' category, along with Eating Disorders (EDs;

Cororve & Gleaves, 2001; Mitchison, Crino, & Hay, 2013). Both BDD and EDs are severe body image disorders (Rosen, Reiter, & Orosan, 1995) characterized by body image disturbance and dissatisfaction. Moreover, BDD and EDs share clinical features (Grant & Phillips, 2004; Phillips, 2005): both disorders are characterized by dissatisfaction and intrusive thoughts about appearance and by an overemphasis on appearance in the evaluation of self-worth (Phillips, Kim, & Hudson, 1995; Rosen & Ramirez, 1998). Furthermore, BDD and EDs are both characterized by repetitive checking behaviors such as mirror checking and body measuring (Phillips, Kim, & Hudson, 1995), as well as behavioral avoidance (e.g., social situations, places, activities, and ways of dressing) and requests for beauty remedies for the appearance concerns (e.g., weight control in anorexia nervosa and cosmetic surgery in BDD; Rosen & Ramirez, 1998). With respect to psychological features, both disorders are characterized by low self-esteem (Phillips, Pinto, & Jain, 2004; Rosen & Ramirez, 1998) and high levels of perfectionism (Bardone-Cone et al., 2007; Buhlmann, Etcoff, & Wilhelm, 2008; Bulik et al., 2003; Veale, 2004).

Due to this considerable overlap, distinguishing between BDD and EDs is sometimes challenging (Dingemans, van Rood, de Groot, & van Furth, 2012). However, people with EDs focus primarily on overall body weight and shape, whereas people with BDD more often focus on specific body parts. The current hierarchical organization of the DSM-5 (APA, 2013) stipulates that a diagnosis of BDD cannot be provided if appearance concerns are better explained by concerns with body fat or weight in an individual whose symptoms meet diagnostic criteria for EDs (APA, 2013); this frequently results in not diagnosing BDD when patients also fulfill the criteria for EDs (Dingemans et al., 2012).

However, comorbidity of BDD and EDs is high (Dingemans et al., 2012; Fenwick & Sullivan, 2011; Grant, Kim, & Eckert, 2002; Kollei, Schieber, Zwaan, Svitak, & Martin, 2013; Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006). For example, the study of Grant et al. (2002), conducted on 41 inpatients with anorexia nervosa, found that 16 patients (39%) also met criteria for BDD. The study of Dingemans et al. (2012) found that 45% of patients with EDs (n = 158) probably suffered from BDD, and contrary to the Authors' expectations, no differences in the prevalence of BDD by ED subtype (anorexia nervosa [AN], bulimia nervosa [BN] or eating disorder not otherwise specified [EDNOS]) emerged. These results are in accordance with the study of Kollei et al. (2013), who found that 14.3% of patients with BN and 9.8% of patients with AN met criteria for BDD; the most commonly reported areas of concern were the skin, arms, eyebrows, and nose. Moreover, inpatients with comorbid BDD referred earlier onset of AN and reported greater severity of eating disorder pathology and general symptomatology than those without comorbid BDD (Grant et al., 2002; Dingemans et al., 2012). Lastly, inpatients with comorbid BDD were three times more likely to have attempted suicide secondary to appearance concerns than those without comorbid BDD.

Given this evidence, assessing the presence of BDD in patients with EDs is important, particularly because the co-occurrence of the disorders appears to confer additional severity (Dingemans et al., 2012; Grant et al., 2002). Furthermore, failures in diagnosing BDD in patients with EDs may have important treatment implications; intense body dissatisfaction can persist after a successful treatment for EDs and it is a reliable predictor for relapse (Cash & Hrabosky, 2004; Marco, Perpina, & Botella, 2013). Usually, standard EDs programs have been demonstrated to have a smaller

treatment effectiveness with respect to body image compared to eating behaviors (Rosen, 1996).

Therefore, the first aim of the present study was to assess the prevalence of BDD and the presence of nonweight-related body image concerns in a sample of Italian patients with AN. Similar to previous studies (Dingemans et al., 2012; Grant et al., 2002; Kollei et al., 2013) and given the shared clinical features between BDD and AN (Grant & Phillips, 2004; Mitchison et al., 2013), we expected high BDD prevalence and presence of nonweight-related body image concerns in patients with AN. Moreover, we aimed at comparing patients with nonweight-related body image concerns, patients with weight-related body image concerns only and a control group as regards BDD symptoms, severity of EDs symptoms, obsessive-compulsive symptomatology, general distress, social anxiety symptoms, self-esteem, and perfectionism. Based on previous studies (Dingemans et al., 2012; Grant et al., 2002) we expected that patients with nonweight-related body image concerns would show higher levels of BDD symptoms, severity of EDs symptoms, obsessive-compulsive symptomatology, and general distress compared to patients with weight-related body image concerns only and compared to a control group. Although the present research represents one of the first studies to compare social anxiety symptoms, self-esteem, and perfectionism among these three groups, we hypothesized that patients with nonweight-related body image concerns would report more severe social anxiety symptoms, lower levels of self-esteem, and higher levels of perfectionism than patients with weight-related body image concerns only and the control group. Indeed, patients with AN plus nonweight-related body image concerns present a more severe body image disorder than patients with weight-related body image concerns only and the control group (Dingemans et al., 2012; Grant et al., 2002).

Therefore, this more complex group may present more psychological symptoms than the other two groups.

## 3.2 Methods

### *3.2.1 Participants*

Sixty-one females patients suffering from AN (77% restricting type and 23% purging type) enrolled in the study. Diagnostic status was ascertained using the Structured Clinical Interview for Axis I Disorders, Patient Edition (SCID-I/P; First, Spitzer, Gibbon & Williams, 2002). Inclusion criteria for all participants were meeting DSM-5 (APA, 2013) diagnostic criteria for current AN and being aged at least 18 years old. Exclusion criteria were the existence of severe neurological diseases, current or past psychotic disorders, and mental retardation. All patients were in treatment (57.4% inpatient and 42.6% outpatient/day hospital) and most of them (68.85%) were medicated: fluoxetine and sertraline were the most represented medications. Patients with AN were divided, according to the Body Dysmorphic Questionnaire (BDQ; see measures section), in two subgroups: patients with weight-related body image concerns only (AN-only; N = 22; 59.1% restricting type) and patients with nonweight-related body image concerns (AN+NWRC; N = 39; 87.2% restricting type). An additional group of 61 healthy controls (HCs) was recruited. None of the HCs met diagnostic criteria for any current psychiatric disorder and none were taking any psychiatric medications. Groups were equivalent with respect to age and years of education (Table 1), whereas significant differences on Body Mass Index (BMI) emerged: Bonferroni post hoc comparisons revealed that the BMI of the clinical groups was lower than the

BMI of the HC group ($p < .001$), whereas no differences between clinical groups emerged ($p = .99$; Table 1). With respect to marital status and occupation, significant differences among the groups emerged ($p = .002$ and $p = .001$, respectively; Table 2).

**Table 1.**

Comparisons among patients with weight-related body image concerns only (AN-only group), patients with nonweight-related body image concerns (AN+NWRC group) and healthy controls (HC group) on age, education and BMI

| | **AN-only (1) (N = 22)** **M (SD)** | **AN+NWRC (2) (N = 39)** **M (SD)** | **HC (3) (N = 61)** **M (SD)** | **F (2,120)** | ***p*** | ***Post-hoc*** |
|---|---|---|---|---|---|---|
| **Age** | 28 (10.12) | 24.56 (8.81) | 25.97 (9.34) | .96 | .39 | - |
| **Years of education** | 12.73 (3.64) | 12.84 (2.54) | 12.98 (2.48) | .08 | .92 | - |
| **BMI** | 16.68 (2.38) | 16.32 (2.41) | 22.02 (3.12) | 61.19 | <.001 | 1 = 2 < 3 |

**Table 2.**

Frequencies of occupation and marital status

| | **AN-only (N = 22)** | **AN+NWRC (N = 39)** | **HC (N = 61)** | | **AN-only (N = 22)** | **AN+NWRC (N = 39)** | **HC (N = 61)** |
|---|---|---|---|---|---|---|---|
| **Occupation** | | | | **Marital status** | | | |
| **Student** | 9 | 21 | 37 | **Single** | 14 | 27 | 20 |
| **Full time employed** | 2 | 6 | 9 | **In a relationship** | 3 | 7 | 29 |
| **Part time employed** | 0 | 4 | 5 | **Married** | 5 | 4 | 12 |
| **Unemployed** | 8 | 5 | 0 | | | | |
| **Other** | 2 | 3 | 7 | | | | |

*3.2.2 Measures*

All participants completed a brief schedule collecting socio-demographic information. Given that no Italian standardized measures assessing BDD were available, two *ad hoc* self-report instruments were developed: the Body Dysmorphic Questionnaire (BDQ) and the Questionario sul Dismorfismo Corporeo (QDC).

The *Body Dysmorphic Questionnaire* (BDQ) is a self-report measure assessing DSM-5 criteria for BDD. The measure is made up of 5 dichotomous items. The first item evaluates concerns with one or more perceived defects in psychical appearance that are not observable to others. If the answer is positive, the participant is required to list areas of concerns and degree of dissatisfaction. The second item assesses the presence of repetitive behaviours (e.g., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g., comparing appearance with that of others) in response to the appearance concerns. In order to proceed, positive answers to these two items should be provided. The third question asks whether the main source of concern is not being thin enough or being too fat. The fourth question assesses the presence of distress or impairment in social and occupational functioning and the presence of avoidant behaviours because of the appearance concerns. Finally, the last item measures the time spent every day thinking about defects. Phillips (1998) suggested that the time spent by thinking about perceived defects should be at least 1 hour every day. A positive screen for BDD is obtained if participants report positive answers to questions one, two and four. Moreover, a negative answer to question number three is required. Finally, in accordance with Phillips's (1998) advice, participants should spend at least 1 hour per day thinking about perceived defects.

The *Questionario sul Dismorfismo Corporeo* (QDC) is a self-report measure made up of 40 items assessing clinical features of BDD. Items are rated on a 7-point Likert scale (from 1 = "strongly disagree" to 7 = "strongly agree"). Higher scores represent more severe BDD symptomatology. The QDC evaluates the presence of typical behaviours associated with BDD, such as repetitive behaviours (e.g., reassurance seeking and mirror checking), mental acts (e. g., comparing the supposed defect with the same body areas of other people), and avoidant behaviours related to appearance concerns. The QDC also assesses the request of cosmetics and surgical procedures and suicidal thoughts due to appearance concerns. Internal consistency coefficient in the present sample was excellent ($\alpha = .97$).

The *Eating Disorder Inventory-2* (EDI-2; Garner, 1991; Rizzardi, Trombini, & Trombini, 1995) is a 91-item self-report questionnaire revised from the EDI-1 (Garner & Olmsted, 1984) assessing psychological features and behaviours relevant in eating problems on a 6-point Likert scale (ranging from 1 = "Never" to 6 = "Always"). The EDI-1 was made up of 64 items forming eight scales (drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, maturity fears) and then expanded with 27 additional items to form the three new scales (asceticism, impulse regulation, social insecurity) of the EDI-2. The original scales of EDI-2 showed good internal consistency, with coefficient alphas ranging from .80 to .91 in a clinical samples (Eberenz & Gleaves, 1994), whereas coefficient alphas of the 3 new subscales ranging from .70 to .80 (Garner, 1991). With respect to the Italian version of the questionnaire, coefficient alphas ranging from .78 to .84 in a clinical sample (Rizzardi et al., 1995). In the present sample, alpha coefficients for the EDI-2 subscales ranged from $\alpha = 65.$ to $\alpha = .93$.

The *Obsessive Compulsive Inventory-42* (OCI-42; Foa, Kozak, Salkovskis, Coles, & Amir, 1998; Italian version by Sica et al., 2009) is a 42-item self-report measure assessing frequency and distress caused by OCD symptoms. Each item is rated on a 5-point Likert scale (ranging from 0 = "Not at all" to 4 = "Extremely"), and the questionnaire is made up of 7 subscales: washing, checking, ordering, obsessing, doubting, mental neutralizing, and hoarding. Internal consistency values of the original version were good (α = .86 to .95; Foa et al., 1998), as were those observed in an Italian clinical group (α = .77 to .94; Sica et al., 2009). In the present study, only distress associated with obsessions and compulsions was taken into account since the two scales (frequency and distress) have been demonstrated to yield redundant information (e.g., Foa et al., 2002; Wu & Watson, 2003). The OCI was preferred over the shorter 18-item version (OCI-R) because previous investigations showed that the brevity of the OCI-R may be of concern, especially for a restricted score range (Ghisi, Chiri, Marchetti, Sanavio, & Sica, 2010; Sica, Caudek, Chiri, Ghisi, & Marchetti, 2012). In the present study, the alpha coefficient for the total OCI distress was α = .96, whereas alpha coefficients for the OCI subscales ranged from α = .79 to α = .91.

The *Depression Anxiety Stress Scale-21* (DASS-21; Lovibond & Lovibond, 1995; Italian version by Bottesi et al., 2015) is a 21-item self-report measure that assesses depression, anxiety, and stress on a 4-point Likert scale (ranging from 0 = "Did not apply to me at all," to 3 = "Applied to me very much or most of the time"), with higher scores representing greater distress. Three subscale scores as well as a "general distress" total score can be computed (Bottesi et al., 2015). The original DASS-21 showed adequate reliability, with coefficient alphas ranging from .73 to .81 in non-clinical samples (Lovibond & Lovibond, 1995). The Italian version proved to be highly reliable

as well, with internal consistency values ranging from α = .74 and α = .90 (Bottesi et al., 2015). Given that findings on the Italian version suggested that use of the total score, measuring a "general distress" factor, could be more appropriate than calculating the three subscale scores separately (Bottesi et al., 2015), for the purpose of the presence research we focused only on the total score of the questionnaire. In the present study, the alpha coefficient for the total DASS was excellent (α = .95).

The *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998; Italian version by Sica et al., 2007) is a 19-item self-report questionnaire designed to assess social interaction anxiety on a 5-point Likert scale (0 = "not at all characteristic of true of me"; 4 = "extremely characteristic of true of me"); higher scores represent higher levels of social interaction anxiety. The SIAS showed strong psychometric properties (Mattick & Clarke, 1998), including high internal consistency (α = .94) and 1 month test-retest stability (r = .92). The Italian version proved to be highly reliable and stable as well (Sica et al., 2007), with an internal consistency value of α = .86 and 1 month test-retest stability of *r* = .93. In the present study, the alpha coefficient for the SIAS was excellent (α = .95).

The *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965; Italian version by Prezza, Trombaccia, & Armento, 1997) is a self-report questionnaire made up of 10 items assessing global self-esteem. Items are rated on a 4-point Likert scale (from 1= "strongly disagree" to 4 = "strongly agree"), with higher scores representing positive self-esteem. Good internal consistency values have been reported for the original RSES, ranging between α = .77 and α = .88 (Dobson, Goudy, Keith, & Powers, 1979; Fleming & Courtney, 1984; Robinson, Shaver, & Wrightsman, 1991). The Italian version also showed good psychometric properties: its internal consistency was α = .84 and the 15-

days test-retest reliability was $r$ = .76 (Prezza et al., 1997). Internal consistency coefficient in the present sample was excellent (α = .93).

The *Multidimensional Perfectionism Scale* (MPS; Hewitt & Flett, 1991) is a 45-item measure evaluating three different domains of perfectionism: self-oriented, socially prescribed and other-oriented. Self-oriented perfectionism includes internal beliefs about striving for perfection and setting high standards for oneself, socially prescribed perfectionism involves beliefs that high standards are expected by significant others, and other-oriented perfectionism places importance on significant others being perfect (Hewitt & Flett, 1991). Each subscale contains 15 items evaluated on a 7-point Likert scale (1 = "strongly disagree"; 7 = "strongly agree"), with higher scores indicating greater levels of perfectionism. Good internal consistency values have been reported for the original MPS, ranging between α = .79 and α = .89 in a student sample (Hewitt & Flett, 1991). The Italian validation of the MPS is not available to date, therefore an *ad hoc* translation was employed. In the present sample, the alpha coefficient was .93 for the self-oriented scale, .88 for the socially prescribed scale and .79 for the other-oriented perfectionism subscale.

### *3.2.3 Procedure*

Patients with AN who entered the study were recruited from both inpatient and outpatient mental health clinics in the Northern Italy. The HC group was recruited through advertisements in public settings, railway stations, libraries, and university buildings, requesting potential volunteers for psychological studies. Before entering the study, all participants were informed about the study's aims and about the voluntary nature of their participation; furthermore, they were aware of the possibility of

withdrawing from the study without penalty. All participants provided written informed consent and completed a brief schedule collecting socio-demographic information. Subsequently, they filled in self-report questionnaires administered in a rotated sequence to avoid order effects. No time limit for completion was imposed (the mean time spent filling in questionnaires was approximately 45 minutes).

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee of the Psychological Sciences, University of Padova.

*3.2.4 Statistical Analyses*

In order to assess the presence of differences among groups on socio-demographic variables, chi-squared analyses and one-way analyses of variance (ANOVAs) were conducted. Bonferroni post-hoc comparisons were conducted to compare the groups when significant differences emerged. In order to estimate the presence of nonweight-related body image concerns and prevalence of BDD in patients with AN, descriptive analyses (frequencies and percentages) were performed. Finally, one-way ANOVAs were performed in order to compare groups (AN-only group vs. AN+NWRC group vs. HC group) on psychological and psychopathological features and Bonferroni post hoc comparisons were computed when significant differences emerged. Conventional significance levels were used ($ps < .05$) for the QDC, the DASS-21, the SIAS, the RSES, and the MPS, whereas Bonferroni's corrections for multiple comparisons were applied to the EDI-2 and the OCI-42 subscales ($p < .004$ and $p < .006$, respectively). All statistical analyses were conducted using IBM SPSS statistics, version 21.

## 3.3 Results

### *3.3.1 Presence of nonweight-related body image concerns and prevalence of BDD in patients with AN*

Among all of the 61 patients with AN who entered the study, 39 (63.93%) reported the presence of nonweight-related body image concerns. The most frequent nonweight-related body image concerns were: hair (41.02%), nose (30.77%), skin (30.77%), teeth (25.64%), and height (20.51%; Table 3). Among these 39 patients with nonweight-related body image concerns, 16 (41.03%) had probable comorbid BDD based on the questions of the BDQ (see measures section). With respect to the overall sample, 26.23% of patients had probable comorbid BDD. Patients diagnosed with comorbid BDD were primary concerned with one or more perceived defects in physical appearance unrelated to weight or body shape. Of these 16 patients with AN, 13 (81.25%) had the restrictive subtype and 3 (18.75%) the purging/binge subtype.

**Table 3.**

Frequencies of nonweight-related body image concerns in patients with AN

| | Frequencies |
|---|---|
| **Hair** | 16 |
| **Nose** | 12 |
| **Skin** | 12 |
| **Teeth** | 10 |
| **Height** | 8 |
| **Face (shape)** | 8 |
| **Body hair** | 8 |
| **Breast** | 8 |
| **Feet** | 6 |
| **Eyes** | 5 |
| **Hands** | 5 |
| **Scars** | 4 |
| **Shoulders** | 2 |
| **Lips** | 2 |
| **Moles** | 2 |
| **Finger** | 1 |
| **Knees** | 1 |
| **Ears** | 1 |
| **Back** | 1 |

### *3.3.2 Psychological and psychopathological features among AN-only, AN+NWRC and HC*

*BDD symptoms.* With respect to BDD symptoms, the ANOVA revealed differences among groups on QDC. Both the AN-only and the AN+NWRC groups scored significantly higher than the HC group on QDC total score (both *ps* < .001). Moreover,

the AN+NWRC group scored significantly higher than the AN-only group ($p$ = .02). Means, standard deviations and comparisons are reported in Table 4.

*EDs symptoms.* With respect to EDs symptoms, the ANOVAs revealed differences among groups on all the EDI-2 subscales with the exception of the Bulimia subscale. Both AN-only and AN+NWRC groups scored significantly higher than the HC group on the Drive for thinness, Body dissatisfaction, Ineffectiveness, Interpersonal distrust, Interoceptive awareness, Asceticism, Impulse regulation and Social insecurity subscales (all *ps* < .05). Moreover, the AN+NWRC group scored significantly higher than the AN-only group on the Ineffectiveness, Interpersonal distrust, Interoceptive awareness, Asceticism, and Social insecurity subscales (all *ps* < .05). With respect to the Perfectionism subscale, the AN+NWRC group scored significantly higher than the HC group ($p$ < .001), while the AN-only group did not differ from neither the AN+NWRC ($p$ = .06) nor the HC groups ($p$ = .81). Means, standard deviations and comparisons are reported in Table 4.

*Obsessive-compulsive symptoms and general distress.* With respect to obsessive-compulsive symptoms, significant differences among groups on the OCI-42 Washing, Doubting, Ordering, Obsessing, and Neutralizing subscales, and on the total score were found. On each scales, both the AN-only and the AN+NWRC groups scored significantly higher than the HC group (*ps* < .05). Moreover, the AN+NWRC group scored higher than the AN-only group on the Obsessing subscale and on the total score ($p$ = .03 and $p$ = .04, respectively). There were no differences among the groups on the Checking and Hoarding subscales of the OCI-42 (*ps* > .05).

Concerning general distress, both the AN-only and the AN+NWRC groups scored significantly higher than the HC group on DASS-21 total score ($p < .05$), whereas no difference between the AN-only and the AN+NWRC emerged ($p > .05$). Means, standard deviations and comparisons are reported in Table 4.

*Social anxiety, self-esteem and perfectionism.* With respect to social anxiety, significant differences between groups on the SIAS total score were found. Both the AN-only and the AN+NWRC groups scored significantly higher than the HC group ($p < .05$). Moreover, the AN+NWRC group scored significantly higher than the AN-only group ($p < .05$). Means, standard deviations and comparisons are reported in Table 4.

Significant differences between groups were found on the RSES total score. Both the AN-only and the AN+NWRC groups scored significantly lower than the HC group (both *ps* < .001). Moreover, the AN+NWRC group scored significantly lower than the AN-only group ($p = .02$). Means, standard deviations and comparisons are reported in Table 4.

Concerning perfectionism, differences among groups emerged. The AN+NWRC group scored significantly higher on the Self-oriented and Socially prescribed perfectionism MPS subscales than the HC group (both *ps* < .001), whereas the AN-only group did not differ from either the AN+NWRC ($p = .08$ and $p = .51$, respectively) and HC groups ($p = .75$ and $p = .09$, respectively). There was no difference between the groups on the MPS Other-oriented subscale (*ps* > 0.05; Table 4).

**Table 4.**

Comparisons among patients with weight-related body image concerns only (AN-only group), patients with nonweight-related body image concerns (AN+NWRC group) and healthy controls (HC group) on psychological and psychopathological features

| | **AN-only (1) (N = 22)** **M (SD)** | **AN+NWRC (2) (N = 39)** **M (SD)** | **HC (3) (N = 61)** **M (SD)** | **F (2,120)** | ***p*** | ***Post-hoc*** |
|---|---|---|---|---|---|---|
| **QDC** | 140.19 (56.93) | 172.54 (42.69) | 94.64 (32.62) | 39.79 | <.001 | 2 > 1 > 3 |
| **EDI drive for thinnes** | 12.90 (7.80) | 13.92 (7) | 3.27 (3.79) | 46.98 | <.001 | 1 = 2 > 3 |
| **EDI bulimia** | 3.50 (4.56) | 2.47 (3.95) | 1.57 (2.56) | 2.68 | .07 | - |
| **EDI body dissatisfaction** | 12.73 (8.27) | 17.21 (6.46) | 7.41 (6.69) | 23.64 | <.001 | 1 = 2 > 3 |
| **EDI ineffectiveness** | 9 (5.79) | 16.08 (7.96) | 2.79 (3.07) | 68.35 | <.001 | 2 > 1 > 3 |
| **EDI perfectionism** | 3.91 (3.08) | 6.26 (4.70) | 2.88 (3.19) | 9.79 | <.001 | 2 > 3 = 1 |
| **EDI interpersonal distrust** | 5.90 (3.99) | 8.51 (4.52) | 2.69 (2.77) | 31.25 | <.001 | 2 > 1 > 3 |
| **EDI interoceptive awerness** | 9 (6.12) | 12.81 (7.87) | 2.06 (3.35) | 44.79 | <.001 | 2 > 1 > 3 |
| **EDI maturity fears** | 7.33 (5.62) | 8.72 (7.12) | 5 (4.99) | 4.93 | .01 | 2 > 3 = 1 |
| **EDI asceticism** | 6.33 (3.69) | 8.86 (4.32) | 3.26 (2.75) | 29.71 | <.001 | 2 > 1 > 3 |
| **EDI impulse regulation** | 5.80 (5.64) | 8.03 (6.79) | 2.02 (3.38) | 16.22 | <.001 | 1 = 2 > 3 |
| **EDI social insecurity** | 7.52 (3.88) | 11.43 (4.82) | 3.57 (2.86) | 51.23 | <.001 | 2 > 1 > 3 |
| **OCI washing** | 5.71 (4.88) | 7.87 (7.67) | 3.59 (3.95) | 7.05 | .001 | 1 = 2 > 3 |
| **OCI checking** | 5.81 (6.18) | 7.22 (7.45) | 4.46 (4.38) | 2.62 | .08 | - |
| **OCI doubting** | 2.62 (2.84) | 4 (3.52) | 1.61 (1.78) | 9.79 | <.001 | 1 = 2 > 3 |
| **OCI ordering** | 5.55 (5.63) | 7.58 (6.64) | 3.22 (3.01) | 9.33 | <.001 | 1 = 2 > 3 |
| **OCI obsessing** | 8.91 (7.87) | 13.37 (8.67) | 4.47 (3.85) | 22.19 | <.001 | 2 > 1 > 3 |
| **OCI hoarding** | 2.71 (3.10) | 3.10 (3.26) | 2.13 (2.08) | 1.59 | .21 | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| **OCI neutralizing** | 3.05 (3.33) | 5.77 (6.37) | 2.75 (2.76) | 6.07 | .003 | 2 > 1 > 3 |
| **OCI total score** | 29.95 (27.35) | 48.23 (36.85) | 21.63 (15.11) | 11.89 | <.001 | 2 > 1 > 3 |
| **DASS total score** | 25.24 (13.15) | 31.60 (14.50) | 13.27 (9.78) | 27.45 | <.001 | 1 = 2 > 3 |
| **SIAS** | 27.24 (16.88) | 41.47 (17.29) | 21.49 (11.59) | 21.38 | <.001 | 1 = 3 < 2 |
| **RSES** | 23.73 (5.63) | 19.81 (5.81) | 31.70 (5.02) | 59.84 | <.001 | 2 < 1 < 3 |
| **MPS Self-Oriented** | 66.41 (21.37) | 78.60 (22.98) | 60.67 (17.24) | 9 | <.001 | 1 = 2 > 3 |
| **MPS Other-Oriented** | 53 (12.04) | 48.76 (15.41) | 50.93 (13.11) | .62 | .54 | - |
| **MPS Socially Prescribed** | 57.67 (18.20) | 63.71 (18.55) | 48.80 (13.65) | 10.29 | <.001 | 2 > 1 > 3 |

### 3.4 Discussion

BDD and AN are severe disorders characterized by body image concerns (Rosen et al., 1995). Despite the high comorbidity between these disorders (Dingemans et al., 2012; Fenwick & Sullivan, 2011; Grant et al., 2002; Kollei et al., 2013; Ruffolo et al., 2006), few studies have explored the relation between BDD and AN. Indeed, to the Authors' knowledge, this is the first study assessing the prevalence of BDD and the presence of nonweight-related body image concerns in an Italian clinical sample with AN. Moreover, this is the first study assessing the prevalence of BDD in patients with AN accordingly with DSM-5 criteria (APA, 2013).

The present study showed that 63.93% of the patients with AN reported the presence of nonweight-related body image concerns. Moreover, 26.23% of these patients screened positive for BDD. Therefore, the present study suggested a BDD prevalence of 26.23% in Italian patients with AN. These findings are in accordance with previous studies that found a high presence of nonweight-related body image concerns and high rates of

BDD prevalence in patients with AN, ranging from 9.8% (Kollei et al., 2013) to 46% (Dingemans et al., 2012). Our study found a prevalence of BDD in the middle of the range reported by the literature. The prevalence we found may be explained by the adoption of DSM-5 (APA, 2013) diagnostic criteria and by methodological and sample differences. The study of Dingemans et al. (2012), for example, employed self-report questionnaires assessing BDD according to DSM-IV (APA, 1994) criteria in a sample of AN patients from The Netherland, whereas the studies of Kollei et al. (2013) and Grant et al. (2002) employed both structured clinical interviews and self-report questionnaires to assess DSM-IV (APA, 1994) BDD criteria in a German and USA sample, respectively.

Furthermore, we found that hair, nose, skin, teeth, and height were the most common nonweight-related body image concerns. As reported in previous studies (Gupta, Gupta, & Haberman, 1987; Kollei et al., 2013; Tyler, Wiseman, Crawford, & Birmingham, 2002), the presence of concerns with hair, skin and teeth may be partially explained by the consequences of AN core symptoms (for example, starvation, vomiting, and abuse of laxatives and diuretics); however, the presence of concerns unrelated to organ systems affected by AN, such as nose and height, may be explained by a severe body image disturbance not limited to weight and shape in a subgroup of our clinical sample. Therefore, based on the presence of nonweight-related body image concerns, we decided to divide the clinical sample in two subgroups: the AN+NWRC group and the AN-only group.

The evidence of a subgroup of patients in our sample characterized by a severe body image disturbance not limited to weight and shape is supported by the finding that the two clinical groups differed with respect to BDD symptomatology. Patients in the

AN+NWRC group presented with more BDD symptoms such as repetitive behaviours, mental acts, avoidant behaviours, request of aesthetical procedures, and suicidal thoughts related to appearance concerns than the AN-only group, suggesting the presence of a more severe body image disorder. Interestingly, both the clinical groups emerged to differ from the HC group but were equivalent with respect to weight-related measures such as the BMI and the EDI-2 subscales, which assess the core features of AN symptomatology (drive for thinness and body dissatisfaction, as suggested by the study of Gupta and Johnson, 2000). Therefore, the presence of nonweight-related body image concerns in the AN+NWRC group seems unrelated to a more severe eating pathology, as emerged in the study of Dingemans and colleagues (2012).

Therefore, our clinical sample includes a subgroup of patients characterized by a severe body image disturbance not limited to weight and shape. This result is only partially in accordance with the study of Gupta and Johnson (2000). Indeed, these authors found multiple nonweight-related body image concerns in patients with AN but, in contrast to our findings, these areas of concerns emerged to be associated with greater dissatisfaction with the usual weight-related indices, such as drive for thinness and body dissatisfaction. Concerning other EDs symptoms, the two clinical groups differed from each other with respect to symptom dimensions that measure broad constructs, rather than those related to weight and shape.

Relative to the AN-only group, the AN+NWRC group showed higher levels of feeling of inadequacy and worthlessness, social fears, as well as reluctance to develop close relationships. Moreover, the AN+NWRC group showed greater lack of confidence in recognizing emotions and sensations of hungry and satiety and a stronger need to control one's need by self-discipline and sacrifices than the AN-only group. Lastly, both

clinical groups differed from the HC group with respect to all EDI-2 subscales, with the exception of Bulimia subscale, assessing the presence of binge eating episodes followed by the impulse to engage in self-induced vomiting. Nevertheless, only the AN+NWRC group showed higher levels of perfectionistic traits and fears of facing the demands of adult life than the HC group, whereas no differences emerged with respect to the AN-only group. These results are in accordance with studies underlined that patients with a more severe body image concerns are characterized by more impairment that patients with body image concerns only (Grant et al., 2002; Dingemans et al., 2012).

With respect to OCD symptoms, as expected, both clinical groups showed more OCD features than the HC group, with the exception of checking and hoarding symptomatology, where no differences among groups emerged. Although checking behaviours are more common in patients with AN than in healthy controls (Mountford, Haase, & Waller, 2006; Shafran, Fairburn, Robinson, & Lask, 2004), our results did not underline a difference with respect to checking behaviours between clinical groups and healthy controls. This result may explain by the fact that patients in the present study were in treatment; giving that the severity of AN is associated with the frequency of body checking and it represent one of the most important maintaining factors of AN (Shafran, Teachman, Kerry, & Rachman, 1999; Shafran et al., 2004), one of the aims of AN treatment is to reduce checking behaviours, particularly body checking. The AN+NWRC group showed also more severe overall OCD features and obsessive symptoms than the AN-only group. This result is consistent with studies that underlined the presence of higher OCD symptoms in patients with BDD (Bohne, Wilhelm et al., 2002; Gunstad & Phillips, 2003) and studies underscoring that a more severe body

image disturbance is associated with greater OCD symptomatology (Biby, 1998; Bohne, Keuthen, Wilhelm, Deckersbach, & Jenike, 2002; Tamini, Rahdar, & Kahrazei, 2015).

Concerning general distress, both clinical groups showed higher distress than the HC group, whereas the two clinical groups did not differ. This result was somewhat unexpected given that the presence of a more severe body image disturbance should lead to a greater distress (Grant et al., 2002; Dingemans et al., 2012), and it might be explained by the fact that all patients in our study were in undergoing psychological treatment, therefore general distress may have been attenuated in the AN+NWRC group.

With respect to social anxiety, as hypothesized, both clinical groups scored higher than the HC group. Moreover, the AN+NWRC group reported higher levels of social anxiety characteristics than the AN-only group, in accordance with studies reporting that the presence of multiple concerns about defects in physical appearance may be likely associated with the fear of negative evaluation by others, which is also the core feature of social anxiety disorder (Fang & Hofmann, 2010).

Concerning self-esteem, as expected, both clinical groups scored lower than the HC group. This result is in accordance with the study of Rosen and Ramirez (1998) that found low self-esteem in patients with body image disorders compared to nonclinical controls. Indeed, a deficiency in self-esteem might be essential for the development and course of body image disorders (Grubb, Sellers, & Waligorski, 1993). In addition, the AN+NWRC group showed lower levels of self-esteem than the AN-only groups, in accordance with studies that found a correlation between low self-esteem and poor body esteem (Biby, 1998; Bohne, Wilhelm et al., 2002).

Lastly, the AN+NWRC group reported that they set higher standards for themselves and had stronger beliefs that high standards are expected by significant others than the AN-only group and the HC group. This finding is in accordance with studies underlining that perfectionism may play a key role in the development of body image disorders, especially BDD (Andreasen & Bardach, 1977; Bartsch, 2007; Hanstock & O'Mahony, 2002).

Although current findings are intriguing, several limitations characterizing the present study deserve to be mentioned. First of all, the sample size was somewhat small and there was a lack of information regarding past and current comorbidity; second, patients in the current study were in treatment and our findings may not be generalizable to other patients with AN; third, there was an absence of psychometric information for some of our self-report measures.

As a whole, in accordance with the study of Rosen and Ramirez (1998), both clinical groups were more impaired than the HC group. Moreover, the AN+NWRC group was revealed to be more impaired than the AN-only group with respect to almost all the psychological and psychopathological features we assessed, with the exception of core ED symptoms (such as BMI and drive for thinness and body dissatisfaction subscales of EDI-2) and general distress. These findings are in accordance with previous studies that highlighted a more severe psychopathology in patients with AN and nonweight-related body image concerns (Grant et al., 2002; Dingemans et al., 2012); therefore, it is important to assess the presence of nonweight-related body image concerns in patients with AN, giving that it seems to confer additional risk and severity (Grant et al., 2002; Dingemans et al., 2012).

# Chapter 4

## Prevalence of Muscle Dysmorphia and its associated psychological features in three groups of Italian recreational athletes

### 4.1 Introduction

Muscle Dysmorphia (MD) is a subtype of Body Dysmorphic Disorder (BDD) characterized by the preoccupation with the idea that one's body is not sufficiently lean and muscular (American Psychiatric Association [APA], 2013; Pope, Gruber, Choi, Olivardia, & Phillips, 1997; Pope, Phillips, & Olivardia, 2000). Individuals with MD perceive themselves as small and weak even if they look normal or more muscular than the average of people (Choi, Pope, & Olivardia, 2002; Pope et al., 1997). As a consequence, individuals with MD engage in behaviors aiming at achieving the desired lean and muscular physique (Pope et al., 1997); these behaviors are compulsive and include excessively workout and rigid diet, as well as excessive use of dietary supplements and anabolic-androgenic steroids (AAS) use (Olivardia, 2001; Olivardia, Pope, & Hudson, 2000; Phillips, O' Sullivan, & Pope, 1997; Pope et al., 1997). Individuals with MD frequently avoid important social or occupational activities because of the compulsive need to maintain their workout and rigid diet (Olivardia, 2001; Pope et al., 1997); any deviation from these regimens results in marked distress (Pope et al., 1997). In regard to compulsive workout and rigid diet, many studies stated

that MD shares clinical features with Eating Disorders (EDs), specifically with Anorexia Nervosa (AN); indeed MD was first described as "reverse anorexia" (Kuennen & Waldron, 2007; Pope, Katz, & Hudson, 1993). MD and AN share body distortion and dissatisfaction, dysfunctional eating behaviors and psychological features such as perfectionism and low self-esteem (Grieve, 2007; Pope et al., 1993). Literature well documented the high comorbidity between MD and EDs (Nieuwoudt, Zhou, Coutts, & Booker, 2015; Olivardia et al., 2000), but little is known about dysfunctional eating patterns such as Orthorexia Nervosa (ON) in individuals with MD. ON is defined as an obsession for healthy food and differs from EDs since the eating pathology is expressed in a "qualitative" way in the former and in a "quantitative" manner in the latter (Donini, Marsili, Graziani, Imbriale, & Cannella, 2005; Olivardia et al., 2000).

As mentioned, psychological features may play a role in the development of MD. Perfectionism might be involved given that individuals with MD struggle to reach an unattainable body shape (Grieve, 2007; Skemp, Mikat, Schenck, & Kramer, 2013), and it may influence the development of MD both directly and indirectly. The direct influence relies in the pursuit of the perfect body, whereas the indirect influence might be enacted through body dissatisfaction (Grieve, 2007).

Also self-esteem might play a key role in the development of MD (Cafri et al., 2005; Grieve, 2007; Lantz, Rhea, & Mayhew, 2001; Olivardia, 2001): the existence of a negative association between self-esteem and MD symptoms has been documented (Kuennen & Waldron, 2007; Olivardia, Pope, Borowiecki, & Cohane, 2004); furthermore, individuals with MD are characterized by lower self-esteem levels than individuals without MD (Pope et al., 2000). In individuals with MD, self-esteem depends on physical appearance (Olivardia, 2001; Pope et al., 2000); therefore, their

level of self-esteem varies accordingly to the satisfaction with their physical appearance (Grieve, 2007). Low self-esteem provides a source of motivation for MD behavioral symptoms (Crocker, 2002): individuals with MD may engage appearance-improving behaviors such as weightlifting, excessive workout, rigid diet, and heavy use of dietary supplements and AAS to enhance their self-esteem (Crocker, 2002). The muscular development obtained performing these activities enhance self-esteem, and the person is reinforced to engage in these activities again. Low self-esteem may also contribute to the avoidance of social situations in which the body is exposed to others, and such avoidance is negatively reinforced by a temporary reduction in anxiety (Olivardia, 2001); indeed, individuals with MD try to avoid any places and situations in which their body might be seen by others (e.g. beaches, swimming pools), or endure such situations with marked distress and anxiety (Olivardia, 2001; Pope et al., 1997). Although the role of social physique anxiety has been well explored with respect to MD development (Ebbeck, Watkins, Concepcion, Cardinal, & Hammermeister, 2009; Pope et al., 1997), little is known about social anxiety in MD.

MD affects mostly men (Pope et al., 1997), and its prevalence rates vary significantly depending on the sample population; in particular, athletes involved in weightlifting activities are considered at high-risk for MD development (Pope et al., 1993; Pope et al., 1997). However, a generalization for all athletes involved in weight training activities does not appear to be justified: a discrepancy of MD prevalence and features among subgroups within the weightlifting community exists, and it depends on the goals of the weight training activity (Skemp et al., 2013). Indeed, athletes who engage in appearance-related weight training (e.g. bodybuilders) may be at greater risk for MD development than athletes involved in weight training to improve strength (e.g. strength

trainers/power lifters; Skemp et al., 2013). In fact, many studies underlined that bodybuilders display higher MD prevalence rates and more MD features than other weightlifting trainers (e. g. strength trainers/power lifters; Cella, Iannaccone, & Cotrufo, 2012; Lantz, Rhea, & Cornelius, 2002; Mitchell et al., 2016; Pope et al., 1997; Skemp et al., 2013), with prevalence rates within this population ranging from 3.4% (Cella et al., 2012) to 53.6% (Hitzeroth, Wessels, Zungu-Dirwayi, Oosthuizen, & Stein, 2001). Therefore, differences in goals characterizing bodybuilders and other weightlifters may influence the prevalence and the manifestation of MD symptoms (Mosley, 2009) Although bodybuilders are considered at high risk for developing MD (Pope et al., 1993; Pope et al., 1997; Skemp et al., 2013), the study of Pickett, Lewis, & Cash (2005) reported that competitive bodybuilders did not differ from other weight trainers with respect to the self- evaluation of their body image; furthermore, both groups reported higher positive self-evaluation of their body than physically active controls. Moreover, both competitive bodybuilders and weigh trainers were more satisfied about their upper torso and muscle tone than physically active controls. Finally, competitive bodybuilders reported more social self-esteem than both weight trainers and athletically active controls (Pickett et al., 2005). Also results from the study of Finkenberg and Teper (1991) highlighted that bodybuilders had significantly higher scores on personal, social, and satisfaction dimensions of self-concept than non-bodybuilders. These inconsistent findings may be due to sampling methods (e. g. different level of competition) and by the self-report measures employed to assess MD, that may fail in the evaluation of the condition's key features (Mosley, 2009).

As far as concern psychological features that may play a different role with respect to MD development within the weightlifters community, a recent review and meta-

analysis by Mitchell and colleagues (2016) found that anxiety, depression, and neuroticism were positively associated with MD, whereas self-esteem was negatively associated with it within a bodybuilding group. Interestingly, within a sample of non-bodybuilder resistance trainers, MD was positively associated with anxiety, depression, and also with social physique anxiety and perfectionism; with respect to self-esteem, as in the bodybuilding group, it resulted negatively associated with MD (Mitchell et al., 2016).

Despite the increased awareness and interest towards MD in recent studies, it continues to be an under-studied disorder, especially in the Italian context. Indeed, to the Authors' knowledge, only one study has explored the prevalence of MD in the Italian context, and it found a prevalence rate of 3.4% in bodybuilders (Cella et al., 2012). Also the study of Santarnecchi and Dèttore (2012) assessed MD in samples of Italian competing bodybuilders, non-competing bodybuilders and non-training individuals, but no data pertaining its prevalence were reported. Therefore, the main purpose of the present study was to explore the prevalence and the phenomenology of MD in three groups of Italian participants who trained regularly for recreational purposes: bodybuilders, strength trainers, and fitness wellness trainers. Given that MD prevalence varies according to the goals of weight training activity (Skemp et al., 2013) and may varies in accordance with the level of competition, we decided to focus on bodybuilders and strength trainers given that they are characterized by different goals in weight training activity and because both athletes train for recreational purposes. To note, we included the fitness/wellness group as a control group given that it shares training features with bodybuilders and strength trainers.

In accordance with some of the previous studies, we expected higher MD prevalence and features in bodybuilders than in the other two groups (Cella et al., 2012; Hitzeroth et al., 2001; Lantz et al., 2002; Mitchell et al., 2016; Pope et al., 1997). Shedding light on the prevalence and phenomenology of MD in these groups of athletes might improve MD assessment and treatment methodologies, as well as raise awareness about this disorder. The second aim of the present study was to investigate MD related psychological features such as self-esteem, perfectionistic traits, social anxiety and ON symptoms, and general distress within these groups of athletes. In accordance with the majority of the previous studies, we expected to observe lower levels of self-esteem and higher perfectionistic traits, as well as higher orthorexic behaviors in bodybuilders than in the other two groups, given that these features frequently co-occur with MD and we hypothesized that bodybuilders are characterized by higher MD prevalence and features (Anderson et al., 1995; Blouin & Goldfield, 1995; Muller, Dennis, Schneider, & Joyner, 2004). On the other hand we hypothesized to observe higher levels of social anxiety symptoms and general distress in bodybuilders than in the other two groups; nonetheless, it is to note that no studies have explored these characteristics among these groups of athletes yet. Lastly, we aimed at assessing the presence of associations between MD and related psychological features among the three groups and, with exploratory purposes, possible MD predictors among groups. In accordance with the meta-analysis of Mitchell and colleagues (2016) we expected a different pattern of correlation among groups. With respect to the bodybuilding group we expected positive correlations between MD and perfectionistic traits, social anxiety and ON symptoms, and general distress, and a negative correlation with self-esteem. We expected this pattern of correlations because all of these psychological features are associated with

MD (Cafri et al., 2005; Ebbeck et al., 2009; Grieve, 2007; Kuennen & Waldron, 2007; Lantz et al., 2001; Olivardia, 2001; Olivardia et al., 2004; Pope et al., 1997). With respect to the strength trainer group, in accordance with the meta-analysis of Mitchell and colleagues (2016), we expected positive associations between MD and perfectionistic traits, social anxiety symptoms, and general distress, and a negative correlation between MD and self-esteem. Given that we considered the fitness/wellness group as a control group, we expected no significant correlations between MD and psychological features within this group. Finally, given that no studies have examined MD predictors among the groups of interest, we conducted regression analyses with exploratory purposes; therefore, no hypotheses have been made.

## 4.2 Method

### *4.2.1 Participants*

Participants were 125 males who trained regularly for recreational purposes: bodybuilders ($n$ = 42; BB group), strength trainers ($n$ = 61; ST group) and fitness/wellness trainers ($n$ = 22; FW group). All participants satisfied the following general inclusion criteria: at least 18 years of age; absence of severe neurological or medical conditions; no current or past psychotic disorders; no evidence of intellectual disabilities. The mean age of the total sample was 30.89 (SD = 8.90; range = 19-55) and the mean age of education was 15.02 (SD = 2.85; range = 8-21). The majority of participants reported to be single (36%) and full employed (46.4%). Groups were equivalent with respect to age, years of education, marital status and occupation ($p$ > .05; Table 1), whereas differences emerged on BMI ($p$ = .01): Bonferroni post hoc

comparisons revealed that the BMI of the ST group was higher than the BMI of the FW group ($p$ = .01), whereas the BB group did not differ from neither the ST ($p$ = .06) nor the FW ($p$ = .99) groups (Table 1).

**Table 1.**

Comparisons among bodybuilders (BB group), strength trainers (ST group) and fitness/wellness trainers (FW group) on age, education, marital status, occupation and BMI

| | **BB group (N = 42)** | **ST group (N = 61)** | **FW group (N = 22)** | **χ2 /F** | **df** | ***p*** |
|---|---|---|---|---|---|---|
| **Age** | 28.17 (8.14) | 32.26 (9.08) | 32.27 (8.97) | 3.05 | 2,123 | .06 |
| **Education** | 15.10 (2.93) | 14.92 (2.73) | 15.14 (3.17) | .07 | 2,123 | .93 |
| **Marital status (% single)** | 50 | 26.23 | 36.36 | 8.38 | 6 | .21 |
| **Occupation (%full-employed)** | 45.24 | 45.90 | 50 | 11.12 | 10 | .35 |
| **BMI** | 24.77 (2.12) | 25.89 (2.36) | 24.23 (2.53) | 5.32 | 2,123 | .01 |

*4.2.2 Measure*

All participants completed a brief schedule collecting socio-demographic information, self-reported weight and height, daily proteins assumption, anabolic-androgenic steroids use, and checking weight behaviors. Given that no Italian standardized measures assessing Pope et al. (1997) diagnostic criteria for MD were available, an *ad hoc* self-report instrument was developed:

The *Pope's Criteria Questionnaire* (PCQ) is a self-report measure assessing Pope et al. (1997) diagnostic criteria for MD made up of 4 dichotomous items (Yes/No). The first item evaluates the preoccupation with the idea that one's body is not sufficiently muscular and lean. If the answer is positive, the participant is required to express the degree of preoccupation (little, moderate, much, very much). The second item assesses the presence of compulsive workout, excessive attention to diet and avoidance of situations where one's body is exposed to others in response to concerns about being

not sufficiently muscular and lean. The third question assesses the presence of distress or impairment in social and occupational functioning because of the concern about being not sufficiently muscular and lean. Finally, the last question asks whether the main source of concern is not being sufficiently muscular and lean as distinguished from fear of fat (as in anorexia nervosa [AN]) or primary preoccupation with other aspects of appearance (as in BDD). Participants can be classified as ‘‘probable MD’’ if they fulfill all the diagnostic criteria for MD evaluated by the PCQ.

The *Muscle Dysmorphic Disorder Inventory* (MDDI; Hildebrandt, Langenbuchert, & Schlundt, 2004; Italian version by Santarnecchi & Dèttore, 2012) is a 13 items self-report questionnaire assessing symptoms associated with muscle dysmorphia (MD) on a 5 point Likert scale (from 0 = “never” to 4 = “always”). It contains 3 subscales: desire for size (DFS), appearance intolerance (AI), and functional impairment (FI); a total score can also be computed. The DFS subscale assesses beliefs of being smaller and weaker than desired, or wishes to be more muscular. The AI is made up of questions regarding negative beliefs and anxiety associated with one’s body and appearance. Finally, the FI assesses the presence of negative emotions when deviating from daily exercise, or avoidance of social situations because of the preoccupation with one’s body. The questionnaire showed good internal consistency, with alpha’s coefficients raining from $\alpha = .77$ to $\alpha = .85$ (Hildebrandt et al., 2004). The Italian version proved to be highly reliable as well, with the exception of the AI subscale ($\alpha = .45$; Santarnecchi & Dèttore, 2012). In the current study, the alpha coefficient was .80 for the DFS scale, .73 for AI scale and .83 for FI subscale. Finally, the alpha coefficient of the total score was .83.

The *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965; Italian version by Prezza, Trombaccia, & Armento, 1997) consists of 10 items measuring global self-esteem. Items are rated on a 4-point Likert scale, ranging from 1 = "strongly disagree" to 4 = "strongly agree", with higher scores representing greater self-esteem. Good internal consistency values have been reported for the original RSES, ranging between α = .77 and α = .88 (Dobson, Goudy, Keith, & Powers, 1979; Fleming & Courtney, 1984; Robinson, Shaver, & Wrightsman, 1991). The Italian version showed good psychometric properties as well: its internal consistency was α = .84 (Prezza et al., 1997). The internal consistency coefficient was excellent also in the present sample (α = .88).

The *Multidimensional Perfectionism Scale* (MPS; Hewitt & Flett, 1991) is a 45 items self-report questionnaire designed to assess three different domains of perfectionism: self-oriented, socially prescribed and other-oriented. Self-oriented subscale involves self-directed perfectionistic behaviors such as setting high standards for oneself; socially prescribed subscale involves the perceived need to attain standards prescribed by significant others; other-oriented subscale involves place unrealistic standards for significant others and places importance on other people being perfect. Each subscale of the questionnaire contains 15 items evaluated on a 7-point Likert scale (ranging from 1 = "strongly disagree" to 7 = "strongly agree"), with higher scores indicating greater levels of perfectionism. With respect to the original MPS, good internal consistency values have been reported, ranging between α = .79 and α = .89 in a student sample (Hewitt & Flett, 1991). The Italian validation of the MPS is not available to date, therefore an *ad hoc* translation was employed. In the present sample, the alpha

coefficient was α = .89 for the self-oriented scale, α = .80 for the socially prescribed scale and α = .72 for the other-oriented perfectionism subscale.

The *Social Phobia Scale* (SPS; Mattick & Clarke, 1998; Italian version by Sica et al., 2007) consists of 20 items assessing situations that involve being observed by others (e. g., public speaking, eating in public, etc.). Items are rated on a 5-point Likert scale, ranging from 0 = "not at all" to 4 = "extremely", with higher scores indicating greater social phobia. The SPS showed good psychometric properties: its internal consistency was α = .90 in a community sample and α = .89 in patients with social phobia. Test-retest reliability was *r* = .91 on a 4 weeks period (Mattick & Clarke, 1998). The Italian version proved to be highly reliable and stable as well (internal consistency: α = .87; 30-days test-retest reliability: *r* = .87; Sica et al., 2007). Internal consistency coefficient was excellent in the present sample (α = .89).

The *ORTO-15* (Donini et al., 2005) is a 15 items self-report questionnaire assessing orthorexia. The questionnaire evaluates the presence of obsessive attitudes towards choice, preparation and consumption of healthy foods on a 4 point Likert scale ranging from 1 = "never" to 4 = "always", with lower scores indicating orthorexic behaviors. Cut-off point values can be set depending on the purpose of the study (Donini et al., 2005). Within the validation sample, the ORTO-15 demonstrated high specificity (73.6%) and high negative predictive value (100%) with a threshold value of 40 points (Donini et al., 2005).

The *Depression Anxiety Stress Scale-21* (DASS-21; Lovibond & Lovibond, 1995; Italian version by Bottesi et al., 2015) is a 21 items self-report questionnaire assessing depression, anxiety, and stress on a 4-point Likert scale (ranging from 0 = "did not

apply to me at all" to 3 = "applied to me very much"), with higher scores indicating greater distress. Three subscale scores and a "general distress" total score can be computed (Bottesi et al., 2015). The original DASS-21 demonstrated adequate reliability in non-clinical samples, with coefficient alphas ranging from α = .73 to α = .81 (Lovibond & Lovibond, 1995). The Italian version proved to be highly reliable as well, with internal consistency values ranging from α = .74 to α = .90 in a community sample (Bottesi et al., 2015). Given that findings on the Italian version suggested that use of the total score, measuring a "general distress" factor, could be more appropriate than calculating the three subscale scores separately (Bottesi et al., 2015), for the purpose of the present research we focused only on the total score of the questionnaire. In the present study, the alpha coefficient for the total DASS was excellent (α = .91).

*4.2.3 Procedure*

Participants were recruited online through links posted on bodybuilding and weightlifting discussion forums (http://www.projectinvictus.it; http://www.ironmanager.it). All individuals participated on a voluntary basis and provided their informed consent clicking agreement before starting to complete the survey about male body image and related psychological and psychopathological features; participants were also informed about the possibility to withdraw from the survey at any stage without explanation. After provided informed consent, participants completed the brief schedule collecting socio-demographic information and the self-report measures; responses were saved on the Google Drive server. Participants took approximately 30 minutes to complete the survey.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee of the Psychological Sciences, University of Padova.

*4.2.4 Statistical Analyses*

In order to assess the presence of differences among groups on socio-demographic variables, one-way analyses of variance (ANOVAs) and Chi-squared analyses were conducted. Bonferroni post hoc comparisons were computed when significant mean differences emerged.

For participants who satisfied all the diagnostic criteria for MD (i.e., "probable MD"), descriptive analyses (means, frequencies and percentages) were computed.

Chi-squared analyses and one-way ANOVAs were performed in order to compare groups (BB group vs. ST group vs. FW group) on behaviors, psychological and psychopathological features related to MD; also in this case, Bonferroni post hoc comparisons were computed when appropriate. We calculated Pearson's correlations to examine the association between MD and related psychological and psychopathological features within each group (BB group, ST group and FW group). Finally, we performed 3 two-step hierarchical regression analyses within each group (BB group, ST group and FW group) to further understand the relation between MD (as measured by MDDI total score) and related psychological and psychopathological features (RSES, MPS, SPS and ORTO-15): The MDDI Total score was the dependent variable, the DASS-21 Total score was always included in the first block, whereas the other variables were entered in the second block.

Conventional significance levels were used (*ps* < .05). All statistical analyses were conducted using IBM SPSS statistics, version 21.

## 4.3 Results

### *4.3.1 MD prevalence*

Overall, eight participants (6.4%) satisfied Pope et al. (1997) diagnostic criteria for MD. Specifically, 4 participants were bodybuilders, 2 practised strength training and 2 were in the fitness/wellness group. No differences among groups emerged with respect to MD prevalence ($\chi^2_2 = 1.94$; $p > .05$). The 8 participants with probable MD were aged between 19 and 39 years (M = 28.63; SD = 6.19) and their educational level ranged between 13 and 20 years (M = 15; SD = 2.58); BMI ranged between 23.59 and 26.87 (M = 25.55; SD = 1.28). Five out of 8 participants with probable MD were single, 2 were partnered and 1 was married. Four participants with probable MD were full employed, 2 were unemployed, 1 had a part-time job, and 1 was a student.

With respect to behaviors related to MD, 4 participants reported they had never used anabolic-androgenic steroids, 3 reported they had used steroids in the past, and 1 declared to think about taking them. Five participants with probable MD declared to assume more than 2 daily grams of proteins and 3 participants reported to assume an amount ranging between 1.2 and 2 grams a day. Concerning checking weight behaviours, 6 participants reported to monitor their weight at least once week, 1 declared to monitor his weight every day and 1 reported to check his weight less than once a week.

### *4.3.2 MD behaviors and symptoms among groups*

With respect to behaviors related to MD, Chi-squared analyses showed significant differences among groups (BB group, ST group and FW group) on daily proteins assumption ($p = .004$) and AAS use ($p = .04$), whereas no differences among groups

emerged on checking weight behaviors ($p > .05$; Table 2). Indeed, more individuals in the BB group reported to think about taking AAS (10 participants vs 4 participants in the ST group and no one in the FW group) and to assume more than 2 daily grams of proteins (18 participants vs 6 participants in the ST group and 4 participants in the FW group).

With respect to MD symptoms, the ANOVAs revealed significant differences among groups on the MDDI. In particular, the BB group scored significantly higher on the DFS scale than the ST ($p = .001$) and the FW ($p = .02$) groups, whereas no difference between the ST and the FW groups emerged ($p > .05$). Moreover, the BB group scored significantly higher on the total score of the MDDI than the FW group ($p = .02$), while the ST group did not differ from neither the BB ($p = .21$) nor the FW groups ($p = .49$). With respect to others MDDI subscales, no differences among groups emerged ($ps > .05$). Means, standard deviations and comparisons are reported in Table 3.

**Table 2.**

Comparisons among bodybuilders (BB group), strength trainers (ST group) and fitness/wellness trainers (FW group) on MD related behaviors

| | **BB group (N = 42)** | **ST group (N = 61)** | **FW group (N = 22)** | **$\chi 2$** | **gdl** | ***p*** |
|---|---|---|---|---|---|---|
| **Daily protein assumption (% > 2 gr)** | 42.86 | 9.84 | 18.18 | 19.28 | 6 | .004 |
| **AAS use (% yes)** | 23.81 | 6.56 | 0 | 13.32 | 6 | .04 |
| **Checking weight behaviors (at least one time every day)** | 21.43 | 13.11 | 22.73 | 8.86 | 4 | .06 |

*4.3.3 Psychological and psychopathological features related to MD among groups*

As far as concern the MPS, significant differences among groups only in the MPS Self-oriented scale scores emerged. Specifically, the ST group scored significantly higher than the FW group ($p = .002$), whereas the BB group did not differ from both the ST ($p$

= .07) and the FW ($p$ = .39) groups. Groups did not differ as regards scores on the RSES, the SPS, the ORTO-15, and the DASS-21 total score (all $ps$ > .05). Means, standard deviations and comparisons are reported in Table 3.

**Table 3.**

Comparisons among bodybuilders (BB group), strength trainers (ST group) and fitness/wellness trainers (FW group) on MD and related psychological features

| | **BB group (N = 42)** | **ST group (N = 61)** | **FW group (N = 22)** | $F_{(1,123)}$ | $p$ |
|---|---|---|---|---|---|
| **MDDI desire for size** | 10.31 (4.32) | 7.05 (4.18) | 7.14 (4.64) | 7.85 | .001 |
| **MDDI appearance intolerance** | 4.17 (2.94) | 3.93 (3.02) | 3.36 (2.84) | 3.07 | .06 |
| **MDDI functional impairment** | 6.93 (4.20) | 7.34 (3.61) | 4.91 (4.51) | .53 | .59 |
| **MDDI total score** | 21.40 (8.44) | 18.33 (7.83) | 15.41 (9.80) | 3.90 | .02 |
| **RSES** | 30.74 (4.95) | 31.70 (5.41) | 32.77 (4.68) | 1.17 | .31 |
| **MPS self-oriented** | 68.09 (15.67) | 74.98 (15.35) | 62.14 (11.61) | 6.78 | .02 |
| **MPS other-oriented** | 57.17 (12.52) | 60.87 (9.73) | 59.91 (9.20) | 1.52 | .22 |
| **MPS socially prescribed** | 50.40 (12.97) | 54 (13.31) | 50 (8.16) | 1.41 | .25 |
| **SPS total score** | 16 (10.57) | 14.18 (9.64) | 12.41 (7.73) | 1.05 | .35 |
| **ORTO-15 total score** | 34.31 (3.54) | 35.80 (3.44) | 35.54 (4.07) | 2.24 | .11 |
| **DASS-21 total score** | 17.74 (8.64) | 16.97 (9.73) | 14.77 (9.77) | .73 | .48 |

*4.3.4 Associations between MD and related psychological and psychopathological features within groups*

With respect to the BB group, significant positive medium-large range associations between the MDDI total score and the MPS Socially prescribed scale ($r$ = .39; $p$ = .01), the SPS ($r$ = .65; $p$ < .001), and the DASS-21 total score ($r$ = .38; $p$ = .01) emerged, whereas significant negative medium range associations between the MDDI total score and the RSES ($r$ = -.45; $p$ = .003) and the ORTO-15 ($r$ = -.36; $p$ = .02) were observed. No associations between the MDDI total score and both the MPS self-oriented subscale ($r$ = .10; $p$ = .26) and the other-oriented subscale emerged ($r$ = -.03; $p$ = .72).

With respect to the ST and FW groups, significant positive medium-large range associations emerged between the MDDI total score and the SPS ($r$ = .48; $p$ < .001 and $r$

= .47; $p$ = .03, respectively) and the DASS-21 total score ($r$ = .37; $p$ = .004 and $r$ = .64; $p$ = .001, respectively), whereas a significant negative association with the RSES emerged ($r$ = -.37; $p$ = .003 and $r$ = -.64; $p$ = .001, respectively). No associations between the MDDI total score and both the MPS scales (ST group: MPS self-oriented, $r$ = .18; $p$ = .16; other oriented, $r$ = .08; $p$ = .53; socially prescribed, $r$ = .18; $p$ = .16; FW group: self-oriented, $r$ = -.08; $p$ = .71; other oriented, $r$ = -.01; $p$ = .96; socially prescribed, $r$ = .19; $p$ = .39) and the ORTO-15 emerged (ST group: $r$ = -.06; $p$ = .66; FW group: $r$ = -.03; $p$ = .90).

*4.3.5 Psychological and psychopathological features as predictors of MD*

In light of correlational findings emerged within the BB group, in the first two steps hierarchical multiple regression the RSES, the MPS Socially prescribed scale, the SPS, and the ORTO-15 were included in the second step. The overall model explained the 49.1% of the variance in the MDDI total score. The DASS-21 total score entered in the first step emerged to significantly predict the MDDI total score, F(1,40) = 6.62, $p$ = .01, explaining the 14% of the variation in the MDDI total score. The inclusion of the other variables in the second step explained an additional 41% of variation in the MDDI total score (F change = 8.27; $p$ < .001). Results revealed that, after controlling for the DASS-21 total score, the SPS and the ORTO-15 were significant predictors ($\beta$ =.51 t = 3.95, $p$ < .001 and $\beta$ =-.24 t = -2.12, $p$ = .04, respectively), whereas the RSES and the MPS Socially prescribed scale were not (all $ps$ > .05).

With respect to the ST group, in the two steps hierarchical multiple regression only the RSES and the SPS were included in the second step on the base of correlational findings. The overall model explained the 23.3% of the variance in the MDDI total score. Results

revealed that, at step one, the DASS-21 total score was a significant predictor, $F(1,59) = 9.22$, $p = .004$, and accounted for 13% of the variation in the MDDI total score. Entering the other variables in step 2 explained an additional 14% of variation in the MDDI total score (F change = .14; $p = .01$). Results highlighted that, after controlling for the DASS-21 total score, only the SPS was a significant predictor of the MDDI total score ($\beta = .37$ $t = 2.83$, $p = .01$), while the RSES was not ($p > .05$).

Lastly, as far as concern the FW group, in the two steps hierarchical multiple regression only the RSES and the SPS were included in the second step on the base of correlational findings. The overall model explained the 40.4% of the variance in the MDDI total score. Findings revealed that, at step one, the DASS-21 total score was a significant predictor, $F(1,20) = 14.22$, $p = .001$, and accounted for 42% of the variation in the MDDI total score. Entering the other variables in step 2 did not explain additional variance in the MDDI total score (F change =1.29; $p = .30$).

### 4.4 Discussion

MD is a subtype of BDD (APA, 2013) that is still under-recognized in the Italian context, despite its severity and its associated dangerous behaviours. To the Authors' knowledge, to date only one study has assessed MD prevalence in the Italian context, and it found a prevalence rate of 3.4% within a bodybuilding group (Cella et al., 2012). The current study evidenced a MD prevalence of 6.4% in Italian participants who trained regularly for recreational purposes. Our study found a MD prevalence rate higher than the one emerged in Cella and colleague's (2012) study; the higher prevalence emerged in the current study may be explained by methodological and

sample differences. Indeed, the study by Cella and colleagues (2012) compared a group of competitive bodybuilders with a group of non-bodybuilders; on the contrary, our study assessed MD prevalence among three groups of athletes involved in weight training activity only for recreational purposes (bodybuilders, strength trainers, and fitness wellness trainers). Interestingly, we found that 4 participants (9.52%) in the bodybuilding group, 2 participants (3.28%) in the strength group and 2 participants (9.09%) in the fitness/wellness group satisfied Pope's et al. (1997) diagnostic criteria for MD, and no differences among the groups with respect to MD prevalence rates emerged. These findings are in contrast with studies that underlined a higher MD prevalence in bodybuilders than in other weightlifting trainers and athletes (Cella et al., 2012; Lantz et al., 2002; Skemp et al., 2013). These inconsistent findings may be explained, once again, by methodological and sample differences. For example, the study by Lantz and colleagues (2002) compared elite-level competitive bodybuilders with elite-level power lifters, and the study by Skemp and colleagues (2013) focused both on competitive and recreational athletes involved in appearance-related weight training (such as bodybuilders) and athletes involved in weight training to improve strength (such as strength trainers), and found that athletes involved in appearance-related weight training were at greater risk for MD development. Therefore, the level of competition might influence MD development: in other words, competitive athletes involved in appearance-related weight training may be at greater risk to develop MD than athletes involved in appearance-related weight training for recreational purposes. Although no differences among groups with respect to MD prevalence emerged, the BB group, as expected, reported more MD related behaviours than the other two groups; specifically, the BB group reported more frequently to think about taking AAS and to

assume more than 2 daily grams of proteins than the ST group and the FW group. These findings are in accordance with studies underlining that being involved in sports that reward building muscles and gaining size such as bodybuilding could expose to a greater risk to engage in dangerous behaviours such as heavy use of AAS (Grieve, 2007; Irving, Wall, Neumark-Sztainer, & Story, 2002). These results are also in accordance with studies that affirmed the strict adherence to a high-calorie, high-protein, and low-fat diet in bodybuilders (Baghurst & Lirgg, 2009; Muller et al., 2004). Furthermore, as expected, bodybuilders reported more beliefs about being smaller and weaker than desired or wishes to be more muscular than the others two groups. These findings are in accordance with the study by Lantz and colleagues (2002), which highlighted that bodybuilders are more likely to report body size-symmetry concerns than strength trainers because they are primarily interested in lifting weight to develop a hypermesomorphic physique, defined by muscular shape and symmetry. Furthermore, the BB group reported more general symptomatology related to MD including negative emotions when deviating from daily exercise, anxiety associated with one's body appearance, and avoidance of social situations because of the preoccupation with one's body than the FW group, whereas no differences between the BB group and the ST group emerged. These results are consistent with those by Blouin and Goldfield (1995), who observed that bodybuilders reported greater MD symptomatology than athletes not characterized by weight lifting activities, such as runners and martial artists. However, our findings are in contrast with the meta-analysis by Mitchell and colleagues (2016) revealing that bodybuilders have greater MD symptomatology than other weightlifters. Based on the results obtained in the current study, the BB group presents more MD behaviours and negative beliefs about being smaller and weaker than desired, or wishes

to be more muscular, than the others two groups, but more severe MD symptomatology only with respect to the FW group (Babusa & Túry, 2012). Accordingly, the BB group and the ST group differed only with respect to the presence of the negative belief of being smaller and weaker that desired, whereas negative emotions when deviating from daily exercise, anxiety associated with one's body appearance and avoidance of social situations because of the preoccupation with one's body emerged to be common both in the BB group and in the ST group; therefore, the BB group and the ST group are similar with respect to MD general symptomatology.

As far as concern psychological features related to MD, no differences among groups emerged with the exception of perfectionistic traits. The ST group reported to set higher standards for themselves than the BB group and the FW group, whereas no differences between the BB group and the FW group emerged. These findings are partially in line with the study by Muller and colleagues (2004), suggesting the presence of higher perfectionistic traits in bodybuilders and weightlifters than in non-weightlifters athletes. However, the lack of differences in perfectionistic traits between the BB group and both the ST and the FW group was unexpected, because the majority of the studies underlined that perfectionistic traits are more prevalent in bodybuilders than in other athletes (Anderson et al., 1995; Babusa & Túry, 2012; Blouin & Goldfield, 1995). However, these studies focused on both competitive and recreational bodybuilders, and it may be possible that perfectionistic traits characterize competitive bodybuilders rather than recreational bodybuilders.

The lack of differences with respect to self-esteem and orthorexic behaviours among the groups is another unexpected finding: in accordance with other studies, we expected lower levels of self-esteem (Blouin & Goldfield, 1995) and higher orthorexic behaviors

(Baghurst & Lirgg, 2009; Muller et al., 2004; Olivardia et al., 2000) in the BB group than in both the ST and the FW groups. Indeed, some of the most common appearance-improving behaviours performed by bodybuilders (e.g. weightlifting and strictly adherence to rigid diet) might be endorsed because they experience low of self-esteem (Crocker, 2002; Klein, 1992). However, these results are partially in accordance with the study by Blouin and Goldfield (1995): even though they found lower levels of self-esteem in bodybuilders than in martial athletes, they did not find any difference in self-esteem between bodybuilders and runners. Once again, differences in our study may be due to sampling methods.

Also with respect to social anxiety symptoms, in contrast with our expectations, no differences among groups emerged. This result, however, is in accordance with the meta-analysis by Mitchell and colleagues (2016) concerning symptoms of anxiety and social physique anxiety. Mitchell and colleagues (2016) reported that symptoms of anxiety and social physique anxiety in bodybuilders are less than, or comparable to, those referred by other weight trainers and physically active controls (Hallsworth, Wade, & Tiggemann, 2005; Hurst, Hale, & Smith, 2000; Pickett et al., 2005). Also general distress did not differ among groups, and also this result is somewhat unexpected given that bodybuilders pursuit a lean and muscular physique through strictly workout schedule and rigid diet (Olivardia, 2001; Phillips et al., 1997; Pope et al., 1997). Such a finding could be explained by the fact that all the athletes involved in the current study train for recreational purposes.

The lack of differences with respect to psychological features related to MD among groups, with the exception of perfectionistic traits, may be also explained by the fact that groups did not differed in regard to MD prevalence. Nevertheless, even though the

FW was conceptualized as a control group, 2 participants within this group satisfied Pope's et al (1997) diagnostic criteria for MD; therefore, also this is group is somewhat characterized by MD features.

In regards to associations between MD and related psychological features among groups, in accordance with the meta-analysis by Mitchell and colleagues (2016), different correlational patterns emerged. Concerning the BB group, MD symptoms resulted positively associated with socially prescribed perfectionism, social anxiety symptoms, and general distress. Therefore, the perceived need to attain high standards prescribed by others may increase the pursuit of a lean and muscular physique and the related functional impairment. In accordance with MD etiological models, perfectionism may play a key role in the development and maintenance of MD, both directly and indirectly (Davis, Karvinen, & McCreary, 2005; Grieve, 2007). Furthermore, in accordance with other studies, MD symptoms resulted associated with marked distress (Olivardia, 2001; Phillips et al., 1997; Pope et al., 1997) and with high levels of anxiety experienced in social situations when one's body may be exposed to others (Olivardia, 2001; Pope et al., 1997). Moreover, in line with our expectation, MD symptoms resulted negatively associated with self-esteem and orthorexic behaviors, in accordance with studies underlining that MD symptomatology is associated with low levels of self-esteem (Cafri et al., 2005; Grieve, 2007; Kuennen & Waldron, 2007; Lantz et al., 2001; Olivardia, 2001; Olivardia et al., 2004) and dysfunctional eating patterns characterized by strict adherence to a low-fat, high-calorie, and high-protein diet in bodybuilders (Baghurst & Lirgg, 2009; Muller et al., 2004).

Concerning the ST and the FW groups, positive and significant correlations between MD symptomatology, social anxiety symptoms, and general distress were observed in

both cases. Furthermore, a negative significant correlation between MD and self-esteem emerged. These results are partially in accordance with our expectation given that, in line with the meta-analysis by Mitchell and colleagues (2016), we expected a positive correlation also with perfectionistic traits in the ST group, since perfectionism appears to be related to MD symptoms also in these athletes. However, it is noteworthy that the ST athletes who entered the current study train for recreational purposes, whereas other studies focused on competitive athletes (Skemp et al., 2013); therefore, the level of competition may influence the relation between MD and perfectionistic traits within this group of athletes. Finally, we expected no significant correlations between MD symptoms and related psychological features in the FW group. The emerged correlational patterns might be explained in light of the fact that a growing number of males are dissatisfied with their appearance (Pope et al., 2000) and because of the presence of MD features within this group; indeed, 2 participants within this group satisfied Pope's et al (1997) diagnostic criteria for MD.

Lastly, as far as concern the exploratory aim of the current study, different prediction models among groups emerged. Results showed that within the BB group, MD symptomatology was predicted by social anxiety and by othorexic behaviours. Therefore, the strictly adherence to diet regimens and the obsession for healthy food may contribute to MD development, in accordance with studies affirming that the majority of individuals with MD present a dysfunctional eating pattern characterized by rigid diet and by the avoidance of the food when its caloric content is unknown (e.g. eating food in restaurant; Olivardia, 2001). As regards social anxiety symptoms, the emerged findings are in accordance with the study by Chandler, Grieve, Derryberry, and Pegg (2009), who underlined that social anxiety symptoms may represent a

motivational factor that influence MD symptoms. Indeed, if individuals are anxious about how their physique looks, they are more prone to experience a higher level of body focus. Because the social ideal for the male body is a hypermesomorphic physique (Grieve, Newton, Kelley, Miller, & Kerr, 2005; Parks & Read, 1997; Ridgeway & Tylka, 2005), an acceptable way to decrease social anxiety is to develop a drive for muscularity. The same mechanism may be involved concerning the ST group; indeed, social anxiety symptomatology resulted the only significant predictor of MD symptomatology within this group. Finally, concerning the FW group, no psychological features related to MD resulted predictive for MD. These results are not surprising given that the FW was conceptualized as a control group, even though 2 athletes within this group satisfied Pope's et al (1997) diagnostic criteria.

Overall, the present findings suggest that the pursuit of a lean and muscular physique in bodybuilding is not always associated with MD and psychological related features as already suggested by the meta-analysis by Mitchell and colleagues (2016). Therefore, although the BB group reported more negative beliefs about being smaller and weaker than desired or wishes to be more muscular than the others two groups, bodybuilders as a group may not necessarily have psychological features related to MD such as low self-esteem, high perfectionism, social anxiety symptoms and dysfunctional eating patterns. Furthermore, correlational patterns emerged in the current study are partially in accordance with our expectations, and regression analyses underlined that orthorexic behaviours, as well as social anxiety symptoms, may predict the MD symptomatology in bodybuilders.

To note, the current study is characterized by several limitations, including the small sample size and the online recruitment strategy, that under-sampled those without

internet capability. Furthermore, online assessment and data collection prevent the opportunity of conducting face-to-face interviews of participants self-identifying as bodybuilders, strength trainers and fitness/wellness trainers. This might have lead to a great heterogeneity, especially within the fitness/wellness group. Such shortcomings limit the generalizability of the emerged results. Furthermore, the absence of psychometric information for some of the employed measures (e.g., the PCQ and the MPS) is another limitation. Future studies overcoming these issues are highly recommended.

To conclude, despite the above-mentioned shortcomings, the present study represents one of the first attempts to assess prevalence, phenomenology and possible predictors of MD in the Italian context among athletes who trained regularly for recreational purposes. Indeed, only few studies have addressed the distinction between pathological versus non-pathological pursuit of hypermuscularity within the Italian context.

# Chapter 5

# General discussion

Body Dysmorphic Disorder (BDD) is a severe and debilitating psychological disorder characterized by concerns about the presence of one or more perceived defects in physical appearance that are not observable or appear slight to others (APA, 2013). Individuals with BDD exhibit high levels of functional and social impairment, and a substantial portion of those individuals (36%-39%) are unable to work due to their mental illness (Didie, Menard, Stern, & Phillips, 2008; Phillips, Quinn, & Stout, 2008; Veale, Boocock et al., 1996). However, individuals with BDD are often reluctant to seek help because they feel ashamed about revealing their concerns about appearance (Phillips, 2006). Therefore, many individuals with BDD may ask for non-psychological treatment (such as aesthetic plastic surgery or cosmetic medical procedures) in order to fix the perceived defects. Nevertheless, these treatments do not typically result in a decrease of BDD symptoms severity (Crerand, Phillips, Menard, & Fay, 2005; Phillips, Grant, Siniscalchi, & Albertini, 2001; Phillips, McElroy, Keck, Pope, & Hudson, 1993), and some patients experience symptoms exacerbation and develop new areas of concern (Crerand et al., 2005; Phillips et al., 2001; Veale, 2000; Veale, Boocock et al., 1996). Despite its growing prevalence and severity (Veale, Gledhill, Christodoulou, & Hodsoll, 2016), BDD is still under-recognized or left untreated in a variety of clinical settings, especially in the Italian context. For this reason, it is important that mental health professionals improve BDD assessment strategies and acquire skills to recognize

clinical and subclinical manifestations of BDD, as well as develop effective psychological treatments for this disorder.

The current contribution has been designed to help in terms of BDD conceptualization within the Italian context given that it represents the first study aiming at assessing BDD prevalence, phenomenology, and at risk populations in Italy.

Based on the results emerged from the first study, BDD is not a rare condition in Italy (1.63%), and its prevalence rate is comparable to the prevalence rates emerged in other Countries (e.g., Germany, Sweden). Also the BDD phenomenology observed in Italian individuals is comparable to the one reported in other Countries, with the head and the face in general as the most common areas of concern in individuals with BDD (Cansever, Uzun, Dönmez, & Özşahin, 2003; Phillips et al., 1993; Rief, Buhlmann, Wilhelm, Borkenhagen, & Brähler, 2006; Veale, Boocock et al., 1996). In terms of BDD epidemiological features, emerged results have underlined that young women are at high risk of developing BDD; indeed, the 90% of individuals screened at risk for BDD were female and aged between 18 and 28 years old. Furthermore, among these young women, the request for surgical cosmetic procedures was high. This information is crucial because it suggests that young women may be vulnerable with respect to BDD development and may seek non-psychological treatments in order to reduce their concerns about physical appearance. Therefore, a screening of BDD among young women, especially among those that require cosmetic procedures, may be useful in terms of BDD prevention. An early detection of BDD can improve treatment outcomes; indeed, early BDD detection, as well as early psychological treatment, represents the most important positive prognostic factors in BDD. Findings from this study are crucial, because they may lead to a better recognition of BDD in the Italian context, thus

providing crucial cues for both diagnostic and therapeutic issues related to this challenging disorder. Furthermore, shedding light on BDD prevalence within the Italian context might improve assessment and treatment methodologies, as well as raise awareness about this under-diagnosed disorder.

Screening for BDD is also recommended in patients with AN. In line with literature (Dingemans, van Rood, de Groot, & van Furth, 2012; Grant, Kim, & Eckert, 2002; Kollei, Schieber, Zwaan, Svitak, & Martin, 2013), the results emerged from the second study of the present contribution have underlined the high comorbitity (26.23%) between these disorders and the high presence of nonweight-related body image concerns in patients with AN. Despite the shared clinical features between these disorders, the presence of BDD is usually not investigated in patients with AN nor in EDs clinical settings. This limitation should be addressed given that the results of the present contribution, in accordance with literature studies (Dingemans et al., 2012; Grant et al., 2002), underlined that the comorbidity between these disorders confer greater overall severity in terms of body image dissatisfaction and clinical symptomatology. Furthermore, a diagnosis of BDD in patients with AN might affect treatment choice. Indeed, standard AN treatment programs are usually focused almost exclusively on the ED pathology and have limited efficacy in body image improvement (Rosen, 1996); indeed, the degree of clinical significant change is much greater for disturbance in eating behaviours than for body image (Davis, Olmsted, & Rockert, 1990; Rosen, 1990; Rosen, 1996). However, the intense body dissatisfaction may persist after a successful treatment for AN and the persistence of body dissatisfaction is a reliable predictor for relapse (Marco, Perpina, & Botella, 2013; Stice & Shaw, 2002). Therefore, especially when BDD and AN are comorbid, a psychological intervention should target

both eating pathology and body image. Thus, psychological treatments focused specifically on improving body image disturbance, such as mirror retraining, cognitive restructuring, exposure and response prevention (Key et al., 2002; Veale & Neziroglu, 2010), may be promising in patients with both disorders. Given these findings, a careful assessment of body image, nonweight-related body image concerns and BDD symptoms and related clinical features in patients with AN is recommended, even though generally neglected in clinical practice.

Lastly, male athletes could be at high risk to develop a subtype of BDD, the Muscle Dysmorphia (MD). MD is an under-recognized disorder, especially in the Italian context, characterized by preoccupation with the idea that one's body is not sufficiently lean and muscular (APA, 2013). Individuals with MD are characterized by impairment in social and occupational functioning, distress, and adoption of unhealthy behaviors such as rigid adherence to dietary regimes and anabolic-androgenic steroids (AAS) use (Olivardia, Pope, & Hudson, 2000; Phillips, O' Sullivan, & Pope, 1997; Pope, Gruber, Choi, Olivardia, & Phillips, 1997). Results from the third study of the current contribution have underlined that MD is not uncommon in the Italian weightlifting context (6.4%) and, in accordance with previous studies (Pope et al., 1997; Pope, Katz, & Hudson, 1993), have highlighted the presence of MD related behaviors and features in bodybuilders and strength trainers. Furthermore, orthorexic behaviors and social anxiety symptoms resulted the most relevant predictors of MD symptomatology within the bodybuilding group. This information is crucial since it may lead to a better understanding and recognition of MD in the Italian context. Furthermore, improving the identification of risk factors and predictors for MD, as well as associated psychological features in the Italian context, might facilitate the development of prevention strategies

and intervention, as well as the identification of at risk trainers. Furthermore, a deeper understanding of MD manifestation among athletes may help to distinguish individuals participating in a healthy manner versus those participating in an unhealthy manner.

The current contribution is characterized by several limitations. First of all, the small sample size is a common shortcoming across all the studies that implies low power and makes difficult drawing generalizable conclusions. Furthermore, we used self-report questionnaires rather than clinical structured interviews, which represent the gold standard to identify people with probable BDD and MD and to assess associated psychological and psychopathological features; future studies should employ clinical structured interviews as well as cognitive tasks and/or implicit measures to assess some of the psychological features related to BDD and MD. Finally, the absence of psychometric information for some of the self-report questionnaires employed across the three studies represents a further limitation. Future studies overcoming these issues are highly recommended.

Overall, despite the above-mentioned shortcomings, the present contribution represents the first research attempting to shed further light on the conceptualization of BDD and one of its subtypes (MD) in the Italian context. Future studies focused on BDD psychological treatments in the Italian context are recommended, given that CBT treatments have already demonstrated their effectiveness in the majority of the studies conducted in other Countries (Williams, Hadjistavropoulos, & Sharpe, 2006), but studies on this topic within the Italian context are lacking. Furthermore, research aiming at investigating and clarifying BDD etiology and pathophysiology is recommended. Such investigation will clarify the relation between BDD and other disorders that share clinical features and provide new leads for treatment and prevention strategies.

Finally, research on other at risk populations such as patients with EDs other than AN and people who seek and undergo to aesthetic plastic surgery or cosmetic medical procedures are highly recommended. Indeed, results emerged from a preliminary study still in progress are in line with the importance of assessing the prevalence of BDD and its related psychological and psychopathological features in individuals who seek aesthetic plastic surgery and cosmetic medical procedures. In particular, preliminary findings showed that the 23.08% of 23 patients (21 females and 2 males) seeking aesthetic plastic surgery and other appearance-enhancing medical treatments satisfied DSM-5 (APA, 2013) diagnostic criteria for BDD. The most common aesthetic procedures required by all the 23 patients were: rhinoplasty (17.07%), laser treatment (17.07%), filler injection (12.19%), and liposuction (7.32%). Furthermore, this group, compared with a matched healthy control group, reported higher dysmorphic concerns, obsessive-compulsive symptomatology, levels of self-oriented perfectionism, general distress, and dysfunctional eating attitudes. Consistently with literature evidence (Phillips et al., 2001; Sarwer & Crerand, 2008; Sarwer, Crerand, & Magee, 2010; Veale, De Haro, & Lambrou, 2003), these preliminary results highlighted that individuals who seek cosmetic procedures in order to improve their satisfaction about physical appearance reported an higher prevalence rate and more severe psychopathological symptoms than a control group. Despite rather interesting, such data are only preliminary, and further studies further exploring BDD features in individuals who seek aesthetic surgery and other appearance-enhancing medical treatments are recommended.

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# Appendix

**COMITATO ETICO DELLA RICERCA PSICOLOGICA (AREA 17)**
**Dipartimenti/Sezione di Psicologia - Università di Padova Via Venezia 8, 35131, Padova FAX. +39-0498276600, Email: comitato.etico17@gmail.com; Sito WEB: http://ethos.psy.unipd.it/**

**Protocollo: 1552**

**Data:** 06/02/2015

**Numero Univoco:** 71EC918F2A81F1BBBC0BBE7D719720E8

**Scopo:** Richiesta di parere

**Titolo:** Indagine esplorativa inerente l'immagine corporea in gruppi di individui

**Proponente Cognome e nome:** Cerea Silvia **Ruolo:** Dottorando **e-mail:** silvia.cerea@studenti.unipd.it

**Area:** Psicologia clinica e dinamica

**Ricercatori partecipanti:** 2 Ghisi Marta - Ricercatore confermato - Dipartimento di Psicologia Generale Bottesi Gioia - Specializzanda in psicoterapia cognitivo-comportamentale

**Parole chiave:** 1 - immagine corporea 2 - disturbo di dismorfismo corporeo 3 - caratteristiche psicologiche e psicopatologiche

**Tipologia di ricerca:** Ricerca applicata

**Il Comitato Etico, dopo attento esame delle informazioni fornite dal proponente, esprime parere positivo riguardante gli aspetti etici del progetto.**

**The project has been approved by the Ethical Committee for the Psychological Research of the University of Padova.**

Informativa ex art.13 D. Lgs. 196/2003 per il trattamento di dati sensibili

Gentile Signore/a,

ai sensi del D.Lgs. 196/2003, sulla tutela delle persone e di altri soggetti rispetto al trattamento dei dati personali, il trattamento delle informazioni che La riguardano, sarà improntato ai principi di correttezza, liceità e trasparenza e tutelando la Sua riservatezza e i Suoi diritti.

In particolare, i dati personali possono essere oggetto di trattamento solo con il consenso scritto dell'interessato e previa autorizzazione del Garante per la protezione dei dati personali (articolo 26).

Ai sensi dell'articolo 13 del predetto decreto, La informiamo che, nei limiti dell'Autorizzazione generale del Garante n.2/2004:

1. I dati sensibili da Lei forniti verranno trattati per la finalità della ricerca denominata "Indagine esplorativa inerente l'immagine corporea ". La presente ricerca ha l'obiettivo di indagare la percezione dell'immagine corporea nella popolazione generale, in coloro che si sottopongono a interventi di chirurgia plastica e di medicina/dermatologia estetica e in individui che presentano disturbi psicologici (disturbo di dismorfismo corporeo, disturbi del comportamento alimentare, fobia sociale e disturbo ossessivo compulsivo). Inoltre, la presente ricerca si propone di indagare la qualità della vita, le caratteristiche psicologiche (ad esempio, perfezionismo) e psicopatologiche (ad esempio, ansia, depressione) inerenti l'immagine corporea nei sopracitati gruppi di individui. Infine, la ricerca si pone come fine la validazione di questionari *self-report* volti all'indagine dei disturbi dell'immagine corporea.
2. Gli sperimentatori non comunicheranno a nessuno i dati raccolti; garantendone la riservatezza, i dati raccolti potranno essere utilizzati solo nell'ambito della presente ricerca scientifica (elaborazione ed eventuale pubblicazione scientifica presentando i dati grezzi medi che non rendono individuabili i singoli partecipanti).Il partecipante avrà il diritto di interrompere in qualsiasi momento la ricerca senza fornire alcuna spiegazione e senza penalizzazione alcuna e ottenendo il non utilizzo dei propri dati.
3. Qualora il partecipante richiedesse la restituzione dei propri punteggi grezzi, questa gli verrà fornita. In caso di risultati di rilevanza clinica è possibile rivolgersi alla responsabile della ricerca (Dott.ssa Marta Ghisi: marta.ghisi@unipd.it) per informarla e ottenere chiarificazioni a riguardo.
4. Il partecipante potrà esercitare i propri diritti ai sensi dell'articolo 7 del D.lgs.196/2003, che regolamenta il diritto di accesso ai dati personali. Il partecipante alla ricerca ha il diritto di ottenere la conferma dell'esistenza di dati personali che lo riguardano, anche se non ancora registrati, e la loro comunicazione. L'interessato, inoltre, ha il diritto di ottenere l'indicazione delle finalità e delle modalità di trattamento dei dati, la logica applicata in caso di trattamento effettuato con l'ausilio di strumenti elettronici e gli estremi indicativi del responsabile del trattamento dei dati. Il partecipante, inoltre, ha il diritto di ottenere l'aggiornamento e l'integrazione dei dati in caso di interesse, oltre che la cancellazione dei dati. L'interessato, infine, ha diritto di opporsi al trattamento dei dati personali che lo riguardano, anche se pertinenti con gli scopi della ricerca.

**Formula di acquisizione del consenso per il trattamento di dati sensibili**

Luogo……., Data……. Cognome ..... Nome .....

Il/La sottoscritto/a, acquisite le informazioni fornite dal titolare del trattamento ai sensi dell'art. 13 del D.lgs. n. 196/2003, e consapevole, in particolare, che il trattamento riguarderà i dati "sensibili" di cui all'art.4 comma 1 lett. d), nonché art.26 del D.lgs.196/2003, vale a dire i dati *"idonei a rivelare l'origine razziale ed etnica, le convinzioni religiose, filosofiche o di altro genere, le opinioni politiche, l'adesione a partiti, sindacati, associazioni od organizzazioni a carattere religioso, filosofico, politico o sindacale, nonché i dati personali idonei a rivelare lo stato di salute e la vita sessuale"*;

- presta il suo consenso per il trattamento dei dati necessari allo svolgimento delle operazioni indicate nell'informativa.

Firma leggibile .....

- presta il suo consenso per la diffusione dei dati nell'ambito indicato nell'informativa

Firma leggibile .....

- Il/la sottoscritto/a dichiara inoltre: (1) di non essere stato/a in alcun modo forzato/a alla partecipazione, (2) di essere stato/a informato/a sulla possibilità di abbandonare in qualsiasi momento la ricerca stessa senza penalizzazione alcuna e ottenendo il non utilizzo dei propri dati

Firma leggibile .....

Informativa ex art.13 D. Lgs. 196/2003 per il trattamento di dati sensibili

Gentile Signore/a,

ai sensi del D.Lgs. 196/2003, sulla tutela delle persone e di altri soggetti rispetto al trattamento dei dati personali, il trattamento delle informazioni che La riguardano sarà improntato ai principi di correttezza, liceità e trasparenza e tutelando la Sua riservatezza e i Suoi diritti.

In particolare, i dati personali possono essere oggetto di trattamento solo con il consenso scritto dell'interessato e previa autorizzazione del Garante per la protezione dei dati personali (articolo 26).

Ai sensi dell'articolo 13 del predetto decreto, La informiamo che, nei limiti dell'Autorizzazione generale del Garante n.2/2004:

1. I dati sensibili da Lei forniti verranno trattati per la finalità della ricerca denominata "Indagine delle caratteristiche psicologiche delle persone che si allenano in palestra", i cui responsabili sono la Prof.ssa Marta Ghisi e il Prof. Antonio Paoli, che svolgono la propria attività presso il Dipartimento di Psicologia Generale e il Dipartimento di Scienze Biomediche, Università degli studi di Padova. La presente ricerca ha l'obiettivo di indagare le caratteristiche psicologiche (ad esempio, percezione dell'immagine corporea, perfezionismo, autostima) negli individui che si allenano in palestra.
2. Gli sperimentatori non comunicheranno a nessuno i dati raccolti; garantendone la riservatezza, i dati raccolti potranno essere utilizzati solo nell'ambito della presente ricerca scientifica (elaborazione ed eventuale pubblicazione scientifica presentando i dati grezzi medi che non rendono individuabili i singoli partecipanti). Il partecipante avrà il diritto di interrompere in qualsiasi momento la ricerca senza fornire alcuna spiegazione e senza penalizzazione alcuna e ottenendo il non utilizzo dei propri dati.
3. Per avere ulteriori informazioni inerenti la ricerca o per richiedere informazioni inerenti i propri punteggi le richieste vanno inoltrate al seguente indirizzo e-mail: unipd.sportresearch@gmail.com.
4. Il partecipante potrà esercitare i propri diritti ai sensi dell'articolo 7 del D.lgs.196/2003, che regolamenta il diritto di accesso ai dati personali. Il partecipante alla ricerca ha il diritto di ottenere la conferma dell'esistenza di dati personali che lo riguardano, anche se non ancora registrati, e la loro comunicazione. L'interessato, inoltre, ha il diritto di ottenere l'indicazione delle finalità e delle modalità di trattamento dei dati, la logica applicata in caso di trattamento effettuato con l'ausilio di strumenti elettronici e gli estremi indicativi del responsabile del trattamento dei dati. Il partecipante, inoltre, ha il diritto di ottenere l'aggiornamento e l'integrazione dei dati in caso di interesse, oltre che la cancellazione dei dati. L'interessato, infine, ha diritto di opporsi al trattamento dei dati personali che lo riguardano, anche se pertinenti con gli scopi della ricerca.

**Formula di acquisizione del consenso per il trattamento di dati sensibili**

Luogo……., Data…….

Cognome ..... Nome .....

Il/La sottoscritto/a, acquisite le informazioni fornite dal titolare del trattamento ai sensi dell'art. 13 del D.lgs. n. 196/2003, e consapevole, in particolare, che il trattamento riguarderà i dati "sensibili" di cui all'art.4 comma 1 lett. d), nonché art.26 del D.lgs.196/2003, vale a dire i dati *"idonei a rivelare l'origine razziale ed etnica, le convinzioni religiose, filosofiche o di altro genere, le opinioni politiche, l'adesione a partiti, sindacati, associazioni od organizzazioni a carattere religioso, filosofico, politico o sindacale, nonché i dati personali idonei a rivelare lo stato di salute e la vita sessuale"*;

- presta il suo consenso per il trattamento dei dati necessari allo svolgimento delle operazioni indicate nell'informativa.

Firma leggibile .....

- presta il suo consenso per la diffusione dei dati nell'ambito indicato nell'informativa

Firma leggibile .....

- Il/la sottoscritto/a dichiara inoltre: (1) di non essere stato/a in alcun modo forzato/a alla partecipazione, (2) di essere stato/a informato/a sulla possibilità di abbandonare in qualsiasi momento la ricerca stessa senza penalizzazione alcuna e ottenendo il non utilizzo dei propri dati

Firma leggibile .....