



Psychometric properties and construct validity of the Muscle Appearance Satisfaction Scale among Hungarian men

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ABSTRACT

Limited studies have evaluated the psychometric properties of the Muscle Appearance Satisfaction Scale (MASS), a measure of muscle dysmorphia, in different cultures and languages. The aims were to examine the psychometric properties of the Hungarian version of the MASS (MASS-HU), and to investigate its relationship with self-esteem and exercise-related variables. Two independent samples of male weight lifters ($n_s = 289$ and 43), and a sample of undergraduates ($n = 240$) completed the MASS, Eating Disorder Inventory, and Rosenberg Self-esteem Scale. Exploratory factor analysis supported the original five-factor structure of the MASS only in the weight lifter sample. The MASS-HU had excellent scale score reliability and good test–retest reliability. The construct validity of the MASS-HU was tested with multivariate regression analyses which indicated an inverse relationship between self-esteem and muscle dysmorphia. The 18-item MASS-HU was found to be a useful measure for the assessment of muscle dysmorphia among male weight lifters.

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Introduction

Muscle dysmorphia (MD) was first described in 1993 (Pope, Katz, & Hudson) as the opposite form of anorexia nervosa. The focus of this special body image distortion is on the perceived lack of muscle size and the idea that one's body is not sufficiently lean and muscular. Later, MD was conceptualized as a subtype of body dysmorphic disorder (BDD), which is characterized by a pathological preoccupation with muscle size and muscularity (Pope, Gruber, Choi, Olivardia, & Phillips, 1997). This preoccupation with muscle size and body shape is persistent and causes clinically significant impairment or distress in social and occupational functioning (Olivardia, 2001). Because of the overlap with BDD symptoms, the proposed diagnostic criteria for MD are based on the DSM-IV diagnostic criteria for BDD (Pope et al., 1997). This special form of body image disorder is often accompanied by disordered eating behavior, exercise/bodybuilding dependence, and obsessive-compulsive features (Chung, 2001; Hale, Roth, DeLong, & Briggs, 2010; Kanayama, Barry, Hudson, & Pope, 2006; Pope & Katz, 1994).

As most of the studies on MD have been conducted in the U.S., little is known about this muscle appearance-related disorder in European countries, including Hungary. A study conducted in two

Western European countries (Austria and France) and the United States found that men's ideal bodies were 28 lbs more muscular than their actual bodies (Pope, Gruber, et al., 2000). The authors indicated that this discrepancy may be a contributing factor in the development of body image disorders, including MD, in men. MD was first published in Hungary in a case report (Túry & Gyenis, 1997). The first Hungarian epidemiological study on MD was conducted among 140 male bodybuilders (Túry, Kovács, & Gyenis, 2001). According to the results, 9.3% used anabolic steroids, and 4.3% fulfilled the criteria of MD proposed by Pope et al. (1997). Studies have provided evidence that MD is a frequent and often unrecognized disorder among weight lifters and bodybuilders (e.g., Olivardia, 2001; Pope et al., 1997; Pope, Katz, & Hudson, 1993); however, the number of studies in Eastern and Central Europe is limited.

The Muscle Appearance Satisfaction Scale (MASS; Mayville, Williamson, Netemeyer, & Drab, 2002) is a 19-item self-report measure for the assessment of MD symptoms. The questionnaire was developed to assess symptoms related to cognitive, behavioral and affective dimensions of MD. An exploratory factor analysis revealed and a subsequent confirmatory factor analysis supported five underlying factors: Bodybuilding Dependence, Muscle Checking, Substance Use, Injury Risk and Muscle Satisfaction. The first factor, Bodybuilding Dependence, reflects excessive weightlifting activity with some compulsive traits towards weight lifting/bodybuilding. The second factor, Muscle Checking, entails reassurance seeking and mirror checking behavior to check the appearance of muscles. The third factor, Substance Use, measures the attitudes and

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willingness to try out steroids and other muscle-enhancing substances. The fourth factor, Injury Risk, assesses the symptoms of overtraining and attitudes towards unsafe weightlifting. The fifth factor, Muscle Satisfaction, measures the satisfaction with one's own muscle size and muscle shape. The correlations between the five factors ranged from .06 to .82. The scale score reliability for the total score and subscale scores were high (Cronbach's alphas ranged from .73 to .87). The test–retest reliability analysis revealed stability over a two-week period of the MASS total score and subscale scores (r ranged from .76 to .89). Evaluation of the scale's construct validity showed a high correlation between MASS, measures of body dysmorphic disorder, and general body dissatisfaction.

The number of studies on the psychometric properties of the MASS is limited. A recent study examined the psychometric properties of the MASS among Irish and British men in the general population (Ryan & Morrison, 2010). Instead of the original five-factor structure, the authors suggested a one-dimensional six-item version of the MASS. The results indicated that the factor structure of the MASS was different in weight lifters vs. the general population.

Additionally, a very limited number of studies have evaluated the psychometric properties of the MASS in different cultures and languages. The vast majority of studies on MD have been conducted in Western countries, mostly in the U.S. However, little is known about muscle-related concerns and MD in the European region. Some studies have emphasized that the muscular ideology and MD symptoms are wide-spread phenomena in Hungary (Túry & Gyenis, 1997; Túry et al., 2001). As there are only a few studies examining muscle dissatisfaction and body image-related disorders, including MD, among men in countries other than the U.S., the present study addresses this gap.

Many factors contribute to the etiology of MD. Studies have pointed out the relationship between low self-esteem and MD (Grieve, 2007; Grieve & Helmick, 2008; Lantz, Rhea, & Mayhew, 2001; Pope, Phillips, & Olivardia, 2000). These studies suggest a negative relationship between self-esteem and MD symptoms, as men with lower self-esteem display higher levels of MD. Often, a low level of self-esteem serves as a motivational basis for the behavioral symptoms of MD, for instance weightlifting (Crocker, 2002). The increased drive for a more muscular body can be considered one way of gaining some acceptance or respect from others (Pope, Gruber, et al., 2000).

Although body dissatisfaction in women has been widely documented, the number of papers focusing on concerns related to men's appearance has increased in the last few decades. Studies have documented muscle dissatisfaction and a desire for a more muscular ideal body among men (Fredrick, Fessler, & Hazelton, 2005; Lynch & Zellner, 1999). Recently, many men have developed a drive for muscularity (McCreary, 2007). Men reported wanting to be more muscular than they are and would like to increase muscle mass by approximately 28 pounds (Pope, Gruber, et al., 2000). Male college students also chose an ideal body with about 25 pounds more muscular than their actual bodies (Olivardia, Pope, Borowiecki, & Cohane, 2004). Furthermore, up to 91% of men would like to be more muscular (Jacobi & Cash, 1994). Although the findings are heterogeneous in terms of the study sample, study design, and outcome measures, research revealed that the prevalence of muscle dissatisfaction has been increasing among men. Moreover, some research has pointed out that the drive for muscularity may be a precursor to the development of MD (Olivardia, Pope, & Hudson, 2000; Pope, Gruber, et al., 2000).

The main purpose of the present study was to examine the psychometric properties of the MASS among male weight lifters and undergraduate students in Hungary. Therefore, the factor structure, scale score reliability, test–retest reliability, construct, and discriminant validity of the MASS were investigated. As a secondary

aim multivariate regression analyses were used to study the relationship between aspects of MD, self-esteem, exercise-related, and other variables. Therefore, several hypotheses were tested. Studies documented that the age of onset of MD was in early adulthood (19.17 ± 4.38 years, Cafri, Olivardia, & Thompson, 2008; 19.4 ± 3.6 years, Olivardia et al., 2000). It was expected that younger men would have higher scores on the MASS, and they would display more symptoms of MD (H1). Grieve (2007) involved body mass in the conceptual model of MD since increased body mass and the achievement of muscular and mesomorphic body shape are important for men with MD. Thus, men with higher BMI were predicted to report more symptoms of MD (H2). The conceptual model of MD (Grieve, 2007) along with other studies (Grieve & Helmick, 2008; Lantz et al., 2001; Pope, Gruber, et al., 2000) identified low self-esteem as an etiological factor in MD. The authors hypothesize that men with lower level of self-esteem were expected to display higher levels of MD (H3). Studies suggested that men with MD showed increased desire for gaining muscle mass and drive for muscularity (Olivardia, 2001; Pope et al., 1997). Thus, an inverse relationship was hypothesized between drive for thinness and aspects of MD (H4). MD is accompanied by excessive exercise and weight lifting activity (Pope et al., 1997). A positive correlation between MD symptoms and the years of exercise was assumed (H5). There is a growing literature regarding the use of anabolic-androgenic steroids and food supplements among men suffering from MD, suggesting that these men are more likely to use these substances to increase muscle mass (Kanayama et al., 2006; Olivardia et al., 2000; Pope & Katz, 1994). Finally, it was hypothesized that current steroid users (H6) and food supplement users (H7) report more symptoms of MD. The conceptual model of MD (Grieve, 2007) also involves sport participation as a risk factor. The authors hypothesized that weight lifting activity indicates more MD symptoms in the undergraduates group (H8).

Method

Participants and Procedure

Three independent samples were recruited for this questionnaire based cross-sectional study. In Sample 1, male weight lifters ($n = 289$) participating in weight lifting activity were recruited in fitness centers and gyms located in Budapest and its outskirts. They were invited to complete the online questionnaire anonymously, which took approximately 10 min. The only exclusion criterion was age below 18.

In Sample 2, male undergraduate students ($n = 240$) were asked to complete the paper-and-pencil questionnaire anonymously during or after a university class in a large university located in Budapest.

An additional sample (Sample 3) of male weight lifters ($n = 43$) were recruited in gyms in order to assess the test–retest reliability of the MASS. Participants were asked to write a code on their questionnaire. This code allowed the researchers to perform a two-week follow-up.

Ethical approval for this study was obtained from the relevant university research ethics committees. All participants provided informed consent. They were not remunerated for participation, and taking part in the study was voluntary.

Measures

Sociodemographic and anthropometric data. Six questions were devised to reveal the sociodemographic (age, marital status, place of usual residence, educational qualifications) and anthropometric data (body height and body weight) of the participants.

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