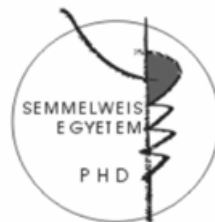


Muscle dysmorphia in Hungarian high risk populations

Ph.D. Theses

Bernadett Babusa

Semmelweis University
Mental Health Sciences Doctoral School



Supervisor: Dr. Ferenc Túry, M.D., Ph.D.

Official reviewers:

Dr. Zsolt Demetrovics, Ph.D.

Dr. Szabolcs Török, M.D., Ph.D.

Head of the Final Examination Committee:

Dr. László Tringer, M.D., D.Sc.

Members of the Final Examination Committee:

Dr. Tamás Tölgyes, M.D., Ph.D.

Dr. Adrien Rigó, Ph.D.

Budapest, 2013

INTRODUCTION

Eating and body image disorders have typically been considered as the disorders of women, although recent evidence suggests the emergence of these disorders among men as well. While women experience pressure towards thinness, men often report pressure to obtain and maintain muscularity. Body dissatisfaction accompanied by body image distortion can lead to the development of muscle dysmorphia (MD). MD is characterized by a pathological preoccupation with muscle size and muscularity and an intense drive to gain muscle mass. MD is considered as a special male body image disorder since it is mostly associated with the male bodybuilder population. Men with MD have a pathological belief that they are weak and small, while in reality they look unusually muscular. This special male body image disorder often causes impairment in social and occupational functioning, distress and adoption of unhealthy behaviours, such as rigid adherence to dietary regimens or anabolic-androgenic steroid (AAS) abuse or dependence. Comorbid disorders often accompany MD, such as eating disorders, mood and anxiety disorders, poor quality of life, and exercise dependence. Research suggests that body image dissatisfaction and the pursuit of muscularity can increase the risk of AAS use and dependence. The abuse of AAS is a public health problem and may be related with adverse physical,

behavioural, and psychiatric effects. Although the risk factors for AAS use are poorly explored, the deeper understanding of AAS use may help to identify those who are at risk for AAS use, and could contribute to the development of effective intervention programs. This male body obsession causes a challenge to the psychiatry, because most of the cases are underrecognized. The new forms of body image disorders and modern obsessions/addictions need extended research to understand their pathogenesis and ultimately to develop effective therapeutical approaches. The vast majority of studies on MD and muscle dissatisfaction among males have been conducted in Western countries –mostly in the United States. Only little is known about this muscle appearance related body image disorder in the Central-Eastern European region, including Hungary. Moreover, only few studies examined the body image related disorders, such as MD, among men in other countries than the U.S. The present study fills a niche, since it aimed to examine MD, related psychological correlates, and anabolic-androgenic steroid use in Hungarian male weightlifters. Additionally, exploring cultural differences in the manifestation of male body image disorders (i.e., prevalence rates, morbidity) may improve our understanding of these disorders as the desire for muscularity may vary from culture to culture.

OBJECTIVES

The general objective of the study was the examination of MD symptomatology and related psychological correlates in Hungarian high risk populations. The current work based on three steps:

1. Examination of muscle dysmorphia in male weightlifters and university students. Since no validated measure for the assessment of MD symptoms was available in Hungary, the aim was the preliminary investigation of the potential usability of the Muscle Appearance Satisfaction Scale (MASS), a measure of MD symptoms, in Hungary. Therefore, we explored MD symptoms in a Hungarian high risk population of male weightlifters as well as among university students. Specifically, eating disorder related psychopathological characteristics and body attitudes in these samples were studied.

2. Adaptation of the Muscle Appearance Satisfaction Scale in Hungary. The main purpose of the second step was to examine the psychometric properties of the MASS among male weightlifters and undergraduate students in Hungary. Therefore, the factor structure, scale score reliability, test-retest reliability, construct and discriminant validity of the MASS were investigated. The secondary aim was the exploration of the relationship between aspects of MD, self-esteem, exercise-related, and other variables.

3. Muscle dysmorphia among Hungarian male weightlifters. The first aim was to identify a group of male weightlifters with unique features of MD, which can be distinctive from “normal” non-muscle dysmorphic weightlifters. The secondary aim of the study was to explore differences between muscle dysmorphic and normal non-muscle dysmorphic groups of male weightlifters based on various psychological correlates. The third aim of the study was to define the tentative cut-off score of the MASS as there is no available cut-off score for the scale. Finally, we aimed to set out the prevalence rate of AAS use among male weightlifters, to examine the characteristics of AAS users, and to determine the risk factors associated with AAS use.

METHODS

Examination of muscle dysmorphia in male weightlifters and university students

Participants in this study were male weightlifters ($n = 60$) recruited in fitness centers and gyms and age-matched undergraduate male students ($n = 60$), reporting no weightlifting activity. All participants provided written informed consent, took part in the study on a voluntary basis and were not remunerated for participation. Participants were asked to complete the paper-and-pencil questionnaire anonymously, which took approximately 10 minutes. In this

study sociodemographic, anthropometric, and exercise related variables were used. The applied measuring instruments were: the Muscle Appearance Satisfaction Scale, the Body Attitude Test, and the Eating Disorders Inventory.

Adaptation of the Muscle Appearance Satisfaction Scale in Hungary

Three independent samples were recruited for the questionnaire based study. In Sample 1, male weightlifters ($n = 289$) participating in weightlifting 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 15-20 min. 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 weightlifters ($n = 43$) were recruited in gyms in order to assess the test-retest reliability of the MASS in a two-week interval. In this study, besides the sociodemographic, anthropometric, and exercise related variables, the Muscle Appearance Satisfaction Scale, the Eating Disorders Inventory – Drive for thinness subscale, and the Rosenberg Self-Esteem Scale were used as measuring instruments.

Muscle dysmorphia among Hungarian male weightlifters

The sample size of the second study was complemented by 15 new participants, thus the total sample size of the third study was 304 male weightlifters. The third study was a larger scale study, thus besides the sociodemographic, anthropometric, and exercise related variables we also used training objectives, subjective satisfaction and weight dissatisfaction variables. In this study the Muscle Appearance Satisfaction Scale, the Eating Disorders Inventory, the SCOFF Questionnaire, the Exercise Addiction Inventory, the State-Trait Anxiety Inventory – Trait Anxiety Subscale, the Rosenberg Self-Esteem Scale, and the General Self-Efficacy Scale were used as measuring instruments.

RESULTS

Examination of muscle dysmorphia in male weightlifters and university students

The results revealed significant differences between male weightlifters and university students. The weightlifter group scored significantly higher on the MASS, $W_{(96)} = 7.407$, $p < .001$, Cohen's $d = 1.35$. The weightlifter group had significantly higher scores on the Ineffectiveness, $Z = 3.124$, $p < .01$, Cohen's $d = 0.60$, Perfectionism, $W_{(109)} = 3.432$, $p < .001$, Cohen's $d = 0.63$, and Interpersonal Distrust, $Z = 2.508$, $p < .05$, Cohen's $d = 0.47$, subscales of the EDI. Furthermore,

participants in the weightlifter group also scored significantly higher on the Body Attitude Test, $t_{(118)} = 2.234$, $p < .05$, Cohen's $d = 0.41$. The prevalence rate of steroid use in the present sample of 60 male weightlifters, was 9.2 % ($n = 11$) and the prevalence of food supplement use was 65% ($n = 39$). Steroid users scored significantly higher on the MASS than steroid non-users, $t_{(58)} = 2.879$, $p < .05$, Cohen's $d = 1.34$. Moreover, steroid users reported higher levels of ineffectiveness, $Z = 2.721$, $p < .01$, Cohen's $d = 0.62$, compared to steroid non-users. The results of the preliminary study suggested that the Hungarian version of the MASS (MASS-HU) is a suitable measure in Hungarian-speaking population; however, further study was required for the psychometric evaluation of the instrument.

Adaptation of the Muscle Appearance Satisfaction Scale in Hungary

As a second step we focused on the examination of the psychometric properties of the MASS-HU. Exploratory factor analysis supported the original five-factor structure of the MASS only in the weightlifter sample (RMSEA = .060 [.048, 0.073], Cfit = .085, CFI = .980; $\chi^2 = 180.1$, $df = 86$, CFI = .980, TLI = .960). In the undergraduate sample, we found a three-factor solution instead of the original five factors (RMSEA = .061 [.049, .073], Cfit = .072; $\chi^2 = 221.0$, $df = 117$, CFI = .965, TLI = .949). The MASS-HU had excellent ($\alpha =$

.87, 95% CI [.85, .89]) scale score reliability in the weightlifter sample and good scale score reliability in the undergraduate sample ($\alpha = .81$, 95% CI [.77, .84]). The measure had good test-retest reliability (Pearson correlation: .84–.91; intraclass correlation: .82–.91). The examination of the construct validity of the MASS-HU suggested an inverse relationship between self-esteem and MD. Moreover, it also revealed the association between the aspects of MD, younger age and current steroid and food supplement use in the weightlifters. BMI and years of exercise was negatively correlated with MD. In the undergraduate group, the aspects of MD were associated with lower self-esteem, drive for thinness, and weightlifting activity. The MASS-HU was found to be a useful measure for the assessment of MD among male weightlifters.

Muscle dysmorphia among Hungarian male weightlifters

Prevalence of exercise dependence among Hungarian male weightlifters

In the current study the prevalence rate of exercise dependence categories were: 29.6% ($n = 90$) asymptomatic, 61.2% ($n = 182$) symptomatic non-dependent, and 9.2% ($n = 28$) at risk for exercise dependence.

Prevalence of eating disorders among Hungarian male weightlifters

Results suggested that 8.5% ($n = 26$) of the participants was likely to have an eating disorder (anorexia vagy bulimia nervosa).

Prevalence of muscle dysmorphia among Hungarian male weightlifters

To identify a group of muscle dysmorphic male weightlifters, a latent class analysis was performed with ten variables associated with the diagnostic criteria of MD. Results indicated a 3-class model, which included high risk MD group (18.0%, $n = 55$), low risk MD group (51.6%, $n = 157$), and normal weightlifters group (30.2%, $n = 92$).

Determination of the tentative cut-off score of the Muscle Appearance Satisfaction Scale

Based on the membership in the high risk MD group as a ‘gold standard’, the sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of the MASS at several possible cut-off points were calculated. A score of 62 as an appropriate cut-off point for the MASS was proposed to distinguish between MD and non-MD cases among male weightlifters.

Psychological correlates of muscle dysmorphia

The high risk MD group had significantly higher levels of trait anxiety, $F_{(2)} = 11.510$, $p < .001$, and higher levels of eating disorders related psychopathological characteristics: drive for

thinness, $H_{(2)} = 11.468$, $p = .003$, interoceptive awareness, $rW_{3(2)} = 5.777$, $p = .004$, perfectionism, $H_{(2)} = 29.861$, $p < .001$, and interpersonal distrust, $rW_{3(2)} = 4.399$, $p = .014$, comparing to the normal weightlifters and low risk MD group. Moreover, the high risk MD group had the lowest level of self-esteem comparing to the other two groups, $F_{(2)} = 12.847$, $p < .001$.

Prevalence of anabolic-androgenic steroid use among Hungarian male weightlifters

According to the results, 17.4% ($n = 53$) of the participants reported past AAS use and 10.2% ($n = 31$) reported current AAS use. Based on these data, the lifetime prevalence of AAS use among the participants was 27.6% ($n = 84$). The prevalence of food supplement use was 65.1% ($n = 198$).

Characteristics of anabolic-androgenic steroid users

Both current and past steroid users displayed significantly higher levels of MD symptoms compared to the past steroid users and non-users, $F_{(2)} = 23.974$, $p < .001$. Current and past steroid users had higher levels of exercise dependence than steroid non-users, $F_{(2)} = 9.389$, $p < .001$. The prevalence rate of exercise dependence was significantly higher in lifetime steroid users (14.3%, $n = 12$) compared to steroid non-users (7.3%, $n = 16$), $\chi^2_{(2)} = 10.983$, $p < .001$. Examination of the psychological correlates indicated that neither trait anxiety, $F_{(2)} = 0.544$, $p = .581$, nor self-esteem, $F_{(2)} = 0.581$, $p = .560$, had significant association with AAS use. However, current

steroid users had the lowest level of self-efficacy and the highest level of interpersonal distrust comparing to past steroid users and non-users, $F_{(2)} = 4.031, p = .019$; $H_{(2)} = 9.916, p = .007$, respectively.

Examination of the risk factors of lifetime anabolic-androgenic steroid use

According to the results, the positive attitude and the willingness to try AAS to gain muscle mass (measured by the Substance Use Subscale of the MASS) significantly increased the odds for AAS use, $OR = 1.24, p < .001$. Higher BMI was also identified as a significant predictor of lifetime AAS use, $OR = 1.09, p = .039$. Finally, lower level of education also emerged as a significant predictor of lifetime AAS use, $OR = 2.33, p = .025$. The explained variance of the model is 33%.

CONCLUSIONS

The present study is the first national study assessing the prevalence of MD in high risk population of male weightlifters with a larger sample size. Previous studies described MD as a culture-bound syndrome that is strongly related to the Western body ideals. Our study pointed out the existence of MD symptomatology and subclinical levels of this male body image disorder among Hungarian male weightlifters. The study results outline that the current prevalence rate of MD is

higher compared to the earlier national and international data reported from 1993-2000.

The study was also able to point out the dramatic changes in trends in male body image concerns and body size ideals in a ten-year perspective. Because of the rapid changes and the comorbid conditions that are associated with the increasing body image dissatisfaction among men (e.g., MD, AAS use, exercise dependence, eating disorders) mental health care professionals should be prepared for challenges.

The effective intervention strategies of MD should focus not only on the body image disorder itself, but the associated psychological characteristics as well, for instance, low self-esteem, high trait anxiety, and perfectionism. We also have to consider that those men who suffer from MD have an increased risk toward AAS use.

Hopefully, the validation of the MASS in Hungary, which is the first measure of MD symptoms in Hungarian, and the proposed tentative cut-off score will stimulate further MD research, and will contribute to the cross-cultural studies on MD.

The AAS use in this high risk population is also understudied in Hungary, since only one former study explored the prevalence rate of AAS use among male weightlifters. More importantly, according to our knowledge the present study is the first Hungarian study that investigated the psychological

correlates and risk factors of AAS users. The examination of the risk factors of AAS use highlighted that effective AAS use prevention programs should be designed to change the attitudes toward AAS use and also to teach refusal skills, which can result in the reduction of intentions to use AAS. Moreover, males with lower level of education may not be aware of the adverse health effects of AAS and may have deficient refusal skills; thus, they may be more vulnerable to misinformation and social influences relating to AAS use. The lack of real and authentic information about the adverse health effects of AAS may contribute to the development of positive attitudes toward AAS use. Therefore, effective prevention strategies emphasize not only the potential consequences of AAS use, but also target the attitude change toward AAS use. Those students who finish their education at a high school level may be a target population for intervention and prevention programs.

Besides our results, we would also like to emphasize that weightlifting as a sport is a healthy physical activity *per se* and the pathologization of this kind of sport would be unwarranted. However, some forms of weightlifting activity can be unhealthy.

BIBLIOGRAPHY OF THE CANDIDATE'S PUBLICATION

Book

1. Túry, F. & Babusa, B. (2012). *Adonisztól Schwarzeneggerig: Férfiideálok és civilizáció [From Adonis to Schwarzenegger: male body ideals and civilization]*. Oriold Kiadó, Budapest.

Peer-reviewed publications

1. Babusa, B., Urbán, R., Czeglédi, E., & Túry, F. (2012). Psychometric properties and construct validity of the Muscle Appearance Satisfaction Scale among Hungarian men. *Body Image, 9*, 155–162. IF: 1.9.
2. Babusa, B. & Túry, F. (2012). Muscle dysmorphia in Hungarian noncompetitive male bodybuilders. *Eating and Weight Disorders, 17*, e49–e53. IF: 0.628.
3. Varga, M. & Babusa, B. (2012). Az új keletű evészavarok néhány pszichológiai és rendszerszemléleti vonatkozása [Some psychological and system-oriented perspectives of modern eating disorder]. *Lege Artis Medicinae, 22*, 440–444.
4. Babusa, B. & Túry, F. (2011). Az izomdiszomorfia nosológiai helye és mérése [The nosological classification and assessment of muscle dysmorphia]. *Psychiatria Hungarica, 26*, 158–166.
5. Túry, F., Babusa, B., & Varga, M. (2010). History of eating disorders in Hungary. *Psychiatry Today, 42*, 73–84.
6. Túry, F., Babusa, B., Dukay-Szabó, Sz., & Varga, M. (2010). Az evés- és testképzavarok újabb típusai a modern civilizációs ártalmak között [New forms of eating and

body image disorders among civilization harms]. *Magyar Tudomány*, 171, 1306–1315.

7. **Babusa, B.** & Túry, F. (2007). Az izomdiszmorfia szelf-fejlesztési megközelítése [Muscle dysmorphia in the aspect of self development]. *Pszichoterápia*, 16, 290–295.

Book chapters

1. **Babusa, B.** (2011). Az izomdiszmorfia terápiás lehetőségei [Therapeutic possibilities of muscle dysmorphia]. In F. Túry & B. Pászthy (Eds.), *Az evészavarok pszichoterápiájának aktuális kérdései* (pp. 115–126). Budapest, Semmelweis Kiadó.
2. Túry, F., **Babusa, B.**, & Dukay-Szabó, Sz. (2011). New psychiatric conditions and body image disorders in sport psychiatry. In *Thimetikos Tomos Georgiou Christodoulou* (pp. 220–226). Athens, Ekdoseis.
3. **Babusa, B.** & Túry, F. (2010). Izomdiszmorfia [Muscle dysmorphia]. In Zs. Demetrovics & B. Kun (Eds.), *Az addiktológia alapjai IV. Viselkedési függőségek* (pp. 481–499). Budapest, ELTE Eötvös Kiadó.
4. Túry, F., Lukács, L., **Babusa, B.**, & Pászthy, B. (2008). Testépítés és testképzavarok – különös tekintettel a férfiakra [Bodybuilding and body image disorders in males]. In F. Túry & B. Pászthy (Eds.), *Evészavarok és testképzavarok* (pp. 79–92). Budapest, ProDie.