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This is an **author produced version** of a paper published in:

Men and Masculinities, 07 February (2018)

DOI: <https://doi.org/10.1177/1097184X17753039>

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Compte, E.J., Sepúlveda, A.R., & Torrente, F. (2018). Approximations to an Integrated Model of Eating Disorders and Muscle Dysmorphia among University Male Students in Argentina. *Men and Masculinities*, 1-18. doi: 10.1177/1097184X17753039

Approximations to an integrated model of Eating Disorders and Muscle Dysmorphia among university male students in Argentina

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Acknowledgements

Dr. Sepúlveda has a postdoctoral Ramon and Cajal scholarship from the Spanish Ministry of Science and Innovation (RYC-2009-05092). We express our gratitude to the students who participated in this study as well as the Headmasters of the institutions.

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Abstract

Male body dissatisfaction has been associated with *drive for muscularity* and, in extreme cases, with the clinical condition referred to as Muscle Dysmorphia (MD). Although recent research suggests that MD is closely linked to Eating Disorders (EDs), it is classed as a sub-type of body dysmorphic disorder. A cross-sectional study was conducted among 402 university male students in Buenos Aires to examine common factors in the development of EDs and MD. Multiple regression analyses were performed to assess the predictive value of the investigated variables. For both conditions the models accounted for 48% of the variance, and were predicted by a similar set of variables. The results support the inclusion of MD within the EDs spectrum.

Keywords: eating disorders, muscle dysmorphia, body dissatisfaction, Buenos Aires, men

Twenty years has passed since the first description of the Muscle Dysmorphia (MD) syndrome (Pope et al. 1997), and not only scientific interest has increased throughout these years (Tod, Edwards, and Cranswick 2016), but it has also been included in the last edition of the *Diagnostic and Statistical Manual of Mental Disorders* of the American Psychiatric Association (2013). MD has been conceptualized as a sub-type of Body Dysmorphic Disorders (BDD), among the Obsessive-Compulsive and Related Disorders category. However, the current description neglects concerns about disordered eating and body weight, and fails to provide information for the accurate diagnosis and treatment (Compte and Sepúlveda 2014; Mitchison and Mond 2015).

MD was originally described as a psychiatric disturbance involving body image, mainly observed among men. Unlike the preoccupation with a particular body part like in common forms of BDD (e.g., nose, ears, hair, etc.), people with MD are concern with appearance as a whole; specifically, they are preoccupied that their body is not muscular and/or big enough, and have their lives consumed by exercising, dieting and related behaviors (e.g., body checking and/or avoidance). Besides the similarities described with the EDs, MD was associated with a desired to increase body size (muscle mass) with a primary focus on physical activity, and secondary on diet; while contrary, EDs were related with a desired to loose weight (body fat), developing primary pathological patterns of eating and secondarily on exercising (Pope et al. 1997). In this sense, the pursue of the muscular ideal has been operationalized as *drive for muscularity*, which on extreme cases (e.g., anxiety over their training schedule, overtraining, and potentially use or abuse of anabolic steroids, etc.) may underlie MD (Parent 2013); while, high levels *drive for thinness* (e.g., concerns about body fat, anxiety over their dieting behavior, food restriction, potentially use or abuse diuretics and/or laxatives, etc.), as the pursue of the thin

ideal, has been long been associated to EDs (Garner, Olmstead, and Polivy 1983).

Despite the fact that they currently have different nosological status, an increasing body of research has highlighted similarities between EDs and MD (Murray, Rieger, et al. 2012; Griffiths, Murray, and Touyz 2013; Murray, Maguire, et al. 2012; Murray and Griffiths 2014; Murray et al. 2013). Moreover, evidence of a previous EDs among people with MD is well documented in the literature (Olivardia et al. 2000; Pope et al. 1997; Murray, Maguire, et al. 2012), which resembles the diagnostic crossover among EDs (Tozzi et al. 2005). In this regard, Murray et al. (2017) have recently described the transition from thinness-oriented to muscularity-oriented disordered eating during the course of treatment for Anorexia Nervosa (AN) of teenage boy. Curiously, not only similar clinical presentations were described on the original paper (Pope et al. 1997), but also MD was firstly considered to represent the male analogue of AN and the social pressure towards thinness seen in young women, called *Reverse Anorexia* (Pope, Katz, and Hudson 1993).

Notwithstanding the nosological controversy, there is a broad consensus on the difficulties and shortcomings of the evaluation of body dissatisfaction, disordered eating, EDs and MD among males. On the one hand, it has been argued elsewhere that the use of instruments developed and validated in female populations tends to underestimate male body image concerns and muscularity-oriented disordered eating (Compte and Duthu 2015; Darcy and Lin 2012; Strother et al. 2012). Similarly, diagnostic criteria have also been questioned due to its female orientation (e.g., presence of Amenorrhea in the diagnoses of AN (American Psychiatric Association 1994)). Finally, the lack of an agreement on the clinical features and the nosological status of MD spoils its assessment and comprehension (Suffolk et al. 2013; Tod, Edwards, and Cranswick 2016). Consequently, prevalence rates and other research findings of EDs and MD

among men, as well as the clinical conceptualization, may better interpreted carefully given the limitations recently exposed (Dakanalis and Riva 2013; Darcy and Lin 2012; Murray and Touyz 2013; Strother et al. 2012; Suffolk et al. 2013).

However, in order to better understand males' features of EDs and MD previous research sought to identify risk factors. Among the social factors, the increased cultural pressure over muscularity (Baghurst et al. 2006; Dittmar, Halliwell, and Ive 2006; Leit, Pope, and Gray 2001) has been presented as a key factor in the development of MD (Leit, Gray, and Pope 2002; Grieve 2007), similarly to impact of the social pressure towards thinness in the causation of EDs (Garner et al. 1980; Garner, Olmstead, and Polivy 1983; Striegel-Moore and Bulik 2007). Low overall self-concept and high levels of depression, anxiety and interpersonal sensitivity, were found to be predictive of body image concerns among European college men (McFarland and Kaminski 2009); likewise, preoccupation with muscularity has been associated with disordered eating in teenage boys (Rodgers et al. 2012), and in college-aged men (Dakanalis, Zanetti et al. 2015). Also among college students, EDs and MD symptoms were found to be predicted by the transdiagnostic model of EDs (Dakanalis et al. 2014; Murray et al. 2013), which posits that all forms of EDs are conceptually similar in representing varying behavioral expressions of a tendency to place too much emphasis on evaluations of shape, weight and eating (Fairburn, Cooper, and Shafran, 2003). Overall, the variables most consistently associated with symptoms of EDs and MD in men are low self-esteem, high frequency of physical activity, use of dietary supplements, high media exposure, disorder eating, interpersonal problems, anxiety and depression (Dakanalis et al. 2016; Dakanalis and Riva 2013; Grieve 2007; Lantz, Rhea, and Cornelius 2002; Lantz, Rhea, and Mayhew 2001; Murray et al. 2013; Rodgers et al. 2012).

Notably, most of the studies on body dissatisfaction, EDs and MD have been conducted in developed countries (mostly Australia, Canada, U.K, and U.S) and less is known about these conditions in other cultures (Holmqvist and Frisé 2010; Smink, van Hoeken, and Hoek 2012). Therefore, the main aim of this study is to explore common factors associated to the development of EDs and MD among a large sample of university male students in Argentina. Based on previous findings, a similar pattern of risk factor is to be expected, with differences based on the body ideal pursued under each condition.

Method

Procedure

A survey was administered to male students from two public and four private universities chosen at random from all of the universities in Buenos Aires. Once institutional consent was obtained, teachers were contacted by email requesting authorization to assess students during classes; students exclusively belong to classes whose teacher agreed to participate. Approval of the Ethics Committee of the Autonomous University of Madrid (CEI-Reference No. 48-926) was also obtained. Of the total sample, one participant withdrew his consent before starting the test, and two participants withdrew their consent during the evaluation. Also, data from 70 participants were removed due to the presence of missing values and outliers. The final sample was composed of 402 students, with a mean age of 22.02 years ($SD=3.64$). Body Mass Index ($BMI= \text{weight (kg)} / \text{height (m)}^2$), weekly frequency of physical exercise, food supplement intake, and media exposure (TV and Internet) were based on self-reported values. Pearson coefficient was used to assess correlations among continuous variables. We followed Cohen's criteria for describing the strength of correlations: correlations $\geq .10$ were considered small, correlations $\geq .30$ were considered medium and correlations $\geq .50$ were considered large (Cohen

1992). Separate multiple regression analyses were used to assess how much of the variance in EDs and MD was accounted by the set of variables studied. The threshold for statistical significance was set at $p < .05$.

Measures

Eating Disorder Examination - Questionnaire (EDE-Q; Fairburn and Beglin 1994). The EDE-Q, derived from the Eating Disorder Examination interview (EDE) (Fairburn and Cooper, 1993) is widely used for assessing EDs. Twenty-two of the 36 items assess attitudes relevant to EDs; these items are organized into four subscales (restraint (i), and preoccupations with: food (ii); weight (iii); and figure (iv)). Responses are given on a seven-point Likert-type scale (0 = never; 6 = every day) and a Global Score is obtained by averaging scores on all attitudinal items. The remaining items assess the presence and frequency of behaviors associated with ED (excessive exercise, self-induced vomiting, binge eating, etc.). The Argentine validation replicates the theoretical factor structure (Compte, Sepúlveda, and Muiños, in preparation), with evidence for its concurrent validity and excellent level internal consistency for the Global Score (Cronbach's $\alpha = .93$). For the purpose of this study, the EDE-Q Global Score was used as criterion variable in the EDs model.

Drive for Muscularity Scale (DMS; McCreary and Sasse 2000). The DMS consists of 15 items rated on a six-point Likert-type scale (1 = strongly disagree; 6 = strongly agree); it is used to assess desire to become more muscular. Higher scores represent a higher *drive for muscularity*. Analysis of the Spanish-speaking version used in this sample (DMS) confirmed the two-factor structure and provided evidence of construct validity; also, adequate levels of internal consistency (Cronbach's $\alpha = .89$) were observed (Compte et al. 2015). Given the content of the items (e.g., “*I think I would feel more confident if I had more muscle mass*”, “*I try to consume*

as many calories as I can in a day”, “*I feel guilty if I miss a weight training session*”) the DMS was used as criterion variable in the MD model.

Rosenberg Self-Esteem Scale (RSE; Rosenberg 1965). The RSE is a widely used 10-item measure of global self-esteem and feelings of self-worth. Participants indicate their agreement with items using a four-point Likert-type scale (1 = strongly disagree; 4 = strongly agree). Higher scores indicate higher self-esteem. The Argentinian version used in the present study has shown adequate internal consistency in both clinical (Cronbach’s $\alpha = .78$) and general samples (Cronbach’s $\alpha = .70$) (Góngora and Casullo 2009). In this sample the internal consistency was good (Cronbach’s $\alpha = .80$).

Symptom Check List Revised (SCL-90-R) (Derogatis 2002), is a self-report test which is widely used for assessing psychological distress and psychopathology. It consists of 90 items, which are rated on a five-point Likert-type scale (0 = not at all; 4 = extremely). The mean score on the scale is termed the Global Severity Index (GSI) and is widely used as a global index of distress; this is the indicator used in this study. Previously, the GSI showed excellent levels of internal consistency in a study in Argentina using a clinical sample (Cronbach’s $\alpha = .96$) (Sanchez and Ledesma 2009). In our sample the GSI also had excellent internal consistency (Cronbach’s $\alpha = .97$).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, and Borkovec 1990). The PSWQ is a 16-item self-report questionnaire that was developed to measure worrying as a trait variable. The PSWQ has been found to have a one-factor structure and high internal consistency (Cronbach’s $\alpha = .93$). The Argentine version used in this study has previously shown to have good internal consistency ($\alpha = .94$) (Rodríguez-Biglieri and Vetere 2013). In this sample Cronbach’s α was .89.

Social Interaction Anxiety Scale (SIAS; Mattick and Clarke 1998) is a 19-item scale designed to measure fear in social interactions. All items are rated using a five-point Likert-type scale (0 = not at all; 4 = extremely). The SIAS has been shown to have high internal consistency, both in college students (Cronbach's $\alpha = .88$), and patients with social phobia (Cronbach's $\alpha = .93$). The Spanish-speaking version used in the present study also presents adequate internal consistency (Cronbach's $\alpha = .89$) (Olivares, García-López, and Hidalgo 2001) and in this sample internal consistency was high (Cronbach's $\alpha = .91$).

Physical Appearance Comparison Scale - 4 (PACS-4; Dany and Urdapilleta 2012; Thompson, Heinberg, and Tantleff-Dunn 1991) The original version of the PACS consisted of five items rated on a five-point Likert-type scale (1 = never; 5 = always), with higher scores reflecting a greater tendency to make physical comparisons between oneself and others. The PACS was shown to have good internal consistency in Spanish-speaking male high school students (Cronbach's $\alpha = .88$) (Calado 2008). Analysis of data for this study revealed that in our sample the internal consistency of the scale was below the acceptance threshold, (Nunnally 1978) due to low correlation between item 4 and the other items. Other studies have reported the same problem and dealt with it by excluding item 4 from analysis (Dany and Urdapilleta 2012; Davison and McCabe 2006). We followed the same approach, so analyses are based on a four-item version (PACS-4) with good consistency (Cronbach's $\alpha = .81$).

Media Exposure Questionnaire (MEQ) – Following Calado's (2008) recommendations, participants were also asked how frequently they were exposed (read and/or watch) to eight body image-related topics categories (fashion, beauty, sexuality, diets, fitness, health, music videos and sport) on the media (TV, magazines and Internet), using a five-point Likert-type scale ranging (1=never; 5=always). Higher scores indicated higher exposure to each kind of topic. At

the end, magazine exposure data were not included in the final analyses because 87.2% of participants reported that read magazines rarely or never. There were high correlations between TV and Internet exposure on each topic, ranging from .66. to .81 (most correlations were $> .70$). A principal components analysis revealed a four-factor structure for the 16 items, which accounted for 67% of the variance. The Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy was .84, above the recommended minimum of .6. The first factor was named 'fashion exposure' (MEQ-Fashion); it consisted of six items evaluating TV and Internet exposure to three topics: fashion, beauty and sexuality. The MEQ-Fashion subscale had adequate internal consistency (Cronbach's $\alpha = .89$). The second factor was named 'body care' (MEQ-Body care) and consisted of items six items assessing TV and Internet exposure to the topics diets, physical exercise, and health; this factor had good internal consistency (Cronbach's $\alpha = .84$). The third and fourth factors both consisted of two items relating to a single category: 'music video exposure' (MEQ-Music) and 'sports exposure' (MEQ-Sports); these factors had adequate internal consistency (Cronbach's $\alpha = .77$ and Cronbach's $\alpha = .89$, respectively).

Results

Table 1 shows mean scores, standard deviations and correlations among variables. Between the EDE-Q and the DMS a medium positive correlation was observed. Although almost all studied variable were significant correlated with the EDE-Q and the DMS, only BMI showed different direction on its correlation with both variables; significant positive with the EDE-Q, and significant negative with the DMS. Also, different strengths of correlations are observed between most of the studied variables, and the EDE-Q and DMS; however strength was similar in both variables with physical comparison (PACS-4) and the exposure to fashion topics in the

media (MEQ-Fashion), positive large and positive medium respectively. Lastly, pairwise correlations between studied variables were below .70 so the risk of multicollinearity was deemed low and it was considered appropriate to use them in the regression models.

Separate multiple linear regressions were used to determine the extent to which the studied variables predicted variance in EDs and MD; the results presented in Table 2 shows that in both cases the model accounted for 48% of the variance in the outcome variable. Besides of the few specific predictors for each model, both showed a similar set of predictors. Differences have been observed in the direction of the relationship between variables and in the exposure to specific media topics. Also, each dependable variable (EDE-Q and DMS) was a significant positive predictor of the other, with the same contribution on each model. The EDE-Q model was positively predicted by the DMS, BMI, physical exercise, GSI (psychological distress), and the PACS-4; and it was negatively predicted by the MEQ-Sports subscale (exposure to sports related topics in the media). For the MD model, the EDE-Q, physical exercise, food supplement intake, PACS-4, and the MEQ-Body Care subscale (exposure to body care related topics in the media) were found to be positive predictors, while negative predictors were the BMI and the MEQ-Music (exposure to music videos related topics in the media). Finally, other psychological variables (self-esteem, tendency to worry, and social interaction anxiety) did not significantly contribute to the variances of both models.

Discussion

The aim of this study was to assess up to what extent EDs and MD were predicted by a similar set of variables, given the similarities between both condition described in the literature, in a large sample of university male students in Buenos Aires. For that purpose, separate multiple

regressions were conducted. Surprisingly, both models explained the same proportion of outcome variance (48%); and, as expected, the significant predictors were similar in both cases. More interesting is the finding that the outcomes variables (EDE-Q and DMS) were significant predictors of each other, with exactly same power. Also, although BMI was a significant predictor of both EDs and MD, the direction of the association was different reassembling the first conceptualization of MD as *reverse anorexia* (Pope, Katz, and Hudson 1993).

Regression models also involved frequency of physical exercise and tendency to make physical comparisons as predictors for both conditions, and food supplement intake as a positive predictor of MD. Current results are consistent with previous findings, suggesting that physical exercise is associated with EDs and MD in undergraduate students (Bo et al. 2014). It has previously been observed that participation in sport increases the risk of developing MD through promoting internalization of the muscular body ideal by a direct exposure to muscular bodies and body comparison behaviors (Grieve 2007). In particular tendency to make physical comparisons between oneself and other was the most powerful predictor of MD and almost the most powerful predictor of EDs in the regression models. Previous research highlighted the role of body checking behaviors in the maintenance of body dissatisfaction, and it has frequently been associated with EDs and MD in men (Dakanalis, Carrà et al. 2015; Grieve 2007; Lantz, Rhea, and Mayhew 2001; Parent 2013; Walker, Anderson, and Hildebrandt 2009). In a previous regression model, body checking behaviors predicted the abuse of appearance- and performance-enhancing drugs and was the best single predictor of variance in MD (Walker, Anderson, and Hildebrandt 2009). The use of food supplements has also been previously associated with MD but not EDs (Bo et al. 2014), and has been proposed to work as a maintenance mechanism (Lantz, Rhea, and Cornelius 2002; Lantz, Rhea, and Mayhew 2001).

Among the psychological variables studied, surprisingly self-esteem did not predict EDs or MD as there is a considerable body of literature associating low self-esteem with the development of both conditions (Grieve 2007; Lamanna et al. 2010; Lantz, Rhea, and Mayhew 2001; Murray et al. 2013; Parent 2013). It is important to consider, however, that the conceptual models linking self-esteem with EDs and MD were based on research on body dissatisfaction in female populations and/or specific male populations (e.g., bodybuilders). Current findings are consistent with a previous observation that self-esteem predicted EDs in women, but not in undergraduate men (Elgin and Pritchard 2013). Likewise, in a sample of Turkish male college students self-esteem also failed to predict EDs (Erol, Toprak, and Yazici 2006). Additionally, in the present study tendency to worry failed to predict EDs and MD, contrary to previous findings where it was found to be predictor of EDs symptoms (Sassaroli and Ruggiero 2005). Similarly, social anxiety also failed to predict EDs and MD, despite having been previously linked to the development of EDs among undergraduate men (Liao et al. 2010). Finally, psychological distress did predict EDs in this sample. In this regard, previous research posits that men with EDs presents higher levels of psychological distress than women (Núñez-Navarro et al. 2012).

The extent to which participants were exposed to body image-related categories in the media was found to be a significant predictor in both conditions. On the one hand, exposure to body care topics (diets, physical exercise, and health) was found to be a strong positive predictor of MD. Similarly, prior findings have shown that in undergraduate men exposure to material related to men's health topics is associated with a higher *drive for muscularity* (Cramblitt and Pritchard 2013). It has also been proposed that greater media exposure to the muscular body ideal promotes the internalization of that ideal and hence development of MD (Rodgers et al. 2012; Blond 2008). However, the exposure to sports related topics in the media for EDs, and the

exposure to music videos in the MD model, highlights as negative predictors with similar contributions in each model. A possible explanation may be that different body ideals could be represented on each of these media categories (Bell, Lawton, and Dittmar 2007; Blond 2008), and the lack of exposure to a contrary body ideal on each condition (EDs and MD) may be deepening the body ideal pursued.

Altogether, the pattern of results obtained in the present study points to an integrated model of EDs and MD in men. This model involves the role of current BMI as a core variable in the risk for both conditions, even if it works in the opposite direction in each case. A higher BMI might activate the *drive for thinness* component of EDs, meanwhile a lower BMI might trigger the *drive for muscularity* that characterizes MD. In both cases, body dissatisfaction may act as an underlying psychological dimension that inflates the drive to make behavioral changes according to the ideal body pursued. This behavioral component is also depicted in both models through the variable of physical exercise as a weight control behavior and through the variable of social comparison as an indicator of body ideal internalization and checking behaviors. Also, as a shared variable, interest in media contents related to dieting might also account for a cognitive component related with weight control.

These global findings are consistent with previous research (Cafri, Olivardia, and Thompson 2008; Lantz, Rhea, and Cornelius 2002; Núñez-Navarro et al. 2012). Lamanna et al. (2010) observed similarities between symptoms of EDs and MD in a mixed sex sample of undergraduate students and, using separate multiple regression analyses, demonstrated that a single set of variables studied predicted EDs in women and MD in men and that the set of variable accounted for a very similar proportion of outcome variance in both models.

It is worth to notice that food supplements intake could be highlighted as a specific feature of MD. Therefore, the use of food supplements may be as specific marker of MD, and relevant to be considered during the clinical assessment of men with body dissatisfaction.

Although this study contributes to the literature on EDs and MD in men it is important to take into consideration its limitations. Only college students were screened; it would be of value to assess other populations that might be at risk (high school students, weight-lifters, rugby players, gay men, and non-university community samples). Also, the transversal design of this study could be complemented with future longitudinal research in order to understand diagnostic crossover from EDs to MD, given the existing evidence in the literature. Also, future research into the relationship between psychological variables previously linked to the development of EDs and MD in men (self-esteem, tendency to worry, and social anxiety) is also warranted among Argentinean males. More important, this study aimed to assess shared risk factors among EDs and MD, when the firsts are well established and long-studied disorders whereas there are still controversies on the conceptualization of MD (Murray and Baghurst 2013). In this sense, the current findings should be considered carefully given that, despite that the criterion variable used for the EDs model was measured through a recognized measure for EDs (i.e., EDE-Q), much research is yet to be done in order to clarify the conceptualization of MD, and to assess up to what extent the DMS is a valid measure for its assessment. However, the DMS was used to assess the dimension MD in previous studies (Compte, Sepulveda, and Torrente 2015; Maida and Armstrong 2005; Rutzstein et al. 2004).

Finally, despite that it was originally proposed that MD might be part of a broad group under the “affective spectrum disorders” classification (Pope et al. 1997), the latest version of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association 2013)

classes MD as a specific type of BDD, as previously mentioned. However, as a subtype of BDD it is required that “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” (American Psychiatric Association 2013, p. 242), which it seems an inaccurate clinical picture of MD given recent findings (Lamanna et al. 2010; Murray, Rieger, et al. 2012; Murray et al. 2017); and also fails to provide practical information that can aid in the accurate diagnosis and treatment of mental disorders, as expected (American Psychiatric Association 2013). In this line, a clinical observation cited above describes a diagnostic crossover from AN symptoms to MD symptoms (Murray et al. 2017). Diagnostic migrations such as this are common among EDs (Fairburn, Cooper, and Shafran 2003). In this regard, despite that some symptom domains are involved in multiple diagnostic categories and may reflect common underlying vulnerabilities for a broad group of mental disorders, concerns on shape/weight, a specific BMI (perceived as too high or too low), body checking behaviors, media influences, and excessive exercise seems not only to be common among people with EDs and MD, but also to be different from people with BDD (Grant and Phillips 2004).

Previous research suggests that due to the difficulty in detecting EDs in primary care settings and making referrals for specialist treatment, only a small proportion of affected individuals seek professional help (Strother et al. 2012; Dakanalis and Riva 2013). We hope that the data available in this study would allow readers to better understand the specific features of male body dissatisfaction and disordered eating, and we expect them to be of use in the development of evidence-based treatments.

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Table 1. Means scores, standard deviations and correlation among variables.

	1. EDE-Q	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2. DMS	.40*															
3. BMI	.26*	-.11*														
4. Physical exercise	.31*	.42*	.07													
5. Food supplements	.01	.25*	-.03	.17*												
6. RSE	-.23*	-.13*	.01	-.06	.04											
7. GSI	.47*	.25**	.10	.17*	-.02	-.56*										
8. PSWQ	.31*	.22*	.12*	.13*	.02	-.29*	.51*									
9. SIAS	.38*	.22*	.03	.12*	.01	-.48*	.56*	.30*								
10. PACS-4	.50*	.51*	.01	.21*	.10*	-.22*	.42*	.39*	.36*							
11. MEQ-Fashion	.28*	.29*	-.07	.22*	.08	-.04	.17*	.17*	.10*	.42*						
12. MEQ-Body care	.28*	.44*	-.03	.36*	.14*	-.01	.15*	.13*	.10*	.31*	.61*					
13. MEQ-Music	.14*	.05	-.12*	.01	-.01	-.06	.14*	.08	.14*	.20*	.39*	.38*				
14. MEQ-Sports	-.07	.04	.04	.04	.07	.17*	-.09	.06	-.13*	.09*	.19*	.17*	.18*			
15. TV	.12*	.05	.05	.08	-.01	-.07	.04	.01	-.03	.03	.15*	.12*	.15*	.27*		
16. Internet	.26*	.17*	.01	.15*	-.01	-.15*	.23*	.12*	.16*	.20*	.12*	.12*	.14*	.01	.33*	
<i>M</i>	0.63	2.08	23.95	1.27	0.33	33.20	0.69	47.57	18.53	8.22	1.50	1.65	2.94	3.36	7.23	8.63
<i>SD</i>	0.73	0.82	3.70	1.74	1.81	4.21	0.53	11.34	11.64	3.35	0.62	0.70	1.15	1.35	3.37	3.63

Note: EDE-Q, Eating Disorders Examination Questionnaire; DMS, Drive for Muscularity; BMI, body mass index; Physical Exercise and Dietary Supplement use are assessed in terms of weekly frequency; RSE, Rosenberg Self Esteem Scale; GSI, Global Severity Index; PSWQ, Penn State Worry Questionnaire; SIAS, Social Interaction Anxiety Scale; PACS-4, Physical Appearance Comparison Scale; MEQ-Fashion, Sociomediatic Questionnaire Fashion subscale; MEQ-Body care, Sociomediatic Questionnaire Body care subscale; MEQ-Music, Sociomediatic Questionnaire Music subscale; MEQ-Sports, Sociomediatic Questionnaire Sports subscale; TV and Internet, weekly frequency in hours.

* $p < .05$

Table 2. Multiple Regression Analysis

Model	EDs (DV: EDE-Q)				MD (DV: DMS)			
	B	t	p	Partial <i>r</i>	B	t	p	Partial <i>r</i>
Model fit	$F(15,386) = 23.43, p < .001$				$F(15,386) = 23.95, p < .001$			
R-square	0.48				0.48			
EDE-Q	-	-	-	-	.17	3.41	.001*	.17
DMS	.17	3.41	.001*	.17	-	-	-	-
BMI	.25	6.49	.001*	.31	-.18	4.48	.001*	-.22
Physical exercise	.10	2.42	.016*	.12	.19	4.57	.001*	.23
Food supplements	-.07	-1.77	n.s.	-.09	.14	3.80	.001*	.19
RSE	-.09	-1.45	n.s.	-.07	.04	0.81	n.s.	.04
GSI	.17	3.01	.003*	.15	.02	0.27	n.s.	.01
PSWQ	-.01	-0.26	n.s.	-.01	.02	0.33	n.s.	.02
SIAS	.07	1.46	n.s.	.07	.02	0.48	n.s.	.02
PACS-4	.24	4.69	.001*	.23	.36	6.88	.001*	.33
SQ-Fashion	.06	1.24	n.s.	.06	-.09	-1.82	n.s.	-.09
SQ-Body care	.03	0.57	n.s.	.03	.30	5.84	.001*	.29
SQ-Music	.04	1.03	n.s.	.05	-.15	-3.49	.001*	-.18
SQ-Sports	-.12	-2.91	.004*	-.15	-.01	-0.05	n.s.	.01
TV	.07	1.57	n.s.	.08	.01	0.15	n.s.	.01
Internet	.06	1.50	n.s.	.08	.03	0.62	n.s.	.03

Note: EDE-Q, Eating Disorders Examination Questionnaire; DMS, Drive for Muscularity; BMI, body mass index; Physical Exercise and Dietary Supplement use are assessed in terms of weekly frequency; RSE, Rosenberg Self Esteem Scale; GSI, Global Severity Index; PSWQ, Penn State Worry Questionnaire; SIAS, Social Interaction Anxiety Scale; PACS-4, Physical Appearance Comparison Scale; SQ-Fashion, Sociomediatic Questionnaire Fashion subscale; SQ-Body care, Sociomediatic Questionnaire Body care subscale; SQ-Music, Sociomediatic Questionnaire Music subscale; SQ-Sports, Sociomediatic Questionnaire Sports subscale; TV and Internet, weekly frequency in hours

* $p < .05$. Bold face values denote the significant p values