

Big men feeling small: Childhood bullying experience, muscle dysmorphia and other mental health problems in bodybuilders

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Abstract

Objectives: Muscle dysmorphia (MD) is a preoccupation with the idea that one's body is insufficiently lean and muscular and considered as a body image disorder in men. This study aimed to investigate the relationship of MD with childhood bullying victimization experiences and mental health problems in a nonclinical sample of male bodybuilders.

Design: A cross-sectional study was conducted with a sample of 100 male bodybuilders.

Methods: Participants completed a questionnaire battery consisting of the muscle dysmorphic inventory (MDI), and scales on childhood bullying victimization, self-esteem, and psychological problems including depression, anxiety and obsessive-compulsive (OC) symptoms.

Results: High scores on the MDI and bullying victimization in childhood predicted global psychopathology and low self-esteem. Psychological functioning and self-esteem were most strongly adversely affected if the men were victims of bullying and scored high on the MDI (significant moderation effect). Structural equation modeling (SEM) analyses furthermore found an indirect linkage of victimization with global psychopathology and self-esteem via MDI (mediation effect).

Conclusions: Childhood bullying victimization and MD are strongly associated with concurrent anxiety, depressive and obsessive-compulsive symptoms and low self-esteem.

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Introduction

Body dysmorphic disorder (BDD) is a preoccupation with an imagined or slight defect in appearance (DSM-IV, 1994; Phillips, McElroy, Keck, Pope, & Hudson, 1993) leading to impairment in social or occupational functioning. Although most individuals with BDD are preoccupied with a particular body part (e.g. nose, hair), some are preoccupied with their entire body, thinking it is not lean enough, too small and insufficiently muscular (Olivardia, 2001; Pope et al., 2005). This fear of looking “puny” or “small” in men when in reality they look normal or even unusually muscular is often associated with distress about the body being seen in public (Choi, Pope, & Olivardia, 2002). Originally this body image distortion was labelled as reverse anorexia or bigorexia

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(“a fear of being too small”; Pope, Katz, & Hudson, 1993). More recently this condition has been labelled muscle dysmorphia (MD) and is considered as a subtype of BDD (Hitzeroth, Wessels, Zungu-Dirwayi, Oosthuizen, & Stein, 2001; Pope, Gruber, Choi, Olivardia, & Phillips, 1997; Zorpette, 1999).

The prevalence of MD in the general population is unknown. It has been described mostly in males (Ung, Fones, & Ang, 2000) but also females (Goodale, Watkins, & Cardinal, 2001; Pope et al., 1997) and is frequent in weightlifters or bodybuilders who more often become consumed with a drive for more muscle bulk and leanness (Blonin & Goldfield, 1995; Hildebrandt, Schlundt, Langenbucher, & Chung, 2006; Hitzeroth et al., 2001; Olivardia, 2001; Pope et al., 1997, 2005). MD is socially and occupationally impairing with many of those affected avoiding activities, places and people because of their perceived body defect. The exercise dependence (Smith & Hale, 2004) and rigorous training regimes put a burden on family and friendship relationships and occupational functioning with some giving up well-paying professional jobs to work at gymnasiums where they can train daily (Olivardia, Pope, & Hudson, 2000). There is increasing evidence that MD and associated body change behaviour has deleterious physical sequelae. This includes a higher prevalence of substance use disorder (Pope et al., 2005) and illicit anabolic-androgenic steroids, prohormones or ephedrine use, all of which are associated with adverse health side effects (Cafri et al., 2005). Furthermore, compulsive excessive training can lead to damage of joints, muscles and general health (Pope et al., 2005).

Little is known about associated psychological problems and possible precursors of MD. Consistent evidence has emerged that muscle dysmorphic men often have a history of concurrent eating disorder (Olivardia, 2001; Olivardia et al., 2000). The eating behaviour often incorporates contradictory strategies including highly structured diets to increase weight and muscularity while at the same time bulimic behaviour and the use of laxatives to avoid depositing any fat (Cafri et al., 2005; Choiet al., 2002; Hildebrandt et al., 2006). Recently, a higher rate of general psychopathology, a higher suicidal tendency and a lower quality of life has been reported in MD men compared to those not diagnosed with MD but other BDD (Pope et al., 2005).

There is a paucity of research on whether men with MD suffer increased anxiety, depression and low self-esteem. MD is considered to be a BDD which in turn is considered to be part of the spectrum of obsessive-compulsive disorders (Pope et al., 1997). Recently, Hildebrandt et al. (2006) reported higher levels of obsessive-compulsive symptomology among MD men supporting the obsessive-compulsive spectrum disorder (OCS) classification of MD. While BDD has been found to be associated with lower self-esteem (Phillips, Pinto, & Jain, 2004), research on MD has failed to support this finding (Muller, Dennis, Schneider, & Joyner, 2004).

Barely anything is known about individual or social risk factors for MD. The literature on BDD suggests that those affected experienced abuse more often in childhood (Didie et al., 2006). Autobiographies of bodybuilders (Fussell, 1991) and single case studies (Aycocock, 1992; Klein, 1993) further suggest that some were physically weak as boys and became victims of bullying (Wolke & Stanford, 1999). These autobiographical accounts describe that being weaker than other boys and being subjected to victimization precipitated taking up vigorous training to escape bullying. Thus, psychological problems attributed to MD could also be a result of bullying victimization that has been reported to be a risk factor for lowered self-esteem, anxiety and depression (Hawker & Boulton, 2000; Wolke & Samara, 2004).

The present study examined firstly, whether childhood bullying victimization and MD have adverse effects on global psychopathology and self-esteem. Secondly, we tested whether MD moderates the effect of bullying victimization on global psychopathology and self-esteem. Moderation would be supported if those bodybuilders who had experienced childhood victimization and scored high on a MD scale were most likely to show the most adverse outcomes in terms of psychological functioning and the lowest self-esteem scores in excess of their additive effect. Finally, structural equation modeling was performed to test whether MD scores mediate the relationship between bullying victimization and global psychopathology or self-esteem (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001).

Method

Participants and procedure

A total of 100 male bodybuilders who trained regularly (four times or more per week according to the gymnasium managers) were recruited from ten gymnasiums in South England and South Wales. Their age ranged

from 16 to 62 years with a mean age of 29.8 years ($SD = 9.1$). After obtaining written informed consent, the participants were asked to respond to a series of questionnaires which took approximately 20 min to complete. All 100 bodybuilders approached agreed to participate. The study was approved by the Ethical Committee of the University of Hertfordshire. All participants were given a high protein bar as appreciation for their participation.

Measures

Participants were asked to complete a questionnaire battery consisting of four sections: (1) The 16-item Muscle Dysmorphic Inventory (MDI; Schlundt, Woodford, & Brownlee, 2000) designed to assess distress and discomfort associated with fears of being too small and not sufficiently muscular. Items such as “I think my body is too small” or “I am very shy of letting people see me with my shirt off” were answered on a five-point Likert scale (0: *never*; 1: *occasionally*; 2: *rarely*; 3: *frequently*; 4: *always*) and responses were totalled. Item scores can range from 0 to 64, with higher scores representing increasing preoccupation with feeling small. An adaptation of the MDI, the Muscle Dysmorphic Disorder Inventory (MDDI) has been shown to have good discriminate and convergent validity, internal consistency and re-test reliability (Hildebrandt, Langenbacher, & Schlundt, 2004; Hildebrandt et al., 2006). The internal reliability of the 16-item MDI in our sample was also excellent based on Cronbach’s coefficient α values ($\alpha = 0.89$). (2) The widely used and validated ten-item Rosenberg Global Self-esteem Scale (RGSS; Phillips et al., 2004; Rosenberg, 1965) was administered and items were answered on four-point scales ranging from *strongly agree* to *strongly disagree*. A total score was computed by summing up the item scores. Higher scores indicate higher self-esteem. Internal consistency was 0.89 in this sample. (3) An adapted bullying questionnaire (Griffiths, Wolke, Page, Horwood, & Team, 2006; Olweus, 1993; Wolke, Woods, Schulz, & Stanford, 2001) was administered asking about victimization (six behaviours such as been kicked, belongings taken or damaged, called names, made fun of, socially excluded, rumours spread about) in childhood and adolescence. It further asked how old the participant was when this first happened regularly. Victims were those who had experienced any of the six victimization behaviours regularly (at least 2–3 times per month). (4) The fourth questionnaire consisted of the three sub-scales depression (13 items; $\alpha = 0.90$), anxiety (10 items; $\alpha = 0.92$) and obsessive-compulsive (OCD; 10 items; $\alpha = 0.90$) of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994), a widely used instrument to screen for people with positive risk of psychiatric disorder (Peveler & Fairburn, 1990). All items were answered using a 5-point rating format (0: *not at all* to 4: *extremely*). The measures of depression, anxiety and obsessive-compulsive behaviour were highly correlated ($r > 0.80$; see Table 2). We thus constructed a global psychopathology measure by adding together the total scores obtained for the anxiety, depression and OCD subscales, with high values indicating greater psychopathology. Internal consistency of this global psychopathology scale was excellent ($\alpha = 0.96$).

Current weight and height were self-reported and body mass was computed as $BMI = \text{kg/m}^2$.

Statistical analyses

Three sets of analyses were conducted. The first set examined the interrelationships among study variables. Next, hierarchical multiple-regression analyses were performed to investigate the unique, joint and moderation effects of victimization and MDI scores on global psychopathology and self-esteem. Finally, structural equation modeling (SEM) using AMOS 6.0 (Arbuckle, 2005) was employed to test the direct and indirect paths (mediation via MDI) of childhood bullying victimization on global psychopathology and self-esteem. In the present study, model fit was assessed using well-established indices such as CFI, IFI, TLI and RMSEA. CFI, IFI and TLI values greater than 0.90 indicate a good fit to the data. For the RMSEA fit index, a value of 0.05 or less indicates a close fit (Byrne, 2001).

Results

Preliminary analyses

Twenty-one of 100 bodybuilders (21%) reported to have been regular victims of bullying during childhood. The mean age of onset of regular bullying was 10.5 years ($SD = 2.4$ years). The mean scores and standard

deviations for the MDI scale, self-esteem and global psychopathology scales, separate SCL-90-R depression, anxiety and obsessive-compulsive scales as well as height, weight and BMI are shown in Table 1.

Pearson product-moment correlations between all the study variables were computed. Table 2 shows that there were significant positive relationships between MDI scores and all indices of psychopathology and the correlation between MDI scores and self-esteem was negative. Results also indicated that victimization was positively correlated with MDI scores as well as all indices of psychopathology. As hypothesised, victimization was negatively related to self-esteem, indicating that bodybuilders who had experienced bullying victimization were more likely to report lower levels of self-esteem. Results also indicated that height, weight and BMI were not significantly related to either MDI scores ($r = 0.11$, 0.15 and 0.11 ns, respectively) or victimization ($r = 0.04$, 0.05 and 0.04 ns, respectively).

Moderation analyses

In order to investigate if there were independent main and interaction effects of MDI scores and victimization (independent variables) on psychological functioning two separate hierarchical regression analyses were performed on each of the outcome variables (global psychopathology, self-esteem). For each model, MDI and bullying victimization were entered jointly into the equation in step 1. The interaction term MDI \times victimization or self-esteem \times victimization was then entered in step 2 to assess whether the interaction led to a significant change in the variance explained in the outcome variable (i.e. global psychopathology or self-esteem). To reduce the effects of multicollinearity, independent variables were first centred and then an interaction term was calculated (Aiken & West, 1991).

Table 1
Descriptive statistics for variables in the analyses

Variable	Mean	SD	Min	Max
MDI	25.28	12.83	3.00	61.00
Victimization	0.21	0.41	0.00	1.00
Global psychopathology	29.26	24.02	0.00	123.00
Depression	10.88	10.06	0.00	51.00
Anxiety	7.87	7.15	0.00	35.00
OCD	10.51	8.17	0.00	37.00
Self-esteem	32.88	5.24	12.00	40.00
Height (cm)	177.83	7.55	157.48	198.12
Weight (kg)	92.59	15.13	55.34	128.82
BMI	29.28	4.49	20.30	43.85

Note: MDI, Muscle Dysmorphic Inventory; OCD, obsessive-compulsive disorder; BMI, body mass index.

Table 2
Pearson correlation coefficients between bullying victimization and MDI scores and psychopathology and self-esteem ($N = 100$)

Variable	1	2	3	4	5	6
1. MDI						
2. Victimization	0.21*					
3. Self-esteem	-0.46**	-0.24*				
4. GP	0.35**	0.44**	-0.53**			
5. Depression	0.38**	0.45**	-0.58**	0.97**		
6. Anxiety	0.32**	0.37**	-0.47**	0.93**	0.86**	
7. OCD	0.27**	0.41**	-0.42**	0.94**	0.85**	0.80**

Note: MDI, Muscle Dysmorphic Inventory; GP, global psychopathology (SCL-90-R); OCD, obsessive-compulsive disorder.

* $p < 0.05$.

** $p < 0.01$.

Table 3 shows the two regression models. Victimization and MDI explained 25.7% of the total variance in global psychopathology. Both predictors were significant (victimization, $\beta = 0.38$, $p < 0.001$ and MDI, $\beta = 0.26$, $p < 0.01$). In the second step of the analysis, the interaction term between victimization and MDI was added, significantly increasing the explained variance of global psychopathology ($\Delta R^2 = 0.048$, $F_{\text{change}}(2,96) = 6.51$, $p < 0.05$). The full model explained 30.4% of the variance in global psychopathology ($F(3, 95) = 13.84$, $p < 0.001$). The regression lines predicting global psychopathology for victims and non-victims of childhood bullying in relation to MDI scores are shown in Fig. 1. The figure illustrates that increasing MDI symptoms lead to particularly high global psychopathology scores when the men had been victims of childhood bullying while the increase was much lower for men with no childhood bullying experience.

For self-esteem, victimization and MDI explained 22.9% of the total variance, though only MDI scores significantly contributed to the model ($\beta = 0.42$, $p < 0.001$). The interaction term between victimization and MDI ($\beta = -0.32$, $p < 0.01$) was a significant predictor that accounted for another 6.7% of the variance ($\Delta R^2 = 0.067$, $F_{\text{change}}(1,95) = 9.11$, $p < 0.01$). Fig. 2 shows that the decrease of self-esteem was greater in men with increasing MDI scores who had been victims of childhood bullying than it was for the men who had not been victimized in childhood.

Mediational models

Before the first SEM model was tested, global psychopathology as a latent variable was specified by the three subscales of the SCL-90-R: anxiety, depression and OCD. All observed (manifest) indicators of global

Table 3
Hierarchical regression analyses of MDI and bullying victimization predicting global psychopathology and self-esteem ($N = 99$)

Independent variable	R^2	ΔR^2	β	B
<i>Global psychopathology</i>				
MDI			0.264**	0.494**
Victimization	0.257	0.257***	0.380***	22.182***
+ MDI \times victimization	0.304	0.048*	0.269*	0.509*
<i>Self-esteem</i>				
MDI			-0.424***	-0.173***
Victimization	0.229	0.229***	-0.148	-1.880
+ MDI \times victimization	0.296	0.067**	-0.320**	-0.132**

Note: MDI, Muscle Dysmorphic Inventory, + represents new step.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

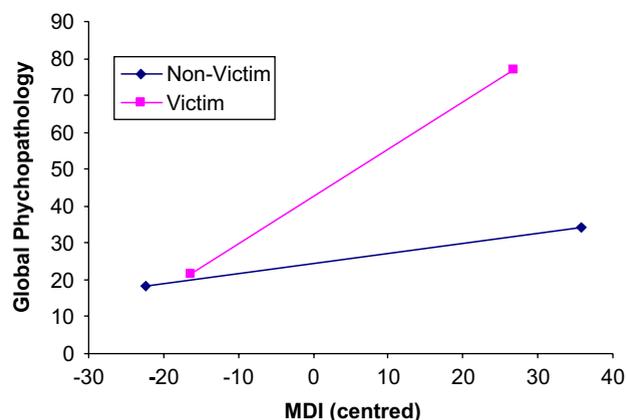


Fig. 1. Interaction effect of victimization and MDI on global psychopathology.

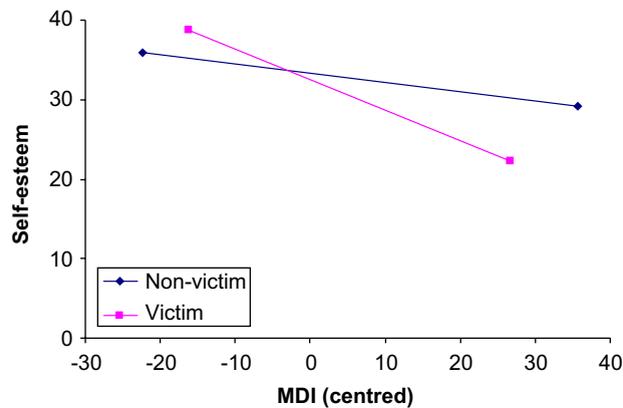


Fig. 2. Interaction effect of victimization and MDI on self-esteem.

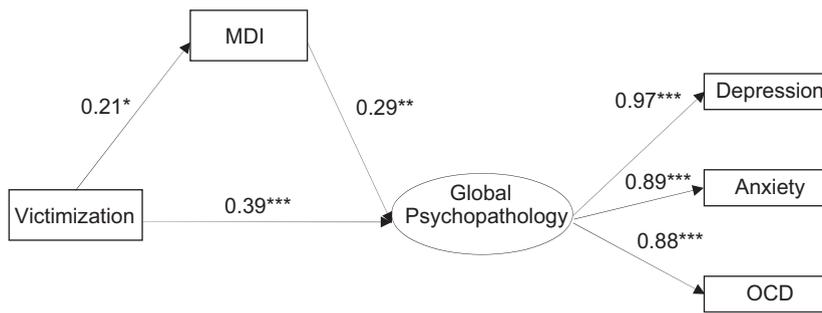


Fig. 3. Structural equation model for hypothesized pathways of victimization and MDI on global psychopathology. For clarity, error variances of endogenous variables have been omitted. * $p < 0.5$, ** $p < 0.01$, *** $p < 0.001$.

psychopathology loaded significantly on the underlying (latent) construct (see Fig. 3). Results indicated that our hypothesized mediating model provided an excellent fit to the data according to all fit indices (RMSEA = 0.01, IFI = 1.00, CFI = 1.00, TLI = 0.999). All three dimensions of global psychopathology were directly predicted by high MDI scores and childhood bullying victimization. The model further confirmed the hypothesis that high MDI scores partially mediate the relationship between childhood victimization and global psychopathology. Standardized β coefficients are shown in Fig. 3. Fifteen percent of the variation in the latent global psychopathology was explained by the direct impact of childhood victimization and a further 6% of the variance was mediated via MDI (MDI scores). MDI independently explained 8.4% of the variation in global psychopathology.

Furthermore, we investigated whether MDI scores mediate the relationship between childhood victimization and self-esteem. Results revealed that our model had a good fit according to some indices (IFI = 1.00, CFI = 1.00). However, the RMSEA index with a value of 0.20 did not support a good fit to the data. The independent direct association between childhood victimization and self-esteem was not significant. Instead, the MDI scores mediated the relationship between childhood victimization and self-esteem with higher MDI scores related to lower self-esteem. Standardized β coefficients are presented in Fig. 4. The model explained 22.8% of the variation in self-esteem.

Discussion

Increasing feelings of being too small, lean, unmuscular and embarrassed about the body's appearance as measured by the MDI was found to be significantly associated with psychopathology and lowered self-esteem. Bodybuilders with increased MDI scores did not differ in weight, height or body mass from those with low MDI scores. Therefore, the MDI measures perceptions about one's own body rather than objective differences

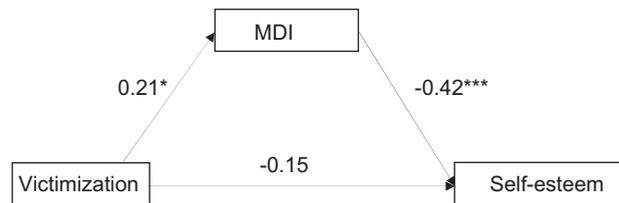


Fig. 4. Structural equation model for hypothesized pathways of victimization and MDI on self-esteem. * $p < 0.5$, *** $p < 0.001$.

in body mass. The mean BMI of 29 was larger than the recommended BMI of 20–25 for the male adult population, a finding replicating that of Pickett, Lewis and Cash (2005). However, it has been argued that the BMI is not a reliable measure of obesity in muscular men since it fails to distinguish between fat and muscle mass (Foreyt, Poston, McInnis & Rippe, 2003). Olivardia et al. (2000) and Choi et al. (2002) have also reported no difference in anthropometric measures between MD cases and non-MD. Although we have no measures of body fat, all men were seen in the gym during training and none was considered obese. Thus, MD is a psychological disorder that is co-morbid with a range of affective psychiatric problems (Olivardia et al., 2000; Pope et al., 2005).

The rate of bullying victimization in childhood of 21% recalled by body builders is comparable to rates reported in community samples of primary school children (Due et al., 2005; Kumpulainen, Rasanen, & Puura, 2001; Wolke et al., 2001), but higher than reported in samples of secondary school children (Whitney & Smith, 1993). It is notable that those who recalled regular bullying victimization in childhood, in particular, being regularly beaten or hit by peers, also had higher MDI scores. There is increasing evidence that victimization is related to either obsessive-compulsive behaviour or BDD. Women who were victims of rape as teenagers or adults have been reported to be more often involved in compulsive weightlifting (Gruber & Pope, 1999). Child abuse experience has been found as an antecedent of BDD (Didie et al., 2006). Childhood bullying victimization itself was significantly related to global psychopathology in our study. Bullying victims had a substantially raised rate of psychiatric problems. This is in line with previous reports of children and adults that found higher psychological morbidity after continuous victimization experience (Bond, Carlin, Thomas, Rubin, & Patton, 2001; Hawker & Boulton, 2000; Kumpulainen et al., 1998; Olweus, 1992; Wolke, Woods, Bloomfield, & Karstadt, 2000). In addition to the moderate to large direct effects of childhood victimization on global psychopathology we found support for both mediation and moderation via MD symptoms. Men who were victims of bullying in childhood were more likely to have higher MDI scores and this partly mediated the effect of victimization on global psychopathology. We further showed that if body builders had experienced regular victimization and had increasing MDI symptoms, then global psychopathology was over proportionally raised and self-esteem was especially low. This is the first study that illustrates that early experience of victimization both increases high MD tendencies and in conjunction has particularly adverse impact on global psychopathology (mediation and moderation; Kraemer et al., 2001).

This cross-sectional study relied on retrospective reports of bullying victimization and concurrent reports of MD. Retrospective reports can be biased because of concurrent or recent psychological difficulties (Mackinger, Pachinger, Leibetseder, & Fartacek, 2000; Richters, 1992). They are dependent on whether single events or recurrent incidences (such as bullying) are recalled (Conway & Pleydell-Pearce, 2000) and on the way the information was elicited (Bradfield & Steblay, 2006; Stephen, Gillian, & Stephanie, 2000). In the present study, the bodybuilders were asked about concrete, recurring behaviours (e.g. being repeatedly beaten by peers) at school age (Bruce, Dolan, & Phillips-Grant, 2000) in a standard questionnaire format avoiding any suggestive or imaginary questioning (Garry, Manning, & Loftus, 1996; Goodman, 2006). Nevertheless, we cannot exclude that the psychological difficulties experienced by these men led to selective recall of victimization experiences in childhood. We can also not unravel whether victimization led to feeling small (high MDI scores) or whether these men already differed in their psychological functioning in childhood, i.e. felt or were small or “puny” in childhood (Kraemer et al., 2001). To draw firm conclusions, longitudinal research on boys who are victims of bullying and their psychological sequelae is required.

There is considerable evidence, however, that children who are bullied are often targeted because of perceived characteristics such as being physically weak, differing in physical appearance, lacking assertiveness,

being anxious and having no or few friends (Griffiths et al., 2006; Horwood, Waylen, Herrick, Williams, & Wolke, 2005; Parker & Asher, 1987; Smith & Brain, 2000; Wolke & Stanford, 1999). Autobiographical accounts of successful bodybuilders (Fussell, 1991; Klein, 1993) and spontaneous reports of bodybuilders in this study suggest that being a victim of bullying as a school boy and feeling weak and pushed around can lead to taking up bodybuilding.

In conclusion, we showed that men with high MDI scores have lower self-esteem and increased global psychopathology than those engaging in the same sport but not affected by altered muscle dysmorphic perceptions. Perception of one's own body as muscle dysmorphic has significant clinical implications supporting the validity of the construct. Our findings also show that many bodybuilders achieving the same physique do not show disordered body perception (Pickett et al., 2005). Our results further suggest that childhood physical victimization by peers is a likely contributory factor to the development of muscle dysmorphic symptoms and psychiatric difficulties in males who take up bodybuilding. The adverse effects of MD and bullying victimization are not only additive, but when occurring together are disproportionately large for self-esteem and psychopathology. Those studying adolescent development should be aware of the desire of young men to develop muscle bulk and definition. Finally, clinicians working with bodybuilders should be aware that significant numbers with high MDI scores are at risk for problems in psychosocial functioning.

Acknowledgement

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Appendix. Muscle dysmorphic inventory

1. I think about my appearance constantly.
2. I think my body is too small.
3. I wear loose clothing so that people can't see my body.
4. There are times when I know my muscles are strong, yet I doubt my strength anyway.
5. I do not like to leave my home because I am embarrassed by my appearance.
6. I think my body is flawed.
7. I worry about aspects of my appearance that would not bother most people.
8. I am afraid of situations that other people do not normally consider dangerous.
9. I feel anxious about the way I look.
10. I hate my body.
11. I wish I could get bigger.
12. I think my chest is too small.
13. I think my legs are too thin.
14. I feel like I have too much body fat.
15. I wish my arms were bigger.
16. I am very shy about letting people see me with my shirt off.

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