Original research

Relationships among muscle dysmorphia characteristics, body image quality of life, and coping in males

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A B S T R A C T

Objectives: The purpose of this study was to examine relationships among bodybuilding dependence, muscle satisfaction, body image-related quality of life and body image-related coping strategies, and test the hypothesis that muscle dysmorphia characteristics may predict quality of life via coping strategies.
Design: Participants (294 males, $M_{age} = 20.5$ years, $SD = 3.1$) participated in a cross-sectional survey.
Methods: Participants completed questionnaires assessing muscle satisfaction, bodybuilding dependence, body image-related quality of life and body image-related coping.
Results: Quality of life was correlated positively with muscle satisfaction and bodybuilding dependence but negatively with body image coping ($P < 0.05$). Body image coping was correlated positively with bodybuilding dependence and negatively with muscle satisfaction ($P < 0.05$). Mediation analysis found that bodybuilding dependence and muscle satisfaction predicted quality of life both directly and indirectly via body image coping strategies (as evidenced by the bias corrected and accelerated bootstrapped confidence intervals).
Conclusions: These results provide preliminary evidence regarding the ways that muscularity concerns might influence body image-related quality of life.

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1. Introduction

Researchers recognize that muscularity is typically a concern among males dissatisfied with their bodies.[1] Muscle dysmorphia has been proposed as an extreme expression and involves individuals' preoccupations that they are insufficiently large and muscular.[2] Associated with such preoccupations are behaviours aimed at increasing size and definition, including excessive weightlifting, restrictive diet manipulation and illicit appearance and performance-related drug use.[2] Researchers have studied both individuals diagnosed with the condition and people not diagnosed with the disorder, but who may display characteristics to varying levels.[3,4] Both foci have value. Understanding, for example, how symptoms interact with other variables in non-clinical populations may help identify at-risk individuals. Although existing studies have focused on relationships between variables, researchers have not typically examined mediation issues or investigated the possibility that muscle dysmorphia characteristics may be related to other variables via multiple pathways. The novel aspects of the current study involved (a) exploring how the relationship muscle dysmorphia characteristics have with body image-related quality of life might consist of both direct and indirect pathways and (b) the involvement of body image-related coping strategies as mediators of the indirect pathway. Body image-related quality of life refers to the extent that a person's cognitive representation of their body influences their quality of life (e.g., men who believe they are insufficiently muscular may avoid social situations, so others do not see their perceived inadequacy, thereby missing out on social interaction and social support).

To date, one study has measured muscle dysmorphia and quality of life and yielded significant and non-significant results.[5] Pope et al.[5] employed one general quality of life measure (the Quality of Life Enjoyment Satisfaction Questionnaire, QLESQ) and three Short Form-36 Health Survey subscales (relating to the mental health, emotional, and social functioning domains). Results indicated significant differences between male body dysmorphic disorder patients with and without muscle dysmorphia on the QLESQ and SF-36 mental health subscale (men with muscle dysmorphia had lower scores), but not with the other assessments. One way to explore Pope et al.'s[5] findings and possibly strengthen understanding of the relationship may be to use a measure that assesses quality of life domains known to be influenced by body

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image disturbances such as muscle dysmorphia. One such measure is the Body Image Quality of Life Inventory[6] which assesses the extent body image is perceived to influence quality of life. Also, muscle dysmorphia is a multifaceted condition and greater detail might emerge if researchers examine the relationships individual characteristics have with quality of life as opposed to the global measure Pope et al.[5] employed.

Similarly, muscle dysmorphia has been correlated with behaviours, including exercise, steroid use, muscle checking and appearance control,[3,7,8] that may represent broader approaches to coping, some of which might be adaptive and some maladaptive. Cash, Santos and Williams,[9] for example, identified three body image coping categories. Avoidance coping refers to attempts to leave or evade stressful body image situations, such as males who do not shower at a gym after working out so they do not reveal their bodies to others. Appearance fixing coping involves altering appearance to disguise perceived defects, such as males who wear oversized clothing to hide their body shapes. Positive rational acceptance coping includes strategies encouraging acceptance of the defect, self-care or rational self-talk, such as males who refute negative thoughts by telling themselves they are healthy despite not being the shape they prefer. Avoidance and appearance fixing coping might be interpreted as maladaptive strategies, because they do not address individuals' beliefs. Positive rationale acceptance, however, is an adaptive strategy because the focus is on individuals confronting or changing their perceptions regarding inadequacy. To date, these coping strategy categories have not been examined as mediators through which muscle dysmorphia characteristics might predict other outcomes, including quality of life, but doing so may advance knowledge and identify ways to help people with muscularity concerns, such as helping them to use adaptive rather than maladaptive strategies.[9] We hpothesized that coping strategies would mediate the relationship between muscle dysmorphia characteristics and quality of life. First, coping strategies represent ways people try to deal with their perceptions regarding muscularity inadequacy, and second, the influence those coping strategies have on their daily functioning and interactions may alter their perceived quality of life. This involvement of coping strategies is in addition to direct relationships between muscle dysmorphia and quality of life.

In summary, the purposes of the current study were to (a) explore relationships muscle dysmorphia characteristics have with body image-related quality of life and coping strategies, and (b) examine if muscle dysmorphia symptoms predict quality of life via direct and indirect pathways (see Fig. 1). In Fig. 1, c represents the direct pathway between muscle dysmorphia and quality of life, whereas $a \times b$ represents an indirect pathway and according to Hayes,[10,11] a significant indirect pathway would be interpreted as muscle dysmorphia predicting quality of life via a coping strategy. We hypothesized that muscle dysmorphia characteristics would be correlated with body image-related quality of life and coping strategies. We also hypothesized that there would be significant indirect pathways from muscle dysmorphia characteristics to body image-related quality of life via body image-related coping strategies. Given Pope et al.'s[5] significant and non-significant results, and because we were separating indirect and direct pathways, we made the hypotheses 2-tailed.

2. Methods

Before starting the study, we obtained institutional human research ethics committee approval. Prior to participating, volunteers received a written explanation of the study's purpose, risks, safeguards and benefits before signing informed consent documents. Participants included 294 males (M_{age} = 20.5 years, SD = 3.1)

who weight trained 2.5 (SD = 1.7) times a week, who had weight trained regularly for 2.47 (SD = 2.40) years and of whom 69% were consuming nutritional supplements. In an open ended question regarding ethnicity 91% described themselves as White British, 6.5% were grouped together as other, and 2.5% did not respond. These males weight trained for various reasons, ranging from recreational lifters to competitive athletes and bodybuilders. Participants were approached in small groups or individually in various locations as we came into contact with them during data collection via several channels (e.g., our networks and recommendations, although we did not approach close friends with whom there may have been a conflict of interest). As such they represent a sample of convenience, rather than a group randomly selected from a specified population, although all participants were regular weight trainers (at least once a week) from a midlands town in the United Kingdom. Individuals received a packet containing the information sheet, written informed consent form, and paper versions of the questionnaires presented in a counterbalanced fashion to avoid order effects. Participants completed the questionnaires anonymously in approximately 10 min.

Participants completed the bodybuilding dependence and muscle satisfaction subscales of the Muscle Appearance Satisfaction Scale (MASS), the Body Image Quality of Life Inventory (BIQLI), the Body Image Coping Strategies Inventory (BICSI) and a demographic questionnaire. The demographic questionnaire recorded age, self-described ethnicity, number of years weight training experience, weight training frequency, reasons for weight training, and consumption of nutritional supplements to help describe the sample.

The bodybuilding dependence subscale has 5 items[12] and the muscle satisfaction subscale has 3 items and they are rated on a 5-point Likert scale, from 1 (definitely disagree) to 5 (definitely agree). An example bodybuilding dependence item is "I often feel like I am addicted to working out with weights." An example muscle satisfaction item is "I am satisfied with the size of my muscles." High scores indicate greater bodybuilding dependence and muscle satisfaction. Evidence exists for the subscales' internal consistency and test–retest reliability, along with construct, divergent and convergent validity.[12] In the current study, Cronbach's alpha for bodybuilding dependence was 0.88 (95% confidence intervals [CI] = 0.86–0.90) and 0.80 (95% CI = 0.76–0.84) for muscle satisfaction.

The BIQLI lists 19 life domains (e.g., relationships, emotions, grooming activities). Participants rate the influence of their body image on each domain using a 7-point bipolar scale from −3 (very negative effect) to +3 (very positive effect) allowing for a negative, positive or neutral influence. The BIQLI yields a total overall score and high scores reflect a greater positive influence of body image on quality of life. Evidence exists for the BIQLI's reliability and validity.[6,13,14] The Cronbach's alpha in the current study was 0.93 (95% CI = 0.92–0.94).

The BICSI has 29 items assessing avoidance, appearance fixing and positive rational acceptance.[9] Participants respond on a 4-point Likert-type scale from 1 (definitely not like me) to 4 (definitely like me). Higher scores indicate greater engagement in these strategies. Appearance fixing has 10 items and one example is "I spend extra time trying to fix what I don't like about my looks." Avoidance has 8 items and one example is "I withdraw and interact less with others." Positive rationale acceptance has 11 items and an example is "I tell myself that I probably look better than I feel that I do." Evidence exists for the reliability and validity of the BICSI.[9,14] The current Cronbach's alpha for appearance fixing was 0.89 (95% CI = 0.87–0.91), avoidance was 0.70 (95% CI = 0.64–0.75) and rational acceptance was 0.80 (95% CI = 0.76–0.83).

There was less than 2% missing data and Little's test indicated they could be considered missing completely at random. The hot deck approach was the imputation method used in the