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Negative psychological correlates of the pursuit of muscularity among women

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Abstract

Objective: There is increasing public and scientific focus on women's pursuit of a muscular and toned appearance. However, the psychological correlates of women's drive for muscularity are currently unclear. Therefore, we examined the associations of drive for muscularity with four important negative psychological indices among women: eating-disorder (ED) symptoms, and symptoms of depression, anxiety and stress. **Method:** A sample of 221 university women completed an online survey that included measures assessing the aforementioned constructs. **Results:** Drive for muscularity evidenced positive associations with all negative psychological indices, except for anxiety. Muscularity-oriented *Attitudes*, as opposed to *Behaviors,* demonstrated the strongest associations with ED and depression symptoms. **Discussion:** Our findings make a novel contribution to the scant literature by demonstrating that women who endorse attitudes and/or behaviors geared towards attaining the female muscular ideal may be susceptible to experiencing ED symptoms and negative emotional states. This study provides preliminary evidence that muscularity-oriented attitudes, in particular, may be a promising target for the treatment of EDs and negative emotional states in women with a preoccupation towards muscularity.

Keywords: drive for muscularity; women; female; eating disorders; negative psychological states

Negative psychological correlates of the pursuit of muscularity among women

Although muscularity concerns among women have been documented for some time (Karazsia, Murnan, & Tylka, 2017), an intensification of the pursuit towards a toned (i.e., lean muscularity) appearance ideal has been noted more recently (Bozsik et al., 2018). However, shifts in women's appearance ideals toward greater muscular leanness bring about new research questions regarding the potential costs of pursuing these ideals. For example, Rodgers et al. (2017) recently found associations between the desire to be toned with body image concerns and a drive for thinness among college women, both of which are cardinal risk factor for eating disorder (ED) pathology (Sharpe et al., 2018; McLean & Paxton, 2019). Given that a crucial aspect of the toned ideal is possessing minimal body fat to enhance the visibility of muscularity, it is reasonable to suspect women with a desire to increase muscle tone may engage in ED behaviors to reduce adiposity (e.g., caloric restriction; Murray, Griffiths, & Mond, 2016). However, while a link between a drive for muscularity and ED pathology has been found among men (for review, see Lavender, Brown, & Murray, 2017), to our knowledge, no study has examined the link between a drive for a toned muscular ideal and ED pathology among women. Furthermore, no research to date has examined whether women with a drive towards this muscular ideal may be vulnerable to experiencing negative emotional states (e.g., depression or anxiety symptoms) as has been demonstrated among men (Parent & Bradstreet, 2017; Mitchell et al., 2017).

The present study aimed to address the dearth of research exploring drive for muscularity in female samples by examining its associations with four theoretically relevant outcomes: ED symptoms, depression, anxiety, and stress. Specifically, we hypothesized that drive towards

muscularity would be positively associated with these negative psychological indices after controlling for important covariates (described further on).

Method

Participants

Participants were 221 Australian college women who participated in exchange for partial course credit at a large public university. Participants were 18-47 years old (*M* = 20.0, *SD* = 3.55), had a mean body mass index (BMI; kg/m^2) of 21.8 (*SD* = 3.31), and on average, reported exercising 2.68 (*SD* = 2.57) hours per week. Participants reported their country/region of birth as Australia (63.8%), Asia (22.6%), North America (3.6%), Europe (3.2%), and other (6.9%). The majority (66.8%) reported English as their first language, followed by Chinese (Mandarin or Cantonese) (19.5%), Arabic (2.3%), and other (11.4%). We obtained demographic information, including BMI and exercise frequency, via self-report survey questions.

Measures

Female drive for muscularity. We measured female drive for muscularity using the 10-item Female Muscularity Scale (FMS; Rodgers et al., 2017). Items comprise two subscales: *Attitudes* (referring to the desire for a toned/tight appearance; e.g., "*I wish I were more toned*") and *Behaviors* (engagement in behaviors aimed at modifying appearance and increasing muscularity and tone; e.g., "*I exercise to try and look fit and sculpted*"). Each subscale contains five items, with responses provided on a 5-point Likert-type scale anchored at "Never" (1) to "Always" (5). Higher total scores reflect a higher drive for muscularity. The FMS demonstrates sound psychometric properties among university women including high internal consistency (α's ranged .89 - .90) and test-retest reliability (*r* = .76; Rodgers et al., 2017). Cronbach alphas for all measures in our study are reported in Table 1.

ED symptoms. We measured ED symptoms using the 12-item, single-factor Eating Disorder Examination Questionnaire Short (EDE-QS; Gideon et al., 2016). Responses on the EDE-QS are given on a 4-point Likert-type scale anchored at "0 days" (0) and "6–7 days" (3). Higher total scores reflect more severe ED (attitudinal and behavioral) symptoms. The EDE-QD demonstrates sound psychometric properties among university students, including excellent internal consistency (α = .91), test-retest reliability (intraclass correlation coefficient = .93), and convergent validity (Gideon et al., 2016).

Depression, anxiety and stress symptoms. We assessed depression, anxiety and stress symptoms (over the past week) using the 21-item Depression Anxiety Stress Scales (DASS-21), a shortened version of the 42-item DASS (Lovibond & Lovibond, 1995). The questionnaire includes three scales of seven items each measuring symptoms of depression, anxiety and stress. Responses are given on a 4-point Likert-type scale anchored at "Did not apply to me at all" (0) to "Applied to me very much, or most of the time" (3). Higher total scores on each scale reflect more severe symptoms in that domain. The DASS-21 demonstrates good psychometric properties, including sound reliability (α's ranged .82 - .90), in non-clinical adults (Henry & Crawford, 2005).

Procedure

Following informed consent, we asked participants to respond to a 20-minute online survey (hosted by Qualtrics) as part of a larger study. We randomized the order of presentation of the questionnaires. The University Human Research Ethics Committee approved the study procedures.

Statistical analyses

We conducted analyses using *R* (*R* Core Team, 2019) and the *jmv* package for *R* (Selker, Love, & Dropmann, 2018). First, to explore the data and their inter-relationships, we calculated descriptive statistics and conducted Pearson zero-order correlational analyses for the variables of interest.

Second, we conducted four separate hierarchical regression analyses (with ED, depression, anxiety and stress symptoms as the four criterion variables) to assess whether female drive for muscularity predicted these outcomes. Step 1 of the regression involved entering age, BMI, and weekly exercise (in hours) to control for their potential confounding effect. We then entered both subscales of female drive for muscularity in Step 2 of the model to test whether they would predict unique variance in our criterion variables over and above covariates.

Results

Preliminary analyses

We examined data for skew and kurtosis and all were within recommended limits (Kline, 2010). We did not exclude outliers as we wanted to capture natural variation in responses in our data. A sensitivity analysis demonstrated our results were not sensitive to the removal of outliers. The level of missing data was trivial ($M \leq 0.13\%$ at item-level), missing completely at random, and dealt with using listwise deletion (Tabachnick & Fidell, 2013). We found no significant violations of other assumptions that would preclude the use of hierarchical regression (Tabachnick & Fidell, 2013). Table 1 presents descriptive statistics and correlations. With the exception of correlations between *Drive for Muscularity - Behaviors* and the three DASS scales, all variables demonstrated significant positive correlations with one another.

Hierarchical multiple regression analyses

Table 2 summarizes results from the hierarchical multiple regression analyses.

ED symptoms. Step 1, with covariates predicting ED symptoms, was significant ($p < .001$), accounting for 13% of the variance in ED symptoms. Drive for muscularity subscales added to Step 2

explained incremental variance (21%) in ED symptoms, Δ*F* (2, 210) = 35.30, *p* < .001. Both *Attitudes* (*p* < .001) and *Behaviors* (*p* = .034) significantly predicted ED symptoms.

Depressive symptoms. Step 1, with covariates predicting depressive symptoms, was not significant (*p* = .051). In Step 2, drive for muscularity subscales explained incremental variance (5%) in depressive symptoms, Δ*F* (2, 210) = 6.18, *p* = .002. Only *Attitudes* significantly predicted depressive symptoms (*p* = .003).

Anxiety symptoms. Step 1, with covariates predicting anxiety symptoms, was not significant (*p* = .490). In Step 2, a drive for muscularity did not explain incremental variance in anxiety symptoms, Δ*F* (2, 212) = 2.22, *p* = .111.

Stress symptoms. Step 1, with covariates predicting stress symptoms, was not significant (*p* = .102). A drive for muscularity added to Step 2 explained incremental variance (3%) in stress symptoms, Δ*F* (2, 212) = 4.18, *p* = .017. *Attitudes* significantly predicted stress symptoms (*p* = .011).

Post hoc analyses

Given the association between female drive for muscularity and ED symptoms, we wanted to ensure this relationship was not emerging merely due to a potential overlap between drive for muscularity as assessed by the FMS and body image concerns as assessed by the EDEQ-S. Therefore, we undertook post hoc analyses to examine whether female drive for muscularity was associated with both attitudinal (i.e., body image concerns) and behavioral ED symptoms. First, we showed that the FMS subscales were significantly correlated with each of the individual EDE-QS items, with only one exception (see Table S1). Second, we computed a composite attitudinal and a composite behavioral ED symptom score by adding scores on the corresponding EDEQ-S items (see Table S1).

Hierarchical regression analyses demonstrated that FMS predicted variance in both attitudinal and behavioral ED composite scores (see Table S2).

Discussion

The current study examined the unique associations between the drive for muscularity and negative psychological indices in women. To our knowledge, this study is the first to demonstrate that a drive for muscular leanness in women is associated with ED symptoms and other negative emotional states, over and above important covariates. Specifically, both muscularity-oriented *attitudes* and *behaviors* were associated with ED symptoms, but only the former was associated with depression and stress symptoms.

The results of our study suggest that similar to a drive for thinness (Thompson & Stice, 2001), a drive for muscularity may represent a unique and important pathway through which ED symptoms may manifest. The drive to enhance the visibility of muscle may precipitate unhealthy cognitions and behaviors where fat loss is a primary goal (Lavender, Brown, & Murray, 2017). Indeed, our results are consistent with similar research demonstrating a positive relationship between the excessive pursuit towards muscularity and traditional ED symptoms among men (Murray et al., 2017), and a relationship between the desire to be more toned and a drive for thinness among women (Rodgers et al., 2017). Although muscular ideals differ between men and women (e.g., hypertrophy in men vs. muscle tone in women), the underlying attitude of idealizing an unattainable body shape is associated with ED pathology in both men and women. Prominent theoretical models of EDs have been largely predicated on the assumption that the overvalued ideal weight and shape is primarily oriented towards thinness (Murray et al., 2017), however our results suggest that a high drive for (and potentially overvaluation of) muscular leanness may, too, be critical in understanding how *both* ED-related attitudes and behaviors may arise.

It is also possible that the relationship between drive for muscularity and ED symptoms would have been stronger if a more context-appropriate ED self-report instrument had been utilized. The drives for muscularity and thinness are correlated among women (e.g., Girard, Rodgers, & Chabrol, 2018). This may reflect the common goal of reducing body fat to reach their respective idealised appearances, and help explain their relationships with thinness-oriented ED pathology. However, a drive for muscularity is distinct from a drive for thinness in that it motivates a distinct group of ED pathology aimed at enhancing muscularity (e.g., overregulation of protein consumption for muscle synthesis; Murray et al., 2017). Unfortunately, most widely accepted measures of ED symptoms reflect the pursuit of thinness, and they may be consequently insensitive to indexing muscularity-oriented ED pathologies (Griffiths, Murray, & Touyz, 2013). The Eating Pathology Symptoms Inventory (EPSI) is one such measure that accommodates *muscle building* into the broader ED construct (Forbush et al., 2013). However, the emphasis of this subscale is on muscle *growth* as opposed to *leanness*, the latter of which is more strongly associated with the muscular ideal pursued by women (Rodgers et al., 2017).

Attitudes towards becoming more muscular and toned, unlike *behaviors* to achieve this appearance, were uniquely associated with depression and stress symptoms. It is plausible that such attitudes reflect an underlying negative appraisal of one's body and a discrepancy in the perceptions of one's own appearance with one's ideal (toned) appearance (Veale, 2004). This mismatch could bring about dejection-related emotions (e.g., sadness, internal shame) in particular, as opposed to other types of distressing experiences (e.g., anxiety)(Veale, 2004). It is plausible that the discrepancy between one's actual and idealised level of muscularity also produces stress, a condition where situational demands are perceived to exceed personal resources (Lazarus & Folkman, 1984). Here, stress may occur among women with a high drive for muscularity if they perceive a level of pressure

to achieve this idealised appearance, but believe they do not have the capacity to attain it. Conversely, it is interesting to note that increased engagement in *behaviors* aimed at achieving such an appearance were not associated with depression or stress symptoms. For some women, it may be that engagement in moderate levels of muscle building behaviors buffer against depression and stress symptoms (Schuch et al., 2016). Alternatively women experiencing such symptoms may be less likely to engage in goal-directed activities, such as those related to muscle enhancing (Tull & Gratz, 2008).

Practical implications

Pending replication using clinical samples, our findings bear practical utility. Our data bolster recommendations put forward by Rodgers et al. (2017) that it may be important to consider muscularity concerns when aiming to identify women at risk for EDs. Moreover, our results support arguments that ED assessment and treatment tools need to recognise that symptoms may derive from an overvaluation of the muscular ideal in addition to the thin ideal, but only the latter is included in widely used tools today (Murray et al., 2017). Research concerning precisely how ED treatments may need to be adapted to better address symptoms deriving from the pursuit of muscularity is still in its infancy (Murray et al., in press). However, it may be fruitful to consult the literature on muscle dysmorphia to determine how best to target a drive for muscularity in an ED treatment framework (see Cunningham et al., 2017). Additionally, our results suggest that a high drive for muscularity may also help identify women who are particularly vulnerable to experiencing depressive symptoms. It is important for clinicians to probe these concerns as muscularity-oriented attitudes and behaviors may be largely ego-syntonic (Griffiths, Mond, Murray, & Touyz, 2015) and women with a pathological pursuit of this ideal could deny they have a problem.

Limitations and future directions

We view our findings in light of a number of limitations. One, the use of cross-sectional data precludes us from drawing firm conclusions about the temporality of the associations found. Two, the use of a non-clinical sample may preclude the generalizability of our findings to women with an ED diagnosis. Therefore, an important avenue for future research is to replicate this study using a prospective design and a clinical ED sample. Finally, in order to capture the full spectrum of potential ED symptoms associated with the pursuit of muscular leanness among women, future research should develop and validate items to assess muscularity-oriented ED symptoms to be incorporated into existing ED assessment tools.

Conclusion

The results of the current study are important by not only building upon the limited literature investigating women's drive for muscularity, but in being the first to provide evidence that women who endorse attitudes and behaviors geared towards attaining the female muscular ideal figure may be particularly susceptible to experiencing ED and depressive symptoms. Pending future research with clinical samples and studies employing longitudinal designs, the findings from our study are important in implicating that muscularity-oriented attitudes, in particular, may be a promising target for the prevention and treatment of EDs and associated negative emotional states in women.

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Table 1. *Descriptive statistics and zero-order correlations between all variables of interest*

	Range	*M* (*SD*)	*α*	1	2	3	4	5	6
1. ED symptoms (EDEQ-S)	0—36	11.5 (8.50)	.92	-					
2. Depression symptoms (DASS)	10—31	16.1 (5.09)	.92	.42***	-				
3. Anxiety symptoms (DASS)	11—32	16.6 (4.26)	.83	.38***	.70***	-			
4. Stress symptoms (DASS)	11—30	18.7 (4.68)	.87	.42***	.78***	.78***	-		
5. Drive for muscularity – attitudes (FMS)	7—25	19.0 (5.20)	.94	.53***	.24***	.16*	.21**	-	
6. Drive for muscularity – behaviors (FMS)	5—25	15.0 (6.21)	.94	.42***	.07	.07	.10	.60***	-

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; EDEQ-S = Eating Disorder Examination Questionnaire – Short Form; DASS = Depression, Anxiety, Stress Scales; FMS = Female Muscularity Scale

Table 2. *Multiple hierarchical regressions with ED, depression, anxiety, and stress symptoms as criterion variables*

	ED symptoms			**Depressive symptoms**			**Anxiety symptoms**			**Stress symptoms**		
	β	***t***	***Part r***	***β***	***t***	***Part r***	***β***	***t***	***Part r***	***β***	***t***	***Part r***
Step 1												
Age	-.11	-1.76	-.11	.01	.19	.01	-.06	-.84	-.06	.05	.78	.05
BMI	.33***	5.11	.33	.18	2.56	.17	.10	1.43	.10	.14	2.09	.14
Weekly exercise	.15*	2.33	.15	-.08	-1.10	-.08	-.02	-.23	-.02	.04	.61	.04
Adjusted R^2	.13***			.02			<.01			.02		
Step 1 model	F (3, 212) = 11.59***			F (3, 212) = 2.64			F (3, 214) = .81			F (3, 214) = 2.09		
Step 2												
Drive for muscularity - attitudes	.37***	5.20	.29	.26*	3.05	.20	.15	1.74	.12	.22*	2.55	.17
Drive for muscularity - behaviors	.16*	2.13	.12	-.04	-.44	-.03	-.01	-.11	-.01	-.04	-.45	.01
Δ Adjusted R^2	.21***			.05**			.01			.03*		
Total model	F (5, 210) = 23.32***			F (5, 210) = 4.13**			F (5, 212) = 1.38			F (5, 212) = 2.96*		

Note: * $p < .05$; ** $p < .01$; *** $p < .001$