COVID-19-Related Stress and Anxiety are Associated with Negative Body Image in Adults from the United Kingdom

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Abstract

The stress and anxiety caused by the coronavirus (COVID-19) pandemic presents a serious threat to psychological well-being in populations worldwide and may also extend to body image outcomes. To test this hypothesis, we conducted a preliminary study in which an online sample of adults from the United Kingdom (N = 506, age M = 34.25 years) were asked to complete measures of perceived stress, stressful life events, trait anxiety, COVID-19-related stress and anxiety, and negative body image (body dissatisfaction and drive for thinness in women, body fat and muscularity dissatisfaction in men). The results of hierarchical regressions indicated that COVID-19-related stress and anxiety explained significant incremental variance in body image outcomes (Adj. ΔR^2 = .02 to .10), over-and-above demographics (age and body mass index) and perceived stress, trait anxiety, and stressful life events. These findings suggest that COVID-19-related stress and anxiety may shape body image outcomes under conditions of physical and social distancing.

Keywords: Negative body image; Stress; Anxiety; Coronavirus; COVID-19

1. Introduction

The novel coronavirus (COVID-19) pandemic presents a serious threat to physical health in populations worldwide. To limit the spread of COVID-19, many nations introduced mandatory lockdown or social-distancing measures; in the United Kingdom, these included only leaving the home for food, health reasons, and work if individuals were unable to work from home. While such prevention measures can be effective against disease transmission (e.g., Tian et al., 2020), the impact of social-distancing and lockdown – including attendant changes to everyday behaviour and functioning – can have adverse impacts on psychological health (e.g., Galea et al., 2020). Indeed, emerging evidence from the United Kingdom indicates that levels of anxiety and stress are elevated compared to pre-pandemic levels (Shevlin, McBride et al., 2020), which is consistent with evidence from other nations (e.g., Tull et al., 2020).

Notably, increased anxiety and stress caused by the pandemic, as well efforts to reduce its spread, may have adverse effects on other aspects of mental health (Reger et al., 2020), such as eating disorder symptomatology (Touyz et al., 2020). It is also possible that the pandemic presents a threat to body image (Cooper et al., 2020), although this has not been investigated to date. Certainly, some pre-pandemic research – mostly with samples of undergraduate women – has shown that perceived stress (i.e., a person's appraisal of stress caused by environmental conditions) and stressful life events were associated with greater body dissatisfaction (e.g., Haddad et al., 2019; Johnson & Wardle, 2005; Murray et al., 2011). Likewise, trait anxiety (i.e., a differential trait reflective of a tendency to worry) has been found to be significantly associated with body dissatisfaction, independently of perceived stress, in women (e.g., Davey & Chapman, 2009) and men (Barnes et al., 2020).

In view of the aforementioned findings, it is important to investigate the extent to which COVID-19-related stress and anxiety specifically are associated with body image

outcomes. As intimated by some scholars (e.g., Cooper et al., 2020; Rodgers et al., 2020), the stress and anxiety triggered by the COVID-19 pandemic may present unique threats to body image, possibly because of changes to daily routines (e.g., exercise, eating, and sleep patterns) that impede adaptive body image coping mechanisms and amplify maladaptive coping, heightened concerns about weight and/or shape changes, and greater frequency of negative body ruminations. The absence of empirical data on these issues, however, is an impediment to both ongoing theorising and health policy considerations in the face of the pandemic.

In the present study, therefore, we examined associations between stress, anxiety, and negative (attitudinal) body image in a sample of adults from the United Kingdom. More specifically, we allowed for the possibility of gendered differences in outcomes and examined the extent to which COVID-19-related stress and anxiety are associated with gender-specific body image outcomes (i.e., body dissatisfaction and drive for thinness in women, body fat dissatisfaction and muscularity dissatisfaction in men). Additionally, to account for the unique effects of COVID-19-related constructs, we considered the extent to which COVID-19-related anxiety and stress would be associated with body image outcomes over-and-above generalised stress and anxiety. We hypothesised that greater COVID-19-related stress and anxiety would be associated with greater negative body image, after accounting for the effects of demographics (age and body mass index) and perceived stress, stressful life events, and trait anxiety.

2. Method

2.1. Participants

Participants were an online sample drawn from the United Kingdom adult population (N = 506). Of the sample, 255 identified as women and 251 as men. Participants ranged in age from 18 to 73 years (M = 34.25, SD = 11.36) and in self-reported body mass index (BMI)

from 15.43 to 47.25 kg/m^2 (*M* = 26.35, *SD* = 5.88). The majority of participants self-reported their sexual orientation as heterosexual (89.1%) and their ethnicity as White (88.5%). In terms of relationship status, 27.9% were single, 38.2% were partnered but not married, 32.0% were married, and the remainder had some other status. In terms of education, 10.9% had completed the General Certificate of Secondary Education (GCSEs), 27.9% had an Advanced-Level qualification, 38.3% had an undergraduate degree, 19.0% had a postgraduate degree, and the remainder had some other qualification.

2.2. Measures

2.2.1. Perceived stress.

Participants completed the 10-item Perceived Stress Scale (PSS; Cohen et al., 1983), which measures an individual's subjective appraisal of the degree to which situations in their life are stressful over the preceding month[1]. All items were rated on a 5-point scale ranging from 0 (*never*) to 4 (*very often*) and an overall score was computed as the mean of all items (higher scores reflect greater perceived stress). Scores on the PSS have adequate factorial and construct validity, and good test-retest reliability in diverse populations (Lee, 2012). Here, McDonald's ω for PSS scores was .88 (95% CI = .86, .89).

2.2.2. Stressful life events.

The List of Threatening Experiences Questionnaire (LTE-Q; Brugha et al., 1985) was used to assess the incidence of stressful life events. The scale consists of 12 items with dichotomous responses (0 = *no*, 1 = *yes*) about the occurrence of 12 prevalent major stressful events that may have occurred in the preceding month. A total score was computed as the sum of all affirmative responses, with higher scores reflecting the occurrence of more stressful life events. Scores on the LTE-Q have been shown to have adequate factorial and construct validity (Brugha et al., 1985). In the present study, McDonald's ω for scores on the LTE-Q was .75 (95% CI = .71, .78).

2.2.3. Trait anxiety.

To measure trait anxiety, we used Form Y-2 of the STAI (Spielberger et al., 1983), which measures a differential trait reflective of a tendency to worry. The scale consists of 20 items that were rated on a 4-point scale, ranging from 1 (*almost never*) to 4 (*almost always*). An overall score was computed as the mean of all items (higher scores reflect greater trait anxiety). This form of the STAI has been shown to have adequate factorial and construct validity (Spielberger et al., 1983). Here, McDonald's ω for STAI scores was .94 (95% CI = .93, .95).

2.2.4. COVID-19-related stress.

Because the PSS does not specifically assess COVID-19-related stress, we also asked participants to complete a novel 5-item measure. The items asked participants how stressed they felt about the impact of the COVID-19 pandemic on their daily lives, their personal relationships, their work and/or studies, their finances, and their future in general. Items were rated on a 7-point scale (1 = *not at all stressed*, 7 = *extremely stressed*). An exploratory factor analysis with a promax rotation indicated that all items loaded onto a single dimension (eigenvalue = 2.96, 59.7% of variance explained), with all items loading at .68 or greater. We, therefore, computed an overall score as the mean of all five items. Although this measure has not been used previously, evidence of construct validity was established in the present study through significant associations with all other included measures (see Table 1). McDonald's ω for scores on this measure was .82 (95% CI = .80, .85).

2.2.5. COVID-19-related anxiety.

To measure anxiety caused by the COVID-19 pandemic specifically, participants were asked to respond to a novel 1-item measure ("How anxious are you about the coronavirus [COVID-19] pandemic?") on a 7-point scale (1 = *Not anxious at all*, 7 = *Extremely anxious*). This measure has been used previously and scores have been shown to have adequate construct and predictive validity (Shevlin, Nolan et al., 2020).

2.2.6. Body image in women.

Women were asked to complete the Body Dissatisfaction subscale (EDI-3-BD; 10 items) and the Drive for Thinness subscale (EDI-3-DT; 7 items) of the Eating Disorder Inventory-3 (Garner, 2004), both of which capture attitudinal dimensions of negative body image relevant to women. The EDI-3-BD measures general dissatisfaction with one's overall shape and size of key body areas, whereas the EDI-3-DT measures an extreme desire to be thin, concern with dieting, and preoccupation with weight. All items were rated on a 6-point scale ranging from 0 (*never*) to 6 (*always*), with higher mean scores reflecting greater body dissatisfaction or drive for thinness. Garner (2004) reported that the EDI-3 was suitable for use with non-clinical populations and that scores had adequate construct and factorial validity. Here, McDonald's ω for EDI-3-BD scores was .89 (95% CI = .87, .91) and for EDI-3-DT scores was .93 (95% CI = .91, .95).

2.2.7. Body image in men.

Men were asked to complete two subscales from the 24-item Male Body Attitude Scale (MBAS; Tylka et al., 2005): the Low Body Fat subscale (12 items) and the Muscularity subscale (10 items). The MBAS includes a third dimension reflective of height dissatisfaction, but this factor has been theoretically problematised (Ryan et al., 2011) and so was not included here. Items were rated on a 6-point scale ranging from 1 (*never*) to 6 (*always*). Mean subscale scores were computed so that higher scores reflect greater body dissatisfaction. Scores on the MBAS have been shown to have adequate factorial and construct validity, and good test-retest reliability (Tylka et al., 2005). In the present study, McDonald's ω for Low Body Fat scores was .93 (95% CI = .92, .93) and for Muscularity scores was .91 (95% CI = .90, .93).

2.2.8. Demographics.

We requested demographic information consisting of age, gender identity, ethnicity, sexual orientation, highest educational qualification, and relationship status. We also asked

participants to self-report their height and weight, and used these data to compute BMI as kg/m^2.

2.3. Procedures

Once the project was approved by the School ethics committee at [blinded for review], data were collected via the Prolific website on May 21, 2020. The project was advertised as a study on "social-distancing and body image" and included an estimated duration. Inclusion criteria included being a resident and citizen of the United Kingdom, being of adult age, and being fluent in English. Prolific ID codes and IP addresses were checked to ensure that no participant completed the survey more than once. After providing digital informed consent, participants were directed to the scales described above, which were presented in a counter-balanced order in Qualtrics™. An attention check item ("Select the third answer option if you're reading this") was embedded halfway through the survey and was passed by all participants. Demographic items were completed first to split participants into their respective body image questionnaires. The questionnaire was anonymous and participants were paid £0.84. All participants received debriefing information.

3. Results

3.1. Descriptive Statistics

Thirty-nine participants had missing height and/or weight data or had improbable BMI values (< 12 or > 50 kg/m^2), so these were replaced using multiple imputations. Missing values in the remainder of the dataset were infrequent (< 0.5% of the total dataset) and were replaced using multiple imputations. Descriptive statistics, gender differences, and inter-scale correlations between all variables included in the present study are reported in Table 1. As can be seen, the only significant gender difference was found for COVID-19-related stress,

but because negative body image variables were gender-specific, further analyses were computed for women and men separately.

3.2. Regression Analyses

To test the study hypotheses, we computed hierarchical regressions with the body image variables (body dissatisfaction and drive for thinness in women, low body fat and muscularity in men) as criterion variables. Age and BMI were entered in a first step; perceived stress, stressful life events, and trait anxiety were entered in a second step; and COVID-19-related stress and anxiety were entered in a third step. This allowed us to examine the extent to which COVID-19-related stress and anxiety incrementally predicted body image variables once the variance associated with the additional variables had been accounted for. All parametric assumptions for multiple regression were met and multicollinearity was not a limiting factor in any of the regressions (all variance inflation factors < 1.24, with values < 10 indicative of inconsequential collinearity; Hair et al., 1995).

For women, the final step of the regression with body dissatisfaction was significant: COVID-19-related anxiety but not stress was significantly associated with body dissatisfaction (ΔF p = .045, Adj. ΔR^2 = .02; see Table 2). The final step of the regression with drive for thinness was also significant, with both COVID-related anxiety and stress significantly associated with drive for thinness (ΔF p < .001, Adj. ΔR^2 = .07; see Table 2). In men, the final step of the regression with low body fat was significant, with COVID-related anxiety but not stress significantly associated with greater dissatisfaction (ΔF p = .38, Adj. ΔR^2 = .02; see Table 3). The final step of the regression with muscularity was also significant: both COVID-related stress and anxiety were significantly associated with greater dissatisfaction (ΔF p < .001, Adj. ΔR^2 = .10; see Table 4).

4. Discussion

The results of the present study confirm that COVID-19-related stress and anxiety are associated with more negative body image, over-and-above the variance explained by perceived stress, stressful life events, and trait anxiety, which is consistent with earlier scholarly commentary (Cooper et al., 2020; Rodgers et al., 2020). Although our data cannot speak to mechanistic pathways, it is possible that COVID-19-related stress and anxiety diminish coping resources to manage threats to body image, increase exposure to thin/athletic ideals via media messaging (e.g., given increased screen-time under lockdown; see Pietrobelli et al., 2020), and heighten concerns about weight and/or shape changes that occur during conditions of lockdown (e.g., because of decreased physical activity) (Cooper et al., 2020; Rodgers et al., 2020). COVID-19-related stress may also be associated with greater frequency of negative body ruminations that lead to a preoccupation with body shape and/or weight and desire to reassert a degree of control through body work (Ruggiero et al., 2008).

In women, greater COVID-19-related anxiety (but not stress) was significantly associated with body dissatisfaction, whereas both COVID-19 anxiety and stress were associated with greater drive for thinness. It is possible that these findings are reflective of women's lived experiences under conditions of lockdown. Anxiety-inducing fear-mongering over weight-gain due to changes to routine during lockdown (e.g., poorer diets, less frequent exercise), greater pressure to conform to traditionally feminine roles and norms, and messaging about self-improvement may lead women to feel dissatisfied with their bodies, but more importantly to increase restriction and weight control ruminations that are central to drive for thinness. To the extent that women act on such ruminations (e.g., by increasing unhealthy weight control behaviours to reduce the risk of weight gain), it may function to regulate the anxiety, stress and uncertainty associated with the COVID-19 pandemic (e.g., see Brown et al., 2017).

In men, COVID-19-related anxiety (but not stress) was associated with body fat dissatisfaction, whereas both COVID-19-related anxiety and stress were associated with greater muscularity dissatisfaction. It may be that these findings reflect the way in which stress and anxiety impact men's relationships with their bodies, particularly in terms of masculine body ideals (e.g., Swami & Tovée, 2005). Specifically, given that hegemonic masculinity emphasises the value of toughness, self-reliance, and the pursuit of status, COVID-19-related stress and anxiety may lead men to place greater value on the importance of being muscular (for discussions, see Frederick et al., 2017; Griffiths et al., 2015). Moreover, because conditions of lockdown may limit men's ability to derive masculine capital through everyday masculine activities (e.g., sport, strength-training in gyms), they may instead seek to reassert feelings of control and increase masculine capital through a desire for greater muscularity and ruminations about perceived body size (see Edwards et al., 2017).

The main limitation of the present study is that we were only able to document direct associations between COVID-19-related stress and anxiety, respectively, and body image. It would be useful for future work to examine mechanistic pathways, including via weight gain, change in behaviours under conditions of lockdown (e.g., increase in sedentary behaviours, eating patterns), and psychological constructs such as loneliness. Doing so may also help to explain why COVID-19-related stress was not significantly associated with some outcomes in our regression. In addition, we operationalised generalised stress and anxiety using a limited range of constructs, although associations between perceived stress and trait anxiety, respectively, and body image were in line with previous reports. Likewise, we constructed novel instruments to measure COVID-19-related stress and anxiety, and although we have no reason to believe that these measures lack construct validity, this should be assessed more thoroughly in future work. It should be noted that our results may have limited

generalisability, given our recruitment methods and the specificity of lockdown conditions in the United Kingdom.

These limitations notwithstanding, our results suggest that the COVID-19 pandemic may have important consequences for body image in women and men. The present findings are particularly important because they suggest that the stress and anxiety related to the COVID-19 pandemic specifically, as opposed to generalised stress and anxiety, significantly contribute to body image outcomes. To the extent that negative body image is a prognostic risk factor for the onset and maintenance of eating pathology (e.g., Stice & Shaw, 2002), our findings also highlight possible additional complications that may stem from COVID-19-related stress and anxiety. In turn, efforts to deal with negative body image under conditions of lockdown will require novel mitigation interventions (e.g., telehealth, guided self-help interventions; Cooper et al., 2020).

Footnotes

[1]In response to the pandemic, a population lockdown was first mandated in the United Kingdom on March 23, 2020. This included a directive for people to stay at home except for essential purchases, essential work travel, medical needs, one period of exercise per day, and providing care for others. A partial relaxation of the lockdown was announced in England – but not the rest of the United Kingdom – on May 10. As such, the period specified in our survey covered the period of the lockdown in Northern Ireland, Scotland, and Wales, and most of the strict lockdown in England (which included the continued closure of gyms and sporting venues).

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Table 1

Descriptive Statistics and Inter-Scale Correlations between all Variables Included in the Present Study, Reported Separately for Women (Top Diaogonal) and Men (Bottom Diagonal).

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Body dissatisfaction/Low body fat[§]			.62**	.27**	.01	.37**	.19*	.32**	.10	.39**
(2) Drive for thinness/Muscularity[§]		.42**		.34**	.04	.41**	.34**	.31**	-.17*	.12
(3) Perceived stress		.32**	.39**		.09	.77**	.42**	.24**	-.21**	.05
(4) Stressful life events		.04	.18*	.14*		.07	.13*	.03	-.05	-.03
(5) Trait anxiety		.31**	.41**	.79**	.12		.36**	.35**	-.11	.10
(6) COVID-19-related stress		.16*	.46**	.39**	.11	.33**		.38**	-.17*	.01
(7) COVID-19-related anxiety		.22*	.37**	.28**	.09	.27**	.48**		.11	.19*
(8) Age		.01	-.33**	-.20*	-.12*	-.20**	-.16*	-.02		.18*
(9) Body mass index		.41**	-.17*	.03	.01	.01	-.08	-.02	.25**	
Women	*M*	4.06	3.48	1.93	0.61	2.30	4.59	4.80	35.26	26.19
	SD	1.13	1.26	0.79	1.34	0.62	1.35	1.59	11.04	6.01

Men	*M*	3.40	3.14	1.76	0.86	2.21	4.21	4.40	33.23	26.52
	SD	1.14	1.10	0.67	1.58	0.56	1.38	1.78	11.58	5.74
t		-	-	2.82	1.88	1.66	3.17	2.70	2.02	0.64
p^{+}		-	-	.005	.061	.097	.002	.007	.044	.524
Cohen's *d*		-	-	0.25	0.17	0.15	0.28	0.24	0.18	0.06

Note. Women $n = 255$, men $n = 251$. [§]Women completed the Body Dissatisfaction and Drive for Thinness subscales of the Eating Disorders Inventory-3, whereas men completed the Low Body Fat and Muscularity subscales of the Male Body Attitudes Scale. [+]Only the gender difference in COVID-19-related stress reaches significance once a Bonferroni correction, such that $p = (1 - \alpha)^k \approx 1 - k\alpha = \alpha/k = .007$, is applied. *$p < .05$, **$p < .001$.

Table 2

Results of Multiple Hierarchical Regression Analyses for the Prediction of Body Dissatisfaction and Drive for Thinness in Women.

		Body dissatisfaction					Drive for thinness				
Step	Variable	B	SE	β	*t*	*p*	B	SE	β	*t*	*p*
1		$F(2, 254) = 22.09$, $p < .001$, Adj. $R^2 = .14$					$F(2, 254) = 6.72$, $p = .001$, Adj. $R^2 = .04$				
	Age	.01	.01	.03	0.47	.640	-.02	.01	-.20	-3.12	.002
	BMI	.07	.01	.38	6.44	< .001	.03	.01	.15	2.45	.015
2		$F(5, 254) = 18.13$, $p < .001$, Adj. $R^2 = .25$ (ΔF $p < .001$)					$F(5, 254) = 11.95$, $p < .001$, Adj. $R^2 = .18$ (ΔF $p < .001$)				
	Age	.01	.01	.07	1.31	.190	-.02	.01	-.14	-2.36	.019
	BMI	.06	.01	.34	6.09	< .001	.02	.01	.11	1.83	.069
	Perceived stress	.02	.14	.01	0.13	.901	.06	.16	.03	0.37	.709
	Stress life events	-.01	.05	-.01	-0.04	.968	.01	.05	.01	0.14	.892
	Trait anxiety	.62	.16	.34	3.95	< .001	.72	.18	.36	3.94	< .001
3		$F(7, 254) = 14.08$, $p < .001$, Adj. $R^2 = .27$ (ΔF $p = .045$)					$F(7, 254) = 11.68$, $p < .001$, Adj. $R^2 = .25$ (ΔF $p < .001$)				
	Age	.01	.01	.06	1.10	.274	-.02	.01	-.14	-2.44	.016
	BMI	.06	.01	.32	5.75	< .001	.02	.01	.09	1.49	.137
	Perceived stress	.01	.14	.01	0.03	.977	-.03	.16	-.02	-0.18	.859
	Stress life events	-.01	.05	-.01	-0.15	.884	-.01	.05	-.01	-0.17	.861
	Trait anxiety	.52	.16	.29	3.26	.001	.58	.18	.29	3.17	.002
	COVID-19 stress	.03	.05	.04	.623	.534	.16	.06	.17	2.56	.011

COVID-19 anxiety	.09	.04	.13	2.07	.040	.12	.05	.15	2.31	.021

Note. $n = 255$. BMI = body mass index.

Table 3

Results of Multiple Hierarchical Regression Analyses for the Prediction of Low Body Fat and Muscularity in Men.

		Body fat dissatisfaction					Muscularity dissatisfaction				
Step	Variable	B	SE	β	*t*	*p*	B	SE	β	*t*	*p*
1		$F(2, 254) = 27.13$, $p < .001$, Adj. $R^2 = .17$					$F(2, 254) = 16.72$, $p = .001$, Adj. $R^2 = .11$				
	Age	-.01	.01	-.11	-1.78	.076	-.03	.01	-.31	-5.04	< .001
	BMI	.09	.01	.44	7.37	< .001	-.02	.01	-.09	-1.50	.135
2		$F(5, 254) = 18.80$, $p < .001$, Adj. $R^2 = .26$ (ΔF $p < .001$)					$F(5, 254) = 17.83$, $p < .001$, Adj. $R^2 = .25$ (ΔF $p < .001$)				
	Age	-.01	.01	-.03	-0.57	.567	-.02	.01	-.21	-3.66	< .001
	BMI	.08	.01	.41	7.35	< .001	-.02	.01	-.12	-2.14	.033
	Perceived stress	.28	.15	.17	1.84	.066	.21	.15	.12	1.37	.171
	Stress life events	-.01	.04	-.01	-0.19	.848	.07	.04	.11	1.90	.059
	Trait anxiety	.36	.18	.18	1.97	.050	.51	.18	.26	2.92	.004
3		$F(7, 254) = 14.63$, $p < .001$, Adj. $R^2 = .28$ (ΔF $p = .038$)					$F(7, 254) = 20.16$, $p < .001$, Adj. $R^2 = .35$ (ΔF $p < .001$)				
	Age	-.01	.01	-.04	-0.72	.472	-.02	.01	-.21	-3.82	< .001
	BMI	.08	.01	.42	7.51	< .001	-.02	.01	-.10	-1.82	< .001
	Perceived stress	.23	.16	.14	1.49	.137	.03	.14	.02	0.18	.855
	Stress life events	-.01	.04	-.02	-0.35	.727	.06	.04	.08	1.62	.107
	Trait anxiety	.32	.18	.16	1.79	.075	.45	.16	.23	2.77	.006
	COVID-19 stress	.01	.06	.01	0.07	.945	.19	.05	.24	3.56	< .001

COVID-19 anxiety	.09	.04	.14	2.14	.033	.09	.04	.15	2.40	.017

Note. $n = 251$. BMI = body mass index.