

BRIEF REPORT

The impact of COVID-19 on body-dissatisfied female university students

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Abstract

Objective: This study investigated the impact of COVID-19 on young women's disordered eating and their responses to online interventions to reduce disordered eating.

Method: University students at risk of developing an eating disorder ($N = 100$) were randomly assigned to either receiving an online intervention to reduce disordered eating or not. Forty-one participants entered the study from September 2019 to March 2020 (pre-COVID) and 59 after physical distancing was introduced due to COVID pandemic (during COVID). Online assessments were conducted at baseline and 1-week follow up.

Results: There was a significant increase in weight concerns, disordered eating, and negative affect among participants entering the trial during COVID compared to pre-COVID. The increases in the first two variables remained when adjusting for baseline negative affect. No significant interactions between time, condition and COVID status were observed.

Discussion: Young women experienced increased levels of disordered eating after the onset of COVID. While no interactions with COVID were detected, changes to within-group effect sizes for disordered eating more than doubled for both online interventions and assessment from pre-COVID to during COVID, suggesting any attention to issues related to disordered eating in the context of reduced social contact may be beneficial.

KEYWORDS

body dissatisfaction, COVID-19, disordered eating, self-compassion

1 | INTRODUCTION

Researchers have raised concerns that people with EDs are at significant risk for increased symptomology during COVID-19 (e.g., Cooper et al., 2020; Rodgers et al., 2020). Using retrospective reporting, Phillipou et al. (2020) found that a general population in Australia increased their restricting and binge eating behaviors during COVID-19, whereas those who had an ED history increased not only their restricting, binge eating but also purging and exercise behaviors.

Qualitative retrospective research has found that those who experienced disordered eating tend to report similar themes; an increase in ED symptoms, need for help and support, limited access to services during COVID-19 (Brown et al., 2021; Nutley et al., 2021; Richardson, Patton, Phillips, & Paslakis, 2020). To date only one study has used a prospective design to report on the impact of COVID on disordered eating, where college students in the US recorded no significant change in weight, BMI, or BMI category, between January and April 2020, but over this time the subjective descriptions of weight changed to significantly be more likely to fall into a higher category (Keel et al., 2020). Keel et al. suggests the advent of COVID may introduce some cognitive distortions about people's perception of their weight

and body shape which could impact the effectiveness of our interventions.

Hence, this article explored the impact of COVID-19 prospectively on young women who are at risk of developing an eating disorder by (a) comparing the levels of disordered eating among this population pre-COVID and during COVID; (b) comparing the size of change in disordered eating resulting from active interventions versus control. We hypothesized that baseline levels of disordered eating would increase and that interventions would be rendered less effective during COVID.

2 | METHOD

2.1 | Participants

Females aged 17 years or older were recruited from the Flinders University School of Psychology research participation pool. Interested participants completed a screening questionnaire, the Weight Concerns Scale (WCS; Killen et al., 1994, p.232). Only those who met a score above 47 on this scale, which is considered to have good predictive validity for development of an eating disorder (Jacobi, Abascal, & Taylor, 2004, p.290), were invited to participate in the study.

2.2 | Design

This study, advertised as “an investigation of new methods to improve body image among young women”, was approved by Social and Behavioural Research Ethics Committee (#8041). Data collection commenced in September 2021 where participants completed interventions in the laboratory with the presence of a research assistant. The online format of the study was introduced in April 2021 due to the physical distancing requirement amidst COVID where participants can complete the same study at home. Other than the presence of a research assistant, all study procedure and questionnaires were the same as they were all delivered online.

Specifically, participants first completed baseline measures after which they received a body-specific negative mood induction (details can be found in Zhou, Pennesi, & Wade, 2020). Then participants either get randomly allocated to an active intervention (e.g., imagery rescripting, psychoeducation, or the combination of the two) or control. Participants were asked to complete a one-week follow-up survey online. All participants were provided with a feedback sheet with contact information of support services included. For the purpose of this investigation, the original design was modified, as we found a main effect of COVID status on our results. In effect, this was an extra moderator for which our study was not powered. We thus combined all active interventions and compared to these to the control (assessment only) condition.

2.3 | Measures

These validated measures were selected to assess the following constructs: disordered eating measured by the global Eating Disorder

Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) score; body image flexibility measured by the Body Image Acceptance & Action Questionnaire (BI-AAQ; Sandoz, Wilson, Merwin, & Kate Kellum, 2013), self-compassion (Self-Compassion Scale – Short Form; Raes, Pommier, Neff, & Van Gucht, 2011), fear of self-compassion (Fear of Self-Compassion Scale; Gilbert, McEwan, Matos, & Ravis, 2011) and negative affect (Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988).

2.4 | Statistical analyses

2.4.1 | Baseline differences pre- versus during COVID

Differences between the group of participants who entered the study pre- and during COVID were compared using analysis of variance (ANOVA). Between-groups effect sizes and 95% confidence intervals that did not cross zero were interpreted as indicating a significant difference.

2.4.2 | Change in outcome over time

Linear Mixed Modeling (LMM) was used to compare the effectiveness of active versus control condition with respect to outcome measures at one-week, adjusting for baseline negative affect that is, 2 (condition) \times 2 (time: baseline, one-week) \times 2 COVID timeframe (pre- and during COVID). Within group effect sizes and 95% confidence intervals were calculated to demonstrate the magnitude of change, accounting for the correlation between the two measures (Lenhard & Lenhard, 2016), using the online effect size calculator for repeated measures: https://www.psychometrica.de/effect_size.html#repeated).

3 | RESULTS

3.1 | Participants

A hundred females ranging in age from 17 to 26 (*Mean* = 19.85, *SD* = 2.01) entered the study. Most participants self-reported as Caucasian (88%) with the next largest groups being Asian (6%), and other (6%). Overall, most participants (53%) were within the normal BMI range (i.e., 18.5 < BMI < 25); 27% were classified as overweight (i.e., 25 < BMI < 30); 17% were obese (i.e., BMI > 30), and 3% were classified as underweight (i.e., BMI < 18.5). Most participants (92%) reported engaging in some form of disordered eating behaviors over the previous 28 days: fasting (71%), driven exercise (71%), binge eating (65%), self-induced vomiting (13%), and laxative misuse (7%). The clinical cut-off on the EDE-Q Global score (i.e., ≥ 2.77 , norm for young adult women +1 SD; Mond, Hay, Rodgers, & Owen, 2006) was attained by 76% of participants. Mean WCS was 68.48 (*SD* = 12.85; scores beyond 47 were identified as at-risk). See Table 1 for means and standard deviations of outcome measures at baseline.

TABLE 1 Descriptive statistics (mean and standard deviation) at baseline by condition and by COVID status. Estimated marginal means and standard errors were presented after adjusting for negative affect, except for negative affect itself. Effect sizes and 95% confidence intervals were provided for pre- and during COVID mean comparisons

Variables	Whole sample (N = 100)	Active (n = 77)	Control (n = 23)	Pre-COVID (n = 41)	During COVID (n = 59)	After adjusting for negative affect	
						Cohen's d (95% CI) COVID status	Pre-COVID (n = 41) During COVID (n = 59) Cohen's d (95% CI) COVID status
Weight concerns	68.48 (12.85)	67.88 (12.40)	70.51 (14.36)	65.04 (10.48)	70.88 (13.86)	0.46 (0.06, 0.87)	65.88 (1.92) 70.30 (1.60) 0.36 (-0.04, 0.76)
Age	19.85 (2.01)	19.89 (2.02)	19.73 (2.03)	19.93 (1.93)	19.80 (2.08)	0.06 (-0.33, 0.46)	20.03 (0.31) 19.73 (0.26) 0.15 (-0.25, 0.55)
BMI	25.52 (6.16)	26.13 (6.70)	23.47 (3.17)	26.86 (5.73)	24.58 (6.32)	0.37 (-0.02, 0.78)	27.05 (0.96) 24.46 (0.80) 0.43 (0.03, 0.83)
Disordered eating	3.64 (1.10)	3.63 (1.07)	3.66 (1.21)	3.29 (1.02)	3.88 (1.10)	0.55 (0.15, 0.96)	3.41 (0.15) 3.80 (0.13) 0.40 (0.01, 0.80)
Body image acceptance	3.34 (1.24)	3.32 (1.22)	3.38 (1.32)	3.59 (1.24)	3.16 (1.21)	0.35 (-0.05, 0.75)	3.46 (0.17) 3.26 (0.15) 0.18 (-0.22, 0.58)
Self-compassion	2.53 (0.48)	2.50 (0.49)	2.63 (0.46)	2.59 (0.51)	2.49 (0.46)	0.21 (-0.19, 0.61)	2.55 (0.07) 2.52 (0.06) 0.07 (-0.33, 0.47)
Fear of self-compassion	1.60 (0.85)	1.55 (0.86)	1.79 (0.83)	1.54 (0.86)	1.65 (0.85)	0.13 (-0.27, 0.53)	1.65 (0.11) 1.57 (0.09) 0.12 (-0.28, 0.51)
Negative affect	2.24 (0.86)	2.23 (0.84)	2.29 (0.94)	2.04 (0.83)	2.38 (0.86)	0.40 (0.00, 0.80)	- - -

Note: BMI, body mass index. Bold font indicates a significant difference between pre/during COVID. All the effect sizes are shown as absolute values reflecting the magnitude of difference between pre- and during COVID.

3.2 | Differences at baseline between condition and COVID timing

Overall, no significant differences among baseline variables were found when comparing active intervention versus control without considering COVID status. However, significant differences were found among those who completed the study pre- and during-COVID. During-COVID, participants reported significantly higher symptomology compared to pre-COVID, all associated with moderate effect sizes (Cohen's $d = 0.40$ – 0.55 , see Table 1). Specifically, the two groups differed in weight concerns, disordered eating, and negative affect. After adjusting for baseline negative affect, the difference in global eating psychopathology remained. The percentage of participants who reported disordered eating behaviors increased during COVID: fasting (from 61% to 78% of participants), binge-eating (61% to 68%), vomiting (7% to 17%), and driven exercise (66% to 75%).

3.3 | Change over follow-up

Of the 100 participants in the analytic sample, 7 (7%) did not complete the one-week follow-up questionnaire. Table 2 shows the overall estimated means and standard errors for outcome measures at baseline and one-week follow-up among all participants together with the within-group effect sizes for each outcome at pre- and during COVID. Linear mixed modeling suggested that main effects of time were observed for disordered eating and body image flexibility, suggesting that there was a decrease in disordered eating and increase in body image flexibility overtime regardless of condition. Main effects of time were not observed for self-compassion and fear

of self-compassion. No main effect of condition was observed for any outcome variables.

A significant time x condition interaction was observed for self-compassion. Post-hoc analyses suggested that active intervention increased self-compassion significantly over time compared to control without considering COVID impact. No other significant time x condition interaction was observed. No significant interactions between time, condition and COVID status were observed. However, just by observing change in size of within-group effect sizes, changes to within-group effect sizes for disordered eating more than doubled for both online interventions and assessment from pre-COVID to during COVID, and the impact of active interventions on self-compassion reduced over time during COVID compared to pre-COVID.

4 | DISCUSSION

This study investigated the impact of COVID-19 on young women's risk of developing an eating disorder and the effectiveness of active interventions during COVID-19. Findings suggest that during COVID, disordered eating behaviors and negative affect were significantly higher than pre-COVID levels, which echoed findings from qualitative research (Brown et al., 2021; Nutley et al., 2021; Richardson et al., 2020). Significant difference in disordered eating pre-versus during COVID remained when adjusting for negative affect. While no interactions with COVID were detected, within-group effect sizes for disordered eating related to either condition increased considerably after onset of COVID. While it makes sense that greater distress over COVID means that effect size decreases will be bigger, the reason for the differential impact on the control condition on disordered eating during COVID is unclear. During

TABLE 2 Linear Mixed Models estimated marginal means and standard error for one-week variables by Time (2), Condition (2) and COVID (2) controlling for baseline negative affect

Variables	Baseline		One week		Within group ES (95% CI)	
	Control	Active	Control	Active	Control	Active
<i>Pre-COVID observations</i>						
	<i>n</i> = 9	<i>n</i> = 32	<i>n</i> = 9	<i>n</i> = 31		
EDEQ	3.51 (0.32)	3.37 (0.17)	3.19 (0.40)	3.14 (0.21)	−0.50 (−1.44, 0.44)	−0.34 (−0.83, 0.15)
BIAAQ	3.60 (0.41)	3.58 (0.22)	3.89 (0.51)	4.11 (0.27)	0.53 (−0.41, 1.47)	0.63 (0.13, 1.14)
SCS	2.77 (0.16)	2.54 (0.09)	2.58 (0.18)	2.68 (0.10)	−0.44 (−1.37, 0.50)	0.50 (0.01, 1.00)
FCS	1.92 (0.24)	1.57 (0.13)	1.90 (0.28)	1.57 (0.15)	−0.08 (−1.01, 0.84)	0 (−0.49, 0.49)
<i>During-COVID observations</i>						
	<i>n</i> = 14	<i>n</i> = 45	<i>n</i> = 13	<i>n</i> = 40		
EDEQ	3.69 (0.26)	3.81 (0.15)	3.07 (0.33)	3.20 (0.18)	−1.14 (−1.94, −0.34)	−0.97 (−1.41, −0.54)
BIAAQ	3.24 (0.33)	3.14 (0.19)	3.52 (0.41)	4.01 (0.23)	0.43 (−0.32, 1.18)	1.29 (0.83, 1.74)
SCS	2.55 (0.13)	2.47 (0.07)	2.54 (0.15)	2.58 (0.08)	−0.03 (−0.77, 0.71)	0.32 (−0.09, 0.74)
FCS	1.65 (0.19)	1.53 (0.11)	1.56 (0.23)	1.37 (0.13)	−0.22 (−0.96, 0.53)	−0.40 (−0.82, 0.01)

Note: Higher EDEQ scores suggest higher level of disordered eating; higher BIAAQ score suggest higher level of body image flexibility; higher SCS score suggest higher level of self-compassion and higher fear of self-compassion score suggest higher level of fear of self-compassion. Bold font indicates a significant difference between baseline and one-week follow-up.

COVID, assessments only may have produced some level of awareness or self-efficacy to reduce disordered eating (i.e., a placebo effect; Weimer, Colloca, & Enck, 2015). It may be that any attention to issues related to disordered eating in the context of reduced social contact may be beneficial.

The main limitation of this current study is that we used a design of convenience to address our questions, rather than the original design, due to the unexpected advent of COVID. This meant the study was not powered to account for the onset of the COVID-19 midway through the study. Therefore, the sample size of active versus control group was unbalanced; however, this does not present an issue when using linear mixed modeling. Second, as we could not randomly assign participants to COVID status, these analyses should be interpreted as an exploratory attempt to detect naturally occurring changes. We acknowledge that COVID status could be impacted by many factors not measured in this study, such as willingness to participate in the study mid-COVID, or deterioration in people's mood. We do note, however the key result (increased disordered eating) remained significant when using negative affect as a covariate over the 1 week of follow-up. More research is needed to ascertain whether the experimental effects could last longer beyond 1 week. Overall, interpretations from the current findings are preliminary and should be viewed with caution.

Further research is needed to understand whether treatment effectiveness is impacted by the pandemic, and the treatment modalities that are suitable in a post-pandemic world. Termorshuizen et al. (2020) suggest that in United State and Netherland, while most eating disorder patients transitioned to an online/telehealth care approach, there still remain a high proportion of people who did not receive any eating disorder treatment despite disordered eating concerns. All of the interventions used in this study could be presented online for easy access, although further research is needed to identify useful approaches to protect or bolster self-compassion during the pandemic as our findings suggest such impact from a previously effective intervention was lost during COVID.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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