



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## Disordered eating across COVID-19 in LGBTQ+ young adults

Erica A. Hart, Alex Rubin, Kiki M. Kline, Kathryn R. Fox\*

University of Denver, Department of Psychology, United States of America

### ARTICLE INFO

#### Keywords:

Eating disorder  
Pandemic  
COVID-19  
Gender minority  
Sexual minority  
LGBTQ+  
Mental health

### ABSTRACT

Emerging evidence suggests that the COVID-19 pandemic is negatively affecting mental health, especially for sexual and gender minority populations. Relatively little is known about the impact of the pandemic on disordered eating behaviors (DEB) for these populations. The aim of this study is to understand changes in DEB across COVID-19 within an LGBTQ+ sample, with a particular focus on differences across sexual and gender identities, and the impact of social support on these outcomes. In a sample of 830 LGBTQ+ adults with a past year history of DEB, most, but not all, participants reported that the frequency of and urge to engage in each DEB increased a little bit or a lot during COVID-19. Contrary to research showing more severe psychopathology and DEB among gender minorities (GM) compared to sexual minorities (SM), changes in DEB severity since COVID-19 were not significantly different between SM and GM participants. There were a few small and significant relationships between changes in average DEB severity and characteristics of interpersonal relationships, average quality of home relationships, and living with someone not affirming of one's identity. Results highlight that COVID-19 may have exacerbated DEB for SGM young adults, that these changes were not different across sexual versus gender minorities, and that these changes are weakly but significantly related to minority stressors.

### 1. Introduction

The novel coronavirus disease (COVID-19) is a respiratory virus that has impacted people globally with threat of contagion, lingering physical health problems, hospitalization, and death since late 2019. The World Health Organization (WHO) declared the COVID-19 outbreak a pandemic in March 2020 (World Health Organization, 2020), after which time, countries adopted varying levels of preventive measures to slow the spread of the virus. Such measures included social distancing, community curfews, restrictions on social gatherings, transitions to working from home, and mandatory stay-at-home orders. Consequences of these measures included limited social interaction, increases in unemployment or changes in job stability, and decreased access to recreational activities.

Some research suggests that COVID-19 and related consequences produced increases in psychological stress, including symptoms of depression and anxiety (Hawes, Szenczy, Klein, Hajcak, & Nelson, 2021; McQuaid et al., 2021; Holmes, 2020) as well as eating pathology (Miniati et al., 2021). Yet, most research on COVID-19 to-date has involved primarily cisgender, heterosexual participants and/or has not assessed sexuality and gender. There has been a call to action for evaluating the pandemic's impacts on vulnerable and minoritized groups

and within specific types of psychopathology (Holmes, 2020). To address this call to action, this paper analyzes the impact of COVID-19 on eating pathology in LGBTQ+ (e.g., those identifying as lesbian, gay, bisexual, pansexual, transgender, gender non-conforming, queer, and questioning, as well as those engaging in some same gender sexual behavior or experiencing some sexual/romantic attraction to others of the same gender) young adults.

Global circumstances resulting from the COVID-19 pandemic have created a context that may increase eating pathology. For example, COVID-19 and related restrictions have led to substantial changes in routine, food availability, cultural messages, restricted healthcare access, and restricted exercise. As a result, people's relationships with food, eating, and their bodies may be particularly vulnerable (Cooper et al., 2020). Supporting this possibility, COVID-19 stay-at-home orders resulted in periodic sparsely stocked grocery stores, increased cultural messages around weight gain (e.g., 'gaining the COVID-19'), and closing and reopening of fitness centers and opportunities; each of these has been associated with restrictive eating and overeating, as well as changes in focus on body weight and shape (e.g., Chen, Poon, DeWall, & Jiang, 2020; Cooper et al., 2020; Jiménez-Pavón, Carbonell-Baeza, & Lavie, 2020; Termorshuizen et al., 2020).

In addition to direct impacts on food, eating, and exercise, COVID-19

\* Corresponding author.

E-mail address: [Kathryn.fox@du.edu](mailto:Kathryn.fox@du.edu) (K.R. Fox).

likely increased broader risk factors (Cooper et al., 2020) and decreased typical protective factors for eating pathology (Rodgers et al., 2020). With unprecedented instability since the start of the pandemic, generalized anxiety, stressful life events (SLEs), and trauma and abuse increased for many people (Cooper et al., 2020), likely exerting adverse effects on mental health, including eating pathology (Fernández-Aranda et al., 2020). At the same time, the pandemic simultaneously set up a context that decreased traditional supports and promotive factors. For example, social distancing mandates and/or fear of contagion decreased social support and increased social isolation (Rodgers et al., 2020).

Given that people in the LGBTQ+ community, compared to their cisgender heterosexual peers, report higher rates of eating pathology (Hazzard et al., n.d.) and more negative impacts across a range of domains from COVID-19 (Drabble, 2021), it is particularly important to examine eating pathology during COVID-19 in this community. In terms of COVID-19 impacts, job loss or insecurity, changes in schooling structure, and general financial instability disproportionately impacted LGBTQ+ young adults (Drabble, 2021), leading to added stress and financial hardship in this community. Likely related to these financial difficulties, many LGBTQ+ young adults had to move back in with family members during some parts of the pandemic. Whereas parents who are accepting can be a major protective factor against psychopathology and suicidal behaviors, familial rejection is a predictor of negative health outcomes in LGBTQ+ people (McCormick & Baldrige, 2019; Ryan, Russell, Huebner, Diaz, & Sanchez, 2010). Thus, this move likely increased many LGBTQ+ young adults' exposure to rejection and stress from (MacCarthy et al., 2020; Suen, Chan, & Wong, 2020) while simultaneously separating them from their supportive social networks. These connections typically help to provide community and buffer the effects of homophobic microaggressions (Kalb, Brodtkin, Goldstein, & Gillis, 2020; Kuyper & Fokkema, 2010).

Together, these COVID-19 related changes and impacts likely increased risk for adverse mental health outcomes in the LGBTQ+ community (Fish et al., 2020; Salerno, Devadas, Pease, Nketia, & Fish, 2020). Indeed, research suggests that depression and anxiety have increased for LGBTQ+ people since the pandemic began (Flentje, Obedin-Maliver, Lubensky, et al., 2020). The goal of this research is to better understand whether and the degree to which disordered eating behaviors (DEB) changed across COVID-19 within an LGBTQ+ sample. Given research indicating that those identifying as transgender and gender non-conforming may be at an even higher risk than sexual minorities for a range of mental health outcomes (e.g., Hendricks & Testa, 2012; Kuper, Adams, & Mustanski, 2018; Puckett, Maroney, Wadsworth, Mustanski, & Newcomb, 2020; Wolford-Clevenger, Frantell, Smith, Flores, & Stuart, 2018), including disordered eating (Mensinger, Granche, Cox, & Henretty, 2020; Simone, Askew, Lust, Eisenberg, & Pisetsky, 2020), this study also focused on differences in changes in DEB across sexual and gender identities. Specifically, this research aims to: (1) analyze changes in eating pathology across COVID-19; (2) examine whether and the degree to which changes in perceived social support impact eating pathology; and (3) examine whether, as with prior research, those identifying as transgender and gender non-conforming versus cisgender show greater changes in eating pathology, given their relative higher risk for eating pathology (Mensinger et al., 2020; Simone et al., 2020) and higher risk for structural level stress that may be exacerbated during the pandemic (Drabble, 2021). Finally, this paper will examine associations between reported changes in eating pathology and perceived social support.

## 2. Methods

### 2.1. Procedure

LGBTQ+ people were invited to participate in a broader study called "Project SIPS (Social Isolation Perception Study)" to investigate the impacts of COVID-19 on the LGBTQ+ community through social media

advertisements (i.e., Facebook, Instagram, Reddit) from July to August 2020. Those interested ( $n = 2900$ ) were directed to a website, hosted in Qualtrics, describing the inclusion criteria and study details. Those that met inclusion criteria (18–30 years old, living in the USA, English proficiency, identify as a sexual or gender minority) were prompted to read the consent form; upon providing an electronic signature, participants completed a comprehension check of the study's procedures, including risk and benefit understanding and confidentiality guidelines. To participate in the study, participants had to answer all questions correctly, and to pass a reCaptcha to prevent fraudulent and abusive responses. The Qualtrics survey was created to prevent 'ballot box stuffing', so that people from the same IP address could not participate twice. Of those that clicked on the link, 2285 provided study consent and successfully completed the consent quiz; 1877 participants began the survey, and 1324 people completed the study. One in five participants were randomly selected to win a \$15 electronic gift card within 48 h of study completion. After participating, all participants were provided a debriefing form describing the purpose of the study, thanking them for their time, and listing a series of electronic mental health and crisis resources. Participants that indicated suicidal ideation thoughts or behaviors within the past month were invited to complete an electronic safety plan.

### 2.2. Participants

The full sample included 1324 young adults ages 18–30 ( $M = 20.6$ ,  $SD = 2.91$ ) who identified as LGBTQ+ living across 47 states and Washington, D.C. in the United States. In addition to LGBTQ+ identity and US residency, study inclusion criteria required the ability to read and respond to an online survey in English and have consistent Internet access. For the purposes of this study, we included only participants from the full sample with a past year history of engaging in restrictive eating ( $n = 679$ ), binge eating ( $n = 557$ ), or compensatory behaviors ( $n = 175$ ), for a total of 830 participants.

### 2.3. Measures

#### 2.3.1. Demographics

We assessed age, race/ethnicity, sex assigned at birth, primary language, sexual and gender identities, social standing, and zip code. Social standing was measured with the MacArthur Subjective Social Status; participants ranked perceived social standing compared to others in their social groups based on money, education level, and job respectability (Adler, Epel, Castellazzo, & Ickovics, 2000).

We combined sexual and gender identity categories in the following ways. For gender identity, we coded a categorical variable consisting of ten levels collapsing across the following identities: Trans Male (FTM and/or Trans male), Trans Female (MTF and/or Trans female), Nonbinary (Nonbinary, Two-Spirited, and/or Third Gender), A-gender (only "A-gender" selected), Queer/Expansive (Gender Expansive and/or Genderqueer), Questioning (only "Not Sure" selected), Other (only "Other" selected), Prefer not to share (only "Prefer not to share" selected), Cis Female (only Female and "no" for "gender is different from sex assigned at birth" selected), and Cis Male (only Male and "no" for "gender is different from sex assigned at birth" selected). For sexual orientation, we coded a categorical variable consisting of eight levels collapsing across the following identities: Bisexual (Bisexual, Polysexual, and/or Omnisexual), Gay (only "Homosexual" selected), Queer (only "Queer" selected), Multiple Orientations (multiple orientations selected with the exception of only Queer and one other identity, in which case participant was coded as the other identity selected), Asexual (only "Asexual" selected), Other (only "Other" selected), Unsure (only "Unsure" selected, or "Unsure" and any other identity selected), Straight (only "Heterosexual" selected).

### 2.3.2. Impacts of COVID-19

Multiple measures/subscales were used to assess stress and social support related to COVID-19. A brief and modified version of the COVID-19 Adult Experiences and Psychological Symptoms Questionnaire (Ladouceur, 2020) captured the time frame and lifestyle, social relationships, social connectedness, frequencies of social contacts, and types of social contact changes. For this study, we exclusively focused on items assessing financial difficulties due to COVID-19 and reduced access to physical and mental healthcare. Because we looked at these items individually, we are not able to evaluate their psychometric properties for this study. The Quality of Relationships Inventory (QRI)-support scale (Pierce, Sarason, Sarason, Solky-Butzel, & Nagle, 1997) was used to assess the perceived availability of social support for each person participants lived with since COVID-19-related social isolation orders were instituted. The QRI has high construct validity and reliability ( $\alpha = 0.733$  to  $0.826$ ) (Yearwood Travezan, Vliegen, Luyten, Chau, & Corveleyn, 2018). In the present study, participants were asked to fill out the 7-item QRI on a scale from 1 (not at all) to 4 (very much) for each person they lived with; we then took the mean of these QRI scores to represent the average home relationship. We assessed Cronbach's alpha for each relationship assessed within the QRI; scores ranged from 0.81 to 0.96.

### 2.3.3. Disordered eating

Changes in DEB were measured in several ways. For restrictive eating, the Dietary Restriction Screener 2 (DRS-2; Haynos & Fruzzetti, 2015) was used to assess whether participants had engaged in restrictive eating over the past year. The DRS-2 has not previously been examined in a sample consisting exclusively of gender and sexual minorities. We selected items from the Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 2008) to assess whether participants had engaged in binge eating (i.e., "How many times have you eaten what other people would regard as an unusually large amount of food [given the circumstances] AND had a sense of lost control over your eating?") and compensatory behaviors (i.e., "How many times have you done any of the following as a means of controlling your shape or weight: made yourself sick [e.g., vomited], taken laxatives, exercised in a 'driven' or 'compulsive' way?") in the past year. Prior to this study, the EDE-Q has been used to successfully interpret disordered eating attitudes and behaviors in gender-expansive samples (Nagata, Compte, Cattle, et al., 2020a; Nagata, Ganson, & Austin, 2020b). Next, participants were asked whether they experienced changes in the urge ("How has the urge to engage in \_\_ behaviors changed since the start of COVID-19?") and frequency ("How has the frequency in which you engage in \_\_ behaviors changed since the start of COVID-19?") of each behavior since the start of COVID-19. Response options included: 'Decreased a lot' (1), 'Decreased a little bit' (2), 'Has not changed' (3), 'Increased a little bit' (4), and 'Increased a lot' (5). We combined the urge and frequency items for each DEB to provide an index of behavior severity change since the start of COVID-19; Cronbach's alphas were 0.71, 0.81, and 0.69 for restrictive eating, binge eating, and compensatory behaviors, respectively.

### 2.4. Data analysis

Participants were grouped based on their sexual and gender identities. Participants were categorized as a sexual minority (SM) if they identified as cisgender and any sexual orientation other than purely heterosexual. Participants were categorized as a gender minority (GM) if they identified with any gender other than their birth assigned sex. Of note, most participants who identified as GM did not identify as heterosexual; therefore, regardless of their sexual orientation, these participants were classified as GM.

Question 1: To what degree did the urge and frequency of each DEB change across COVID-19?

We explored self-reported changes in urge and frequency of

restrictive eating, binge eating, and compensatory behaviors across COVID-19. Given that only a minority of included participants reported engaging in past year compensatory behaviors ( $n = 175$ ) and we did not want 'no change' due to a lack of any history of these behaviors to skew outcomes, for each behavior we included only those participants with a past year history.

Question 2: Are there differences in the average change in DEB severity (i.e., mean of change in frequency and urge) between participants identifying as a sexual minority (SM) and gender minority (GM)?

We sought to test whether changes in DEB severity across COVID were different between SM and GM participants. We defined DEB severity as the average score for mean frequency and urge for each DEB; we then conducted Welch's *t*-tests to examine whether change in severity of restrictive eating, binge eating, or compensatory behaviors varied across SM and GM identities. Again, we included only those participants with a past year history of a given behavior in each analysis (restrictive eating  $n = 679$ , binge eating  $n = 557$ , and compensatory behaviors  $n = 175$  for a total of 830 participants). Given that frequency and intensity of each DEB may have been differentially impacted by COVID-19, we also conducted exploratory analyses to examine whether change in the frequency and urge (separately) of each DEB varied across SM and GM identities; because this doubled the number of statistical tests, these tests were considered exploratory.

Question 3: Are COVID-19 related stressors (i.e., interpersonal support measured via quality of home relationships, interpersonal stress measured via living with someone not affirming of participant identity, increased financial difficulties, and decreased access to physical and mental healthcare) associated with changes in average DEB severity?

We conducted Spearman rho correlations to examine associations across COVID-19 related stressors and DEB severity. To reduce the number of statistical analyses conducted, all participants with a past year history of any DEB were included in these analyses.

## 3. Results

### 3.1. Sample demographics

Sample demographics are described in Table 1. Briefly, participants ranged in age from 18 to 30, and most participants identified as GM and White. Participants self-identified with slightly above-average social standing in their communities (mean [ $M$ ] = 6.02, standard deviation [ $SD$ ] = 1.87) and in the US ( $M = 5.62$ ,  $SD = 1.62$ ). Participants reported extensive DEB engagement in the past month, defined by restrictive, binge, or compensatory eating behaviors occurring at all within the past month. On average, participants reported engaging in 9.86 episodes of restrictive eating ( $SD = 8.66$ ), 7.70 ( $SD = 6.84$ ) episodes of binge eating, and 4.37 ( $SD = 6.17$ ) episodes of purging.

Question 1: To what degree did the urge and frequency of each DEB change across COVID-19?

We explored self-reported changes in urge and frequency of restrictive eating, binge eating, and compensatory behaviors across COVID-19 (see Fig. 1). Patterns were largely similar across behaviors. Most participants reported that the frequency of and urge to engage in each DEB increased a little bit or a lot during COVID-19. However, up to 10% of participants reported that their frequency of and urge to engage in these behaviors decreased since the beginning of social distancing due to COVID-19.

**Table 1**  
Sample demographic characteristics.

	Cisgender, sexual minority (N = 355)	Gender minority (N = 462)	Total (N = 830)
<b>Gender</b>			
Cisgender	355 (100%)	0 (0%)	355 (42.8%)
Nonbinary	0 (0%)	156 (33.8%)	156 (18.8%)
Other	0 (0%)	66 (14.3%)	66 (8.0%)
Queer/expansive	0 (0%)	99 (21.4%)	99 (11.9%)
Questioning	0 (0%)	61 (13.2%)	61 (7.3%)
Transgender (binary)	0 (0%)	80 (17.3%)	80 (9.6%)
<b>Sexual orientation</b>			
Asexual	9 (2.5%)	42 (9.1%)	52 (6.3%)
Bisexual	147 (41.4%)	152 (32.9%)	302 (36.4%)
Gay	94 (26.5%)	106 (22.9%)	203 (24.5%)
Heterosexual	3 (0.8%)	1 (0.2%)	6 (0.7%)
Multiple orientations	47 (13.2%)	75 (16.2%)	123 (14.8%)
Other	2 (0.6%)	9 (1.9%)	11 (1.3%)
Queer	11 (3.1%)	49 (10.6%)	60 (7.2%)
Unsure	42 (11.8%)	27 (5.8%)	69 (8.3%)
<b>Age</b>			
Mean (SD)	20.5 (2.88)	20.5 (2.75)	20.5 (2.82)
Median [min, max]	20.0 [17.0, 30.0]	20.0 [18.0, 30.0]	20.0 [17.0, 30.0]
<b>Race/ethnicity</b>			
Asian	28 (7.9%)	38 (8.2%)	69 (8.3%)
Black	5 (1.4%)	12 (2.6%)	18 (2.2%)
Latino/a/e/x	29 (8.2%)	31 (6.7%)	62 (7.5%)
Multiracial	39 (11.0%)	43 (9.3%)	84 (10.1%)
Other	3 (0.8%)	6 (1.3%)	10 (1.2%)
White	251 (70.7%)	326 (70.6%)	580 (69.9%)
Prefer not to answer	0 (0%)	5 (1.1%)	6 (0.7%)
<b>Social standing — community</b>			
Mean (SD)	5.79 (1.83)	6.18 (1.87)	6.02 (1.87)
Median [min, max]	5.00 [2.00, 10.0]	6.00 [1.00, 10.0]	6.00 [1.00, 10.0]
<b>Socioeconomic status — USA</b>			
Mean (SD)	5.26 (1.57)	5.87 (1.59)	5.62 (1.62)
Median [min, max]	5.00 [2.00, 9.00]	6.00 [2.00, 10.0]	6.00 [2.00, 10.0]

**Question 2:** Are there differences in the average change in DEB severity (i.e., mean of change in frequency and urge) between participants identifying as a sexual minority (SM) and gender minority (GM)?

Welch’s *t*-tests revealed no significant differences regarding change in severity of restrictive eating ( $t(559.88) = -0.44$ , Hedges  $g = -0.04$ ,  $p = .66$ ), binge eating ( $t(453.04) = -1.63$ , Hedges  $g = -0.15$ ,  $p = .10$ ), or compensatory behaviors ( $t(110.64) = -0.61$ , Hedges  $g = -0.11$ ,  $p =$

.54). Given potential differences in changes in urge and frequency of each DEB since the start of COVID-19, we also ran Welch’s *t*-tests to explore potential differences in changes in urge and frequency of each DEB across SM and GM participants. Results of each test were insignificant (*ps* ranged from 0.11 to 0.84).

**Question 3:** Are COVID-19 related stressors (i.e., interpersonal support measured via quality of home relationships, interpersonal stress measured via living with someone not affirming of participant identity, increased financial difficulties, and decreased access to physical and mental healthcare) associated with changes in average DEB severity?

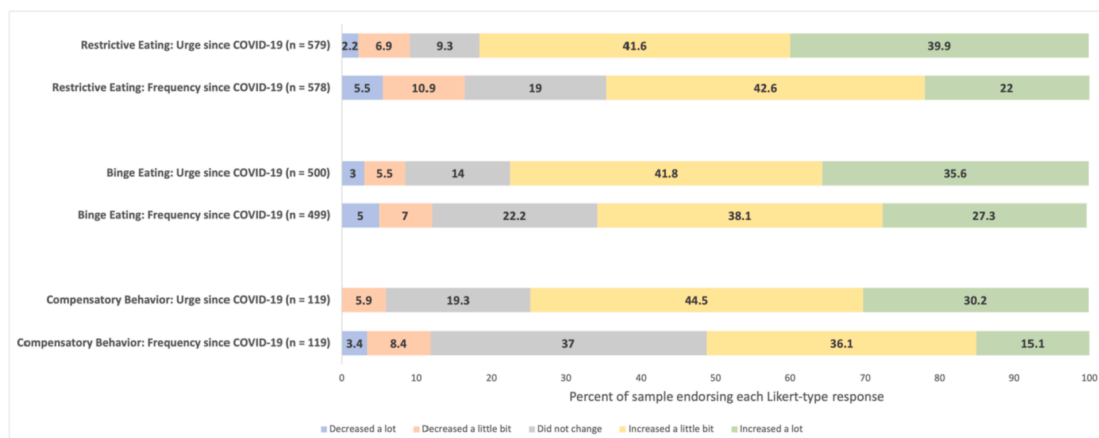
Correlations across variables are provided in Fig. 2. Contrary to hypotheses, correlations across interpersonal support and stress in the home were weakly (restrictive eating, compensatory behaviors) and non-significantly (binge eating) related to disordered eating behaviors. Similar weak and non-significant patterns emerged when considering financial issues due to COVID-19 and reduced access to physical and mental healthcare.

#### 4. Discussion

The current study investigated patterns of change in DEB since the onset of the COVID-19 pandemic in a sample of LGBTQ+ young adults. Specifically, we examined changes in urge and frequency of DEB; differences in average change in DEB severity between SM and GM participants; and cross-sectional relationships between DEB severity change and specific COVID-19 related stressors.

Patterns of change in urge and frequency were largely similar across restrictive eating, binge eating, and compensatory behaviors. Most participants endorsed an increase in both frequency of and urge to engage in DEB, though a non-negligible minority of participants in each category (up to 10%) endorsed a decrease in frequency of an urge to engage in DEB. We also examined differences in average change in DEB severity between SM and GM participants, using a composite measure of change in DEB severity (defined as an average change in frequency of and urge to engage in each DEB). Contrary to hypotheses, there were no statistically significant differences between these groups. Results suggest that, although GM people report higher rates of disordered eating than their SM counterparts (Simone et al., 2020), the pandemic impacted these groups similarly.

Furthermore, there were few significant relationships between changes in average DEB severity and risk and protective factors altered by COVID-19. Considering those engaging in past year restrictive eating, quality of home relationships, non-affirming living environment, and overall friend support were not significantly associated with changes in



**Fig. 1.** Self-reported changes in frequency and urges across restrictive eating, binge eating, and compensatory behaviors since COVID-19.



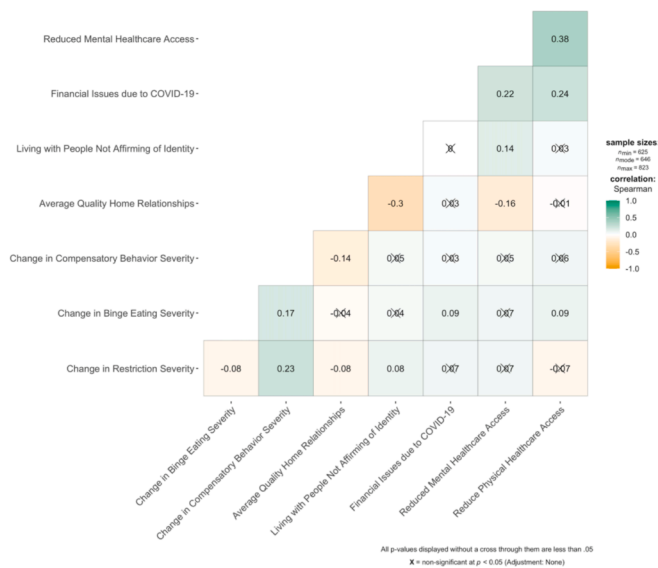


Fig. 2. Spearman rho correlations across COVID-19 related stressors and disordered eating severity.

the restrictive eating severity composite score. However, there was a weak negative association between overall family support and restrictive eating severity. When considering those engaging in past year binge eating, patterns were quite similar. Quality of home relationships, family support, and overall friend support were not significantly associated with changes in the binge eating severity composite score. However, there was a weak positive association between non-affirming living environment and binge eating severity. Patterns were even weaker when considering compensatory behaviors, with no significant associations emerging.

Study results should be interpreted in light of its limitations. For example, most participants in the present study were white; lack of racial and ethnic diversity in this sample constrains the external validity of our findings. In light of the severe racial and ethnic disparities regarding impacts of the COVID-19 pandemic in the United States (e.g., Liu & Modir, 2021), future work should examine pandemic-related patterns of change in DEB specifically among LGBTQ+ youth of color. There are also inherent limitations in the use of a retrospective self-report measure of DEB; it is possible that some participants misunderstood or misreported their disordered eating behaviors. Finally, because data collection took place relatively soon after the initial implementation of COVID-19 restrictions, results might differ if the survey were to be readministered now, later into the pandemic. Studies leveraging longitudinal designs would be better suited to better understand the impact of the pandemic on eating disordered symptoms.

While there were few statistically significant findings in this sample, that does not mean relationships don't exist between DEB and identity, characteristics of interpersonal relationships, average quality of home relationships, or living with someone non-affirming of one's identity. It is possible that sexual and gender minorities do differ in DEB, but respond to COVID-19 related stressors with similar changes. This is likely because prior to the pandemic, research found higher rates of DEB among gender minorities compared to sexual minority individuals (Nagata et al., 2020a, 2020b). Possible future directions include the use of a sample enriched for individuals with eating disorders (due to the low base rate in the general population), as well as further exploration of how the nature of specific DEB may have changed due to COVID (e.g., more secretive purging behaviors, being unable to eat usual foods during a binge episode). It would also be interesting to look at youth under 18 years of age, especially since factors in the home environment may have a larger impact in this population.

To conclude, patterns of change in urge and frequency were mostly

similar across DEB. Majority of participants reported an increased frequency of and urge to engage in DEB, countered by a smaller percentage of participants reporting a decrease in frequency of and urge to engage in DEB. There were no statistically significant differences between sexual and gender minority participants for average changes in DEB severity. Regarding relationships and their relation to DEB, there was a weak negative association between overall family support and restrictive eating severity. There was also a weak positive association between non-affirming living environments and binge eating severity. Patterns weakened with compensatory behaviors, which showed no significant associations.

## Funding

None.

## Credit authorship contribution statement

**Erica A. Hart:** Investigation, Data curation, Writing – original draft, Writing – review & editing, Validation. **Alex Rubin:** Writing – original draft, Writing – review & editing, Validation. **Kiki M. Kline:** Conceptualization, Methodology, Writing – review & editing, Validation. **Kathryn R. Fox:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Validation.

## Declaration of competing interest

All authors declare that they have no conflicts of interest.

## References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy white women. *Health Psychology, 19*(6), 586–592.
- Chen, Z., Poon, K.-T., DeWall, C. N., & Jiang, T. (2020). Life lacks meaning without acceptance: Ostracism triggers suicidal thoughts. *Journal of Personality and Social Psychology. https://doi.org/10.1037/pspi0000238*
- Cooper, M., Reilly, E. E., Siegel, J. A., Coniglio, K., Sadeh-Sharvit, S., Pisetsky, E. M., & Anderson, L. M. (2020). Eating disorders during the COVID-19 pandemic and quarantine: An overview of risks and recommendations for treatment and early intervention. *Eating Disorders, 1*–23. <https://doi.org/10.1080/10640266.2020.1790271>
- Drabble, L. A. (2021). Introduction to special issue: Impacts of the covid-19 pandemic on LGBTQ health and well-being. *Journal of Homosexuality, 2021*.
- Fairburn, C. G., & Beglin, S. J. (2008). Eating disorder examination questionnaire. In , 309. *Cognitive behaviour therapy and eating disorders* (p. 313).
- Fernández-Aranda, F., Casas, M., Claes, L., Bryan, D. C., Favaro, A., Granero, R., ... Treasure, J. (2020). COVID-19 and implications for eating disorders. *European Eating Disorders Review, 28*(3), 239.
- Fish, J. N., McInroy, L. B., Pacey, M. S., Williams, N. D., Henderson, S., Levine, D. S., & Edsall, R. N. (2020). I'm kinda stuck at home with unsupportive parents right now: LGBTQ youths' experiences with COVID-19 and the importance of online support. *Journal of Adolescent Health. https://doi.org/10.1016/j.jadohealth.2020.06.002*
- Flentje, A., Obedin-Maliver, J., Lubensky, M. E., et al. (2020). Depression and anxiety changes among sexual and gender minority people coinciding with onset of COVID-19 pandemic. *Journal of General Internal Medicine, 35*, 2788–2790. <https://doi.org/10.1007/s11606-020-05970-4>
- Hawes, M. T., Szczy, A. K., Klein, D. N., Hajcak, G., & Nelson, B. D. (2021). Increases in depression and anxiety symptoms in adolescents and young adults during the COVID-19 pandemic. *Psychological Medicine, 1*–9. <https://doi.org/10.1017/S0033291720005358>
- Haynos, A. F., & Fruzzetti, A. E. (2015). Initial evaluation of a single-item screener to assess problematic dietary restriction. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 20*(3), 405–413.
- Hendricks, M. L., & Testa, R. J. (2012). A conceptual framework for clinical work with transgender and gender nonconforming clients: An adaptation of the minority stress model. *Professional Psychology: Research and Practice, 43*(5), 460–467. <https://doi.org/10.1037/a0029597>
- Hazzard et al., n.d. V. M. Hazzard M. Simone S. L. Borg K. A. Borton K. R. Sonnevill J. P. Calzo S. K. Lipson Minority college students: Findings from the national Healthy Minds Study. *International Journal of Eating Disorders, 53*(9), 1563–1568. <https://doi-org.du.idm.oclc.org/10.1002/eat.23304>
- Holmes, E. A. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry, 7*(6), 547–560. [https://doi.org/10.1016/S2053-2575\(20\)30314-5](https://doi.org/10.1016/S2053-2575(20)30314-5)
- Jiménez-Pavón, D., Carbonell-Baeza, A., & Lavie, C. J. (2020). Physical exercise as therapy to fight against the mental and physical consequences of COVID-19

- quarantine: Special focus in older people. *Progress in Cardiovascular Diseases*, 63(3), 386–388. <https://doi.org/10.1016/j.pcad.2020.03.009>
- Kalb, N., Brodtkin, S., Goldstein, A. L., & Gillis, J. R. (2020). We're in this together: LGBTQ social identity buffers the homonegative microaggressions—alcohol relationship. *Journal of LGBT Youth*, 1–17. <https://doi.org/10.1080/19361653.2020.1782304>
- Kuper, L. E., Adams, N., & Mustanski, B. S. (2018). Exploring cross-sectional predictors of suicide ideation, attempt, and risk in a large online sample of transgender and gender nonconforming youth and young adults. *LGBT Health*, 5(7), 391–400. <https://doi.org/10.1089/igbt.2017.0259>
- Kuyper, L., & Fokkema, T. (2010). Loneliness among older lesbian, gay, and bisexual adults: The role of minority stress. *Archives of Sexual Behavior*, 39(5), 1171–1180. <https://doi.org/10.1007/s10508-009-9513-7>
- Ladouceur, C. D. (2020). *COVID-19 Adolescent Symptom & Psychological Experience Questionnaire*.
- Liu, S. R., & Modir, S. (2021). The outbreak that was always here: Racial trauma in the context of COVID-19 and implications for mental health providers. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(5), 439–442. <https://doi.org/10.1037/tra0000784>
- MacCarthy, S., Izenberg, M., Barreras, J. L., Brooks, R. A., Gonzalez, A., & Linnemayr, S. (2020). Rapid mixed-methods assessment of COVID-19 impact on Latinx sexual minority men and Latinx transgender women. *PLoS ONE*, 15(12), Article e0244421. <https://doi.org/10.1371/journal.pone.0244421>
- McCormick, A., & Baldrige, S. (2019). Family acceptance and faith: Understanding the acceptance processes of parents of LGBTQ youth. *Social Work*, 10.
- McQuaid, R. J., Cox, S. M., Ogunlana, A., & Jaworska, N. (2021). The burden of loneliness: Implications of the social determinants of health during COVID-19. *Psychiatry Research*, 296, 113648.
- Mensinger, J. L., Granche, J. L., Cox, S. A., & Henretty, J. R. (2020). Sexual and gender minority individuals report higher rates of abuse and more severe eating disorder symptoms than cisgender heterosexual individuals at admission to eating disorder treatment. *International Journal of Eating Disorders*, 53(4), 541–554. <https://doi.org/10.1002/eat.23257>
- Miniati, M., Marzetti, F., Palagini, L., Marazziti, D., Orrù, G., Conversano, C., & Gemignani, A. (2021). Eating Disorders Spectrum during COVID Pandemic: A systematic review. *medRxiv*.
- Nagata, J. M., Compte, E. J., Cattle, C. J., et al. (2020). Community norms for the eating disorder examination questionnaire (EDE-Q) among gender-expansive populations. *Journal of Eating Disorders*, 8, 74. <https://doi.org/10.1186/s40337-020-00352-x>
- Nagata, J. M., Ganson, K. T., & Austin, S. B. (2020). Emerging trends in eating disorders among sexual and gender minorities. *Current Opinion in Psychology*, 33(6), 562–567. <https://doi.org/10.1097/ycp.0000000000000645>
- Pierce, G. R., Sarason, I. G., Sarason, B. R., Solky-Butzel, J. A., & Nagle, L. C. (1997). Assessing the quality of personal relationships. *Journal of Social and Personal Relationships*, 14(3), 339–356.
- Puckett, J. A., Maroney, M. R., Wadsworth, L. P., Mustanski, B., & Newcomb, M. E. (2020). Coping with discrimination: The insidious effects of gender minority stigma on depression and anxiety in transgender individuals. *Journal of Clinical Psychology*, 76(1), 176–194. <https://doi.org/10.1002/jclp.22865>
- Rodgers, R. F., Lombardo, C., Cerolini, S., Franko, D. L., Omori, M., Fuller-Tyszkiewicz, M., Linardon, J., Courtet, P., & Guillaume, S. (2020). The impact of the COVID -19 pandemic on eating disorder risk and symptoms. *International Journal of Eating Disorders*, 53(7), 1166–1170. <https://doi.org/10.1002/eat.23318>
- Ryan, C., Russell, S. T., Huebner, D., Diaz, R., & Sanchez, J. (2010). Family acceptance in adolescence and the health of LGBT young adults: Family acceptance in adolescence and the health of LGBT young adults. *Journal of Child and Adolescent Psychiatric Nursing*, 23(4), 205–213. <https://doi.org/10.1111/j.1744-6171.2010.00246.x>
- Salerno, J. P., Devadas, J., Pease, M., Nketia, B., & Fish, J. N. (2020). Sexual and gender minority stress amid the COVID-19 pandemic: Implications for LGBTQ young persons' mental health and well-being. *Public Health Reports*, 135(6), 721–727. <https://doi.org/10.1177/0033354920954511>
- Simone, M., Askew, A., Lust, K., Eisenberg, M. E., & Pisetsky, E. M. (2020). Disparities in self-reported eating disorders and academic impairment in sexual and gender minority college students relative to their heterosexual and cisgender peers. *International Journal of Eating Disorders*, 53(4), 513–524. <https://doi.org/10.1002/eat.23226>
- Suen, Y. T., Chan, R. C. H., & Wong, E. M. Y. (2020). Effects of general and sexual minority-specific COVID-19-related stressors on the mental health of lesbian, gay, and bisexual people in Hong Kong. *Psychiatry Research*, 292. <https://doi.org/10.1016/j.psychres.2020.113365>
- Termorshuizen, J. D., Watson, H. J., Thornton, L. M., Borg, S., Flatt, R. E., MacDermod, C. M., Harper, L. E., Furth, E. F., Peat, C. M., & Bulik, C. M. (2020). Early impact of COVID -19 on individuals with self-reported eating disorders: A survey of ~1,000 individuals in the United States and the Netherlands. *International Journal of Eating Disorders*, Article eat.23353. <https://doi.org/10.1002/eat.23353>
- World Health Organization. (2020). *WHO director-general's opening remarks at the media briefing On covid-19 - 11 MARCH 2020*. March 11 <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>.
- Wolford-Clevenger, C., Frantell, K., Smith, P. N., Flores, L. Y., & Stuart, G. L. (2018). Correlates of suicide ideation and behaviors among transgender people: A systematic review guided by ideation-to-action theory. *Clinical Psychology Review*, 63, 93–105. <https://doi.org/10.1016/j.cpr.2018.06.009>
- Yearwood Travezan, K., Vliegen, N., Luyten, P., Chau, C., & Corveleyn, J. (2018). Validation of the quality of relationships inventory in a peruvian sample of adolescents: Associations to peer attachment. *Psyche (Santiago)*, 27(1), 1–11.