


Depression and Anxiety During the COVID-19 Pandemic in an Urban, Low-Income Public University Sample

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Mental health disparities in the aftermath of national disasters and the protective role of socioeconomic status are both well documented. We assessed the prevalence of depression and anxiety symptoms among underresourced public university students during the COVID-19 pandemic in New York City. Between April 8, 2020, and May 2, 2020, adult students ($N = 1,821$) across the CUNY system completed an online survey examining COVID-19–related stressors and mental health and sociodemographic factors. Using multivariable logistical regression to assess the association between COVID-19–related stressors and depression and anxiety symptoms, we found a high prevalence and severity of depression and anxiety symptoms. We also observed that more exposure to COVID-19–related stressors was associated with increased depressive (27.0%, 41.4%, and 63.1% for low-, medium-, and high-level stressors, respectively) and anxiety symptoms (19.3%, 34.6%, 52.2%). In addition, the degree of exposure to COVID-19–related stressors served as an important predictor of depression and anxiety symptoms. Compared to high levels of stressors, the odds of depression were 0.2, 95% CI [0.2, 0.3] for low- and 0.4, 95% CI [0.3, 0.5] for medium-level stressors; for anxiety, the odds were 0.2, 95% CI [0.2, 0.3] for low and 0.05, 95% CI [0.4, 0.6] for medium stressors. Finally, household savings of less than \$5,000 increased the risk of anxiety but not depression symptoms, $OR = 1.3$, 95% CI [1.0, 1.6]. Together, these findings tell a devastating story of psychological distress among students from lower socioeconomic groups living in the COVID-19 epicenter of the U.S. pandemic.

The 2020 novel coronavirus outbreak (COVID-19) and its profound economic consequences created a large-scale traumatic event that is expected to have a substantial impact on the mental well-being of numerous populations. The extensive consequences of the pandemic are likely to alter health trajectories, educational systems, and the economy, all of which may contribute to negative mental health outcomes (Centers for Disease Control and Prevention [CDC] COVID-19 Response Team, 2020; Daniel, 2020; Nicola et al., 2020). Clearly, the harmful effects of COVID-19 are widespread. However, sites with increased contagion are likely to experience the associated consequences of the virus with elevated severity (Spinelli & Pellino, 2020). The present study was conducted between April 8, 2020, and May 2, 2020, when New York City was at the epicenter of the global pandemic. At the time of data collection,

New York City had the highest documented number of positive COVID-19 cases and deaths in the United States. Thus, the city is a site in which the interaction between the widespread effects of the COVID-19 outbreak and mental health can be examined (CDC, 2020).

Although the pandemic may significantly affect the mental health of whole populations, these negative consequences may be increased among marginalized populations due to a larger number of daily stressors and an even larger strain on resources (Fiscella & Williams, 2004; Gruebner et al., 2017; Moore et al., 2015). For example, in urban settings, racial and ethnic minorities and immigrant populations have significantly less access to stable housing, livable wages, and physical and mental health resources compared to majority groups, putting them at a higher risk for adverse mental health consequences in the wake of traumatic experiences (Cook et al., 2016; Davis et al., 2008; Hendren et al., 2011; Jones et al., 2001; O'Mahony & Donnelly, 2010). As a result, individuals with lower socioeconomic status (SES) have been shown to experience higher rates of mood and anxiety symptoms after traumatic events compared to those with a higher SES (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). In the context of the present study, it is also significant that students from underresourced families who are pursuing higher education face particular barriers to their academic success,

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such as financial concerns that require simultaneous part- and full-time employment. As a result, it is plausible that the financial consequences of COVID-19 may have a unique bearing on the ability of students from underresourced families to remain enrolled in college if their household income becomes further strained. Similarly, academic achievement among underresourced students often suffers in the context of remote learning due to a limited ability to purchase necessary technology and/or reliable digital connections (Bjelland et al., 2008; Bauldry, 2015; Casey, 2020; Eisenberg et al., Goldstein, 2020).

Daily stressors often increase in the wake of disasters (Lock et al., 2012). These stressors are known to increase symptoms of depression and anxiety in all groups, but this effect is particularly exacerbated among groups that have been previously exposed to substantial socioeconomic hardships (Leon, 2004; Maguen et al., 2012; North & Pfefferbaum, 2013). Studies examining the short- and long-term consequences of the September 11, 2001, terrorist attacks, for example, have documented increased rates of depression and posttraumatic stress disorder (PTSD) among low-SES populations in New York City as compared to populations with more resources (Chatterjee et al., 2018; Nandi et al., 2004). Similarly, after Hurricane Katrina, a disproportionate burden of mental and physical illness was found among marginalized New Orleans residents and evacuees (Joseph et al., 2014; Mortensen et al., 2009).

Education and SES can buffer the negative effect of stressors in the context of disasters (Allen et al., 2014; Bonanno et al., 2007; Erickson et al., 2016; McLaughlin et al., 2012; Pfefferbaum et al., 2015). Specifically, higher SES and/or higher educational attainment are protective against manifestations of depression and anxiety symptoms; conversely, lower SES and/or inadequate educational resources are a risk factor in the development of such symptoms (Erickson et al., 2016; Herrmann et al., 2017; Ibrahim et al., 2013; Li et al., 2011). Given these established associations among SES, education, stressors, and depression and anxiety symptoms in the context of population-level disasters, there is merit to documenting the experience and mental health of university students in the United States during the COVID-19 pandemic.

The present study involved a student sample within the City University of New York (CUNY) system, the largest public university system in the United States. Published demographics of the overall student body indicate substantial racial and ethnic diversity, with 0.3% American Indian/Alaskan Native, 21.6% Asian/Pacific Islander, 26.0% Black, 31.7% Latinx, and 20.4% White (CUNY Office of Institutional Research and Assessment, 2020). Additionally, the undergraduate population is predominantly economically underresourced, with 42.0% coming from household incomes of less than \$20,000 (USD; Chellman & Truelsch, 2020). Previous research has documented significant levels of food insecurity within this university system, with 39.0% of student respondents given the designation of “food insecure” (Freudenberg et al., 2011). This population, therefore, provided an opportunity to understand the contribution of resources, educational accessibility and

achievement, and mental health in the context of COVID-19. We expected to find a higher risk of depression and anxiety symptoms as well as an increase in the severity of symptoms among lower-SES students and those with exposure to a larger number of COVID-19–related stressors (Adeola, 2009; Davis, 2004; Lee et al., 2009; SAMHSA, 2017).

To the best of our knowledge, no studies thus far have focused explicitly on the prevalence of depression and anxiety symptoms among an underresourced urban student population within the context of the current COVID-19 pandemic. Aiming to fill this gap, we studied students in New York City in the spring of 2020, during which the city was at the center of the global outbreak, to document (a) the stressors experienced by this population consequent to the COVID-19 pandemic and (b) to understand the ways in which these stressors interact with SES and shape the symptoms of depression and anxiety in underresourced student groups.

Method

Participants

The primary sample for the present study was a group of urban-dwelling, underresourced adults aged 18 years or older who were currently enrolled in at least one course across six CUNY campuses ($N = 1,821$). The mean participant age was 26.17 years (range: 18–77 years). Table 1 provides descriptive statistics for the sample. Of note, given that just 31.1% of participants in our sample reported household income higher than \$75,000 and that published data demonstrates that 42.5% of New York City households report income levels of \$75,000 or higher, our sample represents a low-income population (NYC Data, n.d.). In total, approximately 40% of our sample met the criteria for poverty designation in New York City, and 70.0% of our sample reported household incomes below the New York City median income level (U.S. Census Bureau, 2020).

The racial and ethnic breakdown of our sample closely matches both the university-wide and campus-specific population data (CUNY Office of Institutional Research and Assessment, 2020). Each college campus documents varying and diverse demographic breakdowns; however, to demonstrate the representative nature of our sample, we provide the following campus-specific example. One of the six campuses assessed in the present study reports a racial/ethnic breakdown as follows: 22.8% Hispanic/Latinx, 35.4% White, 28.1% Asian/Pacific Islander, 13.5% Black, and 0.2% American Indian/Alaskan Native, which corresponds with demographic data of the current sample (CUNY Office of Institutional Research and Assessment, 2020).

A total of 2,927 individuals began the survey and 1,106 opted to exit out of the survey prematurely. Data were not missing at random. The survey, written in English, had three distinct parts, each of which was defined by a transition page that thanked the respondent for their participation up to that point. The

Table 1
Prevalence of Depression and Anxiety Across Demographic Sample Characteristics

Characteristic	Total (<i>N</i> = 1,821)		Depression ^a (<i>n</i> = 915)		Anxiety ^b (<i>n</i> = 752)	
	<i>n</i>	%	%	<i>p</i>	%	<i>p</i>
Total ^c		100.0	50.3		41.3	
Gender				< .001		< .001
Male	493	27.1	45.2		32.9	
Female	1,301	71.6	51.6		44.0	
Age (years)				< .001		.001
18–39	1,627	90.1	52.5		43.0	
40–59	161	8.9	32.3		28.6	
≥ 60	17	0.9	17.6		23.5	
Ethnicity				.032		.123
Latinx	722	39.8	53.5		43.6	
Non- Latinx	1,093	60.2	48.3		40.0	
Race				.003		.001
Non-Latinx White	456	25.1	47.4		42.3	
Non-Latinx Black	216	11.9	42.3		37.2	
Non-Latinx Asian	357	19.6	51.7		35.0	
Latinx	433	23.8	50.0		40.7	
Other race (including multiple races)	356	19.6	58.0		50.0	
Educational attainment				< .001		.001
High school graduate or GED	390	21.5	56.2		39.2	
Some college	904	49.8	52.9		45.5	
College graduate or more	519	28.6	41.8		35.8	
Marital status				< .001	.244	
Married	224	12.4	35.7		35.7	
Widowed, divorced, or separated	64	3.5	48.4		34.4	
Never married	1,387	76.6	53.4		42.6	
Living with partner	135	7.5	44.4		42.2	
Household income (USD)				.002	.042	
\$0–\$19,999	332	19.1	55.5		44.3	
\$20,000–\$44,999	424	24.4	53.3		41.7	
\$45,000–\$74,999	444	25.5	52.3		45.3	
≥ \$ 75,000	541	31.1	43.6		37.0	
Household savings (USD)				.005		.001
\$0–\$4,999	726	43.3	54.5		46.7	
≥ \$5,000	952	56.7	47.5		38.9	
COVID-19 stressor score				< .001		< .001
Low	270	15.0	27.0		19.3	
Medium	572	31.8	41.4		34.6	
High	959	53.2	63.1		52.2	

Note: Data collected from April 8, 2020, to May 2, 2020. GED = General Education Diploma.

^aCalculated using the clinical cutoff score of 10 or higher on the Patient Health Questionnaire–9. ^b Calculated using the clinical cutoff score of 10 or higher on the Generalized Anxiety Disorder–7. ^cThe mean household size for the sample was 3.7 individuals (*SD* = 1.8).

participants who did not complete the survey exited out of the survey at either the first or second transition page. The final sample included 1,821 participants who completed the survey in its entirety. The survey was conducted over the web using Qualtrics (Provo, UT).

Procedure

The Intersect Lab at the City College of New York distributed an original survey to six CUNY campuses, via Qualtrics, between April 8, 2020, and May 2, 2020, to assess exposure to COVID-19–related stressors and mental health and

sociodemographic factors. Participants were initially informed of the study via an email blast from their respective CUNY campus. The email blast provided the URL for the survey. Participants consented by voluntarily opening the survey link and participating in the survey. Study participants were not compensated for their participation. All procedures were approved by the institutional review board at the City College of New York.

Measures

Depressive Symptoms

The nine-item Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) was used to assess depressive symptoms. The PHQ-9 is a clinically validated assessment tool that is used to measure depressive symptoms. The measure has demonstrated a sensitivity of 88.0% for scores of 10 and higher. Each of the nine items is rated on a 4-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). In the current study, depression severity was categorized by total scores of 0–4 for no depression and 5–9 for mild, 10–14 for moderate, 15–19 for moderately severe, and 20 or higher for severe depression. These cutoff scores were determined in accordance with literature documenting the association between PHQ-9 scores and ratios of depression diagnoses (i.e., higher scores correspond to an increased likelihood of diagnosis; Kroenke et al., 2001). The PHQ-9 has demonstrated internal reliability, with previous analyses documenting a Cronbach's alpha value of .89 and a test-retest reliability correlation of .84 (Kroenke et al., 2001). In the current sample, the Cronbach's alpha value was .89.

Anxiety Symptoms

The seven-item Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006) was used to assess anxiety symptoms. The GAD-7 is a clinically validated survey that has demonstrated a sensitivity of 89.0% for a cutoff score of 10. Respondents rate items using a 4-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Anxiety severity was defined by total scores of 0–4 for no anxiety and 5–9 for mild, 10–14 for moderate, and 15 or higher for severe anxiety, which is in accordance with previous analyses that have shown total scores of 5, 10, and 15 to be representative of mild, moderate, and severe levels of anxiety symptoms (Spitzer et al., 2006). Further, higher scores correspond to higher levels of functional impairment (Spitzer et al., 2006). Previous studies have found the GAD-7 to have strong internal reliability (Cronbach's $\alpha = .92$) as well as a test-retest correlation of .83 (Spitzer et al., 2006). In the present sample, the Cronbach's alpha value was .92.

COVID-19-Related Stressors

We assessed 13 stressors based on previous research that has documented posttrauma responses (Boardman et al., 2001; Galea et al., 2008). Additional COVID-19-specific stressors that relate to high levels of financial hardship and the disproportionately high mortality rates experienced by urban marginalized communities compared to more affluent communities were

included. The 13 stressors assessed were: seeing family in person less, seeing friends in person less, travel restrictions, death of a close relative or friend due to COVID-19, family or relationship problems, challenges finding childcare, feeling alone, not being able to get food due to shortages, not being able to get supplies due to shortages, losing a job, a member of the household losing a job, having financial problems, having difficulty paying rent, being forced to leave campus. Respondents were asked to answer “yes” or “no” to each item. Exposure to COVID-19-induced stressors were evaluated based on frequency distributions in the sample and categorized as low (1–2 stressors endorsed), medium (3–4 stressors), and high (5 or more stressors) in accordance with previous research on post-trauma responses (Ettman et al., 2020).

Demographic Characteristics

We used a binary variable to define gender as male or female. Seven exclusive categories were used to define race/ethnicity: non-Latinx White, non-Latinx Black, Latinx, non-Latinx Asian, American Indian or Alaska Native, and Native Hawaiian or other Pacific Islander. We defined educational attainment according to a three-level categorical variable: high school graduate or General Education Diploma (GED) equivalent, some college, and college graduate or more. For marital status, we used a categorical variable with four groups: married; widowed, divorced, or separated; never married; and living with a partner. Socioeconomic status was grouped into four categories according to household income and household savings, with thresholds of \$0–\$19,999, \$20,000–\$44,999, \$45,000–\$74,999, and \$75,000 or higher. Household savings had two groups: \$0–\$4,999 and \$5,000 and over.

Data Analysis

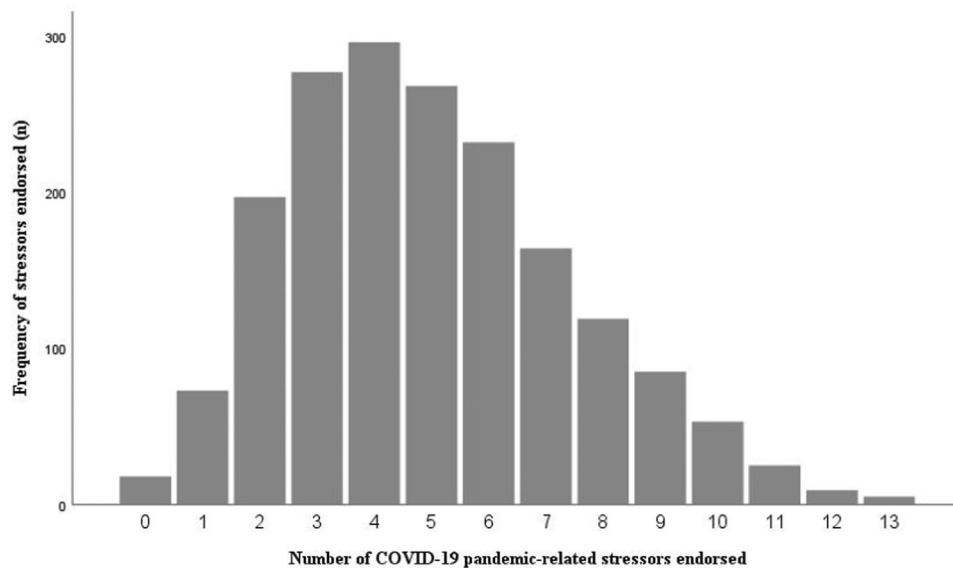
We first assessed the demographic characteristics of our sample. Second, we documented bivariate chi-square analyses to examine the associations between demographic characteristics and clinically significant levels of depression and anxiety in the sample. Third, we estimated the prevalence of depression and anxiety, as defined by the clinical cutoff scores on each measure, during the COVID-19 pandemic among urban-dwelling, marginalized individuals in the university sample. Fourth, after controlling for demographic characteristics and resources (i.e., age, race/ethnicity, and gender), we used multivariable logistic regression to estimate odds ratios and 95% confidence intervals for the COVID-19-related stressors and clinically significant levels of depression and anxiety. We used a complete case analysis for these analyses. All statistical analyses were completed using SPSS (Version 25.0; IBM, 2017).

Results

Table 1 presents the overall demographic characteristics of the sample as well as the prevalence of depression and anxiety across each demographic group, as defined by the clinical

Figure 1

Distribution of the Number of COVID-19 Pandemic-Related Stressors Endorsed by Participants



Note. COVID-19 related stressors included seeing family in person less, travel restrictions, death of someone close due to coronavirus or COVID-19, family or relationship problems (e.g., with spouse or kids), challenges finding childcare, feeling alone, not being able to get food due to shortages, not being able to get supplies due to shortages, losing a job, household member losing a job, having financial problems, having difficulty paying rent, being forced to leave campus.

cutoff score on the PHQ-9 and GAD-7. Table 1 shows that in April 2020 (i.e., 2–3 months after the start of the COVID-19 pandemic in the United States and during the peak of infections and deaths in New York City), 50.3% of the sample met the PHQ-9 clinical cutoff for depression and 41.3% met the GAD-7 clinical cut off for anxiety. Women were more likely than men to meet the clinical cutoff for depression (51.6% vs. 45.2%), $\chi^2(2, N = 1,816) = 19.2, p < .001$, and anxiety (44.0% vs. 32.9%), $\chi^2(2, N = 1,818) = 29.5, p < .001$. Compared to individuals who identified as non-Latinx, those who reported their ethnicity as Latinx had a significantly higher prevalence of clinically significant levels of depressive symptoms (48.3% vs. 53.5%), $\chi^2(1, N = 1,813) = 4.6, p = .032$. Overall, reporting access to fewer resources was associated with a higher prevalence of clinically significant levels of both depression and anxiety symptoms. Regarding educational attainment, 56.2% of individuals with a GED or high school degree met the clinical cutoff for depression, compared to 41.8% of those with a college degree or more, $\chi^2(2, N = 1,811) = 222.8, p < .001$. Participants who had completed some college had a higher prevalence of clinically significant levels of anxiety symptoms (45.5%) compared to those with both less and more education (39.2% and 35.8%, respectively), $\chi^2(2, N = 1,813) = 13.5, p = .001$. Among individuals in the highest household income category (i.e., \$75,000 and above), 43.6% reported clinically significant levels of depressive symptoms, $\chi^2(3, N = 1,739) = 15.3, p = .002$, and 37.0% for clinically significant anxiety symptoms, $\chi^2(3, N = 1,741) = 8.2, p = .042$, whereas individuals in the lowest household income category (i.e.,

under \$19,999) had a higher prevalence of clinically significant levels of both depression (55.5%), $\chi^2(3, N = 1,739) = 15.3, p = .002$, and anxiety symptoms (44.3%), $\chi^2(3, N = 1,741) = 8.2, p = .042$. Similarly, among participants who reported having more than \$5,000 in household savings, fewer individuals met the clinical cut off for depression (47.5%), $\chi^2(1, N = 1,676) = 8.0, p = .005$, and anxiety (38.9%), compared to those with less than \$5,000 in household savings (54.4% and 46.7%, respectively), $\chi^2(1, N = 1,678) = 10.3, p = .001$. Exposure to more COVID-19–related stressors was related to a higher prevalence of clinically significant levels of depression and anxiety symptoms. The prevalence of individuals who reported low-, medium-, and high- levels of COVID-19–related stressor exposure for depression was 27.0%, 41.4%, and 63.1%, respectively, $\chi^2(2, N = 1,801) = 139.1, p < .001$, and 19.3%, 34.6%, and 52.2%, respectively, for anxiety, $\chi^2(3, N = 1,741) = 111.6, p < .001$. Figure 1 illustrates the distribution of COVID-19–related stressors endorsed by participants.

Table 2 shows the prevalence rates of depression and anxiety across categories of severity. In total, 12.0%, 15.3%, 23.0%, and 30.7% of the sample met the criteria for severe, moderately severe, moderate, and mild levels of depression symptoms, respectively. For anxiety, 20.6% of the sample was categorized as having severe anxiety symptoms, 20.7% as having moderate symptoms, and 32.1% as having mild symptoms.

After controlling for demographic characteristics (i.e., gender, age, and race/ethnicity), we completed a multivariable analysis of sociodemographic variables, resources, and COVID-19–related stressors as well as depression and anxiety

Table 2
Prevalence of Depression and Anxiety in the Sample

Variable	%
Depression ^a	
None	19.0
Mild	30.7
Moderate	23.0
Moderately severe	15.3
Severe	12.0
Anxiety ^b	
Minimal	25.6
Mild	32.1
Moderate	20.7
Severe	20.6

Note. $N = 1,821$. Data collected from April 8, 2020, to May 2, 2020. ^aCalculated using the Patient Health Questionnaire-9 with a score of 0–4 for no depression and scores of 5–9 for mild, 10–14 for moderate, 15–19 for moderately severe, and ≥ 20 for severe depression. ^bCalculated using the Generalized Anxiety Disorder-7, with scores of 0–4 for minimal, 5–9 for mild, 10–14 for moderate, and 15–21 for severe anxiety.

symptoms (Table 3). Having less than \$5,000 in household savings was the only sociodemographic characteristic to increase the odds of anxiety symptoms by 1.3, 95% CI [1.0, 1.6]. In addition, COVID-19–related stressors increased the risk for depression and anxiety symptoms, with the odds of depression and anxiety decreasing with fewer reported stressors. The odds ratios (*ORs*) for depression in individuals who reported low and medium stressor scores as compared to those who reported high stressor scores were 0.2, 95% CI [0.2, 0.3], and 0.4, 95% CI [0.3, 0.5], respectively. The risk of anxiety was lower among individuals who had low and medium stressor scores compared to those with high stressor scores, *OR* = 0.2, 95% CI [0.2, 0.3], and *OR* = 0.5, 95% CI [0.4, 0.6].

Discussion

Using a sample from an urban public university, this study was the first of which we are aware to assess the burden of mental illness among a United States–based population that has been particularly vulnerable to the health and economic consequences of the COVID-19 outbreak. First, we found that in our sample, in the context of COVID-19, the prevalence of self-reported depression and anxiety symptoms was skewed toward moderate to severe levels. It is important to note that participants in our sample endorsed levels of depression and anxiety that were above the mean scores established for the measures used in the study (i.e., the PHQ-9 and GAD-7). As expected, the levels of depression and anxiety symptoms documented in this study were higher than those documented among university students before COVID-19. For example, the rate of 14.5% for moderate-to-severe depressive symptoms found in a United States–based undergraduate student population pre–COVID-19

(Gress-Smith et al., 2013) was significantly lower than what we found in the present sample (i.e., 23.0% for moderate, 15.3% for moderately severe, and 12.0% for severe levels of depressive symptoms). Similarly, a research group tasked with assessing the health of the CUNY student body documented that pre–COVID-19, 20.0% and 18.0% of CUNY students suffered from anxiety and depression, respectively (CUNY Graduate School of Public Health & Health Policy, 2018). Moreover, 7.8% and 15.1% of international university students globally endorsed a mood or anxiety disorder in the 12 months prior to data collection, whereas our study suggests that during COVID-19, 50.0% and 40.0% of our sample met the clinical cutoffs for depression and anxiety, respectively (Auerbach et al., 2018).

Second, COVID-19–related stressors were important predictors of depression and anxiety symptoms. Together, these findings contribute to the mounting evidence that COVID-19 is particularly harmful to the health of marginalized student populations. Given the protective role that education plays over the life course, the practical and psychological disruption to academic achievement experienced among this population stands to alter life trajectories of health and academic prosperity (Bauldry, 2015; Bjelland, et al., 2008; Eisenberg et al., 2009).

There is extensive research documenting the increase of depression and anxiety symptoms in response to population-level disasters (Balaban, 2006; Bromet, 2014; Kar & Bastia, 2006; Karatzias et al., 2020; Leon, 2004; Maguen et al., 2012; North & Pfefferbaum, 2013; Van Der Velden et al., 2006; Wang et al., 2020). In addition, population-level disasters have been associated with increased rates of depression and PTSD symptoms and higher rates of unemployment among low-SES populations as well as increased physical and mental health disparities among marginalized populations (Chatterjee et al., 2018; Joseph et al., 2014; Mortensen et al., 2009; Nandi et al., 2004). Moreover, prolonged disasters—such as a pandemic—rather than single-incident disasters, have been shown to cause more perpetual harm to individuals who endure them (Bromet, 2014; Cerdá et al., 2012; Terayama et al., 2020). The present findings build upon previous and preliminary analyses that have investigated disasters and subsequent psychological health, with the aim of understanding the psychological response to disasters among urban-dwelling, underresourced public university students (Cao et al., 2020; Simms et al., 2013).

Household savings and exposure to COVID-19–related stressors were the only two nondemographic factors we found to be related to depression and/or anxiety symptom endorsement. Levels of household savings, specifically savings of less than \$5,000, were associated with a significantly higher risk of anxiety. Financial savings can provide a sense of stability and safety in the context of major life disruption, such as unemployment, which has increased substantially in the wake of COVID-19. Unemployment in the United States rose from 3.6% to 14.7% between January 2020 and April 2020 (Bureau of Labor Statistics, 2020), with individuals who had already experienced socioeconomic disadvantages the most severely affected by a sudden loss of income (Bureau of Labor Statistics,

Table 3
Weighted Odds of Depression and Anxiety Endorsement by Resources

Resource	Depression ^a		Anxiety ^b	
	OR	95% CI	OR	95% CI
Educational attainment				
High school graduate/GED	1.0	[0.7, 1.4]	0.8	[0.6, 1.1]
Some college	0.9	[0.7, 1.2]	1.0	[0.8, 1.4]
College graduate or more (Ref.)	–	–	–	–
Marital status				
Married	1.0	[0.6, 1.6]	0.9	[0.6, 1.5]
Widowed, divorced or separated	1.6	[0.8, 3.1]	0.7	[0.4, 1.5]
Never married	1.3	[0.9, 1.9]	1.0	[0.7, 1.5]
Living with a partner (Ref.)	–	–	–	–
Household income (USD)				
\$0–\$19,999	1.1	[0.8, 1.5]	0.9	[0.6, 1.3]
\$20,000–\$44,999	1.0	[0.7, 1.3]	0.8	[0.6, 1.1]
\$45,000–\$74,999	1.1	[0.9, 1.6]	1.2	[0.9, 1.5]
≥ \$75,000 (Ref.)	–	–	–	–
Household savings (USD)				
< \$5,000	1.1	[0.9, 1.4]	1.3*	[1.0, 1.6]
≥ \$5,000 (Ref.)	–	–	–	–
COVID-19 stressors^c				
Low	0.2*	[0.2, 0.3]	0.2*	[0.2, 0.3]
Medium	0.4*	[0.3, 0.5]	0.5*	[0.4, 0.6]
High (Ref.)	–	–	–	–

Note. $N = 1,821$. Models controlled for demographic characteristics (i.e., gender, age, race, ethnicity). Ref. = reference group; GED = General Education Diploma.

^aDepression calculated using the Patient Health Questionnaire–9, with a clinical cutoff score of 10. ^bAnxiety calculated using the Generalized Anxiety Disorder–7, with a clinical cutoff score of 10. ^cThirteen COVID-19–related stressors were assessed. Stressor scores were categorized as low (1–2), medium (3–4), and high (≥ 5) exposures to COVID-19–induced stressors.

** $p < .05$.

2017). The household income of 43.4% of our respondents was under \$44,999; for 68.9% of participants, household income was under \$74,999. Given that a large portion of our population reported lacking household savings to cover rent and other critical expenses, it is not surprising that the additional stress of unemployment and the transition to remote learning due to COVID-19 were associated with an increase in the risk of anxiety.

Evident in our study is the burden of COVID-19–related stressors. We found that individuals with more exposure to COVID-19–related stressors were more likely to endorse depression and anxiety symptoms than individuals who reported exposure to fewer COVID-19–related stressors. This finding is consistent with a wealth of literature documenting the relation between lifetime exposure to stressors and/or potentially traumatic events and psychological distress (Chapman et al., 2004; Chu et al., 2012; Stevens-Watkins et al., 2014; Williams et al., 2007;). In particular, there is considerable literature documenting not only the negative effect of specific stressors on mental health but also the exponential negative effect of multiple and concurrent stressors on psychological

well-being (Evans & English, 2003; Green et al., 2000; Priebe et al., 2018). Over 50.0% of our respondents met the criteria for a high stressor score (i.e., at least 5 such exposures), 31.8% met the criteria for a medium stressor score (i.e., 3–4 exposures), and only 15.0% met the criteria for a low stressor score (i.e., 1–2 exposures). Increased stressors correspond with the increased prevalence of COVID-19 exposure and mortality rates in both New York City as a whole, specifically in lower-income, non-White neighborhoods in New York City (CDC, 2020; New York City Department of Health, 2020). In addition, COVID-19–related experiences, such as unemployment, the death of a family member or close friend, receiving a positive COVID-19 diagnosis, increased problems with friend(s) and/or family, and difficulty paying monthly rent, all of which are more likely to occur within the context of income insecurity and societal marginalization, increased the odds of both depression and anxiety symptoms among respondents in our study.

Together, these three main results tell a devastating story of significant psychological distress among students from lower socioeconomic groups living in the COVID-19 epicenter of the U.S. pandemic. It is important to note that the present

results not only demonstrate a high prevalence of depression and anxiety symptoms among our sample but also a predominance of moderate-to-severe symptoms across both disorders. Although increases in distress and psychiatric symptoms are often expected during a large-scale disaster and in its aftermath, this study documents significantly higher levels of depressive and anxiety symptom endorsement in comparison to other preliminary population-level health assessments conducted during COVID-19 (e.g., Shevlin et al., 2020). In this manner, the present study highlights one of the various mechanisms through which the outbreak may lead to such significant levels of depression and anxiety symptoms. It is plausible that the high prevalence of moderate-to-severe depression and anxiety symptoms in our urban-dwelling, marginalized student sample represents a compounding of preexisting marginalization, such as previous financial and occupational insecurity, as well as the new stressors, mortality rates, and new socioeconomic consequences that have arisen directly from the pandemic itself (Douglas et al., 2020; Karatzias et al., 2020; McGinty et al., 2020; Pfefferbaum & North, 2020; Shevlin et al., 2020; Wang et al., 2020). The accumulation of lifetime adverse experiences and stressors is a well-documented risk factor for incident and/or worsening depression and anxiety during a large-scale event such as the current pandemic (Duan & Zhu, 2020; Torales et al., 2020). Additionally, previous research has documented higher postdisaster levels of depression and anxiety in underresourced and minority populations compared to more affluent and non-Latinx White populations (Ahern & Galea, 2006; Norris & Alegria, 2005). The interactions between previous adversity, COVID-19–related stressors, and marginalization may be contributing to such increased prevalence.

Three study limitations are important to discuss. First, the COVID-19 pandemic affected areas of the United States at different times and to different degrees. Exposures and experiences related to COVID-19 among students living in New York City during the spring of the 2020 pandemic peak are not meant to be representative of the experiences within both student and general populations throughout the United States. Second, although the study was not made available to every student enrolled in the CUNY system, it was made available to students registered in at least one course across six CUNY campuses. Third, depression and anxiety symptoms were self-reported and assessed using psychometrically sound screening tools; they, therefore, provide an estimate of the burden of each disorder-related symptom cluster in the population. Diagnoses of depression and anxiety can only be made by a clinician following diagnostic evaluation.

Notwithstanding these limitations, to the best of our knowledge, this was the first study to assess the psychological impact of COVID-19 on an urban, marginalized university sample. The reported experience of COVID-19–related stressors was high in the sample studied. The marginalization and vulnerability of this population, in general, is likely only amplified in the context of COVID-19. Combined, these findings suggest

that COVID-19 may be presenting a different socioeconomic and psychological challenge than seen in the aftermath of many population-level disasters.

Of note, this study also begins to speak to the mental health challenges facing undergraduate and graduate students who attend urban public universities. Although the transition to remote learning has and will be a challenge for all institutions and students, there are particular difficulties students who come from underresourced families and communities experience (Casey, 2020; Goldstein, 2020). These include access to quiet study spaces and necessary technology to attend remote courses as well as baseline individual and family stressors above what is experienced among more affluent individuals and families. Moreover, the loss of individual and family income due to COVID-19 will likely result in many of these students postponing their academic goals due to financial constraints and competing priorities. The prevalence of depression and anxiety symptoms documented in the present study may well compound these forces and contribute to a significant impact on academic success and subsequent life trajectories for these individuals (Bauldry, 2015; Bjelland et al., 2008; Eisenberg et al., 2009).

These data tell a story of notable psychological distress and exacerbated daily stressors in the context of COVID-19. Future studies that examine the trajectories of mental health and COVID-19–related exposures are warranted. Such data have the potential to inform how universities and states direct resources to meet the needs of their most vulnerable members.

Open Practices Statement

Neither of the studies reported in this article was formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive; requests for the data or materials should be sent via email to the lead author at mrudensine@ccny.cuny.edu.

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