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Association Between Social Determinants of Health, COVID-19 Stressors, and Mental Health Among New York Residents Early in the Pandemic

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Original Research

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Abstract

Objective: The COVID-19 pandemic is a disaster event. Exposure to stressors during and after disaster events is associated with negative mental health symptoms. To inform targeted COVID-19 recovery efforts, data are needed to understand which stressors play a key role in this relationship.

Methods: Cross-sectional survey data (demographics, impacts of COVID-19, social determinants of health, depression, and anxiety) were collected online from adults living in New York state between May and June 2020. Differences in the proportion of stressors (COVID-19 and social determinants) experienced by race/ethnicity were assessed using chi-square analyses. Logistic regression was used to assess which factors were associated with increased odds of depression and anxiety.

Results: A majority ($n = 258$, 62.2%) of the 415 respondents reported being directly impacted by the pandemic. Non-white respondents reported a significantly larger proportion of stressors compared to white respondents. Under half of respondents reported depression ($n = 171$, 41.2%) and anxiety ($n = 164$, 39.5%). Healthcare and food concerns were associated with increased odds of depression and anxiety, and economic concerns were associated with increased odds of anxiety.

Conclusions: Findings underscore the need to respond to the COVID-19 mental health crisis by addressing social determinants of health.

The coronavirus disease 2019 (COVID-19) pandemic has contributed to increased rates of depression and anxiety. Through nationally representative survey and community-based research, rates of depression for US adults during the pandemic have been between 20 and 40%, compared to pre-pandemic rates of 3 to 4%.[1–5] Similarly, current prevalence rates of adult anxiety in the US are 20 to 45%, compared to pre-pandemic rates of 3 to 10%.[1–3] It is critical to understand the factors that influence mental health distress during the pandemic in order to design policies and inform clinical practice. This is the focus of the current study.

The COVID-19 pandemic is a disaster event. Disasters are defined as large-scale potentially traumatic events that impact communities.[6] Estimates of the prevalence of depression following disasters such as hurricanes and earthquakes range between 5 and 54%, whereas estimates of post-disaster anxiety are between 10 and 50%.[7–11] Individual-level factors increase risk for developing depression and anxiety symptoms post-disaster. These factors include disaster exposure, female gender, younger or older age (i.e., children and the elderly), minoritized race/ethnicity, low socioeconomic status, family instability, diminished pre-disaster functioning, a lack of psychological coping and resources, and low levels of social support.[12–21]

Despite research evaluating the relationship between disaster exposure and mental health distress, research to date has failed to consistently consider the impact of social determinants of health. This is a shortcoming, as social determinants of health are linked to mental health distress for people and communities.[22] Social determinants of health theories link social positionality, institutional processes, and policies to an unequal distribution of resources that negatively affect health.[23] Social determinants of health include inequitable contextual and environmental conditions such as poverty, unemployment, housing insecurity, discrimination, racism, neighborhood violence.[16,22,24–26] These stressors cumulatively and uniquely impact people and communities. For example, daily stressors associated with racism, food insecurity, and housing concerns cumulatively contribute to an increased risk for mental health distress.[22] The inequities

perpetuated by social determinants of health also have intergenerational effects given that stressor exposure is linked to factors such as parental stress and community cohesion.[9,27]

To develop a more comprehensive understanding of the COVID-19 pandemic's impact, evaluations of both individual risk factors and social determinants of health, and their impact on mental health, are needed. Individual risk factors including gender identity and personality characteristics have been associated with an increased risk for developing post-traumatic stress due to exposure to pandemic-related stressors.[28] Additionally, communities of color and low-income communities have experienced disparate negative effects of the pandemic such as high infection and mortality rates, housing and financial insecurity, and unemployment.[13–15]

This paper addresses this gap in the disaster literature by integrating individual risk research with a public health framework to evaluate how contextual factors related to social determinants of health impact individual depression and anxiety symptoms. To guide pandemic-related federal and local aid, more data are needed to understand how stressor exposure differs due to individual and contextual factors. It is unclear which COVID-related stressors or components of social determinants of health are key drivers of the relationship between disaster exposure and mental health.

The current study investigated which COVID-19 and social determinants of health-related stressors were reported within an adult sample, to what degree stressors differed by respondent race/ethnicity, and which stressors were associated with increased odds of depression and anxiety. We expected that ethnically and/or racially minoritized respondents would report a significantly larger proportion of stressors compared to white respondents, and that the presence of COVID-19 and social determinants of health-related stressors would be associated with higher odds of depression and anxiety.

Methods

Participants and Procedures

This study was reviewed and approved as Exempt by the Institutional Review Board at [omitted for review]. Using quotas, a purposive sample of adults (18+ years) residing in New York state with increased risk for COVID-19 was recruited online between May and June 2020 by Qualtrics.[29] The goal was to recruit approximately 500 participants. The New York City metropolitan area was excluded because the experience and context differed from the rest of the state due to its population density and the impact of the early pandemic surge in COVID-19 cases on infrastructure including health care.[30–32] The 415 participants were classified into four quotas with target sample proportions: Black or African American (50%), Hispanic (50%), 2019 income below $25,000 or high school education or less (50%), and male (50%). Participants consented to participating before completing the survey. Survey participants were required to answer all questions, consistent with Qualtrics recommendations for survey panels. Poor quality responses (e.g., straight lining, gibberish, and nonsense answers) were removed.[33]

Demographics (gender identity, 2019 income, age, education, and race/ethnicity), COVID-19 impacts, social determinants of health, and mental health were self-reported. COVID-19 impact questions were adapted from the National Institute of Environmental Health Sciences Disaster Research Response COVID-19 initiative, the PhenX Toolkit COVID-19 Protocol Library, and the COVID-19 and Social Determinants of Health Instrument Repository.[34–37] Early in the pandemic, these were the best available sources of questions to support replication and consistency across studies and facilitate rapid data collection efforts.

COVID-19-related stressors

Pandemic-related stressors assessed included participant health risk, direct impacts of the COVID-19 pandemic (direct impacts), and COVID-19's impact on the respondent (self-impacts). Health risk was assessed by asking participants about 1) whether they experienced at least one of the following pre-existing health concerns: cancer, chronic respiratory disease like asthma or chronic obstructive pulmonary disease, hypertension or high blood pressure, heart disease, cerebrovascular disease, gastrointestinal disease, rheumatoid disorder, diabetes, or other health disorder; 2) whether they were above 65 years; and 3) whether they were an essential worker (e.g., health care and grocery workers). Participants were classified as having health risk during the pandemic if they endorsed any of these three conditions.

Direct COVID-19 impacts were assessed by summing dichotomous (yes/no) responses to the following questions: the respondent 1) knew someone who tested positive for COVID-19, 2) knew someone who was quarantined, 3) knew someone who had been hospitalized, or 4) knew someone who died due to COVID-19. Self-impacts were assessed by summing variables indicating whether respondents had 1) tested positive, 2) quarantined, or 3) been hospitalized due to COVID-19 (yes/no). Direct and self-impacts were summed to indicate whether the respondent experienced 0 to 4 and 0 to 3 impacts, respectively, and coded dichotomously to indicate presence of at least one direct or self-impact.

Social determinants of health-related stressors

Economic concerns were assessed by asking participants whether they experienced 1) reduced work due to job loss, furlough, or reduced hours using a yes/no response scale, and concerns about 2) job security, 3) debt, 4) affording mortgage or rent, and 5) retirement or savings, using a 4-point Likert scale (never, sometimes, most of the time, always). For each of the 4 economic concerns answered using the Likert scale, participants were classified as never or ever (sometimes, most of the time, always) concerned. Economic concerns were summed to indicate whether the respondent experienced 0 to 5 stressors and were also coded dichotomously to indicate presence of at least one economic stressor.

Food and childcare concerns were evaluated using a 4-point Likert scale (never, sometimes, most of the time, always) to assess how often respondents were concerned about 1) being able to afford enough food, 2) finding the foods their household wanted or needed, 3) finding quality foods, 4) not being able to get food through a food pantry, 5) not being able to get meals through a community meal program, and 6) childcare access.[38] For each concern, participants were classified as never or ever (sometimes, most of the time, always) concerned. Food concerns were summed to indicate whether the respondent experienced 0 to 5 concerns and were also coded dichotomously to indicate presence of at least one stressor. Childcare concerns were assessed dichotomously to capture whether respondents never or sometimes, most of the time, or always experienced concerns.

Healthcare concerns assessed included 1) health insurance (insured or uninsured), 2) concerns about health care access during

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the pandemic (never, sometimes, most of the time, always), and 3) concerns about medical expenses during the pandemic (never, sometimes, most of the time, always). Participants were classified as never or ever (sometimes, most of the time, always) concerned about health care access and medical expenses. Healthcare concerns were summed to indicate whether the respondent experienced 0 to 3 health care-related stressors and were also coded dichotomously to indicate presence of at least one stressor.

Mental health

Depression was assessed using the Patient Health Questionnaire-2 (PHQ-2), a validated screener for Major Depressive Disorder. Items assessed loss of interest or pleasure and feeling down or depressed. Anxiety symptoms were assessed using the Generalized Anxiety Disorder-2 (GAD-2), a validated screener for Generalized Anxiety Disorder.[39] Questions asked about feelings of nervousness, anxiety, and not being able to control or stop worrying. All questions were answered on a 4-point Likert scale ("Not at all"= 0; "Several days"= 1; "More than half the days"= 2; "Nearly every day"= 3). Potential scores for each screen ranged from 0 to 6. Scores for each screen were summed, and a cut point of 3 was used to identify cases with likely anxiety (86% sensitivity, 83% specificity)[38] or depression (83% sensitivity, 92% specificity).[40]

Statistical Analysis

Analyses were conducted with SPSS Statistics (Version 27). Descriptive statistics for demographics (gender identity, income, age, and education) were calculated. Next, chi-square analyses evaluated racial/ethnic differences (non-Hispanic white vs. Hispanic vs. non-Hispanic/ non-white) in COVID-19 impacts, social determinants of health-related stressors (concerns about economics, health care, food, child care), and mental health (depression and anxiety). Chi-square analyses also evaluated differences in COVID-19 impacts and social determinants of health-related stressors by categorical mental health outcomes. Two simultaneous logistic regression analyses assessed the association between COVID-19 impacts and social determinants of health-related stressors and depression and anxiety. Within the models, COVID-19 health risk, direct impacts, and self-impacts, as well as economic concerns, health care concerns, and food concerns, were evaluated continuously. Race/ethnicity and gender identity were dummy coded with non-Hispanic white and males as the identified groups, respectively, given evidence suggesting that non-white individuals and non-cisgender males are at higher risk for developing anxiety and depression.[41] Analyses were assessed using an alpha level of 0.05.

Results

Sample Characteristics (Table 1)

A total of 415 people completed the full survey with quality responses. Respondents identified as non-Hispanic white (n = 90, 21.7%), Hispanic (n = 182, 43.9%), and non-Hispanic/non-white (n = 143, 34.5%). A majority (n = 230, 55.4%) of respondents identified as non-male (female: n = 230, 55.4%; other gender: n = 5, 1.3%), whereas 43.4% (n = 180) identified as male. The most commonly reported household income (n = 106, 25.5%) was between $25,000 and $49,000. The largest proportion of those in the lowest income bracket were Hispanic (n = 42, 56.8%), compared to non-Hispanic white (n = 4, 5.4%) and non-Hispanic/non-white (n = 28, 37.8%; p =.002). A majority of the sample was below the age of 44 (n = 128, 30.8%, ages 18-24, and n = 155, 37.4%, ages 25-44). Non-Hispanic white participants had the largest proportion of ages 65+ (n = 27, 61.4%) compared to Hispanic (n = 7, 15.9%) and non-Hispanic/non-white respondents (n = 10, 22.7%; p <.001). Under half of respondents (n = 126, 30.4%) reported earning a bachelor's or graduate degree, whereas 31.6% (n = 131) reported a high school or less than a high school education.

COVID-19 and Social Determinants of Health-Related Stressors by Race/Ethnicity (Table 2)

Over half (n = 258, 62.2%) of the sample (N = 415) reported direct COVID-19 impacts, whereas 20.2% (n = 84) reported self-impacts. Over half (n = 264, 63.3%) reported health risks for COVID-19 due to a health condition (n = 147, 35.4%), older age (n = 44, 10.6%), or being an essential worker (n = 151, 36.4%). The most frequently reported stressors included concerns about finding wanted or needed food (n = 296, 71.3%), finding the quality of food that was needed (n = 292, 70.4%), health care access (n = 276, 66.5%), job security (n = 269, 64.8%), and debt (n = 269, 64.8%). Of the 208 respondents who indicated having at least one child under the age of 18, 59.1% (n = 123) reported childcare concerns. Hispanic and non-Hispanic/non-white respondents reported a significantly larger proportion of stressors compared to non-Hispanic white respondents across all COVID-19 impacts and social determinants of health stressor categories. No significant differences emerged in rates of depression or anxiety across racial/ethnic groups.

COVID-19 Stressors, Social Determinants of Health-Related Stressors, and Mental Health Symptoms (Table 3)

A total of 132 (31.8%) respondents reported symptoms of depression, 164 (39.5%) reported symptoms of anxiety, and 132 (31.8%) reported both. A significantly larger proportion of respondents who reported depression reported direct COVID-19 impacts and concerns about job security, debt, mortgage/rent payments, retirement, health care access, medical expenses, affording food, accessing as much food as wanted/needed, accessing quality food, accessing food pantries, and accessing community meals, compared to respondents who did not report depression symptoms. A significantly larger proportion of respondents with anxiety reported direct COVID-19 impacts and concerns about reduced work, job security, debt, mortgage/rent payments, retirement, health care access, medical expenses, affording food, accessing as much food as wanted/needed, accessing quality food, accessing food pantries, and accessing community meals, compared to respondents who did not report anxiety symptoms.

COVID-19 and Social Determinants of Health-Related Stressors Associated with Depression and Anxiety (Table 4)

Healthcare concerns were significantly associated with depression and anxiety (depression: odds ratio [OR] = 1.42, 95% confidence interval [CI] = 1.08-1.90; anxiety: OR = 1.43, 95% CI = 1.08-1.90). Food concerns were significantly associated with depression and anxiety (depression: OR = 1.34, 95% CI = 1.15–1.55; anxiety: OR = 1.31, 95% CI = 1.12–1.52). Economic concerns were significantly associated with anxiety only (OR = 1.20, 95% CI = 1.02–1.41; Table 3). Non-male gender identity (female and other) was significantly associated with higher odds of depression and anxiety (depression: 1.99, 95% CI = 1.28-3.11; anxiety: 2.06, 95% CI = 1.31–3.27).

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Table 1. Sample demographics of New York state residents with completed measures in May to June 2020 by race/ethnicity (N = 415)

	Total (N = 415)	Non-Hispanic white[b] (n = 90)	Hispanic[c] (n = 182)	Non-white/ non-Hispanic[d] (n = 143)
	N (%)	n (%)	n (%)	n (%)
Gender identity				
Female	230 (55.4)	31 (13.5)	124 (53.9)	75 (32.6)
Male	180 (43.4)	59 (32.8)	57 (31.7)	64 (35.6)
Other[a]	5 (1.2)	0 (0.0)	1 (20.0)	4 (80.0) ***
Income (2019)				
<$13,000	74 (17.8)	4 (5.4)	42 (56.8)	28 (37.8) **
$13,000–$24,999	74 (17.8)	14 (18.9)	29 (39.2)	31 (41.9)
$25,000–$49,999	106 (25.5)	22 (20.8)	44 (41.5)	40 (37.7)
$50,000–$74,999	63 (15.2)	21 (33.3)	27 (42.9)	15 (23.8)
$75,000+	98 (23.6)	29 (29.6)	40 (40.8)	29 (29.6)
Age (years)				
18–24	128 (30.8)	12 (9.4)	65 (50.8)	51 (39.8)
25–44	155 (37.3)	29 (18.7)	71 (45.8)	55 (35.5)
45–64	88 (21.2)	22 (25.0)	39 (44.3)	27 (30.7)
65+	44 (10.6)	27 (61.4)	7 (15.9)	10 (22.7) ***
Education				
High school or less	131 (31.6)	27 (20.6)	64 (48.9)	40 (30.5)
Some college, associate, or technical education	158 (38.1)	27 (17.1)	75 (47.5)	56 (35.4)
Bachelor's or graduate degree	126 (30.4)	36 (28.6)	43 (34.1)	47 (37.3)

Note: Chi-square tests of independence compared the proportion of non-Hispanic white, Hispanic, and non-white/non-Hispanic respondents represented in each demographic category.
*p<.05; **p<.01; ***p<.001.
[a]Gender identity response options included male, female, transgender, non-binary, and other.
[b]A total of 90 participants (21.7%) reported non-Hispanic white race/ethnicity.
[c]Hispanic respondents (n = 182) reported the following races: white (n = 52, 39.0%), Black/African American (n = 55, 30.2%), other races (n = 52, 28.6%), and Asian or Pacific Islander (n = 14, 7.7%).
[d]Non-white/non-Hispanic respondents (n = 143) identified their race as Black or African American (n = 129, 90.2%), Asian or Pacific Islander (n = 8, 5.6%), and other (n = 6, 4.2%).

Discussion

This study evaluated the association between COVID-19 impacts, social determinants of health, and symptoms of depression and anxiety among adults during the initial months of the pandemic. Findings indicate that pandemic and social determinants of health-related stressors were associated with increased odds of depression and anxiety. Non-male gender identity and health care, food, and economic concerns were associated with increased odds of mental health symptoms. These findings align with the social and economic realities of the pandemic, including an overburdened global health care system,[42] food supply chain disruptions,[43] and economic turmoil and job loss.[44]

Due to the pandemic and its economic and psychological burden on the health care system and workers, people seeking out non–COVID-19 related health care have experienced negative effects on care, including delays in treatment and medication shortages.[45,46] Regarding food insecurity, worker shortages and the closure of food production facilities[47] have led to disruptions in daily food supplies.[48] Additionally, the significant impact of the pandemic on the economy has placed millions out of work.[49] Parents and people in hospitality and service jobs have been particularly affected by unemployment.[50]

In this study, a significantly larger proportion of Hispanic and non-Hispanic/non-white respondents experienced COVID-19 and social determinants of health-related stressors compared to non-Hispanic white respondents. These findings are consistent with data indicating that communities of color are disproportionately negatively affected by disaster events[51] including the COVID-19 pandemic.[52,53] Data have indicated that in the United States, Black and Hispanic adults have been more likely to both test positive for COVID-19 and die from the virus.[54,55] Black and Hispanic adults have also been found to be experiencing depression, suicidal ideation, and substance use at significantly higher rates than white adults during the pandemic.[56] These findings underscore the importance of assessing how structural inequalities and individual-level risk and resilience factors impact the immediate and long-term physical and mental health of communities of color within the context of disaster events.[54,55,57,58]

Although Hispanic and non-Hispanic/non-white respondents reported a larger proportion of stressors, they did not report higher proportions of depression and anxiety compared to non-Hispanic white respondents. In addition, minoritized race/ethnicity was not associated with increased odds of depression or anxiety. These findings may be consistent with research indicating that immigrants, including Hispanic immigrants, demonstrate

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Table 2. COVID-19 and social determinants of health-related stressors and mental health by race/ethnicity (*N* = 415)

	Total (*N* = 415)	White, non-Hispanic (*n* = 90)	Hispanic (*n* = 182)	Non-white/ non-Hispanic (*n* = 143)
	N (%)	*n* (%)	*n* (%)	*n* (%)
COVID–19 stressors				
Health risk	264 (63.3)	65 (24.6)	100 (37.9)	99 (37.5) **
Direct impacts	258 (62.2)	34 (13.2)	122 (47.3)	102 (39.5) ***
Self–impacts	84 (20.2)	12 (14.3)	33 (39.3)	39 (46.4) *
Economic concerns				
Reduced work	169 (40.7)	26 (15.4)	87 (51.5)	56 (33.1) *
Job security	269 (64.8)	43 (16.0)	128 (47.6)	98 (36.4) **
Debt	269 (64.8)	46 (17.1)	132 (49.1)	91 (33.8) **
Mortgage or rent	265 (63.9)	37 (14.0)	133 (50.2)	95 (35.8) ***
Retirement or savings	234 (56.4)	50 (21.4)	107 (45.7)	77 (32.9)
Healthcare concerns				
Medical insurance	49 (11.8)	10 (20.4)	23 (46.9)	16 (32.7)
Healthcare access	276 (66.5)	51 (18.5)	132 (47.8)	93 (33.7) *
Medical expenses	256 (61.7)	38 (14.8)	123 (48.0)	95 (37.1) ***
Food concerns				
Afford enough	221 (53.3)	34 (15.4)	110 (49.8)	77 (34.8) **
Find wanted/needed	296 (71.3)	58 (19.6)	137 (46.3)	101 (34.1)
Find quality	292 (70.4)	59 (20.2)	132 (45.2)	101 (34.6)
Pantry access	155 (37.3)	24 (15.5)	74 (47.7)	57 (36.8)
Community food access	132 (31.8)	15 (11.4)	64 (48.5)	53 (40.2) **
Family concerns				
Childcare concerns[a]	123 (59.1)	16 (13.0)	52 (42.3)	55 (44.7) *
Mental health				
Depression	171 (41.2)	33 (19.3)	80 (46.8)	58 (33.9)
Anxiety	164 (39.5)	31 (18.9)	84 (51.2)	49 (29.9)

Note: Chi-square tests of independence compared the proportion of non-Hispanic white, Hispanic, and non-white/non-Hispanic respondents represented in each COVID-19 impact, social determinant of health, or mental health category.
* $p<.05$, ** $p<.01$, *** $p<.001$.
[a]Includes the 208 respondents who indicated having at least 1 child under the age of 18 in the home.

fewer clinically significant mental health problems compared to non-immigrant adults due to the protective factors of family collectivism, social support, and religiosity.[59] Given that the current study did not ask respondents to indicate whether they identified as immigrants, future studies that include questions about immigrant identification would aid in further evaluating this issue.

Limitations

Although this study has many strengths, including sample diversity and survey timing, several limitations should be considered. The study focused on a restricted geographic area, which limits the generalizability of findings. In addition, the COVID-19 stressor measure was not validated due to the timing of data collection. Thus, formal scale evaluation was not conducted to ensure that measures captured the intended domains within the targeted population. Nevertheless, the timeliness of the data is important, given the assessment of early impacts of the pandemic. Finally, due to the number of comparisons made in analyzing the data, the risk for Type I error (falsely rejecting the null hypothesis) was elevated.

Conclusion

The current study found that COVID-19 had significant direct and indirect impacts on individuals even early on in the pandemic, with concerns about food, health care access, job security, and debt being the most frequently reported stressors. Depression and anxiety symptoms were prevalent among participants, with health care and food concerns being significantly associated with both depression and anxiety. In sum, both social determinants of health and COVID-19 stressor exposure were shown to negatively impact individual mental health. In the United States, the mental health needs of the population continue to be inadequately addressed.[60,61] Researchers, policy-makers, and health care providers must take

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Table 3. COVID-19 and social determinants of health-related stressors and mental health (*N* = 415)

	Total (*N* = 415)	Depression (*n* = 171)	No depression (*n* = 244)	Anxiety (*n* = 164)	No anxiety (*n* = 251)
	N (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
COVID–19 stressors					
Health risk	264 (63.3)	106 (62.0)	158 (64.8)	106 (64.6)	158 (59.8)
Direct impact	258 (62.2)	116 (67.8)	142 (58.2) *	112 (68.3)	146 (58.2) *
Self–impact	84 (20.2)	42 (24.6)	42 (17.2)	37 (22.6)	47 (18.7)
Economic concerns					
Reduced work	169 (40.7)	79 (46.2)	90 (36.9)	83 (50.6)	86 (34.3) **
Job security	269 (64.8)	128 (74.9)	141 (57.8) ***	123 (75.0)	146 (58.2) ***
Debt	269 (64.8)	127 (74.3)	142 (58.2) **	128 (78.0)	141 (52.6) ***
Mortgage or rent	265 (63.9)	130 (76.0)	135 (55.3) ***	128 (78.0)	137 (54.6) ***
Retirement or savings	234 (56.4)	112 (65.5)	122 (50.0) **	111 (67.7)	123 (49.0)
Healthcare concerns					
Medical insurance	49 (11.8)	27 (11.1)	22 (12.9)	18 (11.0)	31 (12.4)
Healthcare access	276 (66.5)	134 (78.4)	142 (58.2) ***	139 (84.8)	137 (54.6) ***
Medical expenses	256 (61.7)	130 (76.0)	126 (51.6) ***	123 (75.0)	133 (53.0) ***
Food concerns					
Afford enough	221 (53.3)	114 (66.7)	107 (43.9) ***	115 (70.1)	106 (42.2) ***
Find wanted/needed	296 (71.3)	140 (81.9)	156 (63.9) ***	134 (81.7)	162 (64.5) ***
Find quality	292 (70.4)	140 (81.9)	152 (62.3) ***	135 (82.3)	157 (62.5) ***
Pantry access	155 (37.3)	87 (50.9)	68 (27.9) ***	82 (50.0)	73 (29.1) ***
Community food access	132 (31.8)	71 (41.5)	61 (25.0) ***	70 (42.7)	62 (24.7) ***
Family concerns					
Childcare concerns[a]	123 (59.1)	70 (66.0)	53 (52.0) *	60 (55.0)	63 (63.6)

Note: Chi-square tests of independence compared the proportion of respondents with versus without depression and anxiety in each COVID-19 impact and social determinant of health category. *p<.05, **p<.01, ***p<.001.
[a]Includes the 208 respondents who indicated having at least 1 child under the age of 18 in the home; total *N* with anxiety = 99; total *N* without anxiety = 99; total *N* with depression = 102; total *N* without depression = 106.

Table 4. COVID-19 and social determinants of health-related stressors associated with depression and anxiety (*N* = 415)

	Depression model		Anxiety model	
Factors[a]	OR	95% CI [*P*-value]	OR	95% CI [*P*-value]
Health risk	0.77	0.57, 1.04 [.08]	0.90	0.67, 1.23 [.51]
Direct impacts	1.20	0.73, 2.00 [.48]	1.28	0.78, 2.11 [.33]
Self-impacts	1.36	0.79, 2.34 [.27]	1.02	0.59, 1.77 [.94]
Economic concerns	1.08	0.92, 1.27 [.36]	1.20	1.02, 1.41 [.03]
Healthcare concerns	1.42	1.08, 1.90 [.01]	1.43	1.08, 1.90 [.01]
Food concerns	1.34	1.15, 1.55 [<.001]	1.31	1.12, 1.52 [.001]
Non-male	1.99	1.28, 3.11 [.002]	2.06	1.31, 3.27 [.002]
Non-white	0.62	0.36, 1.14 [.13]	0.65	0.36, 1.16 [.14]

Note: Two simultaneous logistic regression analyses were run (one depression model and one anxiety model).
[a]Health risk (range: 0-3); direct impacts (range: 0-4); self-impacts (range: 0-3); economic concerns (range: 0-5); healthcare concerns (range: 0-3); food concerns (range: 0-5); non-male (male vs. non-male [female and other]); race/ethnicity (non-Hispanic white vs. other).

individual and structural approaches to tailoring mental health care to the needs of the population in the aftermath of the pandemic. Institutional resources, such as community health centers and schools, may be key to supporting the mental health of people and communities affected by the pandemic.

Competing interest. The authors declare none.

Author contribution. The authors confirm contribution to the paper as follows: study conception and design: LC; data collection: LC; analysis and interpretation of results: LC, BSL, ARN; SSA; draft manuscript preparation: ARN, LC, BSL, SSA. All authors reviewed the results and approved the final version of the manuscript.

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