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## Research paper

# Distress in the time of COVID-19: Understanding the distinction between COVID-19 specific mental distress and depression among United States adults



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## A B S T R A C T

**Background:** During the COVID-19 pandemic, many Americans have experienced mental distress, which may be partially characterized by a rise in mental illnesses. However, COVID-19 specific psychological distress may also be separate from diagnosable conditions, a distinction that has not been well established in the context of the pandemic.

**Methods:** Data came from an online survey of US adults collected in March 2020. We used factor analysis to assess the relationship between COVID-19 related mental distress and depressive symptoms. Using four questions on psychological distress modified for COVID-19 and eight depressive symptoms, we conducted an exploratory factor analysis (EFA) to identify the factor structure and then estimated a confirmatory factor analysis (CFA).

**Results:** The EFA model indicated a two-factor solution, where the COVID-19 distress items loaded onto the first factor and depression items loaded onto the second. Only two items cross-loaded between factors: feeling fearful and being bothered by things that do not usually bother the participant. The CFA indicated that this factor structure fit the data adequately (RMSEA=0.106, SRMR=0.046, CFI=0.915, TLI=0.890).

**Limitations:** It is possible that there are additional important symptoms of COVID-19 distress that were not included. Depression symptoms were measured via the CES-D-10, which while validated is not equivalent to a clinician diagnosis.

**Conclusions:** As COVID-19 related mental distress appears to be distinct from, though related to, depression, public health responses must consider what aspects of depression treatment may apply to this phenomenon. For COVID-related distress, it may be more appropriate to treat symptomatically and with supportive psychotherapy.

## 1. Introduction

The COVID-19 pandemic has had significant consequences for the mental health and wellness of adults in the United States. COVID-19 has created many stressors which can negatively impact mental health such as social isolation, fears of death and illness, as well as disruptions of normal routines (i.e., school, work) (Talevi et al., 2020; Torales et al., 2020). One common impact of the pandemic has been psychological distress, which is defined as emotional suffering that is not a result of a specific mental health disorder and can involve a range of somatic, mood, and anxiety symptoms (Drapeau et al., 2012). Economic stress due to lost income and unemployment can further compound the psychological impact of the pandemic (Talevi et al., 2020). Grief at the loss of family or friends and difficult family dynamics and relationship breakdown are further examples of stressors that deeply impact people's

mental health (Holmes et al., 2020). Furthermore, evidence suggests that those with pre-existing mental health issues face greater struggles with social isolation and loneliness, increasing anxiety disorders, Major Depressive Disorder (MDD), and the risk of self-harm; additionally, pre-existing mental health issues can be further exacerbated by difficulty accessing mental health services due to pandemic restrictions (Elovainio et al., 2017; Holmes et al., 2020).

The mental health impact due to stress related to the COVID-19 pandemic requires a strong understanding of the nature of this distress. While there is substantial literature on the difference and overlap of psychological distress, depression, and anxiety (Eysenck and Fajkowska, 2018; Kendall and Watson, 1989), to date, little research has specifically differentiated mental health disorders from normative mental distress as a reaction to the COVID-19 pandemic. Most studies of the mental health response to COVID-19 have focused on anxiety and

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depressive disorders specifically, including post-traumatic stress disorder (PTSD), while fewer have addressed more generalized and non-pathological distress (i.e., distress that does not meet criteria for a specific disorder) (Vindegaard and Benros, 2020; Xiong et al., 2020). Across studies, rates of anxiety disorders, MDD, PTSD, and distress have been alarmingly high during the pandemic, with estimates as high as one-half of the general population experiencing symptoms of anxiety or depression (Xiong et al., 2020).

It is essential for the public mental health response to the pandemic to distinguish between mental health disorders and more normative experiential distress related to COVID-19, as these different phenomena may require distinct screening tools, treatments, and support services. MDD is a psychiatric disorder that is treated with psychological and pharmacological supports that often draw from cognitive behavioral principle and the monoamine hypothesis, respectively (Cuijpers et al., 2008; Dale et al., 2015; Hirschfeld, 2000). Alternatively, psychological distress can be a normative response to a stressor when it is a transient phenomenon and can lead to problem solving and other adaptive coping mechanisms (Drapeau et al., 2012). However, it can be deleterious when a person exhibits maladaptive coping strategies like alcohol and drug use or develops psychiatric symptoms as a result of this distress. Treatment for psychological distress often draws from the stress-distress model and works to address the symptoms of distress and the stressors (Drapeau et al., 2012).

While there are studies that have included both measures of disorders and pandemic related psychological distress (Qiu et al., 2020; Zhang et al., 2020), there have not been any studies, to our knowledge, that explore the interrelationships and distinctions between these constructs among the general US adult population. In the present study, we explore how COVID-19 specific psychological distress and depression are distinct yet related in a sample of US adults.

## 2. Methods

### 2.1. Data Source

Data for this study were from an online survey conducted via Amazon Mechanical Turk (MTurk) between March 24 and 27, 2020. This survey coincided with the point of the COVID-19 pandemic where states were beginning to issue their first round of shutdown orders. Existing research on disaster mental health indicates that distress typically peaks early on during such an event (often referred to as peri-traumatic distress) (Vance, et al., 2018). Though this finding has yet to be replicated in the context of the COVID-19 pandemic (Daly and Robinson, 2021), the existing disaster mental health research suggests that this survey is well timed to capture peak levels of mental distress.

MTurk sample are generally more representative of the population than convenience samples, though still not nationally representative (Berinsky et al., 2012; Follmer et al., 2017; Huff and Tingley, 2015). Participants had to be at least 18 years of age, live in the United States, be able to speak/read English, and have heard of the coronavirus (COVID-19). The analytic sample included 806 surveys from respondents who passed all attention and validity checks (two transgender participants also removed due to small sample size). This study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

### 2.2. Measures

**COVID-19 Related Psychological Distress.** We asked participants five questions about mental health symptoms they were experiencing specifically related to the COVID-19 pandemic, rated on a 5-point scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). The questions were as follows: “I have had a hard time sleeping because of the coronavirus,” “I have had difficulties concentrating because of the coronavirus,” “Thinking about the coronavirus makes me

anxious,” “I am feeling overwhelmed by the coronavirus,” and “I am using drugs, alcohol, or medications more because I am worried about the coronavirus.” The survey items were selected with care based on some of the most common symptoms that occur in the wake of a disaster based on existing literature. The distress symptoms included in this study have been documented in a variety of populations (Morganstein and Ursano, 2020; Vindegaard and Benros, 2020). Our approach of asking participants to self-identify causes of distress is consistent with other measures of distress in the field that have been utilized in a range of populations such as the Impact of Event Scale-Revised (IES-R).

**Depression.** Depression was measured using the Center for Epidemiological Studies Depression Scale (CES-D-10) (Andresen et al., 1994). The CES-D-10 is a ten-item instrument where respondents rate how frequently in the past week they experienced each symptom on a four-point scale (rarely/none of the time, some or a little of the time, occasionally/a moderate amount of the time, all of the time). The symptoms measured by the CES-D include being bothered by things that usually do not bother the participant, trouble concentrating, feeling depressed, feeling like everything was an effort, feeling hopeful about the future, feeling fearful, having restless sleep, anhedonia, loneliness, and being unable to get going. We also created a binary indicator for probable MDD using a cutoff score of 15, as it is the most balanced combination of sensitivity and specificity (Björngvinsson et al., 2013).

**Sociodemographic Characteristics.** Participants reported their age (in years), sex (male/female), education level (categorized as high school equivalent or less/some college/Bachelor’s degree or higher), race (categorized as white/Black/other), income level (<\$15,000, \$15–35,000, \$35–60,000, \$60–90,000, \$90,000 or more), whether anyone over the age of 70 lived in their household (yes/no), and if any children live in their household (yes/no). We asked participants what size community they current live in and created a binary variable to indicate living in an urban area with a population of 100,000 or more. We also asked participants about their political ideology (liberal/moderate/conservative).

**COVID-19 Attitudes and Impacts.** We created a COVID-19 Skepticism score based on the response to three items where participants indicated how much they agreed with the following statements on a 5-item scale (1=strongly disagree, 2=disagree, 3=neither, 4=agree, 5=strongly agree): “The coronavirus isn’t any worse than the flu,” “The health risks from the coronavirus have been exaggerated,” and “The coronavirus is a hoax.” We averaged participant responses (range: 1–5) creating a score where higher values indicate more skepticism. Participants also reported how frequently they watched the news (once per day or less, multiple times a day, hourly or more), if their income had been reduced due to COVID-19 (not at all, a little, a lot), and if they were required to work outside the home (yes/no).

**Health.** We asked participants to rate their own health status (excellent, good, fair, poor). Participants also reported if they had a respiratory condition (yes/no) and if they had health insurance (yes/no). We also asked participants if they believed that they could get excellent medical care if they were to become infected with COVID-19 (strongly agree, agree, neither, disagree, strongly disagree).

### 2.3. Analysis

We first explored the associations between COVID-19 psychological distress symptoms using polychoric correlations. We then used exploratory factor analysis (iterative principal factor method, promax rotation) to understand the relationships of the COVID-19 psychological distress and depressive symptoms. As the COVID-19 psychological distress item about alcohol and drugs had low associations with other variables, it was removed from the factor analysis procedure. We also removed two CES-D-10 items (sleep and concentration) as they violated the conditional independence assumption of factor analysis due to their shared definitions with the COVID-19 psychological distress symptoms. We then used confirmatory factor analysis to assess if the structure

suggested by the exploratory factor analysis fit the data well. Finally, we used linear regression to assess the association between sociodemographic characteristics, COVID-19 attitudes/impacts, and health variables and the COVID-19 psychological distress factor scores. Variables that had significant associations with factors scores in bivariable models were retained in the multivariable model. Analyses were conducted using Stata 14 and Mplus8 (Muthén and Muthén, 1998-2017; StataCorp, 2015).

### 3. Results

The average participant age was 38.2 (SD=11.5; Table 1). Slightly more than half were female (55.5%) and had a bachelor's degree or higher (55.0%). Most participants were white (78.2%). Income levels varied, with \$35-60,000 being the most prevalent (27.9%). Just over half (54.3%) lived in an urban area. Few had people over 70 living in their household (7.6%) and about one third (37.7%) had children in their household. About half identified as politically liberal (52.3%) and one quarter (27.7%) were conservative. The average COVID-19

skepticism score was 1.71 (SD=0.77). Most watched the news either multiple times a day (45.8%) or hourly or more (37.6%). Half (49.3%) had not had their income reduced by COVID-19, while one third (32.8%) had it reduced a little and 18.0% had it reduced a lot. About one quarter (27.7%) were required to work outside their home. Most had health insurance (82.4%). The majority rated their health as good (61.5%). One tenth (9.4%) had a respiratory condition. Beliefs about the availability of excellent medical care varied.

The distribution of COVID-19 related psychological distress symptoms varied by item (Table 2). Using alcohol and drugs was the rarest symptom, with only 7.1% agreeing and 2.4% strongly agreeing. Anxiety was the most common symptom, with 40.8% and 16.6% agreeing and strongly agreeing, respectively. All items, except using alcohol and drugs, correlated highly with each other (0.69 or higher). Using alcohol and drugs had low correlations with other COVID-19 related psychological distress symptoms (0.36 or lower). A minority the sample met the CES-D-10 threshold for MDD (17.9%). The distribution of CES-D-10 item responses varied (Table 3), though most items had moderate to strong correlations with each other.

The exploratory factor analysis procedure (Appendix 1) indicated that the items had a two-factor structure where the COVID-19 psychological distress questions loaded onto one factor and the CES-D-10 items loaded onto the other, the factors were correlated, and two CES-D-10 items cross-loaded onto the COVID-19 psychological distress factor (feeling fearful and being bothered by things that do not usually bother the participant). We then estimated a confirmatory factor analysis model with this structure (Fig. 1). The model fit the data adequately well based on the following fit statistics: RMSEA=0.11, CFI=0.915, TFI=0.890, SRMR=0.046.

In adjusted analyses (Table 4), COVID-19 psychological distress factor scores were higher among female participants than males ( $\beta=0.26$ , 95% CI: 0.15, 0.36). Participants who met CES-D-10 criteria for MDD had higher levels of psychological distress than those who did not ( $\beta=1.01$ , 95% CI: 0.86, 1.15). COVID-19 skepticism was inversely associated with psychological distress ( $\beta=-0.21$ , 95% CI: -0.28, -0.14).

**Table 1**  
Sample characteristics.

	N (%)
<b>Sociodemographic Characteristics</b>	
Age, M(SD)	38.2 (11.5)
Sex	
Female	447 (55.5)
Male	359 (44.5)
Education	
High school or less	96 (11.9)
Some college	267 (33.1)
Bachelor's Degree or higher	443 (55.0)
Race	
White	630 (78.2)
Black	59 (7.3)
Other	117 (14.5)
Income	
Less than \$15,000	67 (8.3)
\$15-35,000	157 (19.5)
\$35-60,000	225 (27.9)
\$60-90,000	194 (24.1)
\$90,000 or more	163 (20.2)
Live in an Urban Area	438 (54.3)
People over 70 in household	61 (7.6)
Children in household	304 (37.7)
Political Alignment	
Liberal	418 (52.3)
Moderate	160 (20.0)
Conservative	221 (27.7)
COVID-19 Attitudes and Impacts	
COVID-19 Skepticism, M (SD)	1.71 (0.77)
Frequency of Watching the News	
Once a day or less	134 (16.6)
Multiple times a day	369 (45.8)
Hourly or more	303 (37.6)
Income reduced due to COVID	
Not at all	397 (49.3)
A little	264 (32.8)
A lot	145 (18.0)
Required to work outside the home	223 (27.7)
Health	
Has health insurance	664 (82.4)
Self-rated health status	
Excellent	146 (18.1)
Good	496 (61.5)
Fair	146 (18.1)
Poor	18 (2.2)
Has a respiratory condition	76 (9.4)
Able to get excellent medical care	
Strongly Agree	67 (8.3)
Agree	277 (34.4)
Neither	270 (33.5)
Disagree	127 (15.8)
Strongly Disagree	65 (8.1)

**Table 2**  
COVID-19 related mental distress.

	N (%)	Correlations			
		1	2	3	4
<b>1. Sleep</b>					
Strongly Disagree	202 (25.1)	-	-	-	-
Disagree	278 (34.5)				
Neither	134 (16.6)				
Agree	128 (15.9)				
Strongly Agree	64 (7.9)				
<b>2. Concentration</b>					
Strongly Disagree	179 (22.2)	0.81	-	-	-
Disagree	265 (32.9)				
Neither	115 (14.3)				
Agree	196 (24.3)				
Strongly Agree	51 (6.3)				
<b>3. Anxiety</b>					
Strongly Disagree	81 (10.1)	0.71	0.73	-	-
Disagree	136 (16.9)				
Neither	126 (15.6)				
Agree	329 (40.8)				
Strongly Agree	134 (16.6)				
<b>4. Overwhelmed</b>					
Strongly Disagree	117 (14.5)	0.69	0.72	0.84	-
Disagree	206 (25.6)				
Neither	150 (18.6)				
Agree	231 (28.7)				
Strongly Agree	102 (12.7)				
<b>5. Alcohol/Drugs</b>					
Strongly Disagree	455 (56.5)	0.33	0.36	0.29	0.34
Disagree	233 (28.9)				
Neither	42 (5.2)				
Agree	57 (7.1)				
Strongly Agree	19 (2.4)				

**Table 3**  
CES-D-10 depression symptomology.

	N (%)	Correlations						
		1	2	3	4	5	6	7
<b>1. Being bothered by things</b>								
Rarely/none of the time	295 (36.6)	–	–	–	–	–	–	–
Some/a little of the time	329 (40.8)							
Occasionally/a moderate amount of time	137 (17.0)							
All of the time	45 (5.6)							
<b>2. Feeling depressed</b>								
Rarely/none of the time	363 (45.0)	0.62	–	–	–	–	–	–
Some/a little of the time	259 (32.1)							
Occasionally/a moderate amount of time	125 (15.5)							
All of the time	59 (7.3)							
<b>3. Everything was an effort</b>								
Rarely/none of the time	398 (49.4)	0.57	0.77	–	–	–	–	–
Some/a little of the time	234 (29.0)							
Occasionally/a moderate amount of time	117 (14.5)							
All of the time	57 (7.1)							
<b>4. Hopeful</b>								
Rarely/none of the time	204 (25.3)	-0.38	-0.57	-0.43	–	–	–	–
Some/a little of the time	256 (31.8)							
Occasionally/a moderate amount of time	242 (30.0)							
All of the time	104 (12.9)							
<b>5. Fearful</b>								
Rarely/none of the time	264 (32.8)	0.63	0.59	0.48	-0.40	–	–	–
Some/a little of the time	286 (35.5)							
Occasionally/a moderate amount of time	173 (21.5)							
All of the time	83 (10.3)							
<b>6. Happy</b>								
Rarely/none of the time	116 (14.4)	-0.46	-0.66	-0.54	0.69	-0.43	–	–
Some/a little of the time	256 (31.8)							
Occasionally/a moderate amount of time	295 (36.7)							
All of the time	138 (17.1)							
<b>7. Lonely</b>								
Rarely/none of the time	410 (50.9)	0.47	0.64	0.57	-0.41	0.44	-0.52	–
Some/a little of the time	211 (26.2)							
Occasionally/a moderate amount of time	124 (15.4)							
All of the time	61 (7.6)							
<b>8. Unable to get going</b>								
Rarely/none of the time	379 (47.0)	0.52	0.70	0.79	-0.47	0.46	-0.52	0.56
Some/a little of the time	253 (31.4)							
Occasionally/a moderate amount of time	127 (15.8)							
All of the time	47 (5.8)							

Watching the news a couple of times a day ( $\beta=0.22$ , 95% CI: 0.07, 0.38) or hourly ( $\beta=0.56$ , 95% CI: 0.40, 0.72), compared to infrequently, was associated with more psychological distress. Having one’s income reduced a little ( $\beta=0.16$ , 95% CI: 0.04, 0.28) or a lot ( $\beta=0.29$ , 95% CI: 0.14, 0.44) was also associated with increased psychological distress, relative to not having lost income. Some levels of the availability of medical care were associated with factor scores, but the pattern across all levels was not consistent, suggesting that the associations may be spurious.

**4. Discussion**

In this study, we explored the structural relationship between symptoms of COVID-19 related psychological distress and depression. We found that COVID-19 psychological distress and depression are distinct but related constructs. The COVID-19 psychological distress factor did share some characteristics with depression, like sleep and concentration disturbances, feeling fearful, and being bothered by things that do not usually bother the participant, but was distinct in its lack of associated mood symptoms.

Key correlates of COVID-19 psychological distress included frequency of watching the news, having one’s income reduced, and beliefs about COVID-19 (i.e. skepticism). These correlates point to macro and individual level interventions that could make meaningful impacts on distress. Increased governmental support through unemployment and underemployment benefits and direct stimulus payments could potentially reduce psychological distress among those who had lost income

due to the pandemic. Individual behavior change related to news and media consumption could also be beneficial, as those who watched the news most frequently had the most psychological distress. Reducing constant negative media consumption, or so called “doomscrolling,” could have benefits for mental health. Behavioral interventions which encourage people struggling with psychological distress to limit media consumption or help patients to engage in behaviors that may increase their sense of empowerment when feeling helpless (e.g., sewing or distributing masks to help others) could mitigate distress (Pinals et al., 2020; Sanderson et al., 2020).

Understanding COVID-19 related psychological distress as a construct that can be viewed as distinct from existing clinically diagnosable conditions like MDD has implications for how these symptoms should be approached and treated by mental health professionals. For psychological distress related specifically to the pandemic that does not constitute a specific disorder, it may be most appropriate to treat individuals’ complaints symptomatically. Psychological distress, demoralization, adjustment difficulties and other forms of subclinical dysthymia are unlikely to respond to the interventions used to treat MDD. Antidepressant medications and cognitive behavioral therapy, first line treatment strategies for MDD, lack evidence for use in sub-clinical psychological distress. Instead, focusing on lifestyle interventions, such as attending to sleep hygiene, diet, regular exercise, mindfulness, avoiding alcohol and illicit substance use, and supplementing with supportive psychotherapies may prove most beneficial. Medications may most useful when targeted symptomatically, such as sleep aides or stress related headache relief, for individuals experiencing



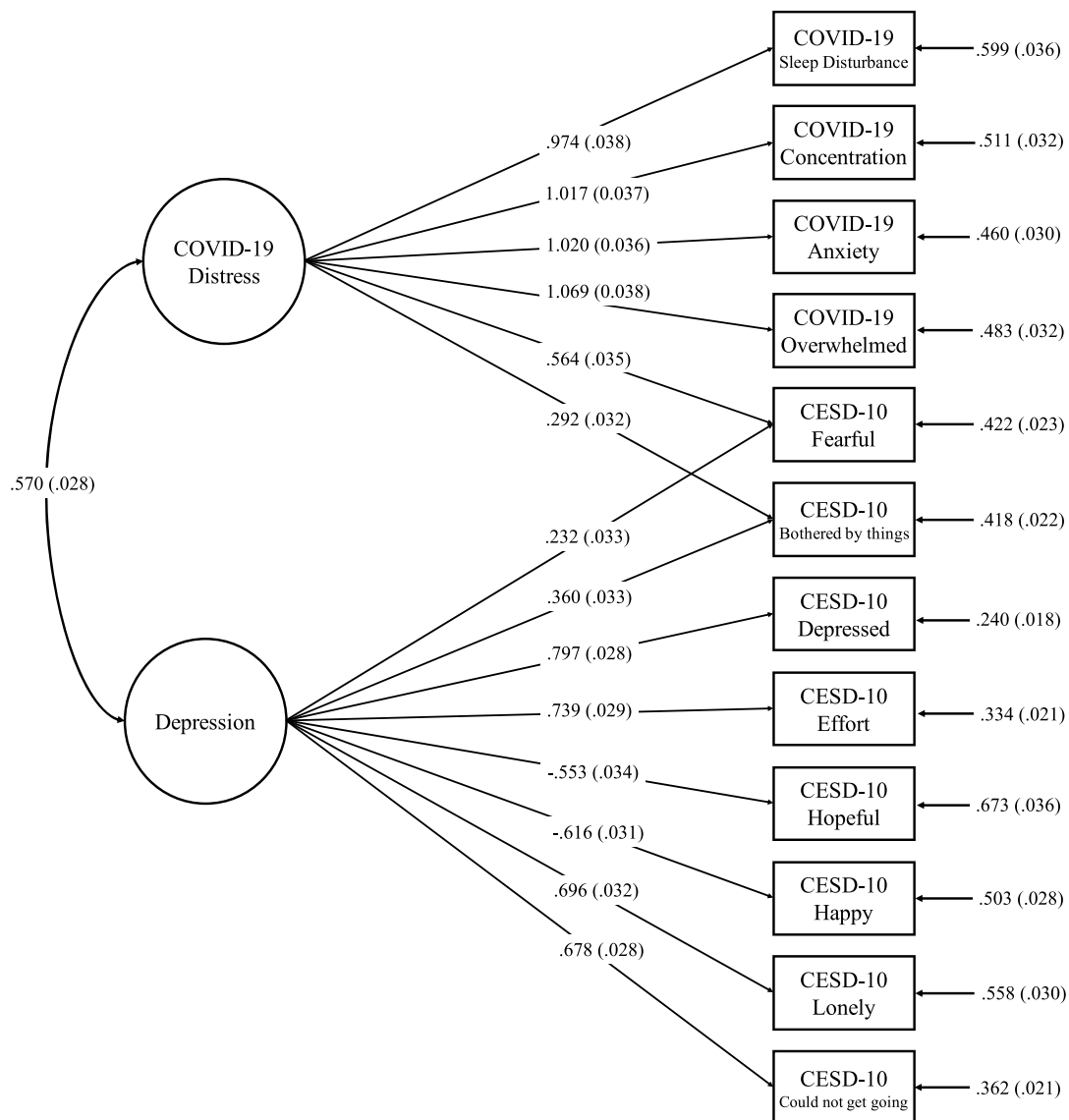


Fig. 1. Confirmatory factor analysis of COVID-19 related mental distress and depression. Note. Estimates are STDYX standardized coefficients.

distress but not a diagnosable condition. To be clear, while our results suggest that COVID-19 related distress is largely distinct from psychopathology, there are undoubtedly cases where such distress does reflect an underlying psychopathology. When the etiology of distress is MDD or another diagnosable disorder, the use of SSRI's, manualized therapies, and escalation to a higher level of care may be warranted. In the presence of MDD, increased attention and screening for suicidality or an escalating crisis may be appropriate.

It is also important to avoid pathologizing all distress responses to the pandemic. Labeling someone who is experiencing normative stress as being depressed or suffering from a mental illness can itself be demoralizing for the sufferer. Adding a medical diagnosis to an already burdened person can be further distressing and may lead them to anticipate worsening symptoms rather than general improvement once the stressor passes. Such pathologizing may also discourage support seeking, especially in communities where mental illness remains highly stigmatized.

It is critical to note that, while relatively rare, more extreme behaviors like alcohol and drug use that participants attributed to the pandemic were still present in our sample. Unlike the psychological distress symptoms included in the factor model, using alcohol and drugs and other similarly maladaptive coping strategies may reflect

pathological conditions that require formal diagnosis and more intensive treatment. Less than 10% of our sample endorsed using alcohol and drugs more due to COVID-19, which is still a substantial population at risk for associated adverse health effects. The relatively low associations between this symptom and the other COVID-19 psychological distress items included in this study highlights the importance of distinguishing between harmful psychological responses to a pandemic that require intervention and levels of psychological distress that are more normative.

Interventions implemented during COVID-19 must also not place individuals at greater risk of contracting the virus. To address both pathological and subclinical psychological distress responses to the COVID-19 pandemic, telehealth and telepsychiatry visits and online peer support can be effective (Pinals et al., 2020). Several avenues of non-psychiatric mental health support can help in addressing mental health concerns during pandemics such as providing opportunities to create virtual social networks as well as online family support (Moreno et al., 2020; Soklaridis et al., 2020). In addition, community-based approaches such as providing emotional and material support for those who may be at high risk for COVID-19 due to age or health impairments may enhance the mental health of both the receiver and giver of support.

**Limitations.** This study does have limitations to consider. First, data

**Table 4**  
Correlates of COVID-19 distress factor scores.

	Bivariable			Multivariable		
	Beta	95% CI	p	Beta	95% CI	p
Age	-0.00	-0.01, 0.00	0.46	–	–	–
Female Gender	0.48	0.35, 0.61	<0.001	0.26	0.15, 0.36	<0.001
Education						
HS or less	REF	–	–	REF	–	–
Some college	0.30	0.08, 0.53	0.007	0.07	-0.11, 0.25	0.461
Bachelor's degree or higher	0.28	0.07, 0.49	0.01	0.16	-0.01, 0.33	0.069
Race						
White	REF	–	–	–	–	–
Black	-0.22	-0.48, 0.03	0.09	–	–	–
Other	-0.12	-0.30, 0.07	0.23	–	–	–
Income						
Less than \$15,000	REF	–	–	–	–	–
\$15-35,000	-0.08	-0.36, 0.19	0.55	–	–	–
\$35-60,000	0.11	-0.15, 0.37	0.42	–	–	–
\$60-90,000	-0.07	-0.33, 0.20	0.63	–	–	–
\$90,000 or more	0.10	-0.17, 0.37	0.47	–	–	–
Live in an urban area	0.01	-0.12, 0.14	0.87	–	–	–
People over 70 in household	0.05	-0.29, 0.30	0.69	–	–	–
Children in household	0.08	-0.06, 0.22	0.25	–	–	–
Has insurance	0.07	-0.10, 0.25	0.41	–	–	–
Self-rated health status						
Excellent	REF	–	–	REF	–	–
Good	0.28	0.11, 0.46	0.001	0.14	-0.00, 0.29	0.051
Fair	0.47	0.25, 0.69	<0.001	0.07	-0.12, 0.26	0.470
Poor	0.62	0.16, 1.08	0.009	-0.22	-0.41, 0.33	0.279
Political alignment						
Liberal	REF	–	–	REF	–	–
Moderate	-0.33	-0.50, -0.15	<0.001	-0.12	-0.26, 0.02	0.096
Conservative	-0.36	-0.51, -0.21	<0.001	-0.08	-0.21, 0.05	0.226
Has a respiratory condition	0.25	0.02, 0.47	0.03	0.01	-0.18, 0.19	0.934
CES-D-10 MDD	1.17	1.02, 1.31	<0.001	1.01	0.86, 1.15	<0.001
COVID-19 Skepticism	-0.35	-0.43, -0.27	<0.001	-0.21	-0.28, -0.14	<0.001
Frequency of watching the news						
Once a day or less	REF	–	–	REF	–	–
Multiple times a day	0.40	0.22, 0.58	<0.001	0.22	0.07, 0.38	0.004
Hourly or more	0.84	0.66, 1.03	<0.001	0.56	0.40, 0.72	<0.001
Income Reduced due to COVID						
Not at all	REF	–	–	REF	–	–
A little	0.31	0.17, 0.46	<0.001	0.16	0.04, 0.28	0.009
A lot	0.55	0.37, 0.73	<0.001	0.29	0.14, 0.44	<0.001
Required to work outside the home	-0.05	-0.19, 0.10	0.538	–	–	–

**Table 4 (continued)**

	Bivariable			Multivariable		
	Beta	95% CI	p	Beta	95% CI	p
Able to get excellent medical care						
Strongly Agree	REF	–	–	REF	–	–
Agree	0.24	-0.02, 0.49	0.07	0.11	-0.10, 0.31	0.306
Neither	0.45	0.20, 0.70	0.001	0.24	0.03, 0.44	0.023
Disagree	0.43	0.15, 0.71	0.003	0.14	0.01, 0.47	0.041
Strongly Disagree	0.32	-0.00, 0.65	0.05	-0.02	-0.29, 0.26	0.893

for this study come from relatively early in the pandemic's timeline. While existing literature would indicate that this is an important time to measure psychological distress in response to such a crisis, more research is still needed to understand how these constructs may have changed as the pandemic progressed. Second, we included four symptoms of pandemic related distress that seemed most relevant based on existing literature and author expectations. However, it is possible that there are other important symptoms or experiences that have not been included. Moreover, symptoms such as problems with sleeping may have been due to schedule disruption rather than distress. The sample had a limited number of racial minority respondents, who have been disproportionately negatively impacted by the pandemic. Future research should study such vulnerable populations. Finally, the CES-D-10, while a validated measure of MDD symptomology, is not equivalent to a clinician diagnosis. This study also has several strengths to highlight. First, we were able to explicitly explore the interrelationship between COVID-19 psychological distress and depression symptomology, which can inform screening and interventions. We were also further able to identify correlates of COVID-19 related psychological distress specifically that can meaningfully inform both individual and population level interventions.

These findings help clarify the nature of psychological distress during the COVID-19 pandemic among adults in the United States. COVID-19 related psychological distress is not simply MDD and may represent a subclinical stress response to a pandemic rather than a specific pathology, though clinically diagnosable presentations of COVID-19 related distress certainly exist. Clinical responses to symptoms of COVID-19 psychological distress should account for the likely time-bound and non-pathological nature of symptoms for many individuals. This is not to say that symptoms should be discounted because they will resolve. Some, such as problems sleeping, can have substantial impact on well-being. Moreover, such symptoms can be due to stress, stressful, and amplify stress. Understanding that COVID-19 related psychological distress is not simply mental illnesses such as depression and anxiety is essential for mounting an effective public mental health response.

**Author statement**

**Contributions:** KES conceptualized the study and conducted the analysis. LD and CAL designed the survey used to collect data for this analysis. All authors contributed to the interpretation of the results and drafting of the manuscript.

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**Declaration of Competing Interest**

The authors have no conflicts to disclose.

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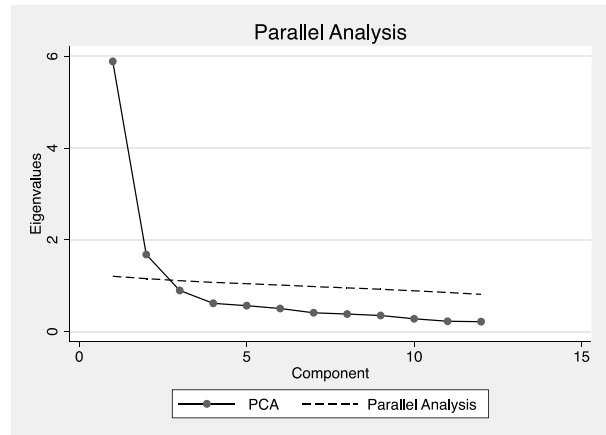
None.

**Appendix 1. Exploratory Factor Analysis**

We conducted a principal components analysis and associated parallel analysis with the COVID-19 distress and CES-D-10 items.

Principal components/correlation                      Number of obs =        805  
 Number of comp. =     12  
 Trace =                   12  
 Rotation: (unrotated = principal)                Rho =                   1.0000

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	5.8888	4.21077	0.4907	0.4907
Comp2	1.67804	.782078	0.1398	0.6306
Comp3	.895959	.280038	0.0747	0.7052
Comp4	.615921	.0520657	0.0513	0.7566
Comp5	.563855	.0622398	0.0470	0.8035
Comp6	.501615	.0921752	0.0418	0.8453
Comp7	.40944	.0280327	0.0341	0.8795
Comp8	.381407	.0328828	0.0318	0.9113
Comp9	.348525	.0708016	0.0290	0.9403
Comp10	.277723	.0541084	0.0231	0.9634
Comp11	.223615	.00851606	0.0186	0.9821
Comp12	.215099	.	0.0179	1.0000



The results of these suggested that a two-factor solution is likely the most appropriate.

We then conducted the exploratory factor analysis for two factors using the iterated principal-factor method, as the maximum likelihood method is only appropriate when items are measured continuously.

. factor rQ125 rQ126 rQ127 rQ129 rQ53 rQ55 rQ56 rQ57 rQ58 rQ60 rQ61 rQ62, ipf fa(2)  
 (obs=805)

Factor analysis/correlation                      Number of obs =        805  
 Method: iterated principal factors                Retained factors =     2  
 Rotation: (unrotated)                              Number of params =    23

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.47219	4.19482	0.8108	0.8108
Factor2	1.27736	0.93178	0.1893	1.0000
Factor3	0.34558	0.17600	0.0512	1.0512
Factor4	0.16958	0.06565	0.0251	1.0763
Factor5	0.10393	0.07786	0.0154	1.0917
Factor6	0.02607	0.03698	0.0039	1.0956
Factor7	-0.01091	0.03838	-0.0016	1.0940
Factor8	-0.04929	0.04807	-0.0073	1.0867
Factor9	-0.09736	0.02196	-0.0144	1.0722
Factor10	-0.11931	0.01261	-0.0177	1.0546
Factor11	-0.13192	0.10448	-0.0195	1.0350
Factor12	-0.23640	.	-0.0350	1.0000

LR test: independent vs. saturated: chi2(66) = 5435.71 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Uniqueness
rQ125	0.6729	0.4032	0.3847
rQ126	0.7474	0.3399	0.3258
rQ127	0.7069	0.4518	0.2962
rQ129	0.7450	0.3682	0.3094
rQ53	0.6677	-0.0207	0.5538
rQ55	0.7698	-0.3459	0.2878
rQ56	0.6862	-0.3714	0.3912
rQ57	-0.5215	0.2280	0.6761
rQ58	0.7265	0.1697	0.4435
rQ60	-0.6133	0.2739	0.5488
rQ61	0.5532	-0.3047	0.6011
rQ62	0.6441	-0.3911	0.4321

We used promax rotation as we expected the factors to have an oblique structure (i.e. be correlated).



```

. rotate, promax

Factor analysis/correlation          Number of obs =      805
Method: iterated principal factors   Retained factors =    2
Rotation: oblique promax (Kaiser off) Number of params =   23

-----
Variable      Variance      Proportion      Rotated factors are correlated
-----
Factor1      4.59208      0.6804
Factor2      4.55881      0.6754

LR test: independent vs. saturated:  chi2(66) = 5435.71 Prob>chi2 = 0.0000

Rotated factor loadings (pattern matrix) and unique variances

-----
Variable      Factor1      Factor2      Uniqueness
-----
rQ125      -0.0520      0.8130      0.3847
rQ126      0.0587      0.7861      0.3258
rQ127      -0.0851      0.8848      0.2962
rQ129      0.0269      0.8154      0.3094
rQ53      0.4023      0.3506      0.5538
rQ55      0.8112      0.0551      0.2878
rQ56      0.7912      -0.0193      0.3912
rQ57      -0.5427      -0.0442      0.6761
rQ58      0.2304      0.5898      0.4435
rQ60      -0.6446      -0.0456      0.5488
rQ61      0.6435      -0.0213      0.6811
rQ62      0.7884      -0.0641      0.4321

-----
. estat structure

Structure matrix: correlations between variables and promax(3) rotated common factors

-----
Variable      Factor1      Factor2
-----
rQ125      0.4135      0.7833
rQ126      0.5087      0.8197
rQ127      0.4214      0.8360
rQ129      0.4936      0.8307
rQ53      0.6030      0.5809
rQ55      0.8427      0.5195
rQ56      0.7801      0.4336
rQ57      -0.5680      -0.3548
rQ58      0.5681      0.7217
rQ60      -0.6707      -0.4146
rQ61      0.6313      0.3471
rQ62      0.7517      0.3872

-----
. estat common

Correlation matrix of the promax(3) rotated common factors

-----
Factors      Factor1      Factor2
-----
Factor1      1
Factor2      .5725      1
    
```

The results of this analysis suggested that the COVID-19 distress questions loaded onto one factor while the CES-D-10 items loaded onto the other. There were two substantial cross loadings, where the CES-D-10 items about feeling fearful and being bothered by things also loaded onto the COVID-19 distress factor. We then used this factor structure for the confirmatory factor analyses.

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