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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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ABSTRACT

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 (Guiljriers 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 peritraumatic 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) (Andreasen 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 (Björvjinsonsson 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 currently 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 (β = 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 (β = 1.01, 95% CI: 0.86, 1.15). COVID-19 skepticism was inversely associated with psychological distress (β = 0.21, 95% CI: -0.28, -0.14).

Table 1
Sample characteristics.

| Sociodemographic Characteristics | N (%) | N (%) |
|----------------------------------|------|------|
| **Sociodemographic Characteristics** | | |
| 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.

| Mental distress | N (%) | Correlations 1 2 3 4 |
|-----------------|------|---------------|
| 1. Sleep | | |
| Strongly Disagree | 202 (25.1) | – – – – |
| Disagree | 278 (34.5) | – – – – |
| Neither | 134 (16.6) | – – – – |
| Agree | 128 (15.9) | – – – – |
| Strongly Agree | 64 (7.9) | – – – – |
| 2. Concentration | | |
| Strongly Disagree | 179 (22.2) | 0.81 – – – |
| Disagree | 265 (32.9) | – – – – |
| Neither | 115 (14.3) | – – – – |
| Agree | 196 (24.3) | – – – – |
| Strongly Agree | 51 (6.3) | – – – – |
| 3. Anxiety | | |
| 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) | – – – – |
| 4. Overwhelmed | | |
| 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) | – – – – |
| 5. Alcohol/Drugs | | |
| 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) | – – – – |
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 in non-clinical settings like community sites. Clinical psychological distress related specifically to the pandemic is likely to require more intensive care through mental health services.

Table 3

| CES-D-10 depression symptomology. | N (%) | Correlations |
|----------------------------------|-------|--------------|
| 1. Being bothered by things      |       |              |
| 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) |              |
| 2. Feeling depressed             |       |              |
| 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) |              |
| 3. Everything was an effort      |       |              |
| Rarely/none of the time          | 398 (49.4) | 0.57         |
| Some/a little of the time        | 234 (29.0) | 0.77         |
| Occasionally/a moderate amount of time | 117 (14.5) |              |
| All of the time                  | 57 (7.1) |              |
| 4. Hopeful                       |       |              |
| Rarely/none of the time          | 204 (25.3) | -0.38        |
| Some/a little of the time        | 256 (31.8) | -0.57        |
| Occasionally/a moderate amount of time | 242 (30.0) | -0.43        |
| All of the time                  | 104 (12.9) |              |
| 5. Fearful                       |       |              |
| Rarely/none of the time          | 264 (32.8) | 0.63         |
| Some/a little of the time        | 286 (35.5) | 0.59         |
| Occasionally/a moderate amount of time | 173 (21.5) | 0.48         |
| All of the time                  | 83 (10.3) | -0.40        |
| 6. Happy                         |       |              |
| Rarely/none of the time          | 116 (14.4) | -0.46        |
| Some/a little of the time        | 256 (31.8) | -0.66        |
| Occasionally/a moderate amount of time | 295 (36.7) | -0.54        |
| All of the time                  | 138 (17.1) | 0.69         |
| 7. Lonely                        |       |              |
| Rarely/none of the time          | 410 (50.9) | 0.47         |
| Some/a little of the time        | 211 (26.2) | 0.64         |
| Occasionally/a moderate amount of time | 124 (15.4) | 0.57         |
| All of the time                  | 61 (7.6) | -0.41        |
| 8. Unable to get going           |       |              |
| Rarely/none of the time          | 379 (47.0) | 0.52         |
| Some/a little of the time        | 253 (31.4) | 0.70         |
| Occasionally/a moderate amount of time | 127 (15.8) | 0.79         |
| All of the time                  | 47 (5.8) | -0.47        |

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 subclinical 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 aids or stress related headache relief, for individuals experiencing...
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 SSRIs, 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 created 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

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

| Variable                          | Bivariable Beta | 95% CI | p    | Multivariable Beta | 95% CI | p    |
|-----------------------------------|-----------------|--------|------|--------------------|--------|------|
| **Age**                           |                 |        |      |                    |        |      |
| -0.00                             | -0.01           | 0.46   | –    | –                  | –      | –    |
| **Female Gender**                 | 0.48            | 0.35   | <0.001 | 0.26            | 0.15   | <0.001 | 38 |
| Education                         |                 |        |      |                    |        |      |
| Required to work                  | 0.55            | 0.37   | –    | –                  | –      | –    |
| A lot                             | 0.31            | 0.17   | <0.001 | 0.16            | 0.04   | 0.009 | 38 |
| Required to work                  | -0.05           | -0.19  | 0.538 | –                  | –      | –    |
| A little                          | 0.55            | 0.37   | <0.001 | 0.29            | 0.14   | <0.001 | 38 |
| Income Reduced                    |                 |        |      |                    |        |      |
| Income                           |                 |        |      |                    |        |      |
| Less than $15,000                 | -0.08           | 0.36   | 0.55 | –                  | –      | –    |
| $15-35,000                        | -0.11           | -0.15  | 0.42 | –                  | –      | –    |
| $35-60,000                        | -0.07           | -0.33  | 0.63 | –                  | –      | –    |
| $60-90,000                        | -0.07           | -0.33  | 0.63 | –                  | –      | –    |
| $90,000 or more                   | -0.10           | 0.17   | -0.47 | –                  | –      | –    |
| **Live in an urban area**         | 0.01            | 0.12   | 0.87 | –                  | –      | –    |
| People over 70 in household       | 0.05            | -0.29  | 0.69 | –                  | –      | –    |
| Children in household             | 0.08            | -0.06  | 0.25 | –                  | –      | –    |
| Has insurance                     | 0.07            | -0.10  | 0.41 | –                  | –      | –    |
| **Self-rated health status**      |                 |        |      |                    |        |      |
| Excellent                         | 0.28            | 0.11   | 0.001 | 0.14            | -0.00  | 0.051 | 38 |
| Good                              | 0.47            | 0.25   | <0.001 | 0.07            | -0.12  | 0.470 | 38 |
| Fair                              | 0.62            | 0.16   | 0.009 | -0.22           | -0.41  | 0.279 | 38 |
| **Political alignment**           |                 |        |      |                    |        |      |
| Liberal                           | -0.33           | -0.50  | <0.001 | -0.12           | -0.26  | 0.096 | 38 |
| Moderate                          | -0.36           | -0.51  | <0.001 | -0.08           | -0.21  | 0.226 | 38 |
| Conservative                      | 0.25            | 0.02   | 0.03  | 0.01           | -0.18  | 0.934 | 38 |
| Has a respiratory condition       | 1.17            | 1.02   | <0.001 | 1.01            | 0.86   | <0.001 | 38 |
| **COVID-19**                      |                 |        |      |                    |        |      |
| Skepticism                        | -0.35           | -0.43  | <0.001 | -0.21           | -0.28  | <0.001 | 38 |
| Frequency of watching the news    |                 |        |      |                    |        |      |
| Once a day or less                | 0.40            | 0.22   | <0.001 | 0.22            | 0.07   | 0.004 | 38 |
| Multiple times a day              | 0.84            | 0.66   | <0.001 | 0.56            | 0.40   | <0.001 | 38 |
| Income Reduced due to COVID       |                 |        |      |                    |        |      |
| Not at all                        | 0.31            | 0.17   | <0.001 | 0.16            | 0.04   | 0.009 | 38 |
| **A little**                      | 0.55            | 0.37   | <0.001 | 0.29            | 0.14   | <0.001 | 38 |
| A lot                             | 0.55            | 0.37   | <0.001 | 0.29            | 0.14   | <0.001 | 38 |
| Required to work outside the home | -0.05           | -0.19  | 0.538 | –                  | –      | –    |

Table 4 (continued)

| Variable                          | Bivariable Beta | 95% CI | p    | Multivariable Beta | 95% CI | p    |
|-----------------------------------|-----------------|--------|------|--------------------|--------|------|
| Able to get excellent medical care|                 |        |      |                    |        |      |
| Strongly Agree                    | 0.24            | -0.02  | 0.07 | 0.11             | -0.10  | 0.306 | 38 |
| Agree                             | 0.04            | 0.20   | 0.001 | 0.24            | 0.03   | 0.023 | 38 |
| Disagree                          | 0.43            | 0.15   | 0.003 | 0.14            | 0.01   | 0.041 | 38 |
| Strongly Disagree                 | 0.32            | -0.00  | 0.05 | -0.02           | -0.29  | 0.893 | 38 |

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.

| Component | Eigenvalue | Difference | Proportion | Cumulative |
|-----------|------------|------------|------------|------------|
| Comp1     | 5.0488     | 4.21877    | 0.4087     | 0.4087     |
| Comp2     | 1.6784     | 0.702876   | 0.1391     | 0.5478     |
| Comp3     | 0.85059    | 0.200038   | 0.0674     | 0.6153     |
| Comp4     | 0.513921   | 0.107457   | 0.0451     | 0.6604     |
| Comp5     | 0.560855   | 0.062308   | 0.0470     | 0.7074     |
| Comp6     | 0.541615   | 0.0921752  | 0.0413     | 0.7487     |
| Comp7     | 0.40044    | 0.020827   | 0.0336     | 0.7824     |
| Comp8     | 0.381487   | 0.000432   | 0.0331     | 0.8155     |
| Comp9     | 0.340326   | 0.000816   | 0.0330     | 0.8485     |
| Comp10    | 0.277272   | 0.0041884  | 0.0231     | 0.8716     |
| Comp11    | 0.223615   | 0.0001646  | 0.0186     | 0.8902     |
| Comp12    | 0.215089   | -          | 0.0170     | 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.

| Number of obs | 805 |
| Method: iterated principal factors | Retained Factors = 2 |
| Rotation: unrotated | Number of params = 23 |

| Factor | Eigenvalue | Difference | Proportion | Cumulative |
|--------|------------|------------|------------|------------|
| Factor1 | 5.472581   | 4.28462   | 0.6468     | 0.6468     |
| Factor2 | 1.677058   | 0.59719   | 0.2102     | 0.8570     |
| Factor3 | 0.345550   | 0.27600   | 0.0452     | 0.9022     |
| Factor4 | 0.169582   | 0.06852   | 0.0251     | 0.9273     |
| Factor5 | 0.166572   | 0.06776   | 0.0254     | 0.9277     |
| Factor6 | 0.082078   | 0.00000   | 0.0000     | 0.9277     |
| Factor7 | 0.082897   | 0.00000   | 0.0000     | 0.9277     |
| Factor8 | 0.082912   | 0.00000   | 0.0000     | 0.9277     |
| Factor9 | 0.082936   | 0.00000   | 0.0000     | 0.9277     |
| Factor10| 0.082936   | 0.00000   | 0.0000     | 0.9277     |
| Factor11| 0.082936   | 0.00000   | 0.0000     | 0.9277     |
| Factor12| 0.082936   | 0.00000   | 0.0000     | 0.9277     |

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

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