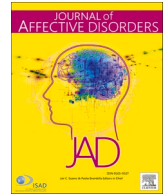




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# The experience of COVID-19 among people with depression: Impact on daily life and coping strategies

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## ABSTRACT

**Background:** The prevalence of depression symptoms among U.S. adults increased dramatically during the early months of the COVID-19 pandemic. We sought to understand the impact of the pandemic on people with a history of depression.

**Methods:** In June 2020, a national sample of 5023 U.S. adults, including 760 reporting past/current diagnoses of depression, completed survey measures related to the COVID experience, coping, anxiety, depression, and PTSD. **Results:** After adjusting for sociodemographic characteristics, a history of depression increased the odds of negative effects of pandemic on multiple aspects of life: routines, access to mental health treatment, alcohol use, prescription painkiller use, and other drug use. Those with a history of depression also scored significantly higher on the PHQ-8, GAD-7, and PDS-5 (all  $ps < 0.0001$ ). Greater use of adaptive coping strategies was significantly associated with lower scores, and greater use of maladaptive strategies with higher scores. Individuals reporting a history of depression reported greater use of both adaptive and maladaptive strategies.

**Conclusions:** Adaptive coping strategies appear to be protective and help regulate symptomatology, suggesting that particular focus during the clinical encounter on developing tools to promote well-being, alleviate stress, and decrease perceptions of helplessness could mitigate the effects.

## 1. Introduction

The general negative impact of the COVID-19 pandemic, including the mitigation measures such as school and business closures and shelter-in-place orders implemented to slow the spread of disease, on mental health has been well documented. For example, in the United States, it is estimated that the prevalence of symptoms of depression among adults was three-fold higher during the early months of the pandemic than during previous years (Ettman et al., 2020). Although individuals with pre-existing mental health conditions were recognized from early on as being among the groups with increased vulnerability to the psychosocial effects of the pandemic (Pfefferbaum and North, 2020), and subsequent research has repeatedly found this to be the case (Blix et al., 2021; Iob et al., 2020; Rahman et al., 2020; Xiong et al., 2020), most studies have focused on mental health history and pandemic effects in very specific populations – for example, pregnant women (Ravaldi

et al., 2020), university students (Husky et al., 2021), and individuals hospitalized with mental illness (Favreau et al., 2021; Oppenauer et al., 2021), which may not generalize to other populations. The evidence regarding the impact of the COVID-19 pandemic on people with pre-existing mental illness has included studies focused on specific diseases, for example, eating disorders (Termorshuizen et al., 2020) or major depressive disorder (Leightley et al., 2021), studies that grouped all mental health diagnoses together (Oppenauer et al., 2021), and studies that examined multiple different diagnoses, and found differences in the mental health impact of the COVID-19 pandemic among them (Favreau et al., 2021; Ravaldi et al., 2020). However, less is known about the experience of and impact on the general population of individuals with past or current mental health conditions.

Some early reports from the pandemic found no changes in depression, anxiety, or quality of life among adults with a history of depression early in the pandemic (Czysz et al., 2021; Leightley et al., 2021), but that

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early disruption of routines and access to mental health care was associated with increased symptoms of depression and anxiety later in the pandemic (Czysz et al., 2021). The broader experience of adults with a past or current diagnosis of depression in the United States, and the impact of the COVID-19 pandemic on their mental health, has not been examined. We conducted an exploratory analysis and used a social determinants of mental health framework (Sanchez and Sanchez, 2019) to understand the unique experience of the COVID-19 pandemic on the daily activities, access to basic needs, coping strategies, and symptomatology for people with a history of depression. Guided by the limited literature available from early in the pandemic (Breslau et al., 2021; Ettman et al., 2020), we expected that, for people with a history of depression, the burden of the pandemic and its associated extreme isolation would lead to more difficult circumstances and deleterious effects on mental health overall.

## 2. Method

### 2.1. Study design

We report results from a nationwide survey. The study was approved by the Institutional Review Board (IRB) at Baylor Scott and White Research Institute (#020–139) and written informed consent was waived.

### 2.2. Study sample and data collection

We present cross-sectional observational data obtained from an online questionnaire administered via the Qualtrics™ survey platform (Qualtrics, Inc.; Seattle, WA). Online research panel participants are recruited from a variety of sources and precise information on how sampling frames are constructed is not available from Qualtrics. The use of quota sampling in online panel research allows researchers to request survey participants matching specified criteria and a target enrollment (Miller et al., 2020). The target enrollment in the current study was 5000 eligible respondents. The online survey was distributed across all regions of the United States and included adults aged 18 years and up. The online questionnaire was distributed over 2 weeks from June 22nd to July 5th, 2020. Qualtrics ensured data quality by configuring a priori appropriate “speed check” criteria that ensured automatic deletion of responses from participants who filled out the questionnaire at an implausible speed. Based on target demographics and quota sampling, panelists were invited to participate in this survey by email and other methods (e.g., messaging through online portals, text message, and in-app advertisements). Questionnaires returned with incomplete/insufficient responses were eliminated from final analyses. Of 6461 initial surveys returned, 1438 did not meet data quality measures, leaving 5023 for analysis (Warren et al., 2021b).

To ensure comprehensive capture of the pandemic’s impact on the emotional well-being of frontline workers and facilitate meaningful comparisons between groups, sampling quotas were requested of Qualtrics to comprise 40 % healthcare workers, 30 % non-healthcare essential workers, and 30 % general population (Warren et al., 2021a). Participants who self-reported a current or previous diagnosis of depression were categorized as “Depressed.” Participants who did not report a current or previous depression diagnosis were categorized as “Not Depressed.”

### 2.3. Study measures

Demographic characteristics included ethnicity, age, race, sex, marital status, BMI, education, occupation and work status, household income, employment status prior to the pandemic, living situation, smoking status, and diagnosis of a comorbid medical condition (cardiovascular disease, chronic renal disease, diabetes, liver disease, lung disease, cancer, immunocompromised condition, neurologic/

neurodevelopmental disability, spinal cord injury, traumatic brain injury, other chronic medical condition).

#### 2.3.1. COVID experience measures

Fear of COVID-19 Scale (FCV-19S) is a 7-item scale that measures perceived fear of COVID-19. The scale uses a 5-item bi-polar Likert-style agreement response format that ranges from “strongly disagree” to “strongly agree”. Total scores range from 7 to 35 (Ahorsu et al., 2020). The FCV-19S has demonstrated both validity and reliability in quantifying fear of COVID 19 in various populations (Alyami et al., 2020; Pakpour et al., 2020; Pang et al., 2020; Sakib et al., 2020; Satici et al., 2020; Soraci et al., 2020; Tsiropoulou et al., 2020). Additionally, the FCV-19S has been validated across gender and age (Lin et al., 2021). The internal consistency of FCV-19S in our sample was excellent (Cronbach’s  $\alpha = 0.92$ ).

In the current study, we chose selected items to be assessed individually from the Coronavirus Impact Scale (Stoddard et al., 2021) since a composite score has not been fully validated for this measure. Specific items included in the current analysis included experiences of stress related to the pandemic, family stress, access to medical care, mental health care, food, family and non-family social supports, impact on family income/employment and daily routines. These items have a Likert-style severity response format that includes “no change”, “mild”, “moderate” and “severe”, and were further classified into moderate/severe vs mild/no change. In the current sample, internal consistency was good among these items (Cronbach’s  $\alpha = 0.80$ ).

The COVID experience also included COVID 19 testing (test/none), knowing someone who tested positive (yes/no), testing positive (yes/no), self-isolating (yes, no, prefer not to answer), and reason for self-isolation (mandatory, social pressure, health concern, other, prefer not to answer). Additionally, changes in use of alcohol, prescription painkillers, drugs other than painkillers, and smoking/vaping were included in the analysis.

#### 2.3.2. Brief-COPE measures

The Brief-COPE is a validated 28-item self-report questionnaire designed to assess coping responses to serious situations (Carver, 1997). It is an abbreviated version of the 60-item COPE (Coping Orientation to Problems Experienced) questionnaire (Carver et al., 1989). Scoring for each item ranges from 1 to 4 (1=‘I haven’t been doing this at all’, 2=‘I’ve been doing this a little bit’, 3=‘I’ve been doing this a medium amount’, 4=‘I’ve been doing this a lot’). We classified coping strategy items into adaptive coping (active coping, use of emotional support, use of instrumental support, positive reframing, planning, humor, acceptance, and religion) and maladaptive coping (self-distraction, denial, substance use, behavioral disengagement, venting, and self-blame) (Meyer, 2001).

#### 2.3.3. PHQ-8, GAD-7, and PDS-5 measures

The PHQ-8 is a brief, 8-item self-report measure of symptoms of depression, validity/reliability has been established in the general and clinical populations (Kroenke et al., 2009). Participants assess how frequently they experienced each symptom over the past two weeks, on a four-point Likert-style rating scale ranging from 0 to 3 (0=‘not at all’, 1 = ‘several days’, 2=‘more than half of the days’, 3=‘nearly every day’). Since a cutoff score of  $\geq 10$  shows 88 % sensitivity and 88 % specificity in discriminating ‘probable’ depression (Kroenke and Spitzer, 2002) we utilized this threshold to dichotomize our sample into respondents with ‘probable depression’ versus others.

#### 2.3.4. Generalized Anxiety Disorder-7 (GAD-7)

The GAD-7 is a brief, 7-item measure of symptoms of Generalized Anxiety Disorder. Participants report on frequency of each of seven symptom over the past two weeks on a four-point rating scale ranging from 0 to 3 (0=‘not at all’, 1 = ‘several days’, 2=‘more than half of the days’, 3=‘nearly every day’). Scores are interpreted as follows:

**Table 1**  
Demographic summary by depression status, n = 5023.

Characteristic	History of depression n = 760	No history of depression n = 4263	p-Value*
Age	46.0 ± 14.4	50.6 ± 14.2	<0.0001
18–29	117 (15.4 %)	350 (8.2 %)	<0.0001
30–39	175 (23.0 %)	746 (17.5 %)	
40–49	146 (19.2 %)	764 (17.9 %)	
50–59	153 (20.1 %)	1069 (25.1 %)	
60–69	143 (18.8 %)	1023 (24.0 %)	
70+	26 (3.4 %)	310 (7.3 %)	
BMI	30.4 ± 11.5	28.0 ± 7.4	<0.0001
Sex			
Male	240 (31.6 %)	1802 (42.3 %)	
Female	514 (67.6 %)	2446 (57.4 %)	
Prefer not to answer	6 (0.8 %)	15 (0.4 %)	<0.0001
Race			
White	624 (82.1 %)	3100 (72.7 %)	
Black	53 (7.0 %)	339 (8.0 %)	
Hispanic	43 (5.7 %)	333 (7.8 %)	
Asian	17 (2.2 %)	342 (8.0 %)	
Other	23 (3.0 %)	149 (3.5 %)	<0.0001
Marital status			
Single	298 (39.2 %)	1249 (29.3 %)	
Married/common law	336 (44.2 %)	2470 (57.9 %)	
Divorced/separated	119 (15.7 %)	511 (12.0 %)	
Unknown/prefer not to answer	7 (0.9 %)	33 (0.8 %)	<0.0001
Highest education level			
Under high school	6 (0.8 %)	34 (0.8 %)	
High school graduate/GED	115 (15.1 %)	500 (11.7 %)	
Vocational/associates degree	236 (31.0 %)	1165 (27.3 %)	
Bachelor's degree	217 (28.5 %)	1431 (33.6 %)	
Advanced degree	184 (24.2 %)	1115 (26.2 %)	
Other	2 (0.3 %)	12 (0.3 %)	
Unknown/prefer not to answer	0 (0.0 %)	6 (0.1 %)	0.012
Current work status			
Working from home	177 (23.3 %)	1079 (25.3 %)	
Working at my normal location	338 (44.5 %)	2201 (51.6 %)	
Retired	44 (5.8 %)	278 (6.5 %)	
In school/Not working for other reasons	86 (11.3 %)	214 (5.0 %)	
Not working right now due to COVID-19	70 (9.2 %)	286 (6.7 %)	
Unemployed right now due to COVID-19	42 (5.5 %)	185 (4.3 %)	
Prefer not to answer	3 (0.4 %)	20 (0.5 %)	<0.0001
Occupation segment			
Essential workers	73 (9.6 %)	428 (10.0 %)	
General population	452 (59.5 %)	2651 (62.2 %)	
Healthcare providers	235 (30.9 %)	1184 (27.8 %)	0.207
Number of people supported by total household income	2.3 ± 1.4	2.3 ± 1.4	0.867
Employment status before COVID-19			
Full-time (≥ 35 h/wk)	462 (60.8 %)	2954 (69.3 %)	<0.0001
Part-time (< 35 h/wk)	168 (22.1 %)	848 (19.9 %)	
Other	30 (3.9 %)	133 (3.1 %)	
Unemployed	43 (5.7 %)	253 (5.9 %)	
Disabled	56 (7.4 %)	55 (1.3 %)	
Unknown/prefer not to answer	1 (0.1 %)	20 (0.5 %)	
Current living situation			
Owns home or apartment	416 (54.7 %)	2923 (68.6 %)	
Rents home or apartment	249 (32.8 %)	998 (23.4 %)	
Lives in family household	74 (9.7 %)	289 (6.8 %)	<0.0001

**Table 1 (continued)**

Characteristic	History of depression n = 760	No history of depression n = 4263	p-Value*
Lives in community housing/homeless	9 (1.2 %)	9 (0.2 %)	
Rehabilitation facility/hospital	1 (0.1 %)	4 (0.1 %)	
Other/unknown	11 (1.4 %)	40 (0.9 %)	
Current smoker	129 (17.0 %)	287 (6.7 %)	<0.0001
Any chronic condition	325 (42.8 %)	1168 (27.4 %)	<0.0001

≥10 = ‘possible diagnosis of GAD’, 5 = ‘mild anxiety’, 10 = ‘moderate anxiety’, 15 = ‘severe anxiety’ (Spitzer et al., 2006). The cutoff threshold of ≥10 has 89 % sensitivity and 82 % specificity in discriminating ‘probable’ anxiety (Spitzer et al., 2006). We utilized this cutoff score to dichotomize our study sample into respondents with probable anxiety versus others.

### 2.3.5. Posttraumatic Diagnostic Scale for DSM-5 (PDS-5)

The PDS-5 is a 24-item self-report measure of posttraumatic stress that applies criteria from the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (Foa et al., 2016). We used a cutoff score of ≥28 to dichotomize the study sample into respondents with or without likely PTSD.

### 2.4. Statistical analysis

Means and standard deviations for continuous and categorical variables were summarized with counts and percentages, and differences were assessed using *t*-tests and chi-square tests. For our analysis, modeling participant demographic factors was not the primary focus, thus for use in all adjusted analysis, we first estimated the propensity for history of depression to combine all patient characteristics into a single score (Elze et al., 2017). Creating propensity scores reduces the risk of overfitting the model and encourages the use of all variables that may be related to the outcome or exposure, thus we did not perform additional variable selection techniques. The scores were calculated by including history of depression as the dependent variable in a logistic regression model with all demographic variables in Table 1 as the predictors.

Associations between each outcome and depression status (reported history of depression vs not) were then evaluated individually in multiple ways. First, multivariable logistic regression was performed to determine significant associations between depression status, the COVID experience, and mental health measures (PHQ-8, GAD-7, and PDS-5) while adjusting for participant characteristics via propensity scores. Next, coping strategies (adaptive and maladaptive) were introduced into the multivariable logistic regressions to determine their association with the mental health outcomes, and also to determine how the associations with depression status were impacted when accounting for these strategies. To determine if adding the coping strategies improved the overall model fit, we compared the Akaike Information Criterion (AIC) for the models with and without coping strategies (Pawitan, 2001). Finally, these models were repeated in the participants reporting a history of depression only to further examine the association between coping and the mental health measures in this group. A 5 % alpha level was used for significance, and all analyses were performed using SAS version 9.4 (SAS Inc., Cary, NC).

## 3. Results

### 3.1. Demographics

The demographic characteristics of participants by reported history of depression are presented in Table 1. Of the 5023 participants who completed the survey, 15.1 % (760) reported either a current or previous

**Table 2**  
COVID experience by depression status.

	History of depression (n = 760)	No history of depression (n = 4263)	Unadjusted p-value	Adjusted OR	95 % CI	Adjusted p-value
COVID fear, mean ± sd	18.7 ± 6.9	17.1 ± 6.6	<0.0001	1.31	0.76, 1.86	<0.0001
COVID impact ranked as moderate/severe						
Routines	583 (76.7 %)	2789 (65.4 %)	<0.0001	1.60	1.31, 1.95	<0.0001
Family income/employment	271 (35.7 %)	989 (23.2 %)	<0.0001	1.38	1.15, 1.67	0.0007
Food access	110 (14.5 %)	422 (9.9 %)	0.0002	1.02	0.77, 1.34	0.896
Medical health care access	251 (33.0 %)	999 (23.4 %)	<0.0001	1.44	1.19, 1.73	0.0001
Mental health treatment	136 (17.9 %)	244 (5.7 %)	<0.0001	2.91	2.23, 3.80	<0.0001
Access to extended family and non-family social supports	353 (46.4 %)	1439 (33.8 %)	<0.0001	1.56	1.31, 1.85	<0.0001
Experiences of stress related to coronavirus pandemic	414 (54.5 %)	1195 (28.0 %)	<0.0001	2.46	2.07, 2.93	<0.0001
Stress and discord in the family	162 (21.3 %)	526 (12.3 %)	<0.0001	1.55	1.24, 1.94	0.0001
COVID-19 testing						
Test	166 (21.8 %)	624 (14.6 %)	<0.0001	1.55	1.25, 1.92	<0.0001
None	594 (78.2 %)	3639 (85.4 %)				
Tested positive	17 (7.5 %)	51 (5.4 %)	0.237	1.03	0.50, 2.12	0.936
Know someone who tested positive	353 (46.4 %)	1786 (41.9 %)	0.064	1.15	0.97, 1.36	0.117
Have you been self-isolating?						
No	241 (31.7 %)	1804 (42.4 %)	<0.0001	1.38	1.16, 1.66	0.0004
Yes	508 (66.9 %)	2400 (56.4 %)				
Prefer not to answer	10 (1.3 %)	54 (1.2 %)				
Reason for self-isolation						
Mandatory	164 (21.6 %)	791 (18.6 %)	0.050	1.22	0.99, 1.50	0.064
Social pressure	82 (10.8 %)	326 (7.6 %)	0.003	1.26	0.94, 1.68	0.122
Health concern	302 (39.7 %)	1221 (28.6 %)	<0.0001	1.44	1.20, 1.72	<0.0001
Other	115 (15.1 %)	530 (12.4 %)	0.040	1.22	0.96, 1.55	0.106
Prefer not to answer	12 (1.6 %)	78 (1.8 %)	0.631	0.69	0.34, 1.40	0.309
Use of alcohol increased since the COVID-19 outbreak	138 (18.2 %)	573 (13.5 %)	0.0006	1.31	1.04, 1.64	0.022
Use of prescription painkillers increased since the COVID-19 outbreak	24 (3.2 %)	37 (0.9 %)	<0.0001	2.65	1.45, 4.83	0.001
Use of drugs other than prescription painkillers increased since the COVID-19 outbreak	51 (6.7 %)	73 (1.7 %)	<0.0001	3.01	1.95, 4.65	<0.0001
Use of smoking/vaping increased since the COVID-19 outbreak	88 (11.7 %)	179 (4.2 %)	<0.0001	1.34	0.95, 1.88	0.094

diagnosis of depression and 84.9 % (4263) did not report a current or previous diagnosis of depression. All demographic characteristics, except occupation and number of people supported by household income, were statistically different between these groups. Participants reporting a history of depression were younger, more likely to be female and to be single, and had lower education levels, higher frequency of being in school or not working for reasons other than the pandemic, and higher prevalence of smoking and of comorbid chronic conditions.

### 3.2. Depression and the COVID experience

Participants who reported a history of depression had greater odds of

the COVID-19 pandemic having a moderately/severely negative impact, after adjusting for all demographic characteristics, on: experiences of stress related to the coronavirus pandemic (*OR* = 2.46, 95 % *CI* 2.07, 2.93), stress in the family (*OR* = 1.55, 95 % *CI* 1.24, 1.94), access to medical care (*OR* = 1.44, 95 % *CI* 1.19, 1.73), access to mental health care (*OR* = 2.91, 95 % *CI* 2.23, 3.80), daily routines (*OR* = 1.60, 95 % *CI* 1.31, 1.95), family income and employment (*OR* = 1.38, 95 % *CI* 1.15, 1.67), access to family and non-family social supports (*OR* = 1.56, 95 % *CI* 1.31, 1.85), (Table 2). Those in the depressed group also had higher odds of receiving a COVID-19 test (*OR* = 1.55, 95 % *CI* 1.25, 1.92), self-isolating (*OR* = 1.38, 95 % *CI* 1.16, 1.66) - especially for health concerns (*OR* = 1.44, 95 % *CI* 1.20, 1.72) - and increased use of alcohol (*OR* =



**Table 3**  
Patient-reported mental health measures by depression status.

Measure	History of depression (n = 760)	No history of depression (n = 4263)	Unadjusted p-value	Adjusted OR	95 % CI	Adjusted p-value
<b>PHQ-8</b>						
Total score	8.8 ± 6.7	3.6 ± 4.8	<0.0001			
Score < 10	451 (59.8 %)	3703 (88.5 %)		3.97	3.27, 4.84	<0.0001
Score ≥ 10	303 (40.2 %)	482 (11.5 %)	<0.0001			
<b>GAD-7</b>						
Total score	8.0 ± 6.5	3.2 ± 4.5	<0.0001			
Score < 10	479 (63.7 %)	3774 (90.0 %)		3.77	3.07, 4.62	<0.0001
Score ≥ 10	273 (36.3 %)	421 (10.0 %)	<0.0001			
<b>PDS-5</b>						
Total score	8.9 ± 14.1	1.7 ± 5.8	<0.0001			
Score < 28	517 (86.9 %)	3723 (98.6 %)		7.17	4.67, 11.00	<0.0001
Score ≥ 28	78 (13.1 %)	54 (1.4 %)	<0.0001			

**Table 4**  
Brief cope by depression status.

Item	History of depression	No history of depression	p-Value
	n (%)	n (%)	n (%)
Adaptive	37.0 ± 9.4	34.8 ± 10.1	<0.0001
Active coping	4.9 ± 1.7	4.8 ± 1.8	0.725
Use of emotional support	4.5 ± 1.8	4.0 ± 1.8	<0.0001
Use of instrumental support	4.0 ± 1.7	3.5 ± 1.6	<0.0001
Positive reframing	4.7 ± 1.8	4.5 ± 1.9	<0.0001
Planning	4.8 ± 1.8	4.5 ± 1.8	<0.0001
Humor	4.0 ± 1.9	3.7 ± 1.8	<0.0001
Acceptance	6.1 ± 1.7	5.8 ± 1.9	<0.0001
Religion	4.3 ± 2.2	4.2 ± 2.2	0.432
Maladaptive	22.7 ± 6.8	19.1 ± 6.4	<0.0001
Self-distraction	5.3 ± 1.8	4.6 ± 1.8	<0.0001
Denial	3.0 ± 1.5	2.8 ± 1.4	0.0004
Substance use	3.2 ± 1.9	2.7 ± 1.4	<0.0001
Behavioral disengagement	3.4 ± 1.7	2.8 ± 1.4	<0.0001
Venting	4.2 ± 1.6	3.5 ± 1.5	<0.0001
Self-blame	3.8 ± 1.9	2.9 ± 1.4	<0.0001

1.31, 95 % CI 1.04, 1.64), prescription painkillers (OR = 2.65, 95 % CI 1.45, 4.83), and drugs other than prescription painkillers (OR = 3.01, 95 % CI 1.95, 4.65) (Table 2).

3.3. Depression and PHQ-8, GAD-7, and PDS-5 scores

The results of the multivariable adjusted analysis for depression status and PHQ-8, GAD-7, and PDS-5 scores are displayed in Table 3. Participants reporting a history of depression had greater odds of a PHQ-8 score ≥ 10 (OR = 3.97, 95 % CI 3.27, 4.84), GAD-7 score ≥ 10 (OR = 3.77, 95 % CI 3.07, 4.62), and PDS-5 score ≥ 28 (OR = 7.17, 95 % CI 4.67, 11.00) compared to those in the group without depression.

3.4. Depression and coping

Participants reporting a history of depression had significantly higher means of both adaptive and maladaptive coping scores (Table 4). This was true for all the individual items within the maladaptive category, and all except active coping and religion in the adaptive category. Table 5 shows the associations between scores on the adaptive and maladaptive components of the Brief COPE, and PHQ-8, GAD-7, and PDS-5 in the full sample and in the subgroup with a past or current diagnosis of depression. In both groups, greater use of adaptive coping strategies was associated with lower scores, and greater use of

**Table 5**  
Regression results for associations with depression status and coping for the full sample (n = 5023) and depressed sample only (n = 760).

	Full sample	GAD-7		PHQ-8		PDS-5	
		Odds ratio for total ≥ 10 (95 % CI)	p-Value	Odds ratio for total ≥ 10 (95 % CI)	p-Value	Odds ratio for total ≥ 28 (95 % CI)	p-Value
Depression	2.93 (2.29, 3.76)	<0.0001	3.37 (2.63, 4.30)	<0.0001	6.11 (3.74, 10.01)	<0.0001	
<b>Brief cope</b>							
Adaptive	0.95 (0.94, 0.96)	<0.0001	0.94 (0.92, 0.95)	<0.0001	0.95 (0.93, 0.98)	0.0008	
Maladaptive	1.24 (1.22, 1.26)	<0.0001	1.28 (1.25, 1.30)	<0.0001	1.20 (1.16, 1.25)	<0.0001	
<b>Sample with history of depression</b>							
<b>Brief cope</b>							
Adaptive	0.95 (0.93, 0.97)	<0.0001	0.95 (0.93, 0.97)	<0.0001	0.96 (0.93, 0.99)	0.0222	
Maladaptive	1.26 (1.21, 1.31)	<0.0001	1.27 (1.22, 1.33)	<0.0001	1.18 (1.13, 1.24)	0.0001	

maladaptive strategies was significantly associated with higher scores, on the scales measuring symptoms of anxiety, depression, and traumatic stress symptoms. Adding coping strategies to the regression models with the full sample did not negate the associations previously found between depression status and the mental health outcomes, however including coping strategies did increase the fit of all models (AIC 2130.5 vs. 3138.3 for PHQ-8; 2260.0 vs. 3177.0 for GAD-7; 592.9 vs. 826.3 for PDS-5), indicating the importance of including these factors.

4. Discussion

In this online survey of a national sample of U.S. adults distributed in June 2020, we found that individuals reporting a past or current diagnosis of depression had greater odds of reporting a moderate-to-severe negative impact of the COVID-19 pandemic on multiple aspects of their lives, including access to mental health treatment, increased use of alcohol, prescription painkillers, and/or other drugs, and of self-

isolating, than individuals without a history of depression. Additionally, individuals with a history of depression reported greater symptoms of depression, anxiety, and traumatic stress than individuals without such history. Our findings are similar to studies from early in the pandemic which found that individuals with a history of depression experienced greater perceived stress across diverse life domains (family, finances, work) as well as increased anxiety and difficulty concentrating (Husky et al., 2021), and changes in depressive symptoms and sleep duration over the course of the lockdown period (Leightley et al., 2021).

Importantly, in the current sample, people with symptoms of depression and anxiety also appeared to experience substantial symptoms of PTSD. These findings are similar to global experiences of women with a history of anxiety or depression during the first month of full lockdown who also experienced significantly more PTSD symptoms (Ravaldi et al., 2020), and Italian adults with a prior psychiatric diagnosis who had significantly greater odds of posttraumatic stress, depression, generalized anxiety, insomnia, perceived stress, and adjustment disorder (Rossi et al., 2020). Essentially, people with clinical presentations of depression and anxiety, and current or previous diagnoses, appear to have experienced the lockdown and related isolation as a traumatic event, with related worsening of symptoms.

The financial hardship of unemployment and decreased income likely exacerbated the psychosocial effects of the pandemic for people with mental disorders (Oppenauer et al., 2021). Our findings shed light on the unique adverse experience of the pandemic for people with a history of depression, especially as it relates to self-isolation, symptom severity, access to treatment, and substance use. Further illustrating this experience, our data on coping strategies indicated use of both adaptive and maladaptive coping styles related to scores on the PHQ-8, GAD-7, and PDS-5 not only in the group reporting a history of depression, but also in the overall sample. In fact, we found adaptive coping provided protection against traumatic stress and symptoms of depression and anxiety, while maladaptive coping increased risk for symptoms of depression, anxiety, and trauma. Since maladaptive coping strategies tend to be associated with worsening of clinical symptoms of depression and adaptive coping is effective for regulation of emotion and handling stressful events (Holubova et al., 2018), the extreme duress associated with a global pandemic may have activated elements of both maladaptive and adaptive coping strategies. This has important implications for people with depression, particularly as our results showed greater use of both types of strategies among participants reporting a history of depression than the remainder of the sample.

#### 4.1. Limitations

There are limitations with the current study which include those associated with survey data. Self-selection bias is a concern and, since this was an online survey published in English, limited internet access and/or computer skills and non-English speakers are likely under-represented. Additionally, a disproportionate number of healthcare workers were represented, an employment category which may have influenced participants' experience of and reactions to the pandemic. Our data on current or past psychological conditions are based on self-report rather than clinical diagnoses. Additionally, measures of anxiety, depression, and traumatic stress were assessed using screening tools, therefore should not be interpreted as prevalence estimates in the general population, as this risks overestimation of these conditions (Thombs et al., 2018).

#### 4.2. Conclusion

Our findings demonstrate that the early months of the COVID-19 pandemic had a significantly greater negative impact on U.S. adults who reported having a history of depression than on those who did not. Since stressful life events are a risk factor for the onset of depression, and a first occurrence may increase risk of subsequent episodes and

exacerbate the stress itself (Husky et al., 2021), these results are not unexpected. They do emphasize the vulnerability people with a history of depression have to the circumstances of a pandemic, and the duty of clinicians to actively seek out patients to ensure they have access to the care they need during extraordinary taxing circumstances. Additionally, since adaptive coping strategies do, indeed, appear to be protective and help regulate symptomatology, particular focus during the clinical encounter on the cultivation of tools to promote general well-being, alleviate stress, and reduce perceptions of helplessness in trying times could provide people with meaningful alternatives to maladaptive coping strategies, which may intensify adverse circumstances. More research on the nuances of the application of various coping mechanisms for unprecedented life events is necessary.

#### CRedit authorship contribution statement

All authors contributed to the study design and development of survey questions. LRH and MMB conducted the analysis. KS, LRH, BdG, and MMB drafted the manuscript, with final review and contributions from AMW and MP. All authors read and approved the final manuscript.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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