

# The Effects of COVID-Related Stressors on Anxiety and Depressive Symptoms during the COVID-19 Pandemic

Emily Levy Kamugisha, MD, AAHIVS, Chance Strenth, PhD, Sapna Srivastava, Alejandro Rocha, MD, PGY-2, Tara Clark, MD, PGY-2, Bliss Puthenpurayil, MD, Amrutha Pavle, MD, Dan Sepdham, MD, and Elizabeth Arnold, PhD

University of Texas Southwestern Medical Center

UT Southwestern Medical Center

## INTRODUCTION

- The COVID-19 pandemic has led to increased rates of stress, anxiety & depression worldwide.
- Research suggests worsening anxiety and depressive symptoms in:
  - younger adults
  - female or non-binary
  - underlying mental or physical health conditions
  - personal history of COVID-19 disease
- Public health prevention measures (e.g. social distancing), may be mood protective but not accessible to the vulnerable (race/ethnicity, income, low SES, or essential workers).
- Studies have assessed the psychological impact of COVID-19
- Little is known about the impact of COVID-19 in primary care settings.
- No studies assessing the 2-question Patient Health Questionnaire (PHQ-2) as a predictor for mental health distress in any pandemic, including COVID-19.
- The social factors impacting mental health during the COVID-19 pandemic remain mostly uncharacterized.

### Research Question(s):

- Primary study aim:**
  - In the primary care setting, do pre-COVID-19 PHQ-2 scores predict psychological distress during the COVID-19 pandemic?
- Secondary study aims:**
  - Is there a statistically significant correlation between COVID-related stressors and the PHQ-9 or GAD-7 scores?
    - COVID-related stressors** include a composite measure of the following:
      - Change in employment
      - Role as essential worker
      - Caregiver
      - Unmet need: food, utilities, shelter, healthcare, medication, phone, clothing, or child care.
  - Do "essential workers" have higher rates of anxiety and depressive symptoms compared to non-essential workers?

## METHODS

- Study Design:**
  - Cross-sectional, self-administered electronic survey
- Setting and Subjects:**
  - n = 118 participants
  - 3 university-affiliated primary care clinics in a large Southern U.S. city
- Inclusion Criteria:**
  - System-wide patient registry who did not opt-out to be contacted for research
  - Established, adult patient
  - Documented PHQ-2 screening score on file from 9/1/19-2/29/20 (the 6 months prior to the COVID-19 pandemic).
- Exclusion Criteria:**
  - History of psychosis, mania, or active substance-induced mood disorder.
- Quasi-randomized sample of eligible participants were identified by the university officials in control of a system-wide patient registry system.
- Procedure:**
  - Recruitment:**
    - Electronic via telephone and email, or during an in-person clinic visit.
- Tool:**
  - Survey & data collected & managed using REDCap
  - Survey: demographics, experiences related to COVID-19, the GAD-7, & the PHQ-9.
- Chart-review to obtain gender and age.
- Analysis:**
  - Primary outcome variables:**
    - Depression & anxiety symptoms as measured by the PHQ-9 & GAD-7 questionnaires respectively.
  - Predictor variables:**
    - Two sub-groups based on degree of depressive symptoms pre-COVID-19 pandemic:
      - Baseline PHQ-2 score < 2
      - Baseline PHQ-2 score ≥ 2
    - Composite COVID-related stressor score
    - Role as an essential worker
  - Statistics**
    - Descriptive
    - t-test for independent samples
    - Univariate regression analyses

## Participant Demographics

Gender	n (%)	Age Range	n (%)	Relationship Status*	n (%)
Male	36 (30.5%)	18-19	0 (0%)	Married	64 (55.17%)
Female	82 (69.5%)	20-29	16 (13.56%)	Divorced	16 (13.79%)
		30-39	28 (23.73%)	Widowed	4 (3.45%)
		40-49	20 (16.95%)	Separated	3 (2.59%)
		50-59	24 (20.34%)	Partnered, not married	8 (6.90%)
		60-69	22 (18.64%)	Single, never married	21 (18.10%)
		70-79	8 (6.78%)		

  

Race **	n (%)	Annual Household Income*	n (%)
White	85 (75.22%)	\$0-\$9,999	1 (0.86%)
Black/African American	13 (11.50%)	\$10,000-\$14,999	2 (1.72%)
American Indian or Alaska Native	0 (0%)	\$15,000-\$24,999	3 (2.59%)
Asian	10 (8.85%)	\$25,000-\$34,999	2 (1.72%)
Native Hawaiian or Other Pacific Islander	1 (0.89%)	\$35,000-\$49,999	14 (12.07%)
Multi-race	4 (3.54%)	\$50,000 or more	89 (76.72%)
		Prefer not to answer	5 (4.31%)

  

Level of Education*	n (%)
Less than high school degree	0 (0%)
High school graduate degree or GED	10 (8.62%)
Some college, no degree	18 (15.52%)
Associate degree and/or technical school	15 (12.93%)
Bachelor's degree	35 (30.17%)
Master's degree	22 (18.97%)
Doctoral degree	16 (13.79%)

## Participant Experience During Pandemic

	Yes - n (%)	No - n (%)
Personal history of COVID-19*	16 (13.8%)	100 (86.2%)
Family of friend tested positive for COVID-19 *	72 (62.1%)	44 (37.9%)
Family or friend died due to complications of COVID-19	25 (21.6%)	91 (78.4%)
Employment status change during the COVID-19 pandemic*	20 (17.2%)	96 (82.8%)
Self/family member "essential worker"***	74 (63.8%)	42 (36.2%)
Caring for dependent(s)*	31 (26.7%)	85 (73.3%)
Living with others*	55 (47.4%)	61 (52.6%)

Personal (or family member) trouble accessing basic need (select all that apply)	n (%)
Food	4 (3.4%)
Utilities	2 (1.7%)
Shelter/Housing	1 (0.85%)
Medications	6 (5.1%)
Health care	4 (3.4%)
Phone	1 (0.85%)
Clothing	1 (0.85%)
Child care	5 (4.2%)
No difficulties accessing any of the above needs	101 (85.6%)

## Participant Mental Health

Baseline PHQ-2 Score Category	n (%)
PHQ-2 Score < 2	99 (83.90%)
PHQ-2 Score ≥ 2	19 (16.10%)

Diagnosed with a mental health illness prior to the pandemic*	n (%)
Yes, during the pandemic:	59 (50.9%)
Required more treatment	15 (25.4%)
Required less treatment	3 (5.1%)
Required no changes to treatment	36 (61.0%)
Felt a need for more treatment but unable to access/afford treatment	5 (8.5%)
No	57 (49.1%)

Started on psychotropic medication during the pandemic*	n (%)	GAD-7 Score	n (%)
Yes	17 (14.7%)	Minimal (0-4)	61 (51.7%)
No	99 (85.3%)	Mild (5-9)	29 (24.6%)
		Moderate (10-14)	18 (15.3%)
		Severe (15-21)	10 (8.5%)

PHQ-9 Score***	n (%)
Minimal (0-4)	57 (48.7%)
Mild (5-9)	28 (23.9%)
Moderate (10-14)	20 (17.1%)
Moderately severe (15-19)	11 (9.4%)
Severe (20-27)	1 (0.85%)

## Mean Difference by Baseline PHQ-2 Score

	PHQ-2 score < 2 (Mean)	PHQ-2 score ≥ 2 (Mean)	t-test/Fisher's Exact	p-value
PHQ-9 score	5.32	10.00	-3.45	0.001
GAD-7 score	5.04	8.32	-2.56	0.012
COVID-related Stressor	1.196	1.737	-1.86	0.065
Age	47.32	44.89	0.646	0.520

\*some data missing (n= 116)  
\*\*some data missing (n=113)  
\*\*\*some data missing (n=117)

## RESULTS

- Majority female, middle-aged, married, higher education, white & non-Hispanic, income > \$50,000/yr.
- 13.8% infected with COVID-19
- 62.1% had family/friend with COVID-19
- 21.6% had family/friend die from COVID-19
- COVID-Related Stressors:**
  - 82.8% no employment status change
  - 63.8% self-identified themselves or a family member as an "essential worker."
  - 26.7% caring for a dependent.
  - 85.6% had no difficulties accessing basic necessities
- Mental Health:**
  - 83.9% with baseline PHQ-2 score < 2
  - 50.9% with self-reported diagnosis of mental health illness pre-pandemic.
    - 25.4% required treatment escalation during the pandemic.
    - 8.5% felt they needed treatment escalation but could not access or afford treatment.
  - 48.4% expressed more than a minimal severity of symptoms on the GAD-7 questionnaire.
  - 51.25% expressed more than a minimal severity of symptoms on the PHQ-9 questionnaire.
- Primary Study Aim:**
  - A significant difference exists between baseline PHQ-2 score categorizations (< 2 & ≥ 2) & symptoms of depression & anxiety during the COVID-19 pandemic.
  - There was no significant difference between the mean composite stressor scale, and the mean age when comparing the PHQ-2 score < 2 and PHQ-2 score ≥ 2 groups.
- Secondary Study Aims:**
  - COVID-related stressors were positively associated with the GAD-7 and PHQ-9.
    - GAD-7 (r [1, 115] = .344, p < .001)
    - PHQ-9 (r [1,115] = .325, p < .001).
  - No significant differences between non-essential and essential workers for both the GAD-7 and PHQ-9
    - GAD-7 ( t[2, 114] = -.352, p = .725)
    - PHQ-9 ( t[2, 114] = -1.00, p = .318)
    - non-essential (n=42, GAD-7<sub>M</sub> = 5.17, PHQ-9<sub>M</sub> = 5.29)
    - essential workers (n=74, GAD-7<sub>M</sub> = 5.51, PHQ-9<sub>M</sub> = 6.36)

## DISCUSSION

- COVID-related stressors are moderately and directly associated with higher levels of anxiety and depressive symptoms.
- Gather social history containing these stressors to better identify those at risk & provide early targeted interventions.
- Further research needed on optimal intervention strategies for those indirectly impacted by COVID-19.
- On average, essential workers reported higher scores on both the GAD-7 and PHQ-9 but there was no significant difference in scores as compared to non-essential workers.
- Psychological impact of pandemic on essential and non-essential workers may be similar or the difference was not captured in this study.
- Further research needed to determine if a significant difference exists over time or in other geographic locations.
- Continue to address mental health of all patients regardless of job classification.
- A significant difference exists between baseline PHQ-2 score categorizations (<2 and ≥2) and symptoms of depression and anxiety during the COVID-19 pandemic.
  - Anxiety symptoms changed, but remained mild in severity: clinical application unclear.
  - Depressive symptoms increased from mild to moderate in severity
    - Practical implications: consider more frequent surveillance of patients with a PHQ-2 score ≥ 2 to assess need for treatment or treatment adjustment
- Cross-sectional data, including PHQ-9 and GAD-7 scores, collected late into the pandemic: initial changes in mood symptoms that were not long-lasting unlikely captured.

## REFERENCES

References furnished upon request

**Contact:**  
Emily Levy Kamugisha, MD, AAHIVS  
Assistant Professor/Associate Program Director  
Department of Family and Community Medicine  
UT Southwestern Medical Center  
Emily.levykamugisha@utsouthwestern.edu

This work was supported in whole or in part by a grant from the Texas Higher Education Coordinating Board (THECB). The opinions and conclusions expressed in this document are those of the author(s) and do not necessarily represent the opinions or policy of the THECB.