

ORIGINAL RESEARCH

Physician Wellness

# Post-traumatic stress and stress disorders during the COVID-19 pandemic: Survey of emergency physicians

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## Abstract

**Objective:** Emergency physicians routinely encounter stressful clinical situations, including treating victims of crime, violence, and trauma; facing the deaths of patients; and delivering bad news. During a pandemic, stress may be increased for healthcare workers. This study was undertaken to identify symptoms of post-traumatic stress disorder (PTSD) among emergency physicians during the coronavirus disease 2019 (COVID-19) pandemic.

**Methods:** This cross-sectional survey was developed using the Life Events Checklist for Diagnostic and Statistical Manual of Mental Disorders, 5th Edition: DSM-5 (DSM-5) and the PTSD Checklist for DSM-5 (PCL-5). The survey was distributed to members of the American College of Emergency Physicians from May 21, 2020, through June 22, 2020.

**Results:** Among 1300 emergency physicians, a significant number of participants (22.3%; 95% confidence interval, 20.3–24.3%) reported symptoms of stress consistent with PTSD (PCL score  $\geq$  33). Higher PCL-5 scores were associated with age younger than 50 years ( $P < 0.05$ ) and  $<10$  years in practice ( $P < 0.05$ ). The major sources of stress identified by participants included disinformation about COVID-19, computer work/electronic medical record, personal protective equipment concerns, and workload. The most common consequences of workplace stress were feeling distant or cut off from other people and sleep disturbance, such as trouble falling or staying asleep.

**Conclusions:** A significant number of emergency physicians reported symptoms of stress consistent with PTSD. Higher PCL-5 scores were associated with age younger than 50 years and  $<10$  years in practice.

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## 1 | INTRODUCTION

### 1.1 | Background

Emergency physicians routinely encounter stressful clinical situations, including treating victims of crime, violence, and trauma; facing the deaths of patients; and delivering bad news. Other workplace stressors are common, including workload, shift work, workplace conflict, medical errors, and litigation.

Post-traumatic stress disorder (PTSD) is a psychiatric diagnosis that requires 4 elements (Table 1).<sup>1</sup> Symptoms of PTSD have been described among family members who have witnessed unsuccessful cardiopulmonary resuscitation. Similar symptoms may occur in healthcare workers experiencing this or similar events. PTSD may be underrecognized among physicians.<sup>2,3</sup> A 2005 study of emergency medicine residents found an 11% incidence of PTSD (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition: DSM-IV criteria) and numerous others with some symptoms of PTSD.<sup>4</sup> A recent study that found a 16% incidence of PTSD among attending emergency physicians identified that being a victim of a prior trauma or abuse is the primary predictor of PTSD.<sup>5</sup>

### 1.2 | Importance

During a pandemic, healthcare workers may experience increased stress. Resources, including medications, physical space, equipment, and staff, become scarce. The altered standards of care demanded by a crisis can be a source of moral distress. Previous studies have reported that the incidence of high levels of stress in healthcare workers during an epidemic or pandemic range from 18.1% to 80.1%.<sup>6</sup> Sources of stress may include increased workload, fears of contagion for themselves and their families, working with new and frequently changing protocols and personal protective equipment (PPE), caring for critically ill patients, and caring for colleagues who have also fallen ill.<sup>7</sup> Several studies have identified high incidences of anxiety, depression, and stress among healthcare workers during this pandemic.<sup>8,9</sup> Among the findings in a 2020 study during the height of the coronavirus disease 2019 (COVID-19) pandemic in New York City were that more than half had high levels of acute stress, nearly half had depression symptoms, one third had anxiety, and most had insomnia and loneliness.<sup>10</sup> A 2020 report indicated significant workplace and home anxiety among academic emergency physicians during COVID-19.<sup>11</sup> Another 2020 study identified risk factors for PTSD symptoms during the COVID-19 pandemic, including exposure level, working role, years of work experience, social and work support, job organization, quarantine, age, sex, marital status, and coping style.<sup>12</sup>

### 1.3 | Goals of this investigation

The goal of this study was to identify the prevalence of workplace-related stress and symptoms of PTSD during the COVID-19 pandemic

#### The Bottom Line

Among 1300 emergency physicians, this study found a significant number of participants (22%) reporting symptoms of stress consistent with PTSD. The major sources of stress identified by participants were largely system-level concerns, including disinformation about COVID-19, computer work/electronic medical record, PPE concerns, and workload.

among emergency physicians. This study was undertaken as an objective of the Ethics Committee of the American College of Emergency Physicians (ACEP) under the direction of the ACEP Board of Directors.

## 2 | METHODS

### 2.1 | Study design and setting

This cross-sectional survey was developed using the Life Events Checklist for DSM-5, a validated and published checklist,<sup>13</sup> and the PTSD Checklist for DSM-5, a 20-item survey and a validated instrument to assess symptoms of PTSD based on DSM-5 diagnostic criteria.<sup>14-20</sup> The study was approved as exempt research by the Wright State University Institutional Review Board. After survey development, the survey was piloted among 50 emergency physicians to assess clarity and readability. Participants were informed that the survey purpose was to identify symptoms of work-related stress and/or PTSD during the COVID-19 pandemic and to help guide ACEP in serving member needs.

**TABLE 1** Diagnosis of post-traumatic stress disorder

- To be diagnosed with PTSD, an adult must have all of the following for at least 1 month:
- At least 1 re-experiencing symptom
  - Flashbacks—reliving the trauma over and over, including physical symptoms such as a racing heart or sweating
  - Bad dreams
  - Frightening thoughts
- At least 1 avoidance symptom
  - Staying away from places, events, or objects that are reminders of the traumatic experience
  - Avoiding thoughts or feelings related to the traumatic event
- At least 2 arousal and reactivity symptoms
  - Being easily startled
  - Feeling tense or “on edge”
  - Having difficulty sleeping
  - Having angry outbursts
- At least 2 cognition and mood symptoms
  - Trouble remembering key features of the traumatic event
  - Negative thoughts about oneself or the world
  - Distorted feelings like guilt or blame
  - Loss of interest in enjoyable activities

Source: National Institute of Mental Health.<sup>1</sup>

## 2.2 | Selection of participants

The survey was distributed to ACEP members from May 21, 2020, through June 22, 2020, by the following mechanisms: EM Today, EngagED, EM Docs Facebook page, and 2 ACEP all-member emails.

## 2.3 | Outcomes

Main outcome measures included symptoms suggestive of PTSD (PCL-5 score  $\geq 33$ ), sources of workplace stress, and responses to workplace stress.

## 2.4 | Analysis

Data were analyzed to identify factors associated with symptoms of PTSD. Scores were compared between subgroups of subjects by the Fisher exact test. Data were analyzed using SPSS (version 25; IBM Corp., Armonk, NY).

# 3 | RESULTS

## 3.1 | Characteristics of study participants

The survey was sent to ACEP members by 4 all-member emails for a total of 83,131 deliveries. Individuals opened an email 36,198 times (43.5%). A total of 1,691 individuals clicked on the survey (4.7% of those who opened). A total of 1300 individuals completed at least a portion of the survey (3.4% of those who opened the email). Among 1300 respondents, the majority were men (60%), younger than age 50 years (59%), and White (81%). The majority practiced in a community setting (56%), followed by urban (36%) and university (32%). The largest category of participants worked in a large volume emergency department (>70,000) (37%).

## 3.2 | Main results

Among 1300 emergency physicians, a significant number of participants (22.3%; 95% confidence interval, 20.3%–24.3%) reported symptoms of stress consistent with PTSD (PCL-5 score  $\geq 33$ ). Higher PCL-5 scores were associated with age younger than 50 years ( $P < 0.05$ ) and <10 years in practice ( $P < 0.05$ ). Practicing in the Northeast census region was associated with lower PCL-5 scores (Table 2).

The major sources of stress identified by participants included disinformation about COVID-19, computer work/electronic medical record, PPE concerns, and workload (Table 3). Narrative comments about sources of stress were given by 163 respondents (Table 4).

The most common consequences of workplace stress included feeling distant or cut off from other people (weighted average 2.27), trou-

ble falling or staying asleep (weighted average 2.13), and having strong negative beliefs about oneself, other people, or the world (weight average 1.98) (Appendix 1).

A total of 737 people provided narrative responses to the question asking how their lives had been affected by workplace stress. Some respondents identified several aspects of their lives that had been affected, and a total of 933 elements were coded (Table 5). The spectrum of responses ranged from extremely negative to neutral/pragmatic to positive. Among those negatively affected, one person endorsed suicidal ideations. Sample narrative comments included the following:

- My expectations about living a satisfying life have diminished.
- This has showed me how disposable we are as individuals.
- With a new baby, there are many tearful days of worrying about what I would do if I was not with her.
- Feel like a pawn in a C-suite game of chess.
- Pressure to conform to the corporate version of COVID.
- Everyday stress from social media due to misinformation.
- I regret choosing emergency medicine. My biggest concern is child-care. We're expected to go to work and do our jobs, but with no school, childcare is a major issue. I want to help and appreciate everyone's thanks, but no one helps us operationalize this for our families.
- I need my kids back in school. I cannot do my job and be my kids' teacher.
- Nonmedical people believing work in the ER is a death wish.
- Elective surgeries but reusing PPE.
- Financial stress related to reduced patient volume.
- I have taken care of sick patients my whole career and consider this to be my responsibility and fate. As long as I have good PPE, I will continue to do this without fear. Made me value my experiences and training that prepared me for experiences like this.
- My wife stood by me.
- Administrative burden.
- Reaffirmed my decision to go into emergency medicine. We truly are essential.

## 4 | LIMITATIONS

These survey data are dependent on the veracity of participants' responses. The voluntary nature of the survey may have introduced response bias. The actual incidence of PTSD symptoms may be higher or lower than reported in this study. Baseline occupational stress before the pandemic was not measured in this population, and it is uncertain what degree of stress was attributed to baseline occupational stress compared with stress during the pandemic. The survey was administered in 2020, during the COVID-19 pandemic, and results may not be generalizable to other time periods. Although the survey specifically asked about symptoms of stress during the COVID-19 pandemic, it is possible that respondents may have indicated symptoms of stress unrelated to the pandemic.

**TABLE 2** Baseline demographics and PCL-5  $\geq 33$  (probable post-traumatic stress disorder) among emergency physicians during the COVID-19 pandemic

	Total number	N with PCL-5 $\geq 33$ (probable post-traumatic stress disorder)	%	95% CI	P <sup>a</sup>
Age, range 24–78 years (mean $\pm$ SEM: 47.4 $\pm$ 0.33)					
<30 years	30	6	20.0	12.1–27.9	
30–39	323	79	24.5	22.1–26.9	
40–49	317	81	25.6	23.2–28.0	
50–59	269	62	23.0	20.4–25.6	
$\geq 60$	199	24	12.1	9.0–15.2	<0.01
$\leq 49$	670	166	24.8	23.1–26.5	
$\geq 50$	468	86	18.4	16.4–20.4	<0.05
Sex					
Female	462	108	23.4	21.4–25.4	
Male	679	146	21.5	19.8–23.2	NS
Years in practice, range 0–49 (mean $\pm$ SEM: 18.3 $\pm$ 0.31)					
<10 years	344	89	25.9	23.6–28.2	
>20 years	497	96	19.3	17.4–21.2	<0.05
Race					
White/European	927	206	22.2	20.8–23.6	
Non-white	226	51	22.6	19.7–25.5	
Asian	54	12	22.2	16.3–28.1	
Asian Indian	40	16	40	33.2–46.8	
Black/African American	31	4	12.9	5.2–20.6	
Other	99	23	23.2	18.9–27.5	NS
Ethnicity					
Hispanic	102	27	26.5	22.2–30.8	
Non-Hispanic	1042	228	21.9	20.6–23.2	NS
Emergency department volume					
<10,000	63	12	19.0	13.3–24.7	
10,000–29,000	147	33	22.4	18.4–26.4	
30,000–49,000	248	59	23.8	20.7–26.9	
50,000–69,000	262	62	23.7	20.6–26.7	
>70,000	407	83	20.4	18.0–22.8	NS
Practice setting					
University	158	38	24.1	20.2–28.0	
University affiliate	210	46	21.9	18.5–25.2	
Community	637	140	22.0	20.1–23.9	
Urban	411	82	20.0	17.6–22.4	
Rural	129	34	26.4	22.1–30.7	NS

(Continues)

**TABLE 2** (Continued)

	Total number	N with PCL-5 $\geq$ 33 (probable post-traumatic stress disorder)	%	95% CI	P <sup>a</sup>
Trauma designation					
Undesignated	123	31	25.2	21.1–29.1	
Level I	348	73	21.0	18.4–23.6	
Level II	283	72	25.4	22.8–27.9	
Level III	223	39	17.5	14.6–20.3	
Level IV	108	27	25.0	20.9–29.1	
Level V	68	15	22.1	16.2–28.0	NS
US census region					
Northeast	194	31	16.0	12.9–19.1	<0.05
Midwest	279	65	23.3	20.7–25.9	
South	346	80	23.1	20.8–25.4	
West	249	57	22.9	20.2–25.6	
Total	1153	257	22.3	20.3–24.3	

CI, confidence interval; NS, nonsignificant.

<sup>a</sup>Fisher exact test.

**TABLE 3** Sources of stress: How many days of the past 30 days have you experienced stress due to these workplace issues?

Issue	Mean number of days/30 days	SEM
Disinformation about COVID-19 (on social media and elsewhere)	12.2	0.334
Computer work/electronic medical record	8.55	0.272
PPE concerns	7.85	0.274
Workload	6.95	0.243
Shiftwork	6.00	0.214
Liability concerns	4.82	0.221
Workplace conflict	3.97	0.176
Patient tragedy/delivering bad news	4.14	0.149
Patient death/bad outcome	3.09	0.141
Violence to you or staff	1.95	0.100
Discrimination	1.38	0.125
Other	8.00	

## 5 | DISCUSSION

Workplace stress is a threat to physician well-being, especially during a pandemic. This study identified that a significant number of participants reported symptoms of stress consistent with PTSD. Higher PCL-5 scores were associated with age younger than 50 years and <10

**TABLE 4** Narrative responses to “How many days of the past 30 days have you experienced stress due to these workplace issues?”<sup>a</sup>

Issue	Frequency	Percent
Decreased hours or pay or loss of benefits	46	24.0
Administration demands or lack of support	23	12.0
Loss of job or fear loss of job	16	8.3
Relationships with friends and family	14	7.3
Personal sickness	12	6.3
Staffing reduction	8	4.2
Family sickness	7	3.6
Hospital financial security	6	3.1
Social unrest and violence	5	2.6
Childcare or education	5	2.6
On leave of absence due to COVID	4	2.1
Others not careful about social distancing or wearing masks	4	2.1
Coworker sickness	4	2.1
Political concerns	3	1.6
Patient expectations	2	1.0
Concern physician hours covered by physician assistants and nurse practitioners	2	1.0
Other	31	16.1
Total	192	100.0

<sup>a</sup>A total of 163 respondents entered an optional narrative response, some with multiple elements, yielding a total of 192 comments that were coded.

**TABLE 5** The US Marine Corps and Navy combat and operational stress continuum model

	Ready (green)	Reacting (yellow)	Injured (orange)	Ill (red)
Definition	<ul style="list-style-type: none"> <li>Adaptive coping</li> <li>Effective functionin</li> <li>Well-being</li> </ul>	Mild and transient distress or loss of function	More severe and persistent distress or loss of function	<ul style="list-style-type: none"> <li>Critical mental disorders</li> <li>Untreated stress injuries</li> </ul>
Types			<ul style="list-style-type: none"> <li>Trauma</li> <li>Fatigue</li> <li>Grief</li> <li>Moral injury</li> </ul>	<ul style="list-style-type: none"> <li>PTSD</li> <li>Depression</li> <li>Anxiety</li> <li>Substance abuse</li> </ul>
Features	<ul style="list-style-type: none"> <li>In control</li> <li>Calm and steady</li> <li>Getting the job done</li> <li>Playing</li> <li>Sense of humor</li> <li>Sleeping enough</li> <li>Ethical and moral behavior</li> </ul>	<ul style="list-style-type: none"> <li>Anxious</li> <li>Irritable, angry</li> <li>Worrying</li> <li>Cutting corners</li> <li>Poor sleep</li> <li>Poor mental focus</li> <li>Social isolation</li> <li>Too loud and hyperactive</li> </ul>	<ul style="list-style-type: none"> <li>Loss of control</li> <li>Can't sleep</li> <li>Panic or rage</li> <li>Apathy</li> <li>Shame or guilt</li> </ul>	<ul style="list-style-type: none"> <li>Symptoms persist &gt;60 days after return from deployment</li> </ul>

Source: Nash WP.<sup>28</sup>

years in practice. The finding that 22% of respondents in this study reported symptoms associated with probable PTSD, compared with pre-COVID PTSD prevalence of 11% in emergency residents and 16% in emergency attendings in recent previous studies, suggests increased prevalence of PTSD during COVID-19. The strengths of this study, including the large number of participants and administration among ACEP members, have important ramifications for the application of this knowledge. It is known that high levels of stress at work can impair decisionmaking, increase errors, increase patient complaints, increase staff turnover, increase absenteeism and illness, and worsen workplace relationships. As supported by the narrative comments from respondents in this study, workplace stress can affect relationships at home with partners, children, and extended family and friends and can have an outward ripple effect affecting even more people. These results provide a compelling reason for healthcare organizations and emergency departments to assume an increased responsibility to monitor workload, work patterns, and work environment and aim to reduce levels of workplace stress.

Knowledge regarding the prevalence and source of workplace stress is necessary to create proactive and preventative strategies for wellness and resiliency.<sup>21</sup> Management of stress and prevention of burnout has been studied in emergency medicine for many years. A cross-sectional study of 24 Los Angeles hospitals indicated that physicians in these emergency departments who reported high levels of job satisfaction and personal accomplishment used short-term and long-term coping methods in dealing with stress.<sup>22</sup> When prevention fails, recognition of PTSD is a top priority, and a high index of suspicion is required.<sup>23</sup>

Occupational stressors may lead to mental health conditions. In a subset of emergency physicians, PTSD and other psychiatric conditions may result. The specialty of emergency medicine is stressful during any time period. Emergency physicians face unexpected tragedy, time constraints, and multiple demands of patients, administrators, and regulatory bodies. In the setting of the COVID-19 pandemic, baseline stress

in emergency medicine is magnified as emergency physicians face additional stressors of daily tragedy; changes in therapeutics, personal protection, and controversies regarding epidemiology and management; and reduction or loss of income.

Several approaches to evaluating workplace stress have been identified. One example is The Stress First Aid model (Table 5), which was first used by the U.S. Marines Corp in combat settings and has been adapted for use by first responders and emergency and trauma healthcare workers to evaluate their own and other's stress responses. The "green" zone is a healthy state, "yellow" identifies initial reactions to stress, "orange" is problematic stress, and "red" is critical mental illness, including PTSD. Early recognition and intervention in the stress continuum are important to bring a person back into a less severe zone.

Recognition and management of workplace-related stress among emergency physicians becomes even more important during a stressful time period, such as a pandemic. Recognition may facilitate engagement in treatment and other healing modalities. A high index of suspicion for PTSD among emergency physicians has been recommended to improve the health and well-being of those who care for others.

Short-term and long-term coping strategies have been proposed. The American Psychological Association 2018 Stress Tip Sheet recommends 7 tips for stress management that are the following: understand your stress, identify your stress sources, learn to recognize stress signals, recognize your stress strategies, implement health stress management strategies, make self-care a priority, and ask for support when needed.<sup>24</sup> A departmental or institutional approach to PTSD may include cognitive behavioral therapy (changing the way we respond emotionally and behaviorally to problems), team debriefing after care of critical patients, mindfulness-based stress management to calm the mind to cope in times of stress, and meditation or mental cues to "self-relax."<sup>25</sup> Peer support can be an effective stress management technique.<sup>26</sup> Peer support can be applied on an individual level, a departmental level, or a more global level, with organizational communications and support. The Mount Sinai Health System Employee, Fac-

ulty, and Trainee Crisis Support Task Force was created in New York City in March 2020. This task force identified the following 3 priority areas to promote and maintain workforce well-being: meeting basic daily needs; enhancing communications for delivery of current, reliable, and reassuring messages; and developing robust psychosocial and mental health support options.<sup>27</sup>

ACEP has both a Well-being Committee and a Wellness Section committed to providing resources for stress management. ACEP's Wellness Section has a list of wellness resources, including *Being Well in Emergency Medicine: ACEP's Guide to Investing in Yourself*.<sup>28</sup> ACEP also offers the Wellness and Assistance Program for ACEP members, including 3 free confidential counseling or wellness sessions 24/7 by text, phone, online, or face to face. In addition to these general resources, ACEP has a COVID-19 page with physician wellness resources related to new concerns brought on by the pandemic; this page includes the recently launched physician wellness hub of peer support, crisis support and counseling, physician wellness advocacy and resources categorized by source of stress (financial, legal, clinical, family, etc), and mental health concerns (PTSD, suicide, burnout).<sup>29</sup>

Despite these resources, we continue to see high rates of stress and burnout among emergency physicians. This study highlights how baseline levels of stress, burnout, and PTSD may be exacerbated during times of crisis. This demonstrates a need for future studies to further delineate the extent of the problem and how to best assist physicians who are in need. There are extensive barriers preventing physicians from seeking help, including stigma and fear of career repercussions.

This study did elucidate some specific areas of opportunity for easing workplace stress. A recurring theme in this study was stress about childcare/schooling and fear of infecting others in the household. In order to work, emergency physicians must not only be able to leave their homes but also return safely or have other temporary living arrangements. Practical solutions may include help with care of dependents, sanitation products for homes, and access to temporary housing.

In summary, a significant number of emergency physician respondents reported symptoms of stress consistent with PTSD. Higher PCL-5 scores were associated with age younger than 50 years and <10 years in practice. The major sources of stress identified by participants included disinformation about COVID-19, computer work/electronic medical record, PPE concerns, and workload. This work highlights the need to study how symptoms of stress change over time, evaluate the effectiveness of available wellness resources, and, importantly, determine if additional resources may be needed to better protect emergency physicians.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

CAM, GLL, VRF, JEM, and LV have made substantial contributions to conception and design. CM and GL made contributions to acquisition of data, and analysis and interpretation of data. CAM, GLL, VRF, JEM, and LV were involved in drafting the manuscript or revising it critically

for important intellectual content; and have given final approval of the version to be published.

## REFERENCES

- National Institute of Mental Health. Post traumatic stress disorder. <https://www.nimh.nih.gov/health/topics/post-traumatic-stress-disorder-ptsd/index.shtml>. Accessed November 7, 2019.
- Compton S, Grace H, Magdy A, Swor RA. Post-traumatic stress disorder symptomatology associated with witnessing unsuccessful out-of-hospital resuscitation. *Acad Emerg Med*. 2009;16:226-229.
- Lazarus A. Traumatized by practice: PTSD in physicians. *J Med Pract Manage*. 2014;30(2):131-134.
- Vanyo L, Sorge R, Chen A, Lakoff D. Posttraumatic stress disorder in emergency medicine residents. *Ann Emerg Med*. 2017;70(6):898-903.
- Mills LD, Mills TJ. Symptoms of post-traumatic stress disorder among emergency medicine residents. *J Emerg Med*. 2005;28(1):1-4.
- DeLucia JA, Bitter C, Fitzgerald J, Greenberg M, Dalwari P, Buchanan P. Prevalence of post-traumatic stress disorder in emergency physicians in the United States. *West J Emerg Med*. 2019;20(5):740-746.
- Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep*. 2020;22(8):43.
- Walton M, Murray E, Christian MD. Mental health care for medical staff and affiliated healthcare workers during the COVID-19 pandemic. *Eur Heart J Acute Cardiovasc Care*. 2020;9(3):241-247.
- Chew NWS, Lee GKH, Tan BYQ, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain Behav Immun*. 2020;88:559-565.
- Elbay RY, Kurtuluş A, Arpacıoğlu S, Karadere E. Depression, anxiety, stress levels of physicians and associated factors in Covid-19 pandemics. *Psychiatry Res*. 2020;290:113130.
- Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, et al. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. *Gen Hosp Psychiatry*. 2020;66:1-8.
- Rodriguez RM, Medak AJ, Baumann BM, et al. Academic emergency medicine physicians' anxiety levels, stressors, and potential stress mitigation measures during the acceleration phase of the COVID-19 pandemic. *Acad Emerg Med*. 2020;27:700-707.
- Carmassi C, Foghi C, Dell'Oste V, et al. PTSD symptoms in healthcare workers facing the three coronavirus outbreaks: what can we expect after the COVID-19 pandemic. *Psychiatry Res*. 2020;292:113312.
- Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. The Life Events Checklist for DSM-5 (LEC-5)—Standard. [https://www.ptsd.va.gov/professional/assessment/te-measures/life\\_events\\_checklist.asp](https://www.ptsd.va.gov/professional/assessment/te-measures/life_events_checklist.asp). Published 2013. Accessed November 22, 2019.
- PTSD Checklist—Civilian Version (PCL-C). [https://www.mirecc.va.gov/docs/vsn6/3\\_PTSID\\_CheckList\\_and\\_Scoring.pdf](https://www.mirecc.va.gov/docs/vsn6/3_PTSID_CheckList_and_Scoring.pdf). Accessed November 22, 2019.
- Karstoft KI Andersen SB, Bertelsen M, Madsen T. Diagnostic accuracy of the posttraumatic stress disorder checklist-civilian version in a representative military sample. *Psychol Assess*. 2014;26(1):321-325.
- Wilkins KC, Lang AJ, Norman SB. Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions. *Depress Anxiety*. 2011;28(7):596-606.
- McDonald SD, Calhoun PS. The diagnostic accuracy of the PTSD checklist: a critical review. *Clin Psychol Rev*. 2010;30(8):976-987.
- Using the PTSD Checklist for DSM-5 (PCL-5). <https://www.ptsd.va.gov/professional/assessment/documents/using-PCL5.pdf>. Accessed December 5, 2019.
- Bovin MJ, Marx BP, Weathers FW, et al. Psychometric properties of the PTSD checklist for diagnostic and statistical manual of

- mental disorders-fifth edition (PCL-5) in veterans. *Psychol Assess*. 2016;28(11):1379-1391.
21. Schmitz GR, Clark M, Heron S, et al. Strategies for coping with stress in emergency medicine: early education is vital. *J Emerg Trauma Shock*. 2012;5(1):64-69.
  22. Keller K, Koenig W. Management of stress and prevention of burnout in emergency physicians. *Ann Emerg Med*. 1989;18(1):42-47.
  23. Shah M. *We must start paying attention to physician PTSD in emergency medicine*. <https://positivepsychology.com/stress-management-techniques-tips-burn-out/>. Published 2019. Accessed October 26, 2020.
  24. Vanyo L, Sorge R, Chen A, et al. Posttraumatic stress disorder in emergency medicine residents. *Ann Emerg Med*. 2017;70(6):898-903.
  25. Albott CS, Wozniak JR, McGlinch BP, Wall MH, Gold BS, Vinogradov S. Battle buddies: rapid deployment of a psychological resilience intervention for health care workers during the COVID-19 pandemic. *Anesth Analg*. 2020 ;131(1):43-54.
  26. Ripp J, Peccoraro L, Charney D. Attending to the emotional well-being of the health care workforce in a New York City health system during the COVID-19 pandemic. *Acad Med*. 2020 ;95(8):1136-1139.
  27. American College of Emergency Physicians. COVID-19 physician wellness. <https://www.acep.org/corona/covid-19-physician-wellness/>. Accessed October 26, 2020.
  28. <https://www.acep.org/globalassets/sites/acep/media/wellness/acepwellnessguide.pdf>. Accessed October 26, 2020.
  29. Nash WP. US Marine Corps and Navy combat and operational stress continuum model: a tool for leaders. *Combat Operational Behavioral Health*. 2011:107-119. Washington DC. [https://ke.army.mil/bordeninstitute/published\\_volumes/combat\\_operational/CBM-ch7-final.pdf](https://ke.army.mil/bordeninstitute/published_volumes/combat_operational/CBM-ch7-final.pdf). Accessed October 26, 2020.

## AUTHOR BIOGRAPHY



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## APPENDIX 1: RESPONSES TO WORKPLACE STRESS DURING THE COVID-19 PANDEMIC

Response	Weighted average of 0-4 response score
Feeling distant or cut off from other people?	2.27
Trouble falling or staying asleep?	2.13
Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	1.98
Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	1.95
Loss of interest in activities that you used to enjoy?	1.93
Irritable behavior, angry outbursts, or acting aggressively?	1.9
Being "superalert" or watchful or on guard?	1.89
Repeated, disturbing dreams of the stressful experience?	1.87
Having difficulty concentrating?	1.86
Avoiding memories, thoughts, or feelings related to the stressful experience?	1.86
Repeated, disturbing, and unwanted memories of the stressful experience?	1.86
Having strong negative feelings such as fear, horror, anger, guilt, or shame?	1.85
Feeling jumpy, or easily startled?	1.83
Feeling very upset when something reminded you of the stressful experience?	1.82
Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	1.79
Blaming yourself or someone else for the stressful experience or what happened after it?	1.77
Thoughts of my own death or suicide?	1.77
Feelings of hopelessness?	1.76
Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	1.74
Trouble remembering important parts of the stressful experience?	1.66
Taking too many risks or doing things that could cause you harm?	1.64
Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	1.2