



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

RESEARCH ARTICLE

Psychological impact of coronavirus disease 2019 (COVID-19) social distancing mandates on trauma survivors

Maggie M. Parker^{a,*}, Stephanie F. Dailey^b, A. Diona Emmanuel^a, Andrew Campbell^c^a Graduate School of Education and Human Development, George Washington University, Washington D.C. 20052, USA^b College of Education and Human Development, George Mason University, Fairfax, VA 22030, USA^c Psychology and Counseling Department, Hood College, Frederick, MD 21701, USA

ARTICLE INFO

Article history:

Received 26 May 2021

Received in revised form 22 March 2022

Accepted 30 June 2022

Available online 9 July 2022

Keywords:

Coronavirus disease 2019 (COVID-19)

Trauma

Risk factors

Psychological distress

Mental health

ABSTRACT

Objective: Despite recognition that coronavirus disease 2019 (COVID-19) pandemic created an unprecedented impact on global mental health, information on the psychological health among trauma survivors during the COVID-19 pandemic is rare. We sought to examine psychological outcomes among individuals with preexisting traumatic experiences during COVID-19.

Methods: We sampled 1 242 adults in the mid-Atlantic region of the United States under a state-issued Phase 1 stay-at-home mandate to examine associations between pre-pandemic trauma exposure as measured by the Brief Trauma Questionnaire (BTQ) and anxiety and depression, as measured by the Patient Reported Outcome Scale Anxiety and Depression (PROMIS-A and PROMIS-D).

Results: Pre-pandemic trauma exposure among the sample was reported, with 281 (22.6%) participants identifying as experiencing one trauma, 209 (16.8%) reporting two, and 468 (37.7%) reporting three or more. As reported experiences of trauma increased, so did participant anxiety and depressive symptomatology. One-way Analysis of Variance indicated that reported trauma was significantly positively correlated with anxiety ($P < 0.01$) and depressive symptomatology ($P < 0.01$).

Conclusion: Findings highlight the immense psychological toll of the COVID-19 pandemic, specifically with individuals who were previously exposed to trauma. Public health officials can encourage physicians, employers, and universities to screen patients, employees, and students to assess previous trauma, psychological functioning, and risk factors. Collaboration between physicians and mental health providers including psychiatrists, psychologists, counselors, and social workers to provide evidence informed rapid coordination of care can better meet the global mental health crisis that is arising as a result of this unprecedented global trauma.

1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic resulted in unprecedented levels of psychological distress, with reports citing COVID-19 as a collective trauma requiring a population health approach.¹ Preliminary investigations of COVID-19 revealed immense psychological disturbances among general populations, with a disproportionate impact on historically marginalized and high-risk groups.²⁻³ In January 2021, the United States (US) National Center for Health Statistics (NCHS) reported four out of ten adults were experiencing symptoms of anxiety or depression.² By comparison, in 2019, NCHS cited anxiety and depression symptomatology in 10%, or 11%, of the adult population.³

Other investigations highlighting poor mental health outcomes related to the COVID-19 pandemic are emerging, including studies with children,⁴⁻⁵ medical personnel,⁶ persons who have contracted COVID-19,⁷⁻⁹ and individuals with pre-existing psychological disorders.¹⁰⁻¹¹

Following historical trends, these reports confirm risk for individuals with pre-existing mental health concerns. Citing pandemic-related consequences, such as economic stress, unemployment, deepening health disparities, and continued uncertainty regarding the future, some experts claim we are facing a global mental health crisis.¹²

Extant research on quarantine and confinement during a public health crisis yields considerable evidence that social distancing has significant mental health consequences.¹³ The pandemic created increased social isolation, loss of daily structure, and limited personal connections, all of which augment anxious rumination and limit individual resources for active coping. While necessary, social distancing created additional barriers for individuals seeking mental health treatment, potentially placing individuals with pre-existing mental health conditions at greater risk.¹³ Research suggests social distancing, employed as a protective action strategy against viral transmission, as a major contributing factor to increased feelings of isolation, fear, anger, and hopelessness.^{1,4}

* Corresponding author: mmparker@gwu.edu.

Rates of anxiety and depression in adults increased from 11% to 40% from 2019 to 2021,¹⁴ demonstrated the impact of COVID-19 on psychological functioning.²⁻³ Vulnerable populations, such as children,⁴⁻⁵ first responders,⁶ those with pre-existing mental health conditions,¹¹ and those who contracted COVID-19⁷⁻⁹ all demonstrated increases in psychological distress. As of this writing, researchers had yet to explore the impact of COVID-19 on the psychological functioning of trauma survivors.

Given claims that the events associated with COVID-19 are a collective trauma, it follows that understanding the impact of pre-COVID trauma exposure should be prioritized.^{1,5} A large percentage of Americans experience at least one traumatic event (e.g., military service, unexpected death of a loved one, exposure to violence, real or perceived threat to life, and/or sexual assault) in their lifetime.¹⁵ In absence of a public health crisis, individuals with reported trauma histories are at higher risk for being diagnosed with an anxiety, depression, substance abuse disorders, and post-traumatic stress disorder (PTSD) than the general population, regardless of when the trauma occurred (i.e. childhood or adulthood).¹⁶⁻¹⁸ The psychological impact of past trauma has been found to augment an individuals' response to additional traumas,^{2,19} including medical threats such as COVID-19.²⁰⁻²¹

While health professionals and researchers identified the potential mental health effects, the focus on “anxiety,” “fear,” and “stress” over trauma and PTSD appears antithetical.²² The COVID-19 pandemic, by definition, is a mass trauma event similar to September 11 in US, however the trauma is augmented due to the duration of the experience and instantly available news.²² Yet research on the psychological impact of COVID-19 and social distancing measures on trauma survivors remains theoretical.

Given increased psychological distress during COVID-19 among the general public,²⁻³ it is vital to explore the impact of trauma exposure on psychological functioning and the impact of this mass trauma on those who previously experienced trauma. To this end, we explored the psychological functioning in individuals during the first four months of the COVID-19 pandemic and the association between reported trauma histories and psychological functioning during this global trauma. Because many individuals who have experienced trauma face considerable barriers in seeking treatment, and the strong correlation between trauma and adverse health outcomes,²³⁻²⁸ identifying and connecting trauma survivors to mental health providers is a critical step in supporting population health.²⁹⁻³² Our intent is to provide public health officials, medical providers, and behavioral health workers with strategies for early risk- identification and to facilitate rapid coordination of care and allocation of resources.

2. Methods

Following approval by the George Mason University Institutional Review Board, data were collected using an online survey administered through a Qualtrics research panel for 20 days in June 2020. Self-selected participants accessed the consent form and survey through an anonymous web link. Inclusion criteria required all participants to be English speaking, over the age of 18, and currently under the same state-issued stay-at-home mandate. Quota sampling ensured our sample reflected 2010 US census distributions for age, gender, race/ethnicity, and income within 10% points of error ($\pm 10\%$) allowing for normative comparisons between the study measures and our sample.

Qualtrics was selected because it is the most demographically representative crowdsourcing platform, reported the highest compensation rates for panelists, and allowed for rapid identification of individuals living under the same state-issued social distancing mandate. We identified one state for recruitment to minimize variance due to differentiated government mandates and social distancing orders. We focused on the early months of the pandemic to examine mental health during the most restrictive government mandate to date.

To compute sample size, an a priori power analysis with 80% power and an alpha of 0.05 established a minimum sample size of 130 was required. Although a valid response rate could not be determined due to use of an anonymous weblink, multiple quality control checks were embedded within the survey. Event logs tracked abnormal completion and response rates, and a question regarding the participant's intent to provide accurate responses (i.e., “Do you commit to providing your thoughtful and honest answers to the questions in this survey?”) was included. Responses indicating abnormal completion rates ($n = 203$), straight-lining ($n = 148$), respondents under the age of 18 ($n = 61$), and individuals not under a stay-at-home order in Virginia ($n = 73$) were removed.

2.1. Instruments

We examined psychological impact using the Patient-Reported Outcomes Measurement Information System (PROMIS) anxiety V1.0 short form 8a (PROMIS-A) and the PROMIS depression V1.0 short form 8b (PROMIS-D).³³ Both 8-item scales ask respondents to indicate symptom occurrence, using a 5-point rating scale ranging from 1 (never) to 5 (always).³⁴ Higher scores indicate greater levels of symptom severity. Created by the National Institute of Health as a universal assessment of emotional functioning,³⁴ item banks for the PROMIS-A and PROMIS-D were developed using item response theory (IRT). Unidimensional IRT models supported calibration and centering for the 2000 and 2010 US census distributions for gender, age, racial identity, and household income.³³⁻³⁵ Widely recommended for initial outcome assessment and to monitor treatment progress relative to US population normative scores, interpretive T-score maps (50 ± 10) allow practitioners to easily identify symptom severity and provide researchers with a clinically meaningful, widely validated common reporting metric for anxiety and depression.³⁵ Sample items for the PROMIS-A include “I've felt like I needed help for my anxiety”, “I've felt uneasy” and “I've felt tense”. Items from the PROMIS-D include “I've felt like a failure”, “I've felt helpless”, and “I've felt sad”.

Reported trauma exposure was assessed using the Brief Trauma Questionnaire (BTQ).³⁶ The BTQ assesses respondents' reported exposure to 10 different types of traumatic events.³⁶ Considered a valid and reliable self-report instrument, the BTQ parallels interview measures of trauma exposure and is often used in medical research as a short and easily accessible assessment for trauma exposure.³⁷⁻³⁹ Examples of traumas identified by the BTQ include “Have you been in a serious car accident, an accident at work, or somewhere else?”, “Have you been in a major natural or technological disaster such as a fire, tornado, hurricane, flood, earthquake, or chemical spill?”, and “Have you ever had (or currently have) a life-threatening illness such as cancer, a heart attack, leukemia, acquired immune deficiency syndrome, multiple sclerosis, etc.?” We identified pre-existing trauma as either no exposure, one exposure, two exposures, or three plus exposures, as identified within the literature.³⁹

2.2. Statistical analysis

Prior to any statistical analyses, we ensured the data met all assumptions. All scales showed high internal consistency, with $\alpha = 0.94$ for the PROMIS-A and $\alpha = 0.95$ for the PROMIS-D. The BTQ showed acceptable internal consistency, with $\alpha = 0.7$. $P < 0.05$ were considered statistically significant. We used frequencies of scores to determine mild, moderate, and severe symptomatology of anxiety and depression, as assessed by the PROMIS-A and PROMIS-D, in participants who reported no, one, two, and three or more trauma exposures. The relationship between trauma exposure and participants' symptoms of anxiety and depression was examined through one-way Analysis of Variance (ANOVAs). Post hoc tests were conducted to determine the relationships between reported trauma exposure and level of depressive and anxiety symptoms within the sample.

Table 1
Sociodemographic information of sample population.

Factor	n (%)
Race	
Asian	74 (6.0)
Black/African American	230 (18.5)
Hispanic/Latino	124 (10.0)
White	761 (61.3)
Other	53 (4.3)
Gender	
Female	633 (51.0)
Male	604 (48.6)
Transgender	5 (0.4)
Age (years)	
18–< 25	219 (17.6)
25–< 35	161 (13.0)
35–< 45	272 (1.9)
45–< 55	153 (12.3)
55–< 65	218 (17.6)
≥ 65	219 (17.6)

Table 2
PROMIS scores and trauma exposure.

Reported trauma	n (%)	PROMIS-A [†]	PROMIS-D [†]
None	284 (22.9)	54.90±9.28	51.04±9.44
One	281 (22.6)	56.80±8.02	53.45±9.12
Two	209 (16.2)	58.46±9.28	55.67±10.03
Three or more	468 (37.7)	60.60±10.05	58.52±10.10
F	–	29.80	38.23
P	–	< 0.01	< 0.01

[†]Mean±SD, demonstrated by one-way ANOVA. -: Not applicable.

3. Results

3.1. Participants

The final sample yielded 1 242 participants, with 633 (51.0%) women. Of the participants, 761 (61.3%) identified as white, 230 (18.5%) identified as Black or African American, 124 (10.0%) as Hispanic/Latino, 74 (6.0%) as Asian, and 54 (4.3%) as other. Participants ranged in age from 18 to over 65. Each of the following categories of age included 219 (17.6%) participants: 18–< 25, 55–< 65, and ≥ 65. Additional demographic data is included in Table 1.

Within the sample, 284 (22.9%) participants reported no traumatic experiences, 281 (22.2%) reported one lifetime trauma exposure, 209 (16.8%) reported two, and 468 (37.7%) participants reported three or more trauma exposures within their lifetime. Additional descriptive information and mean and standard deviations for the PROMIS-A and PROMIS-D scales are provided in Table 2.

3.2. Symptom severity and frequencies

The PROMIS-A and PROMIS-D was centered and calibrated on the 2000 and 2010 Census to assist providers in understanding patient scores compared to the general population and symptoms severity.³³ Using this data, we compared our sample population to the data from the before the pandemic. Within our sample, frequencies of severe anxiety and depression increased with each reported traumatic exposure. Those with no or one reported trauma indicated they were generally well and reported similarly in anxiety and depression symptomatology as the reference population. Those who reported two and three or more traumatic events however reported higher levels of depression and anxiety than the reference population. Figs. 1 and 2 include the frequency of PROMIS-A and PROMIS-D scores by the number of reported traumas. While individuals in the reference population reported levels of mild and moderate anxiety and depression, the number of individuals

reporting severe levels was extremely low. Within our sample, those reporting zero and one trauma exposure demonstrated rates equal or lower to the calibrated population used with the PROMIS-A and PROMIS-D. These rates began to differ as the reported traumas increased to two and three or more reported traumas. Within our sample, the rate of severe depression doubled with two trauma exposures and more than tripled with three trauma exposures. The rates were slightly lower for anxiety, with anxiety increasing from two in the PROMIS-A sample to three in our sample for two reported trauma group and six in the three or more reported trauma group. Figs. 1 and 2 provide graphic representation of the PROMIS-A and PROMIS-D scores by reported trauma group and the original sample from the PROMIS-A and PROMIS-D development. Scores are separated into mild, moderate, and severe levels of depression and anxiety to demonstrate the ways in which trauma may influence depressive and anxious symptomatology.

3.3. Trauma exposure and psychological outcomes

We employed one-way between-subjects ANOVA to determine if the average PROMIS-A and PROMIS-D scores differed depending on the number of reported trauma exposures on the BTQ (0, 1, 2, 3+). Statistically significant differences were found in the average PROMIS-A score between at least two trauma exposure groups ($P < 0.01$). Homogeneity of variance was not met, and Games-Howell post-hoc tests were conducted on all possible pairwise comparisons. Participants with two and three or more trauma exposures reported statistically significant higher anxiety scores than participants with no trauma. Participants with three or more lifetime traumas reported statistically significant higher levels of anxiety than participants with zero, one, and two trauma exposures. Statistically significant differences were found in the average depression score between at least two trauma exposure groups ($P < 0.01$). Homogeneity of variance was not met, therefore Games-Howell post-hoc tests were conducted on all possible pairwise comparisons. Each group of trauma exposure (zero, one, two, and three) reported statistically significantly different depression scores.

4. Discussion

The rates of trauma in this sample mirror national estimates, with 958 (77.1%) reported experiencing at least one trauma as compared to 223.4 million Americans (70.0% of the general population). Our results indicate a significant correlation between trauma exposure and psychological distress within the sample population: as trauma exposures increased, so did depressive and anxiety symptomatology. These results align with previous studies of trauma and psychological and health difficulties,²³⁻²⁴ and further demonstrate the need for health professionals to screen for trauma and psychological distress in those that seek their services. It is vital that health professionals coordinate mental health services during COVID-19.

4.1. Relationships between reported trauma and depression and anxiety symptoms

These results point to the importance of screening for both trauma and psychological functioning during COVID-19 in an effort to address and mitigate adverse psychological outcomes. The results also indicate that individuals who experienced two or more traumas experienced more severe symptoms of depression and anxiety during social distancing measures than those in the reference population. Even one trauma exposure significantly impacted psychological functioning within our sample.

Our results support Alonzi S et al.'s¹⁰ statement that lack of contact and isolation from social support will increase emotional distress. As new variants of COVID-19 are discovered and the vaccination process continues, it is likely that the psychological impact will continue to worsen for high-risk and vulnerable groups. Individuals are coping with

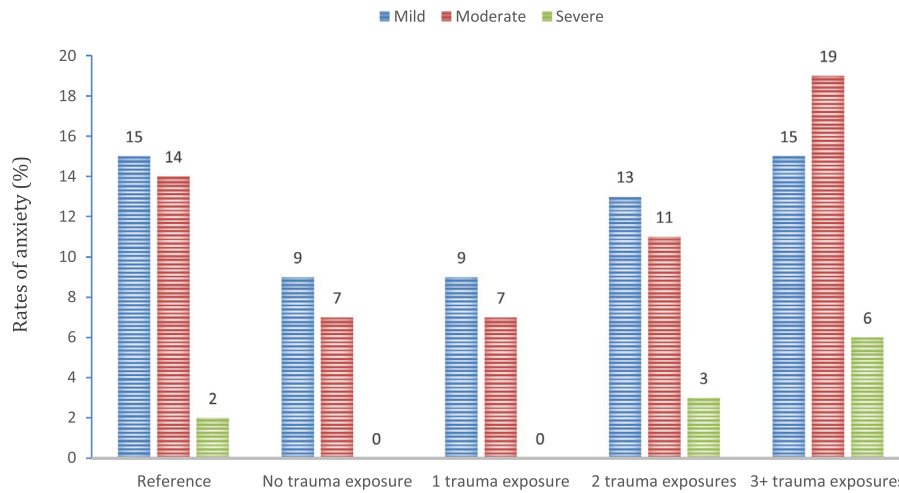


Fig. 1. PROMIS-A comparison and sample by trauma groups.

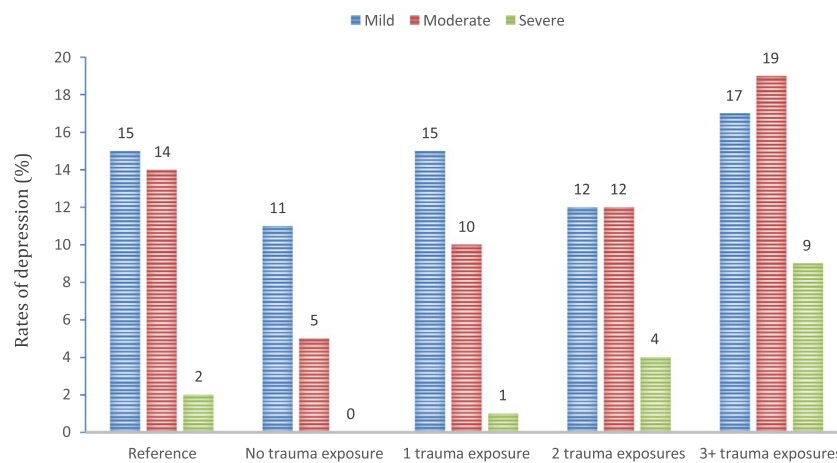


Fig. 2. PROMIS-D comparison and sample by trauma groups.

intense emotional distress due to COVID-19 infection, isolation from social support systems, and, as indicated by this study, previous reported trauma.

These psychological impacts are further compounded by decreased access to physical and mental health care as resources are necessarily diverted to COVID-19 response.¹⁰ Because of the convergence of mental and physical health implications from trauma, as well as the intense emotional distress due to this mass trauma event, individuals can benefit from a multimodal and multidisciplinary approach to health care.³⁹ As stated by Horesh D and Brown AD, “in times of crisis of COVID-19’s magnitude, trauma-related mental health care cannot be separated from other forms of care.”²³ To address the growing mental health needs of individuals during the mass trauma experience of COVID-19, it is important to increase collaboration between medical, mental health, public health officials, and paraprofessionals.^{10,15,22,40} Physical health responses to COVID-19 are not enough, mental health professionals must be prepared to meet mental health needs, both during the current pandemic and after. It is vital that health professionals share resources, gain training in basic mental health screening and care, and collaborate with health professionals to provide the needed mental health care for trauma survivors.

Pfefferbaum B¹⁷ recommended using brief symptom measures to screen for psychological distress within employment settings, primary care settings, and schools. While not intended to replace diagnostic assessment, brief screening tools can support more targeted interventions and resources for a wider variety of health professionals. This is the very

reason we used readily available, brief measures which can be administered by a wide variety of health professionals. As health care providers identify patients with previous trauma and those who are experiencing moderate to severe symptoms of anxiety and depression, they can then collaborate with mental health care providers to provide wraparound services.^{10,41}

Mental health practitioners can work directly with health professionals to provide patients mental health counseling, support groups, and psychoeducation on coping mechanisms, either in person or virtually. Additionally, increasing communication between health professionals can ensure that individuals are receiving effective care to manage their mental and physical health during this crisis.⁴¹ Mental health providers can provide training on diagnostic criteria and basic mental health care that physicians, nurses, public health officials, and other providers can utilize with their patients, as well as referral guidelines and options.⁴¹ Additionally, mental health professionals must adapt to the social restrictions and utilize effective and available telehealth services to meet the increased need.¹⁰

There are several limitations that need to be considered when interpreting results of this study. Participants self-reported trauma, anxiety and depression, and we employed single measures of symptoms, which can result in minimization of symptoms or misinterpretation. Causal associations between psychological outcomes, trauma, and COVID-19 related stressors are limited by the cross-sectional design of our study. To make causal connections, preliminary measures of trauma, anxiety, and depression are necessary. Additionally, our sampling design may

exclude those who do not speak English or have access to reliable internet, and thus may result in sampling bias. We could not calculate a response rate due to the efforts to anonymize our sample. Additionally, participants within our sample identified as predominantly 761 white (61.3%) and 633 female (51.0%) which may impact the generalizability of the results. Finally, generalizing our results to the general population should be done with caution as we purposefully sampled individuals within the same state under the same government sanctioned social distancing mandates.

5. Implications for policy and practice

COVID-19 is a mass trauma and a coordinated, multimodal, and multidisciplinary approach to health care response to care is necessary. Trauma significantly impacted anxiety and depressive symptomatology in sample population during COVID-19 social distancing mandates. Therefore, routine screening for trauma and psychological functioning can assist in identification and treatment of individuals struggling with mental health as a result of the COVID-19 pandemic. Additionally, mental health providers can disseminate information pertaining to mental health symptoms and treatment to health care providers to ensure connection to necessary treatment. The COVID-19 pandemic requires a public health response to mental health supports, especially when considering those most vulnerable to the psychological impacts, those with pre-existing mental health conditions and previous trauma exposures.

6. Conclusions

COVID-19 is a significant stressor with physical and psychological health implications. A major public health challenge of COVID-19 is the deterioration of mental health and increase in mental disorders within the global population.⁴¹ The results of this research support the increasing levels of anxiety and depression among the vulnerable population of trauma survivors. Approaches to address the increasing demand for mental health services can include “task shifting” (i.e., training laypersons to treat mild and moderate depression and anxiety), the continued use of digital mental health services, and use of social prescribing, non-medical interventions including community engagement, physical activity, and the arts can potentially mitigate the negative psychological impacts of COVID-19.⁴²

This research provides valuable information on the psychological impact of COVID-19 among the vulnerable population of trauma survivors. As researchers identified other vulnerable populations pre-existing mental health conditions,¹⁰ and those who contracted COVID-19⁷⁻¹⁰ as reporting increased psychological distress, it was likely the mass trauma of COVID-19 would compound the psychological impacts of trauma survivors. It is possible there will be an expansive mental health crisis following this mass trauma demonstrating a significant need for identification of those in need of mental health care and broad implementation of effective treatment.^{15,22,42} Given claims that the events associated with COVID-19 are a collective trauma, it follows that understanding the impact of pre-COVID-19 trauma exposure should be prioritized.¹⁴

CRedit author statement

Maggie M. Parker: Visualization, Writing—Original draft, Writing—Review & editing. **Stephanie F. Dailey:** Conceptualization, Data curation, Visualization, Project administration, Supervision. **A. Diona Emmanuel:** Methodology, Formal analysis. **Andrew Campbell:** Methodology, Validation.

Ethics approval and consent to participate

This study was performed in line with the 1964 Declaration of Helsinki and its later amendments and received approval from the Institutional Review Board (IRB) of George Mason University.

Availability of data and materials

The data are not available to be shared publicly because we do not have a permission from the IRB to distribute the data. However, analytical methods are available from corresponding author on a reasonable request.

Competing interests

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.

References

- Sun S, Lin D, Operario D. Need for a population health approach to understand and address psychosocial consequences of COVID-19. *Psychol Trauma*. 2020;12(S1):S25-S27. doi:10.1037/tra0000618.
- The implications of COVID-19 for mental health and substance use. Kaiser Family Foundation website. <https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/>. Accessed May 4, 2021.
- Mazza C, Ricci E, Biondi S, et al. A nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: immediate psychological responses and associated factors. *Int J Environ Res Public Health*. 2020;17(9):3165. doi:10.3390/ijerph17093165.
- Singh S, Roy D, Sinha K, Parveen S, Sharma G, Joshi G. Impact of COVID-19 and lockdown on mental health of children and adolescents: a narrative review with recommendations. *Psychiatry Res*. 2020;293:113429. doi:10.1016/j.psychres.2020.113429.
- Shen K, Yang Y, Wang T, et al. Diagnosis, treatment, and prevention of 2019 novel coronavirus infection in children: experts' consensus statement. *World J Pediatr*. 2020;16(3):223-231. doi:10.1007/s12519-020-00343-7.
- Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun*. 2020;88:901-907. doi:10.1016/j.bbi.2020.05.026.
- Mazza MG, De Lorenzo R, Conte C, et al. Anxiety and depression in COVID-19 survivors: role of inflammatory and clinical predictors. *Brain Behav Immun*. 2020;89:594-600. doi:10.1016/j.bbi.2020.07.037.
- Janiri D, Kotzalidis GD, Giuseppin G, et al. Psychological distress after covid-19 recovery: reciprocal effects with temperament and emotional dysregulation. An exploratory study of patients over 60 years of age assessed in a post-acute care service. *Front Psychiatry*. 2020;11:590135. doi:10.3389/fpsy.2020.590135.
- Xiao S, Luo D, Xiao Y. Survivors of COVID-19 are at high risk of posttraumatic stress disorder. *Glob Health Res Policy*. 2020;5(1):29. doi:10.1186/s41256-020-00155-2.
- Alonzi S, La Torre A, Silverstein MW. The psychological impact of preexisting mental and physical health conditions during the COVID-19 pandemic. *Psychol Trauma*. 2020;12(S1):S236-S238. doi:10.1037/tra0000840.
- Asmundson GJG, Paluszek MM, Landry CA, Rachor GS, McKay D, Taylor S. Do pre-existing anxiety-related and mood disorders differentially impact COVID-19 stress responses and coping? *J Anxiety Disord*. 2020;74:102271. doi:10.1016/j.janxdis.2020.102271.
- Todres J, Diaz A. COVID-19 and human trafficking—the amplified impact on vulnerable populations. *JAMA Pediatr*. 2021;175(2):123-124. doi:10.1001/jamapediatrics.2020.3610.
- Cénat JM, Dalexis RD, Kokou-Kpolou CK, Mukunzi JN, Rousseau C. Social inequalities and collateral damages of the COVID-19 pandemic: when basic needs challenge mental health care. *Int J Public Health*. 2020;65(6):717-718. doi:10.1007/s00038-020-01426-y.
- McGinty EE, Presskreischer R, Han H, Barry CL. Psychological distress and loneliness reported by US adults in 2018 and April 2020. *JAMA*. 2020;324(1):93-94. doi:10.1001/jama.2020.9740.
- Kilpatrick DG, Resnick HS, Milanak ME, Miller MW, Keyes KM, Friedman MJ. National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *J Trauma Stress*. 2013;26(5):537-547. doi:10.1002/jts.21848.
- Pfefferbaum B, Nitiéma P, Newman E. A critical review of effective child mass trauma interventions: what we know and do not know from the evidence. *Behav Sci (Basel)*. 2021;11(2):25. doi:10.3390/bs11020025.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Washington, DC: American Psychiatric Association; 2013.
- Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *J Consult Clin Psychol*. 2000;68(5):748-766. doi:10.1037//0022-006x.68.5.748.
- Breslau N, Peterson EL, Schultz LR. A second look at prior trauma and the post-traumatic stress disorder effects of subsequent trauma: a prospective epidemiological study. *Arch Gen Psychiatry*. 2008;65(4):431-437. doi:10.1001/archpsyc.65.4.431.
- Ozer EJ, Best SR, Lipsey TL, Weiss DS. Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychol Bull*. 2003;129(1):52-73. doi:10.1037/0033-2909.129.1.52.
- Green BL, Goodman LA, Krupnick JL, et al. Outcomes of single versus multiple trauma exposure in a screening sample. *J Trauma Stress*. 2000;13(2):271-286. doi:10.1023/A:1007758711939.

22. Horesh D, Brown AD. Traumatic stress in the age of COVID-19: a call to close critical gaps and adapt to new realities. *Psychol Trauma*. 2020;12(4):331-335. doi:10.1037/tra0000592.
23. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The adverse childhood experiences (ACE) study. *Am J Prev Med*. 1998;14(4):245-258. doi:10.1016/s0749-3797(98)00017-8.
24. Green BL, Kimerling R. Trauma, posttraumatic stress disorder, and health status. *Trauma and health: physical health consequences of exposure to extreme stress*. Washington: American Psychological Association; 2004:13-42.
25. Kroenke K, Spitzer RL, Williams JB, Monahan PO, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Intern Med*. 2007;146(5):317-325. doi:10.7326/0003-4819-146-5-200703060-00004.
26. Sareen J, Cox BJ, Clara I, Asmundson GJ. The relationship between anxiety disorders and physical disorders in the U.S. National Comorbidity Survey. *Depress Anxiety*. 2005;21(4):193-202. doi:10.1002/da.20072.
27. Stein MB, Lang AJ, Laffaye C, Satz LE, Lenox RJ, Dresselhaus TR. Relationship of sexual assault history to somatic symptoms and health anxiety in women. *Gen Hosp Psychiatry*. 2004;26(3):178-183. doi:10.1016/j.genhosppsy.2003.11.003.
28. Greene JA, Loscalzo J. Putting the patient back together—social medicine, network medicine, and the limits of reductionism. *N Engl J Med*. 2017;377(25):2493-2499. doi:10.1056/NEJMms1706744.
29. Sugg NK, Inui T. Primary care physicians' response to domestic violence: opening Pandora's box. *JAMA*. 1992;267(23):3157-3160. doi:10.1001/jama.1992.03480230049026.
30. Rodriguez MA, Bauer HM, McLoughlin E, Grumbach K. Screening and intervention for intimate partner abuse: practices and attitudes of primary care physicians. *JAMA*. 1999;282(5):468-474. doi:10.1001/jama.282.5.468.
31. Green BL, Kaltman S, Frank L, et al. Primary care providers' experiences with trauma patients: a qualitative study. *Psychol Trauma*. 2011;3(1):37-41. doi:10.1037/a0020097.
32. Koenick C, Langer-Gould AM, Gould MK, et al. Sociodemographic characteristics of members of a large, integrated health care system: comparison with US Census Bureau data. *Perm J*. 2012;16(3):37-41. doi:10.7812/tpp/12-031.
33. Cella D, Riley W, Stone A, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. *J Clin Epidemiol*. 2010;63(11):1179-1194. doi:10.1016/j.jclinepi.2010.04.011.
34. Liu H, Cella D, Gershon R, et al. Representativeness of the patient-reported outcomes measurement information system internet panel. *J Clin Epidemiol*. 2010;63(11):1169-1178. doi:10.1016/j.jclinepi.2009.11.021.
35. Rothrock NE, Amtmann D, Cook KF. Development and validation of an interpretive guide for PROMIS scores. *J Patient Rep Outcomes*. 2020;4(1):16. doi:10.1186/s41687-020-0181-7.
36. Brief trauma questionnaire (BTQ). PTSD website. https://www.ptsd.va.gov/.../assessment/te-measures/brief-trauma-questionnaire_btq.asp. Accessed May 20, 2022.
37. Thurston R, Barinas-Mitchell E, von Känel R, Chang Y, Koenen K, Matthews K. Trauma exposure and endothelial function among midlife women. *Menopause*. 2018;25(4):368-374. doi:10.1097/GME.0000000000001036.
38. Thurston RC, Carson MY, Koenen KC, et al. The relationship of trauma exposure to heart rate variability during wake and sleep in midlife women. *Psychophysiology*. 2020;57(4):e13514. doi:10.1111/psyp.13514.
39. Morgan CA, Rasmusson AM, Winters B, et al. Trauma exposure rather than posttraumatic stress disorder is associated with reduced baseline plasma neuropeptide-Y levels. *Biol Psychiatry*. 2003;54(10):1087-1091. doi:10.1016/S0006-3223(03)00433-5.
40. Türközer HB, Öngür D. A projection for psychiatry in the post-COVID-19 era: potential trends, challenges, and directions. *Mol Psychiatry*. 2020;25(10):2214-2219. doi:10.1038/s41380-020-0841-2.
41. Lange KW. Coronavirus disease 2019 (COVID-19) and global mental health. *Glob Health J*. 2021;5(1):31-36.
42. Dailey SF, Parker MM, Campbell A. Social connectedness, mindfulness, and coping as protective factors during the COVID-19 pandemic. *J Couns Dev*. 2022:1-13. doi:10.1002/jcad.12450.