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.
COVID-19 as a traumatic stressor is an indicator of mental health symptomatology

Jordana L. Sommer a,b, Natalie Mota c, Kristin Reynolds a, Renée El-Gabalawy a,b,c,d, * 

a Department of Psychology, University of Manitoba, 190 Dyck Arboretum, Winnipeg, Manitoba, Canada R3T 2N2  
b Department of Anesthesiology, Perioperative and Pain Medicine, University of Manitoba, 671 William Avenue, Winnipeg, Manitoba, Canada R3E 0Z2  
c Department of Clinical Health Psychology, University of Manitoba, 771 Bannatyne Avenue, Winnipeg, Manitoba, Canada R3E 3N4  
d Department of Psychiatry, University of Manitoba, 771 Bannatyne Avenue, Winnipeg, Manitoba, Canada R3E 3N4  

ARTICLE INFO  
Keywords:  
COVID-19  
Pandemic  
Trauma  

ABSTRACT  
The mental health impacts of the COVID-19 pandemic are gaining attention. While many are experiencing increased stress due to COVID-19, some perceive the pandemic as traumatic. This preliminary study identified respondents who endorsed a COVID-19-related trauma as their most stressful traumatic experience (i.e., index trauma). We analyzed data from an online Canadian survey (May-July 2020; N = 1,018). Nearly 3% of participants endorsed a COVID-19-related index trauma. These individuals had increased posttraumatic stress, anxiety, and depressive symptoms compared to the remaining sample. Results may inform targeted screening to identify those who may be at greater risk for COVID-19-related mental health sequelae.

There is accumulating research outlining the detrimental mental health impacts of the COVID-19 pandemic. A systematic review revealed elevated posttraumatic stress (PTS), depressive, and anxiety symptoms among COVID-19 patients, healthcare workers, and the general population, and poorer psychological wellbeing compared to before the pandemic (Vindegaard and Benros, 2020). Society is faced with elevated stress associated with several aspects of the pandemic, including the threat of contracting COVID-19, looming uncertainty regarding COVID-19 prognoses and the longevity of the pandemic, shortages of medical resources, unfamiliar public health measures (e.g., quarantine), and financial loss, among others (Pfefferbaum and North, 2020). For some, the pandemic may even be perceived as traumatic, which may pose a greater risk for mental health sequelae. This preliminary study identified the proportion of individuals who endorsed COVID-19 as their index trauma (most stressful lifetime trauma) and examined differences in sample characteristics and mental health symptoms between those who endorsed COVID-19 as their index trauma and those who did not.

We analyzed data from an online Canadian survey (COVID Survey Canada; May-July 2020) examining mental health during the COVID-19 pandemic. The survey (~30-45 minutes; including 13 validated scales) was administered to a convenience sample (N = 1,260) of Canadian residents and/or citizens, aged 18 years and older, who have internet access, and can read and understand English. Participants were recruited via online platforms (e.g., academic listservs, social media). The University of Manitoba Research Ethics Board provided approval and all participants provided consent. 186 participants were excluded due to completing the entire survey in less than 10 minutes (suggestive of invalid responding) and 56 were excluded from the current study due to missing data pertaining to trauma exposure. See Supplemental Table for a complete list of the questionnaires included in the survey.

Participants self-reported lifetime trauma exposure. Those who endorsed trauma were asked whether their most stressful trauma was: 1) related to the COVID-19 pandemic (e.g., death of someone close to you from COVID-19, major stressful life changes due to COVID-19), 2) acquiring COVID-19, 3) related to any other serious illness, 4) any other trauma. We dichotomized this to reflect any COVID-19-related index trauma (options 1 & 2) compared to the remaining sample (options 3 & 4); those who did not endorse any trauma exposure were also categorized with those endorsing options 3 & 4. We included the entire sample in analyses, as opposed to only those who endorsed trauma exposure, considering all participants have been exposed to the pandemic. Participants self-reported sociodemographic characteristics and COVID-19-related factors (e.g., got tested for COVID-19), and completed several validated self-report mental health symptom measures including the Perceived Stress Scale (Cohen et al., 1983), the Primary Care Post-traumatic Stress Disorder Screen for DSM-5 (Prins et al., 2016), and the

* Corresponding author at: Department of Anesthesiology, Perioperative and Pain Medicine, & Department of Clinical Health Psychology, University of Manitoba, Winnipeg, Manitoba, Canada  
E-mail address: renee.el-gabalawy@umanitoba.ca (R. El-Gabalawy).  
https://doi.org/10.1016/j.psychres.2021.113936  
Received 4 December 2020; Accepted 11 April 2021  
Available online 20 April 2021  
0165-1781/© 2021 Elsevier B.V. All rights reserved.
Table 1
Sample characteristics of those who endorsed COVID-19 as their index trauma compared to the remaining sample.

| COVID-19 as index trauma | Remaining sample | Chi-square |
|--------------------------|------------------|------------|
| n(%)                      |                  |            |
| 28 (2.8)                 | 990 (97.2)       |            |

Sociodemographic characteristics

|                          |                  |
|--------------------------|------------------|
| Sex                      |                  |
| Male                     | 9 (32.1)         |
| Female                   | 214 (22.1)       |
| Age                      |                  |
| 18-29                    | 14 (50.0)        |
| 30-49                    | 49 (45.4)        |
| 50+                      | 5 (17.9)         |
| Marital status           |                  |
| Married/common law       | 14 (50.0)        |
| Widowed/separated/divorced | 71 (2.7)       |
| Never married            | 13 (46.4)        |
| Race                     |                  |
| White                    | 21 (75.0)        |
| Non-white                | 809 (83.5)       |
| Education                |                  |
| High school or less      |                  |
| Undergraduate degree/college | 21 (75.0) |
| Masters or doctoral degree | 274 (27.7) |
| Household income         |                  |
| $<5,000                  | 6 (21.4)         |
| $5,000-$99,999           | 16 (57.1)        |
| $100,000+                | 6 (21.4)         |
| Impact of COVID-19 on income |              |
| Decreased                | 15 (53.6)        |
| Stayed the same          | 11 (39.3)        |
| Increased                | 37 (12.1)        |
| Applied for EI due to loss of income from COVID-19 | 9 (32.1) |
| Laid off from your job because of COVID-19 | 11 (39.3) |

COVID-19-related factors

| Got tested for COVID-19 | 10 (35.7) |
| Know someone who tested positive for COVID-19 | 10 (35.7) |
| Someone close to you tested positive for COVID-19 | 9 (32.1) |

Positive screens on mental health measures

| Moderate/high perceived stress | 25 (89.3) |
| Postraumatic stress | 18 (64.3) |
| Anxiety | 17 (65.4) |
| Depression | 13 (50.0) |
| Mean number of mental health symptoms |               |
| Perceived stress (range: 0-40) | 21.96 (6.02) |
| Postraumatic stress (range: 0-5) | 2.86 (1.51) |
| Anxiety (0-6) | 2.81 (1.55) |
| Depression (0-6) | 2.50 (1.70) |

Note. \( n \) = cell size < 5

\( p < .05 \)

\( p < .01 \)

\( p < .001 \)

4-item Patient Health Questionnaire (Lowe et al., 2010). Chi-square analyses and independent samples t-tests examined differences in sociodemographic, COVID-19-related, and mental health correlates between those who endorsed a COVID-19-related index trauma and those who did not.

Nearly 3% of the sample \((n=28)\) endorsed a COVID-19-related index trauma. Groups significantly differed in household income, with those endorsing a COVID-19 index trauma reporting lower income \(<-$50,000: 21.4% vs. 19.3%, $50,000-99,999: 57.1% vs. 36.9%, $100,000+: 21.4% vs. 43.8%). A larger proportion of these individuals applied for employment insurance (EI; 32.1% vs. 13.0%) and were laid off from their job (39.3% vs. 13.8%) due to COVID-19, compared to those who did not endorse a COVID-19 index trauma. These individuals were also more likely to have been tested for COVID-19 (35.7% vs. 9.0%) and to have someone close to them who tested positive for COVID-19 (32.1% vs. 12.7%). Those who reported a COVID-19 index trauma endorsed higher rates of clinically significant PTS (64.3% vs. 40.8%), anxiety (65.4% vs. 30.9%), and depressive (50.0% vs. 23.8%) symptoms compared to those who did not (see Table 1).

Though the literature examining COVID-19 mental health impacts is growing, to our knowledge, this is the first study to identify individuals who report COVID-19-related experiences as their most stressful lifetime trauma, and the associated sociodemographic, COVID-19-related, and mental health correlates. Results highlight that those who perceive COVID-19 as their worst trauma are experiencing greater PTS, anxiety, and depressive symptoms compared to others. In addition, those experiencing financial stressors (e.g., lower income, requiring EI, experiencing job loss) and closer proximity to COVID (e.g., knowing someone close to you who tested positive, personally requiring a COVID test) may be more likely to perceive the pandemic as traumatic. Limitations of this study include the use of a convenience sample, which precluded the calculation of a response rate, reliance on self-report measures, and a cross-sectional design, which inhibits causal and temporal inferences from being made. Further, data were collected early on in the pandemic, and results may vary as the pandemic continues to progress. Nonetheless, results highlight that individuals’ perception of the pandemic as traumatic may have important mental health implications. Findings may inform targeted screening and intervention strategies to mitigate COVID-19 mental health impacts. For example, asking individuals whether they perceive the pandemic as their most stressful trauma could help identify those at elevated risk of mental health sequelae.

Declaration of Competing Interest

None.

Funding

University of Manitoba Start-Up Funding (El-Gabalawy).

Acknowledgements

The authors acknowledge the COVID Survey Canada research team for their contributions to the survey development.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2021.113936.

References

Vindegaard, N., Benros, M.E., 2020. COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. Brain Behav. Immun. 89, 531-542. https://doi.org/10.1016/j.bbi.2020.05.048.
Pfefferbaum, B., North, C.S., 2020. Mental health and the Covid-19 pandemic. New Engl. J. Med. 383, S10-S12. https://doi.org/10.1056/NEJMp2008017.
Cohen, S., Kamarck, T., Mermelstein, R., 1983. A global measure of perceived stress. J. Health Soc. Behav. 24, 385-396. https://doi.org/10.2307/2136044.
Prins, A., Bovin, M.J., Sloominski, D.J., 2016. The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and evaluation within a veteran primary care sample. J. Gen. Intern. Med. 31, 1206–1211. https://doi.org/10.1007/s11606-016-3705-5.
Lowe, B., Wahl, I., Rose, M., 2010. A 4-item measure of depression and anxiety: Validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. J. Affect. Disord. 122, 86–95. https://doi.org/10.1016/j.jad.2009.06.019.

Validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. J. Affect. Disord. 122, 86–95. https://doi.org/10.1016/j.jad.2009.06.019.