Short Communication

Trends in negative emotions throughout the COVID-19 pandemic in the United States

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ARTICLE INFO

ABSTRACT

Objectives: This study aimed to identify trends in the prevalence of negative emotions in the United States throughout the COVID-19 pandemic between March 2020 and November 2021.
Study design: This was a descriptive, repeated cross-sectional analysis of nationally representative survey data.
Methods: Data originated from Gallup's COVID-19 web survey, encompassing 156,684 observations. Prevalence estimates for self-reported prior-day experience of sadness, worry, stress, anger, loneliness, depression, and anxiety were computed, plotted using descriptive trend graphs, and compared with 2019 estimates from the Gallup World Poll. Differences between estimates were evaluated by inspecting confidence intervals.
Results: Stress and worry were the most commonly experienced negative emotions between March 2020 and November 2021; worry and anger were significantly more prevalent than prepandemic. The prevalence of sadness, worry, stress, and anger fluctuated considerably over time and declined steadily to prepandemic levels by mid-2021. Distinctive spikes in the prevalence of several negative emotions, especially sadness and anger, were observed following the murder of George Floyd.
Conclusions: Several negative emotions exhibited excess prevalence during the pandemic, especially in spring/summer 2020. Despite recent reductions to prepandemic levels, continued monitoring is necessary to inform policies and interventions to promote population well-being.

Introduction

Since the beginning of the COVID-19 pandemic, the United States has experienced numerous challenges, including approximately 1 million deaths due to COVID-19 (as of early 2022), stark social and racial disparities in mortality from COVID-19, historically high levels of unemployment, a rise in hate-related events directed at Asian Americans, and ongoing incidents of police brutality against African Americans. Studies have detected a substantially elevated burden of depressive, anxiety, and other symptoms of psychological distress compared with prepandemic data, suggesting that the events of the prior 2 years have had a considerable impact on public mental health.[1–4] According to the US Census Bureau Household Pulse Survey (HPS), the prevalence of current probable anxiety or depressive disorder was 36% in August 2020 and 42% in January 2021, compared with prepandemic (2019) estimates based on the National Health Interview Survey of 11%;[5] in early 2022, the estimated prevalence remained elevated at 31.5%.[6] This study adds a fine-grained analysis of trends in the experience of various negative emotions among US adults between March 2020 and November 2021, based on nationally representative, repeated cross-sectional data. Elucidating temporal dimensions of how this disaster has been experienced emotionally over time complements our understanding of the pandemic's effect on public mental health.

Methods

Respondent data originated from Gallup's COVID-19 web survey, which used a probability-based, nationally representative panel of approximately 80,000 US adults residing in all 50 states and the District of Columbia,[7] with data collection starting March 13, 2020.

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A simple random sample of approximately 1200 panel members was interviewed daily until April 26, 2020; subsequently, about 500 individuals were interviewed each day between April 27, 2020, and August 17, 2020, and approximately 3000 individuals per month thereafter. Starting on March 23, 2020, respondents were asked if they had experienced each of the following negative emotions during "a lot of the prior day" (yes/no): sadness, worry, stress, anger, and loneliness; between May 11, 2020, and August 22, 2021, respondents were also asked about the experience of "depression" and "anxiety." This analysis was based on 156,684 observations collected from 54,530 participants between March 23, 2020, and November 24, 2021. Because this study involved secondary analyses of deidentified data, it did not qualify as Human Subjects Research, and no ethical review was required.

Given the varying frequency of data collection and the reinvitation of panel members to participate in the Gallup COVID-19 web survey, data were analyzed in 36 intervals covering between 4 and 20 (median: 7) days of data collection and including between 2714 and 9353 (median: 3765) respondents. As respondents were not allowed to take the survey more than once every 2 weeks, these data could be analyzed as repeated cross-sectional. For each of the 7 negative emotions, the median, minimum, and maximum prevalence between March 23, 2020, and November 24, 2021 (depression and anxiety: between May 11, 2020, and August 22, 2021) were computed, along with 95% confidence intervals (CIs). For comparison, nationally representative prepandemic data were retrieved from the Gallup World Poll, encompassing data from 1026 US respondents interviewed in April 2019. In addition, descriptive trend graphs were created to plot the US-wide prevalence of each of the seven emotions throughout the COVID-19 pandemic, along with 95% CIs and, for sadness, worry, stress, and anger, prepandemic estimates. Differences between estimates were evaluated by inspecting CIs.

Results

Median, minimum, and maximum prevalence estimates are presented in Table 1. Throughout the period covered by this analysis, stress (52.0%) and worry (46.6%) were the most commonly reported emotions, followed by anxiety (38.7%), sadness (27.6%), anger (23.9%), loneliness (21.9%), and depression (19.9%). The prevalence of sadness, worry, stress, and anger varied considerably across the study period, with lowest prevalence estimates obtained for June and July 2021 and highest estimates for the data collection

intervals starting in late March or early June 2020. Loneliness, depression, and anxiety peaked slightly later, in late July and mid-August 2020, respectively. Compared with 2019, the point estimates for the prevalence of worry and anger were significantly higher (by 11.3 and 9.1 percentage points, respectively).

Trends in the prevalence of these emotions, along with the prepandemic prevalence of sadness, worry, stress, and anger based on data from April 2019, are shown in Supplemental Figures 1 to 7. These figures reveal elevated prevalence of sadness, worry, stress, and anger in spring 2020 compared with prepandemic measures. After mid-2020, sadness and stress were either similarly or significantly less prevalent than prepandemic; anger and worry had reached prepandemic levels by early or mid-2021, respectively, with elevated levels once again being observed in early fall 2021. For loneliness, depression, and anxiety, for which no prepandemic data were available, no clear trajectory could be observed. Moreover, the trend graphs show distinct spikes in the prevalence of several of these emotions in summer 2020, which were most pronounced for sadness and anger during the data collection period June 1—7, 2020.

Discussion

These results suggest a substantially elevated prevalence of several negative emotions during the COVID-19 pandemic in the United States, particularly during the first two waves in spring and summer 2020. There were also noticeable spikes in the prevalence of sadness and anger specifically that coincide with protests across the country in response to the May 25, 2020, murder of George Floyd. By mid-2021, the prevalence of negative emotions for which prepandemic data were available (sadness, worry, stress, anger) had declined to levels of 2019 or below, which may be due to psychological adaptation to the pandemic;[2] however, a renewed uptick was observed in the second half of 2021, which may have been driven by concern about the rising delta variant.

These results largely correspond to those from prior studies that highlight elevated psychological distress in the early pandemic period,[1–4,8] sadness as a relatively common emotional response to disaster,[9] and a fairly rapid return to prepandemic levels of emotional well-being over time.[3] The fact that stress, worry, and anxiety emerged as the most commonly reported negative emotions, particularly in the early pandemic period, may be a result of increased experience of daily stressors such as job loss, caregiving responsibilities, and financial strain.[10] At the same time, the

Table 1
Prevalence estimates for seven negative emotions in the United States, March 23, 2020, to November 24, 2021[a].

Emotion	Median, Prev (%) [95% CI]	Minimum, Prev (%) [95% CI] {Date}[b]	Maximum, Prev (%) [95% CI] {Date}[b]	April 2019, Prev (%) [95% CI]
Sadness	27.6 [26.1; 29.1]	20.8 [18.9; 22.6] {July 19, 2021}	38.1 [34.9; 41.3] {June 1, 2020}	23.1 [19.7; 26.8]
Worry	46.6 [44.7; 48.6]	37.6 [35.8; 39.4] {June 14, 2021}	59.7 [57.6; 61.8] {Mar 30, 2020}	35.3 [31.5; 39.3]
Stress	52.0 [49.5; 54.5]	42.6 [40.4; 44.9] {July 19, 2021}	60.2 [58.2; 62.3] {Mar 30, 2020}	50.5 [46.5; 54.4]
Anger	23.9 [22.0; 25.7]	15.4 [14.0; 16.8] {June 14, 2021}	38.4 [35.2; 41.6] {June 1, 2020}	14.8 [12.0; 18.1]
Loneliness	21.9 [20.7; 23.1]	16.6 [15.1; 18.2] {July 19, 2021}	27.4 [24.2; 30.3] {Aug 10, 2020}	N/A
Depression	19.9 [18.9; 20.9]	16.8 [14.3; 19.3] {June 29, 2020}	24.5 [21.6; 27.4] {Aug 10, 2020}	N/A
Anxiety	38.7 [37.3; 40.1]	34.4 [32.6; 36.2] {July 19, 2021}	44.3 [40.6; 48.0] {July 20, 2020}	N/A

CI, confidence interval; N/A, not available; Prev, prevalence.
[a] Depression and anxiety: May 11, 2020, to August 22, 2021.
[b] Beginning of data collection interval (daily and aggregated by week until Aug 16, 2020; monthly from August 17, 2020).

increase in sadness and anger may reflect feelings of loss and emotional processing of the pandemic's immediate impact on almost every facet of daily life.[11] The findings of this study also mirror previously reported evidence of elevated sadness and anger (also using Gallup data) and probable depression or anxiety disorder (using HPS data) in the period directly following George Floyd's murder.[12] Unfortunately, disaggregation by sociodemographic characteristics such as race/ethnicity was precluded in this analysis by the limited sample size; other limitations included the use of binary self-report items that are not psychometrically validated.

In sum, there is evidence to suggest that the COVID-19 pandemic and associated social and economic challenges in the United States have manifested in measurably elevated levels of negative emotions, although their prevalence appears to have abated to pre-pandemic levels by late 2021. While the temporary experience of negative emotions does not necessarily indicate poor mental health or clinical need, the persistently high prevalence of depressive or anxiety symptoms in the HPS suggests ongoing challenges to public mental health, which calls for continued monitoring and should inform policies and interventions to promote population well-being and resilience.

Author statements

Acknowledgments

Ethical approval

This research did not qualify as Human Subjects Research as per the US regulations for the protection of human subjects in research, thus no ethics approval was required.

Competing interests

The authors have no competing interests to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.puhe.2022.08.009.

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