COVID-19 and Americans' Mental Health: A Persistent Crisis, Especially for Emerging Adults 18 to 29

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Abstract

The COVID-19 pandemic caused not only millions of hospitalizations and over a million deaths in the United States but a widespread and enduring mental health crisis. The present study examined the prevalence of symptoms of anxiety and depression in a large sample of American adults from prior to the pandemic through the summer of 2024, using data from the National Health Interview Survey in 2019 and the Household Pulse Survey from early 2020 onward. The data indicate a steep rise in symptoms of anxiety and depression from 2019 to 2020, across adult age groups but especially among the youngest adults ages 18 to 29. Furthermore, high rates of anxiety and depression persisted through 2023, even though by then there were no requirements for social isolation or social distancing and no major disruptions to daily life. Rates of anxiety and depression declined in early 2024 but remain well above 2019 rates, across adult age groups. Emerging adults may have been especially vulnerable to the mental health effects of COVID-19 because of its disruption to distinctive developmental processes such as identity formation and progress toward independent decision-making and financial self-sufficiency. However, there is an urgent need for more information about why mental health distress is persisting across all adult age groups and for more effective responses to the massive unmet need for mental health treatment.

Keywords Emerging adults · Mental health · COVID-19 · Anxiety · Depression

Introduction

Since it first appeared in early 2020, the COVID-19 pandemic has been devastating to people all over the world. In the United States, over 100 million people have been infected and over one million people have died from the virus (World Health Organization, 2023). Even for those who were not infected, the pandemic had widespread effects on daily life. Normal activities were suddenly disrupted in numerous ways. Children and adolescents lost learning time in school and were isolated from their friends during the lockdown period. Many of the oldest Americans were also isolated and vulnerable, as they suffered the highest rates of hospitalizations and deaths of any group. Millions of other adults were impacted by lost jobs, the stress of having to manage their children's remote learning, grief over loved ones who were killed by the virus, and worries about their children and parents.

Although infections and deaths from COVID-19 continue, the rates are far lower now than at the peak of the pandemic. In the United States, infections peaked in January, 2022 at over 800,000 per day; by May, 2024 the daily average was less than 6,000 per day (Centers for Disease Control and Prevention, 2024). Deaths from COVID-19 peaked in January, 2021 at about 3,300 per day; by May, 2024, there were fewer than 200 deaths per day. The U.S. government ended the three-year "national emergency" inspired by the pandemic in April, 2023, and ended the "public health emergency" in May, 2023.

But what about the mental health effects of the pandemic? It would certainly be expected that such a massive threat to health and life would arouse substantial fear, anxiety, and depression. In response to this possible mental health crisis, the worldwide psychological research community has responded with impressive alacrity and has published tens of thousands of studies in the short time since the COVID-19

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pandemic began. However, the huge volume of studies, and the fact that many of them were designed and conducted in haste in order to respond to the urgent need for mental health data, has made the collective results inconclusive. An ongoing international review by Sun et al. (2023) reported little to no effect of COVID-19 on mental health. Nevertheless, they acknowledged that the studies included in their review are extremely diverse, with large variations in sample sizes, methods, and national contexts, making it difficult to interpret the aggregated results. Kessler et al. (2022) reviewed thousands of studies conducted in the United States but found that many of them were of poor quality and few included data from both before and during the pandemic. Despite these limitations, focusing on high quality studies they were able to conclude that COVID-19 has had a significant negative impact on Americans' reports of anxiety and depression symptoms, with the impact especially strong among women, adults in low-SES groups, and relatively younger adults (under age 60).

Given that the COVID-19 pandemic has spread across the entire world and billions of people have been affected, there is likely to be enormous variation in its impact on people's mental health, including possible variations by country, culture, gender, sexual orientation, socioeconomic status, and age. So far, the evidence indicates that age is perhaps the most important variable in explaining the variance in people's mental health responses to COVID-19. It would have been reasonable to hypothesize that the mental health effects would be greatest in the age group that was most at-risk for infection, hospitalization, and death, that is, the oldest adults, with the mental health effects inversely related to age, so that the youngest, healthiest adults, who were least likely to be hospitalized or die from the pandemic, would also have been the least likely to respond to the pandemic with anxiety and depression (e.g., Carpenter et al.,; 2022; Monahan et al., 2020).

However, evidence of psychological responses to the pandemic in the United States shows a pattern just the opposite of what might be expected based on physical vulnerability: It is the youngest American adults who have been most likely to respond to COVID-19 with psychological distress, not the oldest, and reports of distress decreased, not increased, with age. For example, the Pew Research Center conducted four national surveys of American adults during the period from March 2020 through September 2022, when cases of the pandemic were rising steeply (Pasquini & Keller, 2022). The surveys assessed psychological distress with a five-item scale that included items on *feeling depressed, feeling anxiety, loneliness,* and *trouble sleeping,* along with one COVID-specific item on *anxiety responses to the pandemic*. There was a linear age pattern in the results, negatively related to age: 58% of 18-to-29-year-olds experienced "high psychological distress" during the survey period, and reported

distress was lower in all older age groups—lowest of all, 27%, among the oldest Americans ages 65 and up.

Similar results were reported by Twenge et al. (2021), who used national data from 2019, before the pandemic, compared to four points during 2020, the first year of the pandemic. The age patterns were pronounced, showing that emerging adults ages 18 to 29 were more likely than adults in any older age group to respond to the early stages of the pandemic with symptoms of anxiety and depression serious enough to signify a psychiatric disorder. As in the Pew report, there was a linear pattern inversely related to age, with the youngest American adults most distressed and the oldest Americans the least.

This age pattern was also reported by McGinty et al. (2022), who analyzed data from the National Opinion Research Center's longitudinal study of over 1000 American adults surveyed online four times in 2020 and 2021, with the sample weighted to represent the demographics of the American population. Using the Kessler Psychological Distress Scale (four items on depressive symptoms and two on anxiety symptoms), they concluded that "serious psychological distress" was reported by 12 to 15 percent of the sample across the four time points, with no significant change from 2020 to 2021. Reports of serious psychological distress were elevated among Hispanics, adults in low-income families, and the youngest adults ages 18 to 29. Notably, more than 60% of the participants with serious psychological distress attributed their distress to pandemic-caused disruptions in education, employment, and finances, all areas in which emerging adults experienced greater disruptions than older adults.

Longitudinal studies focusing on the youngest American adults support this pattern of declining mental health in the early period of the pandemic. Buizza et al. (2022) reviewed seven studies of American college students that assessed mental health both before and during the pandemic. All of the studies showed worse mental health once the pandemic struck.

So far, relatively few published studies on the pandemic and mental health have included data from 2022 and beyond. However, focusing on depression, the Gallup organization surveyed American adults before the pandemic, in 2017, and in 2023 (Witters, 2023a, 2023b, May 17). The questions pertained to clinical diagnoses, specifically: "Has a doctor or nurse ever told you that you have depression?" and "Do you currently have or are you being treated for depression?" Results showed an increase from 2017 to 2023, both for lifetime and current depression, especially for emerging adults ages 18 to 29. Lifetime depression rose from 20% in 2017 to 34% in 2023 for emerging adults, but barely changed for Americans age 65 and older. Likewise, current depression rose from 13 to 25% for emerging adults ages 18 to 29, but was unchanged at 12% for persons age 65 and older. Also, in

one of the only studies to compare adolescents and emerging adults, in data collected in December, 2022 from a national sample, Weissbourd and colleagues (2023) reported that among emerging adults (ages 18–25) 36% were above the clinical threshold for anxiety and 29% for depression—rates over twice as high as for adolescents (ages 14–17).

A Focus on Age Differences

The main aims of this paper were (1) to investigate if the impact of COVID-19 on Americans' mental health found in previous studies has continued into 2024, well after the impact of COVID-19 on daily life in the United States has receded; (2) to examine whether the inverse relationship between age and mental health responses to COVID-19 reported in previous studies still persist; (3) to propose a more extensive developmental explanation for the age differences in the mental health impact of COVID-19, with hypotheses to be examined in future research; and (4) to propose policy responses to the continuing mental health crisis inspired by COVID-19. Because of the vast number of studies published worldwide on COVID-19 and mental health and because patterns and causes may vary by differences in national policies and cultural practices, the present paper focuses solely on the United States.

Method

Participants

Beginning in April, 2020, in order to monitor diverse effects of the COVID-19 pandemic on American adults, the National Center for Health Statistics (NCHS) and the U.S. Census Bureau initiated the online Household Pulse Survey (National Center for Health Statistics, 2024). The samples are drawn from the U.S. Census Bureau's Master Address File Data. Household units (defined as "all the people who occupy a housing unit") are randomly invited to participate via email and text messages. Among households that respond, one participant from each household is included in the study. The total number of participants in the ongoing biweekly survey has ranged from slightly over 37,000 to slightly under 119,000. In the data reported from the survey, responses were weighted to match Census Bureau estimates of the American adult population by age, sex, race and ethnicity, and educational attainment. However, individual characteristics were not connected to mental health reports in the data set, so it is not possible in this paper to include individuals' age, sex, race and ethnicity, and educational attainment in the analyses.

As a source of pre-pandemic mental health data for American adults, 2019 data were drawn from the monthly National Health Interview Survey (NHIS) conducted by the National Center for Health Statistics (Terlizzi & Schiller, 2021). Like the Household Pulse Survey (HPS), the NHIS was based on a large representative sample of American adults, over 31,000. However, the NHIS was based on in-person household interviews rather than administered via the internet. Response rates were higher for the NHIS (around 60%) than for the HPS (1–3% in the early months of the survey, 6–10% subsequently; Kessler et al. [2022]). The 2019 NHIS data are available at https://www.cdc.gov/nchs/data/nhis/mental-health-monthly-508.pdf and the HPS data are available at https://www.cdc.gov/nchs/covid19/pulse/mental-health.htm.

Measures

In both the National Health Interview Survey and the Household Pulse Survey, each survey included four items assessing mental health, with two items on anxiety symptoms from the Generalized Anxiety Disorder (GAD-2) scale and two items on depressive symptoms from the Patient Health Questionnaire (PHQ-2), as follows:

GAD-2 Questions

Over the last 14 days, how often have you been bothered by the following problems … Feeling nervous, anxious, or on edge? Would you say *not at all, several days, more than half the days, or nearly every day*? Select only one answer.

Over the last 14 days, how often have you been bothered by the following problems … Not being able to stop or control worrying? Would you say *not at all, several days, more than half the days, or nearly every day*? Select only one answer.

PHQ-2 Questions

Over the last 14 days, how often have you been bothered by … having little interest or pleasure in doing things? Would you say *not at all, several days, more than half the days, or nearly every day*? Select only one answer.

Over the last 14 days, how often have you been bothered by … feeling down, depressed, or hopeless? Would you say *not at all, several days, more than half the days, or nearly every day*? Select only one answer.

For each question, *not at all* = 0, *several days* = 1, *more than half the days* = 2, and *nearly every day* = 3.

The GAD-2 and PHQ-2 have been widely validated as screening questions for generalized anxiety disorder and major depressive disorder (Kroenke et al., 2003, 2007). A sum of 3 or greater for the two questions on the GAD-2 has been shown to be associated with diagnoses of generalized anxiety disorder. A sum of three or greater on the PHQ-2

has been shown to be associated with diagnoses of major depressive disorder. *Sensitivity* and *specificity* are indicators of validity. Sensitivity is the ability of a screening test to correctly identify the percentage of people with the disease or condition. Specificity is the ability of a test to correctly identify the percentage of persons who do not have the disease or condition (Trevethan, 2017). The GAD-2 has a sensitivity of 86% and specificity of 83% for generalized anxiety disorder when using a cut-off score of ≥ 3 (Kroenke et al., 2007). The PHQ-2 has a sensitivity of 83% and specificity of 90% for major depressive disorder when using a cut-off score of ≥ 3 (Kroenke et al., 2003).

Procedure

The Household Pulse Survey was administered weekly beginning in late April, 2020. Beginning in August, 2020, the sampling time frame was changed from one week to two weeks, and that procedure has continued through the present. Also, from late April, 2020, through early July, 2021, participants were asked to respond to the 4 questions about mental health with respect to the "last 7 days." However, beginning late July, 2021, and continuing through the present, the time frame for the questions was changed to the "last 14 days" to conform to the previous standard time frame used.

Results

Two questions were addressed. First, how have reports of symptoms of anxiety and depression among American adults changed from the pre-COVID-19 period of 2019 through the summer of 2024? Second, how are symptoms of anxiety and depression related to age over this time period?

Conceptually, the combined data from NHIS and HPS were divided into six distinct time periods, guided by the CDC's COVID-19 timeline (Centers for Disease Control & Prevention, 2023). Period 0 was the pre-COVID-19 year of 2019, using baseline 2019 NHIS data. In all subsequent periods HPS data were used. Period 1 covered April 23 to December 7, 2020, capturing the time from when COVID-19 was declared a global pandemic to the emergency use authorization for COVID-19 vaccines by the Food and Drug Administration (i.e., December 11, 2020). Period 2 included HPS phases from December 9, 2020, to June 21, 2021, marking the beginning of vaccination (December 14, 2020) to dominance of the Delta variant in the United States (June 1, 2021). Period 3 spanned from June 23 to December 13, 2021, including the booster doses and the Omicron surge in the United States in early December. Period 4 stretched between December 29, 2021 and Oct 30, 2023. The most recent HPS phase 4 spanned the remainder of the HPS data, period 5, January 9 to August 19, 2024. Figure 1 presents a
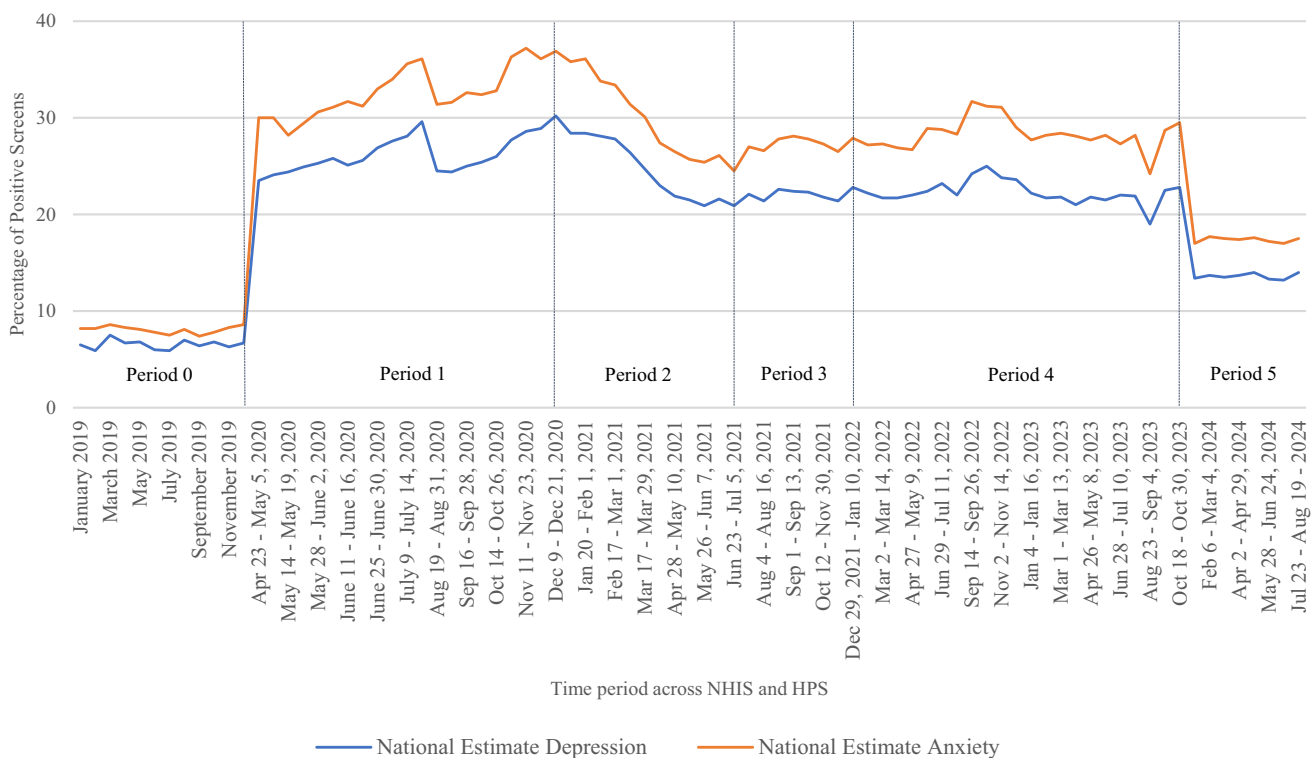

Fig. 1 Frequency distribution of national estimates of anxiety and depression symptoms for american adults from NHIS and HPS datasets

frequency distribution of the national estimates of the prevalence of anxiety and depression symptoms across all six phases for the entire sample. Reports of anxiety and depression rates were far higher in the HPS data than in the baseline 2019 NHIS data. Subsequently, overall rates of anxiety and depression fell at the beginning of 2024 but remained higher than baseline levels.

Figures 2 and 3 depict the distribution of positive screenings for anxiety and depression across different age groups. Both graphs demonstrate a consistent pattern of elevated reports of anxiety and depression symptoms compared to baseline levels, for all age groups but especially among emerging adults ages 18 to 29. Specifically, in 2019 (Period 0), 11% of emerging adults had positive screenings for anxiety, which increased sharply to an average of 43% during 2020 (Period 1). This elevated rate persisted at 41% during Period 4 and has declined in the most recent Period 5 (through August 2024) to 30%. Similarly, with respect to depression, 6% of emerging adults reported positive screenings in 2019, which rose to an average of 38% during Period 1 and remained notably high at 34% in Period 4. As with anxiety, reports of depression symptoms declined by August 2024, to 24%, but remain high relative to the pre-COVID period.

Two univariate analyses were conducted to evaluate if the prevalence of clinical anxiety and depression maintains an elevated level in 2023 when contrasted with the pre-COVID period of 2019, and more recently from 2020 to 2023. The year 2024 was not included in the analysis since HPS data collection is available only through August, 2024. Significant variations in anxiety prevalence were observed across the years, $F(4, 67) = 208.4$, $p < 0.001$, $\eta 2 = 0.926$, as well as in depression, $F(4, 67) = 236.41$, $p < 0.001$, $\eta^2 = 0.933$. The results of post-hoc tests for both anxiety and depression indicated that the national estimates in 2019 were significantly lower than all other years. Because Levene's test and F ratio were both statistically significant, Tamhane's T2 test was used to interpret the post-hoc results to accommodate violations of the assumption of equal variances (Meyers et al., 2017). As indicated in Table 1, the results showed that, for both anxiety and depression, the prevalence rates in 2023 differed significantly from 2019 and 2020. The positive difference in means observed compared to 2019 indicates an increase in the prevalence of positive screenings for anxiety and depression in 2023, compared to pre-COVID in 2019. Additionally, the negative difference in means compared to 2020 indicates that for all age groups combined, there has been a decrease in prevalence of anxiety and depression symptoms in 2023 compared to 2020. Importantly, no statistically significant difference was found when comparing the prevalence of anxiety and depression in 2023 to the years 2021 and 2022.

Next, we conducted a relative risk analysis to examine changes in the likelihood of a positive screening for anxiety
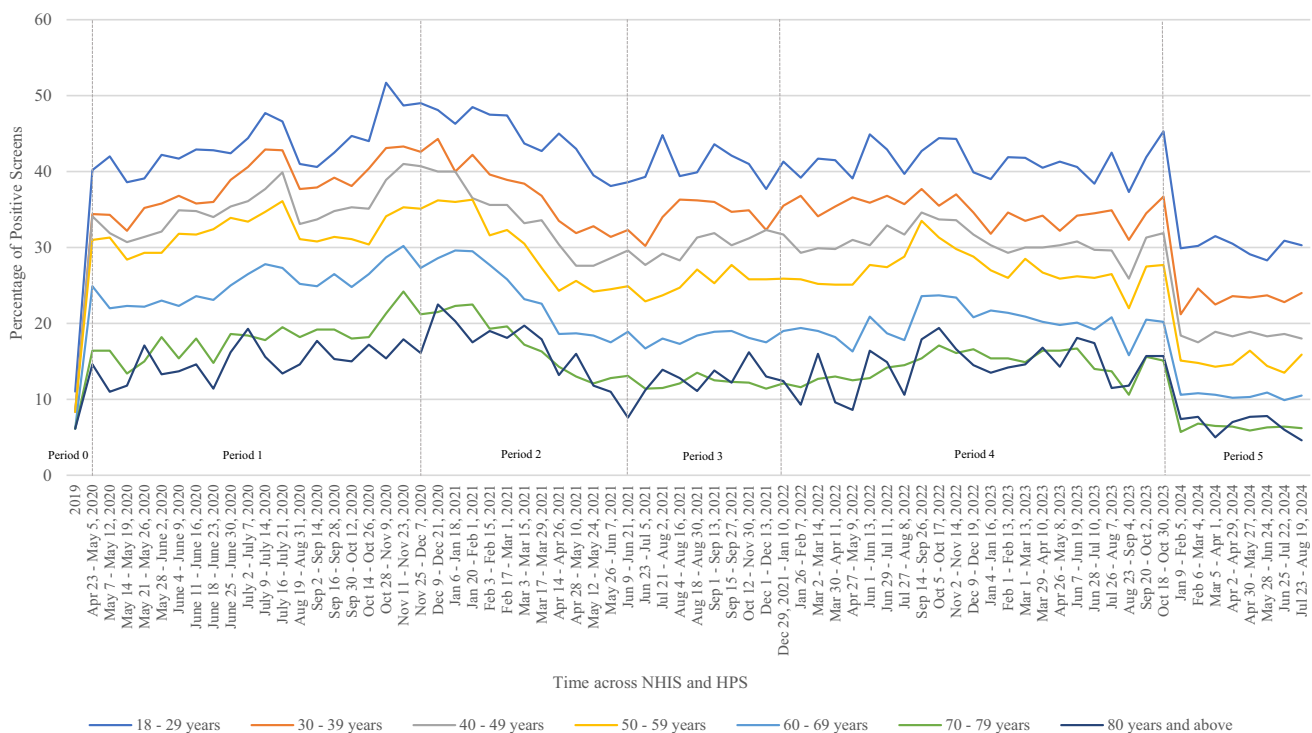

Fig. 2 Frequency distribution of positive screens for anxiety across age groups from NHIS and HPS datasets
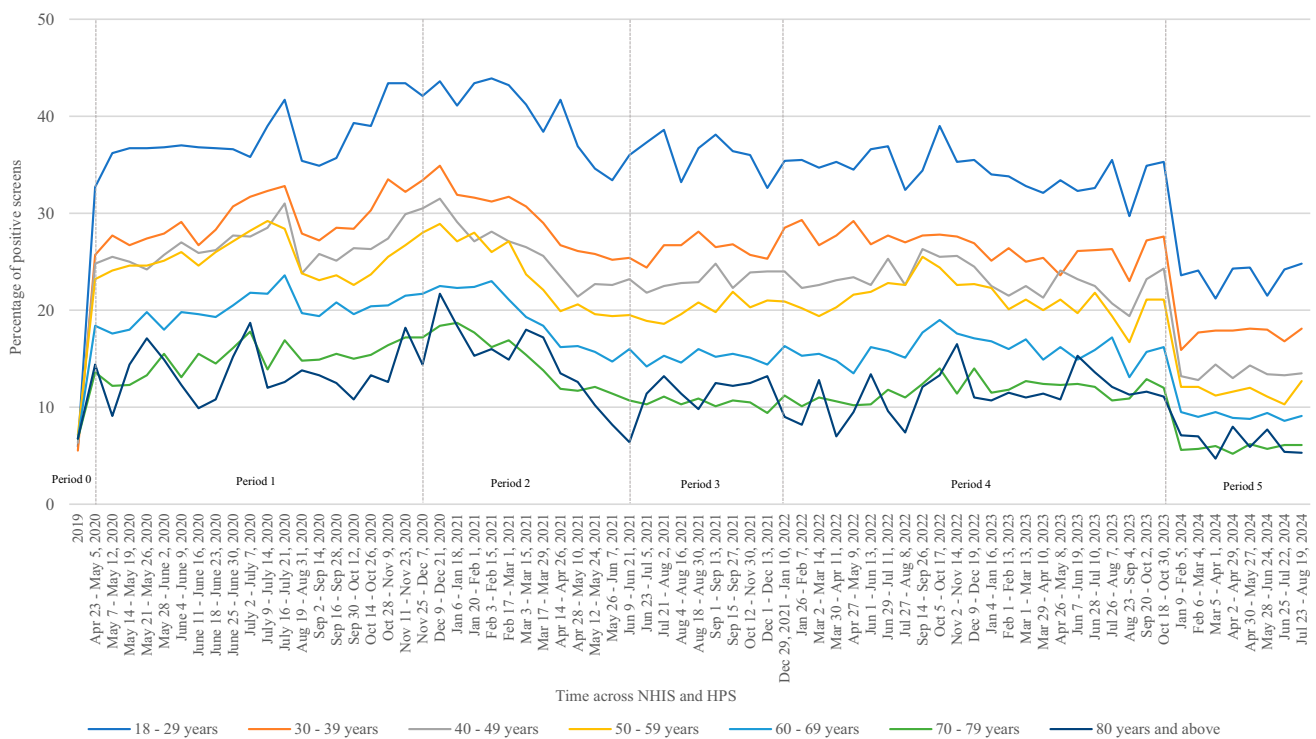
Fig. 3 Frequency distribution of positive screens for depression across age groups from NHIS and HPS datasets

Table 1 Anxiety and depression mean scores and post hoc results from 2019 to 2023

	Anxiety			Depression		
	M	SD	Post Hoc	M	SD	Post Hoc
2019	8.08	0.38	1 < 2**, 3**, 4**, 5**	6.54	0.48	1 < 2**, 3**, 4**, 5**
2020	32.77	2.67	2 > 1**, 3**, 4**, 5**	26.27	1.95	2 > 1**, 3**, 4**, 5**
2021	28.81	3.57	3 > 1**, 3 < 2**	23.56	2.77	3 > 1**, 3 < 2**
2022	28.75	1.74	4 > 1**, 4 < 2**	22.88	1.08	4 > 1**, 4 < 2**, 5
2023	27.98	0.39	5 > 1**, 5 < 2**	21.74	0.36	5 > 1**, 5 < 2**, 5

2019 (1), 2020 (2), 2021 (3), 2022 (4), 2023 (5) for Years. All post hoc comparisons were significant at $p < .001$ unless specified

**significant at $p < .01$, *significant at $p < .05$

and depression across the different age-groups through the six time periods. Relative risk is a statistical measure that depicts how likely an outcome is to happen in one group relative to a reference group (Ranganathan et al., 2015; Tenny & Hoffman, 2023). For example, a relative risk of 2.0 means that the outcome was twice as likely relative to the reference group. A limitation of the HPS data was that the sample sizes for each age-level were not available for the HPS data, so they were calculated using proportions and confidence intervals. For the scope of the relative risk analyses, the sample sizes were determined using the proportion and 95% confidence intervals available from the data (Boston University School of Public Health, n.d.; Watts, 2022). Similarly, the

positive screenings and sample sizes in the NHIS dataset for age groups were averaged to align with the HPS groupings.

The findings show that adults in the United States were more likely to screen positively for anxiety and depression across all periods between 2020 through 2024 relative to the baseline year of 2019 (Tables 2 and 3). For example, the RR of anxiety of Period 1 compared to Period 0 is 4.14 (3.98–4.3), indicating that the rate of positive screenings across all adults in the United States was over 4 times higher in 2020 (Period 1) than in 2019 (Period 0).

In exploring the data for the 18–29 years age group, the prevalence of anxiety was 11.0% in Period 0, which increased to 43.2% in Period 1. The corresponding RR was 3.92 [3.6–4.27], indicating a notable increase in the

Table 2 Relative risk for anxiety across five periods

	Period0	Period 1	RR of 1 vs 0	Period 2	RR of 2 vs 0	RR of 2 vs 1	Period 3	RR of 3 vs 0	RR of 3 vs 1	RR of 3 vs 2	Period 4	RR of 4 vs 0	RR of 4 vs 1	RR of 4 vs 2	RR of 4 vs 3
National estimate	7.8%	32.4%	4.14 [3.98–4.3]	30.6%	3.91 [3.76–4.06]	0.94 [.94–.95]	27.0%	3.44 [3.31–3.58]	0.83 [.82–.84]	0.88 [.87–.89]	28.3%	3.61 [3.48–3.75]	0.87 [.87–.88]	0.92 [.92–.93]	1.05 [1.04–1.06]
Age groups															
18–29	11.0%	43.2%	3.92 [3.6–4.27]	44.0%	3.99 [3.66–4.35]	1.02 [1.–1.04]	40.7%	3.69 [3.38–4.03]	0.94	0.93 [.9–.95]	41.3%	3.75 [3.44–4.08]	0.96 [.94–.97]	0.94 [.92–.96]	1.01 [.98–1.04]
30–39	8.4%	38.3%	4.58 [4.18–5.03]	37.1%	4.44 [4.05–4.88]	0.97 [.95–.99]	34.1%	4.08 [3.72–4.49]	0.89 [.87–.91]	0.92 [.9–.94]	34.8%	4.16 [3.81–4.58]	0.91 [.9–.92]	0.94 [.92–.96]	1.02 [1.–1.04]
40–49	8.4%	35.2%	4.21 [3.84–4.62]	32.7%	3.92 [3.57–4.31]	0.93 [.91–.95]	30.3%	3.63 [3.3–3.99]	0.86 [.84–.88]	0.92 [.9–.95]	30.4%	3.64 [3.35–4.04]	0.86 [.86–.89]	0.93 [.92–.96]	1.00 [.99–1.04]
50–59	8.3%	32.0%	3.84 [3.5–4.21]	29.8%	3.58 [3.26–3.93]	0.93 [.91–.95]	25.2%	3.03 [2.75–3.33]	0.79 [.77–.81]	0.85 [.82–.87]	26.8%	3.22 [2.96–3.56]	0.84 [.83–.86]	0.90 [.89–.93]	1.06 [1.04–1.1]
60–69	6.1%	25.3%	4.12 [3.65–4.66]	23.6%	3.84 [3.4–4.34]	0.93 [.91–.95]	17.9%	2.92 [2.58–3.31]	0.71 [.69–.73]	0.76 [.74–.78]	19.8%	3.23 [2.9–3.7]	0.78 [.78–.81]	0.84 [.83–.87]	1.10 [1.09–1.15]
70–79	6.1%	18.0%	2.92 [2.59–3.31]	17.5%	2.85 [2.52–3.22]	0.97 [.94–1.01]	12.1%	1.97 [1.73–2.24]	0.67 [.64–.71]	0.69 [.65–.73]	14.3%	2.32 [2.07–2.65]	0.79 [.78–.83]	0.82 [.79–.85]	1.18 [1.13–1.26]
80 above	6.1%	14.8%	2.41 [2.12–2.75]	15.8%	2.57 [2.24–2.95]	1.06 [.98–1.16]	12.3%	2.01 [1.72–2.35]	0.83 [.75–.93]	0.78 [.7–.88]	13.8%	2.26 [1.97–2.57]	0.93 [.86–1.01]	0.88 [.8–.95]	1.12 [1.–1.25]

	Period 5	RR of 5 vs 0	RR of 5 vs 1	RR of 5 vs 2	RR of 5 vs 3	RR of 5 vs 4
National estimate	17.4%	2.21 [2.13–2.3]	0.54 [.53–.54]	0.57 [.56–.57]	0.64 [.63–65]	0.61 [.61–62]
Age groups						
18–29	30.1%	2.73 [2.5–2.99]	0.70 [.68–.72]	0.68 [.66–.71]	0.74 [.71–.77]	0.73 [.71–.75]
30–39	23.2%	2.77 [2.52–3.05]	0.61 [.59–.62]	0.62 [.61–.64]	0.68 [.66–.7]	0.67 [.65–.68]
40–49	18.3%	2.19 [1.99–2.41]	0.52 [.51–.53]	0.56 [.54–.57]	0.60 [.59–.62]	0.60 [.59–.62]
50–59	14.8%	1.77 [1.61–1.95]	0.46 [.45–.48]	0.50 [.48–.51]	0.59 [.57–.61]	0.55 [.54–.57]
60–69	10.5%	1.71 [1.51–1.94]	0.41 [.4–.43]	0.45 [.43–.46]	0.58 [.56–.61]	0.53 [.51–.55]
70–79	6.2%	1.01 [.89–1.15]	0.35 [.33–.36]	0.36 [.34–.38]	0.52 [.48–.55]	0.44 [.42–.46]
80 above	6.3%	1.03 [.88–1.2]	0.43 [.38–.48]	0.40 [.36–.45]	0.51 [.44–.59]	0.46 [.41–.51]

RR relative risk. Confidence Intervals at 95% for RR are within brackets. Period 0: 2019. Period 1: April 23 to Dec 7, 2020, Period 2: Dec 9 to Jun 21, 2021, Period 3: June 23 to Dec 13, 2021, Period 4: Dec 29, 2021 to Oct 30, 2023, Period 5: Jan 9–August 19, 2024

Table 3 Relative risk for depression across five periods

	Period0	Period 1	RR of 1 vs 0	Period 2	RR of 2 vs 0	RR of 2 vs 1	Period 3	RR of 3 vs 0	RR of 3 vs 1	RR of 3 vs 2	Period 4	RR of 4 vs 0	RR of 4 vs 1	RR of 4 vs 2	RR of 4 vs 3
National estimate	6.4%	25.9%	4.03 [3.86–4.2]	25.3%	3.92 [3.76–4.09]	0.97 [.96–.98]	21.9%	3.40 [3.25–3.55]	0.84 [.83–.86]	0.87 [.85–.88]	22.2%	3.45 [3.32–3.62]	0.86 [.85–.87]	0.88 [.88–.89]	1.01 [1.01–1.03]
Age groups															
18–29	5.9%	37.5%	6.33 [5.62–7.12]	39.8%	6.72 [5.96–7.57]	1.06 [1.04–1.09]	35.8%	6.03 [5.34–6.81]	0.95 [.92–.98]	0.90 [.87–.93]	34.3%	5.78 [5.15–6.54]	0.91 [.9–.94]	0.86 [.84–.89]	0.96 [.93–.99]
30–39	5.5%	29.2%	5.28 [4.7–5.93]	29.2%	5.27 [4.69–5.93]	1.00 [.98–1.02]	26.4%	4.77 [4.24–5.37]	0.90 [.88–.93]	0.91 [.88–.93]	26.6%	4.81 [4.29–5.41]	0.91 [.9–.93]	0.91 [.89–.93]	1.01 [.98–1.04]
40–49	6.3%	26.7%	4.21 [3.78–4.69]	25.7%	4.05 [3.63–4.52]	0.96 [.94–.98]	22.9%	3.62 [3.24–4.04]	0.86 [.83–.88]	0.89 [.87–.92]	22.9%	3.62 [3.27–4.06]	0.86 [.85–.88]	0.89 [.88–.92]	1.00 [.98–1.04]
50–59	7.1%	25.1%	3.51 [3.17–3.89]	23.4%	3.27 [2.96–3.63]	0.93 [.91–.95]	19.9%	2.78 [2.51–3.09]	0.79 [.77–.82]	0.85 [.82–.88]	20.9%	2.93 [2.68–3.28]	0.83 [.83–.86]	0.90 [.88–.93]	1.05 [1.03–1.1]
60–69	6.8%	20.1%	2.97 [2.64–3.33]	19.1%	2.83 [2.51–3.17]	0.95 [.93–.98]	15.1%	2.23 [1.98–2.51]	0.75 [.73–.78]	0.79 [.76–.82]	15.9%	2.35 [2.1–2.65]	0.79 [.78–.81]	0.83 [.81–.86]	1.05 [1.03–1.1]
70–79	6.8%	15.1%	2.24 [1.99–2.52]	14.6%	2.16 [1.92–2.44]	0.97 [.93–1.01]	10.4%	1.54 [1.36–1.74]	0.69 [.65–.73]	0.71 [.67–.75]	11.6%	1.71 [1.52–1.92]	0.77 [.73–.79]	0.79 [.76–.82]	1.12 [1.05–1.17]
80 above	6.8%	13.0%	1.92 [1.69–2.19]	12.7%	1.87 [1.64–2.14]	0.97 [.89–1.07]	11.8%	1.74 [1.49–2.04]	0.91 [.8–1.02]	0.93 [.82–1.06]	11%	1.62 [1.4–1.83]	0.84 [.77–.91]	0.87 [.78–.94]	0.93 [.81–1.05]

	Period 5	RR of 5 vs 0	RR of 5 vs 1	RR of 5 vs 2	RR of 5 vs 3	RR of 5 vs 4
National estimate	13.6%	2.11 [2.02–2.21]	0.52	0.54	0.62	0.61
Age groups						
18–29	23.5%	3.97 [3.51–4.49]	0.63 [.6–.65]	0.59 [.57–.62]	0.66 [.63–.69]	0.69 [.66–.71]
30–39	17.5%	3.16 [2.81–3.56]	0.60 [.58–.62]	0.60 [.58–.62]	0.66 [.64–.69]	0.66 [.64–.68]
40–49	13.5%	2.13 [1.91–2.38]	0.51 [.49–.52]	0.53 [.51–.54]	0.59 [.57–.61]	0.59 [.57–.61]
50–59	11.5%	1.62 [1.46–1.8]	0.46 [.45–.48]	0.49 [.48–.51]	0.58 [.56–.61]	0.55 [.53–.57]
60–69	9.1%	1.35 [1.2–1.52]	0.46 [.44–.47]	0.48 [.46–.5]	0.61 [.58–.63]	0.58 [.56–.6]
70–79	5.7%	0.85 [.75–.96]	0.38 [.36–.4]	0.39 [.37–.41]	0.55 [.52–.59]	0.50 [.47–.52]
80 above	6.1%	0.90 [.77–1.05]	0.47 [.41–.53]	0.48 [.42–.54]	0.51 [.44–.6]	0.55 [.49–.62]

RR relative risk. Confidence Intervals at 95% for RR are within brackets. Period 0: 2019. Period 1: April 23 to Dec 7, 2020, Period 2: Dec 9 to Jun 21, 2021, Period 3: June 23 to Dec 13, 2021, Period 4: Dec 29, 2021 to Oct 30, 2023, Period 5: Jan 9—August 19, 2024

likelihood of positive screenings for anxiety during Period 1 compared to the baseline. In Period 5 anxiety prevalence was 30.1%, and the RR relative to Period 0 was 2.73 [2.5–2.99]. For depression, the percentage of positive screens in the 18–29 age group was 5.9% during Period 0, increasing to 37.5% in Period 1. The RR of depression between Period 1 and Period 0 was 6.33, indicating emerging adults were 6.33 [5.62—7.12] times more likely to report depression symptoms during Period 1 compared to the baseline Period 0. Similarly, the RR of Period 5 compared to the baseline period was 3.97 [3.51–4.49] for symptoms of depression, indicating an elevated level in the probability of positive screenings in 2024 relative to the 2019 baseline.

Discussion

The COVID-19 pandemic has killed millions of people and disrupted the lives of billions worldwide since it was first identified in 2020. The response by the scientific community was remarkably swift and effective, as vaccines became available within a year after the pandemic began and have been widely distributed since 2021, dramatically reducing the number of cases, hospitalizations, and deaths. As of 2024, the pandemic no longer requires social isolation or causes economic upheaval and jarring disruptions to daily life. However, the present study indicates that the mental health impact of the pandemic in the United States has been widespread and serious, and that it continues to this day, especially among the youngest American adults.

The data presented here indicate that the COVID-19 pandemic set off a massive mental health crisis in the United States that has persisted even well after the pandemic itself has abated, the economic and social disruptions caused by the pandemic have ended, and it appears outwardly that life has returned to normal. Data from the National Health Interview Survey in 2019 and the Household Pulse Survey from early 2020 through the summer of 2024 show that symptoms of anxiety disorder and major depression escalated quickly and steeply in the early months of the pandemic and have declined only moderately in the three years since 2021. Across adult age groups, positive screens for anxiety disorder and major depression were compressed into a narrow range in 2019, before the pandemic began, from 6 to 11%, but had risen exponentially by mid-2020, especially for the youngest adults ages 18 to 29, for whom the peak positive screen rates were 43% for anxiety disorder and 38% for major depression. By the summer of 2024, rates of anxiety and depression had declined to around baseline level for the oldest age groups but remained substantially elevated for younger adults. From the beginning of the pandemic to the present there has been an inverse linear relation between mental health distress and age, with the youngest adults most

vulnerable and the oldest adults the least vulnerable. This is in striking contrast to their physical susceptibility to the pandemic with respect to infections, hospitalizations, and deaths.

Limitations of the Data and Constraints on Generality

The data presented in this study, although abundant, have limitations that warrant caution in interpreting the results. Most importantly, the method in the 2019 National Health Interview Survey was an in-person household survey with a response rate of 60%, whereas the method for the Household Pulse Survey used from early 2020 to the present was an internet survey with a much lower response rate, 1–3% in its early weeks and 6–10% subsequently.

Yet, two other points support the potential validity of the data and argue for the data to be regarded as indicators of an enduring national mental health crisis. First, although the method of data collection changed from 2019 to 2020, it has been consistent since 2020. Because 2020 is when infections, hospitalizations, and deaths from the pandemic first accelerated, and by 2024 rates of all these consequences of COVID-19 had declined to a small proportion of their earlier heights, it might have been expected that symptoms of anxiety and depression would have declined to baseline levels by now. However, this is not the case; symptoms of anxiety and depression remain strikingly high, especially among emerging adults, even if they are not as high now as they were in the early period of the pandemic.

Second, there are corroborating data from several other sources that show both a continuing mental health crisis from COVID-19 and an age pattern of highest distress among emerging adults ages 18 to 29, with a linear decline with age from youngest to oldest adults. Numerous studies have shown that mental health distress in 2020 and 2021 was highest among the youngest American adults (Kessler et al., 2022; McGinty et al., 2022; Pasquini & Keller, 2022; Twenge et al., 2021). Studies that include mental health data from 2020 to the present are scarce, but the existing evidence shows persistently elevated rates of anxiety and depression well into 2023. Gallup national surveys on adults' reports of treatment for clinical depression indicated much higher rates in 2023 than in 2017 and also showed that depression was especially elevated in 2023 among 18-to-29-year-olds (Witters, 2023a, 2023b, May 17).

Other limitations should be noted. First, the time intervals were not consistent across the various periods of the NHIS and HPS, posing limitations on our ability to conduct robust time series analyses. Second, the available data did not allow for analyses by gender, race and ethnicity, or educational attainment due to lack of individual level data. These are characteristics that may have influenced mental health

responses to COVID-19 and should be investigated further. Finally, the data in the present study are strictly quantitative, so although the results indicate high rates of persistent mental health distress, especially among the youngest American adults, the reasons for that distress remain to be investigated.

The Need for a Developmental Explanation

To develop hypotheses to explain why emerging adults have been especially vulnerable to the mental health effects of COVID-19, it is essential to understand the psychological features of this age group. The past two decades of research on 18-to-29-year-olds have revealed five features that are distinctive to this new life stage (Arnett, 2024):

1. *Identity explorations:* deciding "who I am" and trying out various possible futures, especially in love and work;
2. *Instability*, in love, education, work, and place of residence;
3. *Self-focus,* as ties to parents wane but new roles and commitments have not yet been entered;
4. *Feeling in-between*, on the way to adulthood but not there yet; and
5. *Possibilities/optimism*, when hopes are high and many bright futures still seem possible.

This theory helps to explain the greater mental health impact of COVID-19 on emerging adults. Their *identity explorations* were disrupted at a crucial time, just as they were making efforts to build a life for themselves in education, work, and love relationships. The *instability* that is common in this life stage was exacerbated by the pandemic, as they lost their jobs in massive numbers, their educational institutions closed down, and the combination of lost jobs and closed colleges sent them home to live with their parents in unprecedented proportions (Fry et al., 2020). Their normal *self-focus* veered into loneliness as they were cut off from their friends and romantic partners (Witters, 2023a, 2023b, April 4). *Feeling in-between* adolescence and adulthood may have been sharpened and extended by the unexpected delay in their progress toward building an independent life. Their habitual sense of wide-open *possibilities* received a rude shock, and their *optimism* may have been dimmed by the crush of current circumstances.

The three top criteria for adulthood named by American emerging adults in numerous studies are all independence-based—*accepting responsibility for yourself, making independent decisions,* and *becoming financially independent* (Arnett, 2024; Nelson & Luster, 2015)—and their progress on all three of these criteria was delayed or reversed by the pandemic. Most required help from their parents or other

adults when the pandemic hit, because they became unable to continue their progress toward *becoming responsible for themselves* due to disruptions in school and work. Their ability to *make independent decisions* was hindered by school closings, job loss, and the necessary retreat to living with their parents again after having moved out, because they could no longer afford to live on their own. Similarly, few were able to remain *financially independent* because job loss was so pervasive among 18-to-29-year-olds, and most did not have any kind of savings to draw upon.

An Urgent Call for Qualitative Research

The continuing mental health crisis caused by COVID-19 presents an urgent challenge as well as an opportunity: To investigate more deeply why it is occurring, in order to address the current crisis and promote preparation for the mental health effects of the next pandemic. Although national data show persistently high levels of anxiety and depression, at this point there is a lack of good national data showing why. Many of the qualitative studies conducted so far have used samples of college students (e.g., Ewing et al., 2022; Farris et al., 2021). Although this approach is understandable given the need for quick and easily obtainable data, college students do not adequately represent emerging adults, much less the broader adult population.

Furthermore, early studies showed that factors such as lost jobs, reduced income, closed colleges, and social isolation contributed to the initial rise in mental health distress (Fruehwirth et al., 2021; McGinty et al., 2022)—but none of those conditions are still occurring, yet rates of mental health distress remain appallingly high. Why? Qualitative studies with interviews of adults across age groups are necessary, and the sooner the better, while the crisis is still ongoing. We need to ask adults why they are feeling depressed and anxious in response to the pandemic, and why those feelings are continuing now, long after the peak of morbidity and mortality from the pandemic has passed. For emerging adults in particular, the possible developmental explanations presented above should be investigated.

Responding to the Current Mental Health Crisis, and the Next One

The mental health consequences of COVID-19 overwhelmed the mental health treatment system, and are still overwhelming it (Muñoz et al., 2022; Whittingham et al., 2023). Many people who have sought mental health services have been unable to obtain them. The youngest adults have been not only the most affected by the mental health impact

of the pandemic but the age group most likely to lack access to treatment (Vahratian et al., 2021). The lack of available mental health treatment helps explain why the anxiety and depression provoked by the pandemic persist to this day.

Because its contagiousness required so much social distancing, the pandemic inspired a flourishing of growth in "telehealth," that is, the delivery of health services via the internet, including for the delivery of mental health services (Cantor et al., 2023; Zimmerman et al., 2023). This new method promises to be especially appealing and suitable for emerging adults, because they change geographical locations more frequently than any other age group (Arnett, 2024) and because they have grown up with media technology as part of their daily lives so that most of them are comfortable with making virtual connections with others. Although during the COVID-19 pandemic people expressed a preference for in-person therapy over telehealth therapy, they also welcomed telehealth therapy for its advantages of convenience and accessibility (Barney et al., 2022). For example, Waselewski et al. (2022) surveyed a national sample of young Americans ages 14 to 24. Many of the youth were open to using telehealth treatment, but they preferred video calls to phone services and viewed both as less effective than in-person treatment. Turner and Seigel (2022) interviewed 10 therapists about their experiences with telehealth delivery. They acknowledged its advantage for accessibility but noted that it is often hindered by technical problems and, for young people, some faced difficulty in finding a place where they were undistracted and undisturbed, especially those in low-income families. On the other hand, Mulia et al. (2023) surveyed a national sample of adults and found that telehealth delivery of mental health services was especially important for underserved groups. Overall, the evidence suggests that the effectiveness of telehealth may improve as the technology and methods of delivery improve.

To prepare for the next pandemic mental health crisis, a Telehealth Corps could be developed, of mental health professionals who would be ready to serve in case of a sudden, pervasive need such as the one that has recently occurred. The next pandemic, like this one, will require social distancing that makes in-person psychotherapy difficult or impossible, so it is important to develop and improve telehealth services now so that they will be more effective. The Telehealth Corps could be staffed mainly by people who have mental health treatment skills that are currently underused, such as mental health professionals who have retired but still have the ability and desire to provide treatment when needed, or those who have stepped away temporarily due to family obligations and are ready to make their way back into professional service. Many talented and experienced clinicians will be aging out of the workforce in the years to come and could be recruited for the Telehealth Corps.

Conclusion: Turning Crisis Into Opportunity

Even now, as the COVID-19 pandemic has receded and people have largely returned to their previous patterns of education, work, and social life, the mental health effects of the pandemic continue, as this paper has shown. The evidence here should be a call to action to learn more about why the distress is continuing and to provide the mental health resources that people need in order to overcome it. Clearly, the crisis is not simply going away on its own.

The first step should be to *listen,* that is, to conduct research to interview people for their accounts of their current mental health distress, how the COVID-19 pandemic helped trigger it, and why it persists. This research should especially focus on persons ages 18 to 29, who were the most affected, but people of all ages should be included. Surveys like those presented here are helpful, but numbers alone are not enough. We need to hear the voices of the people affected, providing their own accounts of why the mental health effects of the pandemic have occurred and why they are continuing. That is the best way, and the overwhelmingly necessary way, to gain insights that will enable us to respond in ways that ameliorate the current crisis and make the next one less likely.

It is of vital importance to respond to the current crisis with evidence-based information that will lead to effective mental health policies and programs. If it is done well, the response to the crisis detailed here has the potential to provide a structure of mental health resources that could be the basis of long-term progress in access to mental health resources, to the benefit of Americans of all ages, now and in the future.

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