Racial and Ethnic Disparities in Mental Health and Mental Health Care During The COVID-19 Pandemic

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Abstract

During the pandemic, the overall mental health of the US population declined. Given higher rates of COVID-19 infections and deaths experienced by communities of color along with greater exposure to pandemic-related stressors (e.g., unemployment, food insecurity), we expect that the decline in mental health during the pandemic was more pronounced among Black, Hispanic, and Asian adults, with these groups also having less access to mental health services. We examine two nationally representative US surveys: the 2019 National Household Interview Survey (NHIS; $N = 30,368$) and the 2020–2021 Household Pulse Survey (HPS; $N = 1,677,238$). We find mental health of Black, Hispanic, and Asian respondents worsened relative to White respondents during the pandemic, with significant increases in depression and anxiety among racialized minorities compared to Whites. There is also evidence of especially high mental health burden for Black adults around the murder of George Floyd by police and for Asian adults around the murder of six Asian women in Atlanta. White respondents are most likely to receive professional mental health care before and during the pandemic, and Black, Hispanic, and Asian respondents demonstrate higher levels of unmet mental health care needs during the pandemic than White respondents. Our results indicate that within the current environment, White adults are at a large and systemic advantage buffering them from unexpected crises—like the COVID-19 pandemic. Without targeted interventions, the long-term social consequences of the pandemic and other co-occurring events (e.g., death of Black and Hispanic people by police) will likely include widening mental health disparities between racial/ethnic groups.

Keyword Racism; Race/ethnicity; Mental health; COVID-19 pandemic; Mental health care; Health disparities

Background

In 2020, approximately 375,000 people in the USA died from coronavirus disease 2019 (COVID-19) [1]. The COVID-19 pandemic caused significant disruptions in daily life and steep increases in stressors for much of the population [2]. Pandemic-related stressors have been linked to worse mental health during the pandemic [3, 4]. For example, one study found that adults in the early months of the pandemic were more than three times as likely to screen positive for depression and anxiety compared to in 2019 [5].

The dramatic growth in mental health concerns occurred alongside a decrease in socioeconomic resources (including health insurance coverage linked to employment) and the closure of many in-person mental health care services, meaning when mental health needs were at their greatest during the pandemic, there were also more barriers for accessing mental health professionals and care [6].

Previous studies indicate that the negative consequences of the pandemic have been most pronounced for racial/ethnic minoritized people. For example, Black and Hispanic populations experienced higher infection and death rates from COVID-19 as well as higher rates of losing employment, income, and childcare [1, 7–9], and Asian communities had an unprecedented level of job loss as well as an increase of hate crimes linked to racist narratives about the origins of COVID-19 [10, 11]. In addition to the negative impacts of the pandemic, people of color have been exposed to multiple potentially racially traumatic events in 2020 and 2021, including the murder of George Floyd

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by police and the murder of six Asian women in Atlanta, leading Laurencin and Walker [8] to argue that racial/ethnic minoritized groups have been experiencing a "pandemic on a pandemic." Thus, we expect that during the April 2020 to April 2021 period, people of color's mental health has seen greater harm compared to White populations, with this likely most pronounced during times of additional potentially traumatic events.

Yet, our expectation of worse mental health for racial/ethnic minoritized people is complicated due to previous research demonstrating that Black, Hispanic, and Asian adults typically have better mental health, specifically lower rates of anxiety and depression, compared to White adults—despite much higher rates of stressor exposure and fewer socioeconomic resources (i.e., the "mental health paradox" [12–14]). Goldmann and colleagues [15] found that the odds of anxiety symptoms and worse self-rated mental health were lower among Black respondents relative to the White respondents, despite them experiencing significantly more COVID-19-related stressors. However, these data were collected early in the pandemic, likely before the significant mental health effects could manifest, and may not capture the full well-being trajectory of racial disparities as the pandemic went on. Importantly, according to studies prior to the pandemic, White adults are the most likely to receive mental health care services and Asian adults the least likely [16]. Disparities in mental health care are generally wider than disparities in other areas of health care services [17], with this perhaps particularly impactful during the COVID-19 pandemic given the higher rates of stressors and the greater loss of resources experienced by Black, Hispanic, and Asian populations which may have created both additional mental health needs and additional mental health care barriers for these groups [2].

In this study, we draw attention to differences in the associations between race/ethnicity, mental health, and mental health care prior to (2019) and during (April 2020–April 2021) the COVID-19 pandemic. We analyze data from the 2019 National Health Interview Survey (NHIS) and the 2020–2021 Household Pulse Survey (HPS), two comparable nationally representative probability samples. In separate analyses, we estimate the associations between race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and Asian groups) and three mental health-related outcomes (having depression and/or anxiety, receiving mental health care, and having unmet mental health care needs) before and during the pandemic. We also specifically consider any differences in mental health disparities across racial/ethnic groups as possibly influenced by two events that occurred during the pandemic—the murder of George Floyd by police in May 2020 and the murder of six Asian women in Atlanta in March 2021.

Racial/Ethnic Differences in Mental Health and Mental Health Care

Over the last few decades, racial/ethnic differences in mental health outcomes have remained fairly consistent but also counterintuitive, representing what researchers termed the "mental health paradox" [8, 14]. Studies mostly conducted prior to the COVID-19 pandemic report that Black, Hispanic, and Asian adults tend to have significantly lower rates of psychiatric disorders, including depression and anxiety, relative to non-Hispanic White adults [see 14 for overview]. Researchers note the paradoxical nature of these findings given the stress-inducing disadvantages due to racism experienced by these groups [13, 18]. For example, Black and Hispanic adults report higher levels of perceived social stress and worse well-being compared to their White counterparts but still report lower rates of psychiatric disorders [14, 19].

Even taking into account different levels of mental health issues across racial/ethnic groups, existing evidence demonstrates glaring racial/ethnic disparities in mental health care use. One estimate found that rates of mental health care utilization among Black and Hispanic adults are less than half the rates of White adults and even lower among Asian Americans [17]. Barriers to mental health care for racial/ethnic minoritized groups include financial, geographic, cultural and linguistic obstacles [20]. Furthermore, racial/ethnic minoritized people are more likely to experience discrimination by mental health care professionals as evidenced by audit studies showing major difficulties among Black and Hispanic adults in even securing mental health appointments [21, 22]. Significant collateral mental health damage likely emerges because of these barriers, especially within the context of high levels of racism-related stressors. For example, Black and Hispanic adults are more likely to endure more severe and debilitating episodes of mental illness that go untreated for longer periods of time compared to White adults [23, 24].

Mental Health Disparities and Racialized Stressor Exposures During the COVID-19 Pandemic

Concerns surrounding mental health and mental health care disparities are especially pertinent during the COVID-19 pandemic, given its profound mental health impact at the population level [5] and the racial disparities in illness and death stemming from the pandemic [7]. As theorized by the stress process model [25], different levels of exposure to various stressors together with access to resources

(e.g., financial, social) create a process of stress that in turn has deleterious consequences on well-being. The pandemic itself brought with it many stressors and reduced people's resources, limiting availability of social support and inducing financial insecurity [2, 26]. Following from the stress process model, we expect that the greater levels of stressors would contribute to worse mental health generally, as already well-documented [3–5]. The stress process model is also useful for theorizing about mental health disparities and, to the extent that pandemic-related stressors and reduced resources are unevenly distributed in the population, the pandemic would impact not only mental health but also mental health inequity. Early in the COVID-19 pandemic, it was clear that the negative consequences of the pandemic were more strongly experienced by communities of color [7, 20]. This was especially seen around excess death rates, with preliminary evidence demonstrating that adjusted excess all-cause mortality early in the pandemic was 1.5 per 10,000 for White people, 2.7 for Asian people, 4.3 for Hispanic people, and 6.8 for Black people [27]. These heightened stressors and reduced resources were also seen in other areas; for example, one study found that Black and Hispanic people in particular had higher rates of unemployment, income loss, food insufficiency, and school closure than White people [2].

As a complement to the stress process model, the racism-related stressors framework draws attention to several types of stressors experienced by Black people and other people of color due to multiple levels of discrimination, both covert and overt, and the health costs of this racism [14, 28]. One key racism-related stressor is racial trauma, defined as reactions to dangerous events and racial discrimination experiences [29]. For example, police brutality against Black and Hispanic people has been identified as a possible source of racial trauma, harming the mental health of these groups [14]. A study by Bor and colleagues [30] found that when police kill unarmed Black people, there is a subsequent increase in the number of poor mental health days reported by Black adults. The pandemic was itself possibly a source of racial trauma, given the racialized differences in risk for negative outcomes, and the pandemic occurred within the context of increased racial discrimination and a cumulative series of other potentially traumatic events [20, 30–32]. Just 2.5 months after the World Health Organization declared COVID-19 a pandemic, George Floyd, a Black man, was violently killed in Minneapolis by a police officer. This led to a series of protests, but there was little meaningful government intervention and more Black men and women were killed by police in 2020–2021 [30].

Racialized stress exposures and racism within society during the pandemic also harm the well-being of other communities of color beyond Black communities. During the pandemic, Asian adults experienced high rates of discrimination and, in particular, a spike in hate crimes [10]. A Pew Research Survey in June 2020 found that four in ten US adults reported it was more common for people to express racist views towards Asian Americans since the pandemic began [31]. Supporting this, a study from December 2020–February 2021 found that racially/ethnically minoritized people reported high rates of COVID-19-related discrimination, with the highest rates among Asian American adults [32]. The authors concluded that the pandemic intensified preexisting prejudice and discrimination against communities of color in the USA. As a racialized stressful event with particular salience for Asian people, on March 16, 2021, a White man committed a series of mass shootings at three spas and massage parlors in Atlanta, killing eight people including six Asian women. Hispanic groups have also experienced heightened discrimination during the pandemic due to a political environment that stoked fear of "outsiders" [28, 32]. As previous research has indicated, both Hispanic and Asian people, regardless of their immigration status, are negatively impacted by anti-immigrant stigma [33], which was likely especially pronounced during the pandemic period [32].

Present Study

In this study, we first ask, how does the likelihood of experiencing depression and anxiety for White, Black, Hispanic, and Asian groups compare before and during the pandemic? Second, how do probabilities of seeing a mental health professional compare over time for these same groups, including probabilities of unmet mental health care needs (i.e., classified as having depression or anxiety but not seeing a mental health professional)? Third, focusing specifically on two possible sources of racial traumatic events during the pandemic—the killing of George Floyd by police (May 25, 2020) and the killing of six Asian women in Atlanta (March 23, 2021)—how do probabilities of depression and anxiety for White, Black, Hispanic, and Asian adults differ before, during, and after these events? Following research based on the mental health paradox [13], we consider all patterns first at baseline (net of age and gender) and then adjust for socioeconomic resources (e.g., household income, food insecurity).

Method

Our data are from the National Health Interview Survey (NHIS; https://www.cdc.gov/nchs/nhis/about_nhis.htm; $N = 30,368$) and the Household Pulse Survey (HPS; https://www.census.gov/data/experimental-data-products/household-pulse-survey.html; $N = 1,677,238$). These data are

publicly available and de-identified. We conducted separate analyses, first with data from the 2019 NHIS to provide a baseline and next with data from 28 time points between April 2020 and April 2021 from the HPS, and compared these analyses. Because April–July 2020 of the HPS did not ask about mental health care, this period was not included within our analysis of the second research question. Although there are several notable differences between the NHIS and HPS, discussed in more detail in our "15" section below, the surveys are comparable in terms of study design [34]. Both share a similar purpose—to monitor the health of the US adult population through collection and analysis of data on a broad range of health topics, including mental health, and both are administered by the US Census Bureau. The surveys also share similar methodology, repeated cross-sectional studies using a probability design with random selection relying on the Census' Master Address File, and question phrasing and ordering. We analyzed the two datasets separately and for both used weights created by the NHIS and HPS that allowed our estimates to match Census Bureau estimates of the US population by age, gender, race/ethnicity, and educational attainment. These weights also adjusted for nonresponse and different sampling probabilities.

Measures

Mental Health and Mental Health Care Our first outcome was whether the respondent was categorized as having depression or anxiety. Depressive symptoms were assessed using the Patient Health Questionnaire 2-item (PHQ-2) index which asked how often in the past seven days respondents experienced "having little interest or pleasure in doing things" and "feeling down, depressed, or hopeless." Response choices were not at all (0), several days (1), more than half the days (2), and nearly every day (3), and responses for the two items were added together such that the values range from 0 to 6. Anxiety was assessed using the Generalized Anxiety Disorder 2-item (GAD-2) index which asked respondents how often in the past seven days they experienced "feeling nervous, anxious, or on edge" and "not being able to stop or control worrying," with the same four response choices as the PHQ-2 and scores again ranging from 0 to 6. NHIS respondents were asked about the last 2 weeks, and HPS respondents were asked about the last 7 days. Given that the HPS wording covered a shorter time period, HPS responses are likely underestimates compared to the NHIS in prevalence of negative mental health outcomes [5]. Both measures were analyzed as dichotomous indicators, such that a score of three or greater was categorized as having depression or anxiety, consistent with previous studies [4, 5] and in line with research indicating that this cutoff on the PHQ-2 was associated with diagnosis of

major depressive disorder and on the GAD-2 generalized anxiety disorder [35].

To assess mental health care, respondents indicated whether they were seeing a mental health professional to receive counseling or therapy. In the NHIS, mental health professional visits were assessed by asking respondents, "Are you currently receiving counseling or therapy from a mental health professional such as psychiatrist, psychologist, psychiatric nurse, clinical social worker?" In the HPS, respondents were asked the same question, although specifically regarding whether they had received this care in the past 4 weeks. Respondents were coded as 0 if not receiving counseling or therapy, and 1 if they were receiving counseling or therapy. This question was added in August 2020 in the HPS, so the HPS sample for this analysis only included August 2020–April 2021 ($N = 926,182$). For our proxy measure for unmet mental health care needs, we included only the subsample of respondents in the NHIS and HPS (August 2020–April 2021) with depression/anxiety ($N = 3,305$ NHIS and 326,013 HPS) and reverse coded the above variable as to evaluate whether those with depression/anxiety were receiving mental health care.

Race/Ethnicity For race/ethnicity, respondents selected all that applied from 15 racial identity options. Respondents were also asked if they were of Hispanic, Latino, or Spanish origin. Based on these responses, we created four categories for race/ethnicity: (non-Hispanic) White, (non-Hispanic) Black, Hispanic, or Asian. Respondents who identified as another racial group (e.g., Native American) or multiracial ($n = 79,180$) were dropped from the analysis due to issues with how this question was asked within the HPS, significant heterogeneity within this category, and statistical power issues across time periods. We also excluded respondents who were missing on race/ethnicity (NHIS: $n = 845$; HPS: $n = 6,204$).

Time Periods To compare mental health patterns during the pandemic, we constructed six time periods using the HPS data, with each covering approximately 2 months: T1 April 23–June 2 (April–May 2020), T2 June 4–July 21 (June–July 2020), T3 August 19–September 28 (August–September 2020), T4 September 30–November 23 (October–November 2020), T5 November 25–February 1 (December 2020–January 2021), and T6 February 3–April 26 (February–April 2021). These time periods roughly matched distinct COVID-19 infection waves within the USA, with T1 representing the initial transition into the pandemic, T2 and T5 representing periods of high infection rates, T4 a period of moderate infection rates, and T3 and T6 periods of relatively lower infection rates [36].

Other Covariates All models adjusted for gender and respondent's age. For gender, respondents were asked whether they were male or female. We refer to males as men and females as women throughout this study. Age was a continuous variable from 18 to 89 years (top coded at 89). After estimating baseline models, we also adjusted for socioeconomic resources. For educational attainment, respondents reported the highest degree or level of school they completed, and we coded these responses as four categories: "less than high school," "high school" (including GED), "some college," and "college degree" (including graduate and professional degrees). For household income, respondents were asked, "[In the previous year], what was your total household income before taxes?" and chose from eight categories. For our analysis, we collapsed these into four categories: "less than $35,000" "between $35,000 and $74,999," "between $75,000 and $149,000," and "more than $149,000." For housing, we constructed three categories: rent home, own home (includes mortgage), and other arrangement. For food insecurity, questions were phrased differently in the NHIS and the HPS, and we followed conventions from previous research [2]. In the NHIS, respondents were asked if in the past 30 days, "The food that we bought just didn't last, and we didn't have money to get more." If respondents said yes, we coded them as being food insecure. In the HPS, respondents were asked if in the past 7 days they had enough to eat. If they responded that they sometimes or often did not have enough to eat, we coded them as food insecure. For all covariates, we used the imputations provided by NHIS and the HPS for age, gender, number of children and adults in household, and educational attainment.

Analytic Strategy

Analyses were conducted using Stata/SE 16.1. We first calculated descriptive statistics for all variables in both datasets: NHIS (2019; before the pandemic) and HPS (April 2020-April 2021; during the pandemic) and by race/ethnicity. We compared the means and proportions using t-tests and chi-square tests, depending on the outcome. For our first research question, we used logistic regression models to estimate how race/ethnicity was associated with the odds of being categorized as having depression and/or anxiety and seeing a mental health professional in 2019 using the NHIS data, and then conducted the same analysis using the six pandemic time periods from the HPS data. The HPS models included the interaction terms (i.e., product terms) between each racial/ethnic category and the time periods. We then used the estimates from the NHIS and HPS models to generate predicted probabilities to demonstrate the association between race/ethnicity and each time period [37]. Due to concerns about the large sample sizes and our use of

multiple comparisons, for all analyses we conducted supplementary analysis using a Bonferroni correction for multiple testing, which provided the same conclusions (not shown). As a supplementary analysis specifically for the depression/anxiety outcome and to adjust for temporal changes in mental health during 2019, we matched quarterly time periods within the NHIS to the HPS and found similar results in terms of changing patterns of mental health disparities before and during the pandemic outcome—especially for White, Black, and Hispanic groups (see Supplemental Figure A for predicted probabilities). To evaluate unmet mental health care needs, we estimated the odds of not seeing a mental health professional using only the subsample of respondents categorized as having depression and/or anxiety. Finally, to evaluate anxiety/depression disparities around two key events—the killing of George Floyd by police on May 25, 2020, and the murder of six Asian women in Atlanta on March 23, 2021—we only included HPS data from the three time periods closest to these events (one before, one during or immediately after, and one in later weeks), including interaction terms between racial/ethnic categories and the three time periods. As above, we generated predicted probabilities and pairwise comparisons to compare differences across times. For all models, we first adjusted for gender and age, and then add covariates for socioeconomic resources, and all analyses were adjusted using sampling weights provided by NHIS and HPS.

Results

Descriptive Statistics

In 2019, 10.74% of respondents were categorized as having depression/anxiety and 5.76% reported receiving professional mental health care (i.e., seeing mental health professional). In April 2020–April 2021, 39.25% of respondents were categorized as having depression/anxiety and 9.74% were receiving professional mental health care. Notably, among all the respondents categorized as having depression and/or anxiety, 11.62% met criteria only for depression, 36.36% only for anxiety, and 52.02% for both depression and anxiety. Among those with depression/anxiety, 79.37% of those in the 2019 data were not receiving mental health care (i.e., had unmet mental health care needs) compared to 83.35% in 2020–2021. Descriptive statistics presented in Table 1 compare covariates by race/ethnicity in 2019 to 2020–2021. In 2019, the percentage of White and Black respondents categorized as having depression/anxiety was similar (about 11%; $p = 0.290$), whereas a smaller percentage of Hispanic (9.43%) and Asian (5.11%) respondents compared to White respondents were categorized as having these mental health issues ($p < 0.01$ and $p < 0.001$, respectively).

Table 1 Percentages and means (with standard deviations) for key variables from analytic sample (National Health Interview Study, 2019, $N=30,368$; Household Pulse Survey, April 2020–April 2021; $N=1,677,238$)

	2019 (NHIS)				2020–2021 (HPS)			
	White	Black	Hispanic	Asian	White	Black	Hispanic	Asian
Percentage of sample	64.91	12.07	16.98	6.04	63.60	12.49	17.86	6.04
Depression or anxiety	11.58	10.80	9.43[A]	5.11[A]	37.97[B]	41.69[AB]	44.23[AB]	34.31[AB]
Receiving mental health care[X]	6.52	5.63	3.91[A]	2.44[A]	10.14[B]	9.29[AB]	8.87[AB]	6.46[AB]
Not receiving mental health care when have depression or anxiety[+]	79.52	75.47	80.36	84.03	82.09	84.98[AB]	86.18[AB]	87.67[A]
Woman	50.92	54.79[A]	51.59	52.11	51.38	56.00[A]	49.96[A]	49.13[A]
Age (years)	50.10 (0.16)	45.39[A] (0.40)	41.99[A] (0.32)	45.16[A] (0.54)	50.16 (0.04)	46.62[AB] (0.10)	42.63[AB] (0.10)	44.64[A] (0.15)
Education								
Less than high school	7.81	12.30[A]	30.46[A]	8.61	4.39[B]	9.14[AB]	20.27[AB]	10.46[A]
High school	27.05	33.01[A]	28.54	15.46[A]	30.43[B]	34.17[A]	33.12[AB]	15.94[A]
Some college	32.64	34.41	25.91[A]	21.65[A]	30.90[B]	33.14[A]	29.12[AB]	22.58[A]
College degree	32.50	20.29[A]	15.10[A]	54.28[A]	34.28[B]	23.55[AB]	17.48[AB]	51.02[AB]
Household income in previous year								
Less than $35 K	20.28	39.03[A]	33.35[A]	21.65	21.33[B]	42.68[AB]	38.77[AB]	21.21
Between $35 K–$74 K	30.24	33.08[A]	37.31[A]	24.65[A]	30.43	31.69[A]	34.01[AB]	26.10[A]
Between $75 K–$149 K	14.40	11.26[A]	11.83[A]	12.80	31.82[B]	19.07[AB]	20.19[AB]	28.84[AB]
More than $149 K	35.08	16.64[A]	17.51[A]	40.90[A]	16.42[AB]	6.56[AB]	7.03[AB]	23.85[AB]
Housing								
Rent	23.45	53.10[A]	46.03[A]	34.41[A]	23.05	47.94[AB]	41.76[AB]	28.96[AB]
Owns house	74.41	45.21[A]	51.33[A]	62.49[A]	75.53[B]	49.50[AB]	55.99[AB]	69.33[AB]
Other arrangement	2.15	1.68	2.64	3.10	1.42[B]	2.56[B]	2.25	1.71[AB]
Food insecure	6.88	19.47[A]	15.44[A]	5.33	7.76[B]	20.22[A]	18.15[AB]	7.61[B]

Weighted using sample weights; [X]$N=30,368$ (NHIS) and 926,182 (HPS); [+]$N=3,305$ (NHIS) and 360,976 (HPS); [A]statistically different ($p<0.05$) from White respondents within same year; [B]statistically different ($p<0.05$) from 2019 race/ethnicity counterpart

The percentage of respondents with depression/anxiety was larger for all groups in 2020–2021 compared to 2019 ($p<0.001$), and there were significant shifts in how racial/ethnic groups compared to each other. In 2020–2021, a larger percentage of Black (41.69%) and Hispanic (44.23%) respondents were categorized as having depression/anxiety compared to White respondents (37.97%; $p<0.001$ for comparisons to Black and Hispanic respondents), with a smaller percentage of Asian respondents having depression/anxiety (34.31%) compared to White respondents ($p<0.001$). The percentage of respondents receiving mental health care was also higher in 2020–2021 compared to 2019 for all groups ($p<0.001$), as was the proportion of White, Black, and Hispanic (but not Asian) respondents with unmet mental health care needs ($p<0.05$, $p<0.001$, and $p<0.05$, respectively). A larger percentage of White adults received mental health care compared to Hispanic and Asian respondents in both time periods, but the difference between White and Black respondents in percentage receiving mental health care was only statistically significant in 2020–2021 ($p<0.001$). Notably, the percentage of respondents with unmet mental health care needs were statistically similar between racial/ethnic groups in 2019, but in 2020–2021, more Black, Hispanic, and Asian respondents had unmet care needs (84.98%, 86.18%, and 87.67%, respectively) compared to White respondents (82.09%); $p<0.001$), with Asian respondents having the most unmet care needs.

Racial/Ethnic Disparities in Depression and Anxiety

Next, we used logistic regression to estimate mental health outcomes, receipt of mental health care, and unmet mental health care needs across racial/ethnic groups first in 2019 using the NHIS data and then in 2020–2021 using the HPS

data. We used baseline regression results adjusting for gender and age, presented in Supplemental Table A (Models 1a and 1b), to calculate predicted probabilities with pairwise comparisons—shown in Table 2 (for NHIS 2019 and HPS T1, T3, and T5) and Fig. 1. In 2019, White respondents had 0.11 probability of depression/anxiety, and the probabilities of being categorized as having depression/anxiety were statistically similar for Black respondents (0.10) but lower for Hispanic (0.09) and Asian respondents (0.05). During the early pandemic months (T1: April–May 2020), the probabilities of having depression/anxiety were significantly higher across all racial/ethnic groups compared the 2019, with the steepest positive difference for Black, Hispanic, and Asian respondents relative to White respondents. Comparing 2019 to April–May 2020, probabilities of depression/anxiety were 218% larger for White respondents, 280% larger for Black respondents, 344% larger for Hispanic respondents, and 560% larger for Asian respondents. Pairwise comparisons showed this led to a narrowing of the mental health gap for Asian compared to White respondents (-0.07 in 2019 to -0.02 in April–May 2020) so that these two groups' mental health were no longer statistically different. Also during this period, a crossover in probabilities occurred for Black and Hispanic respondents compared to White respondents, as illustrated in Fig. 1. Specifically, by April–May 2020, Black and Hispanic respondents had higher probabilities of depression/anxiety compared to White respondents. The mental health disadvantage for Hispanic respondents compared to White respondents continued through the end of the study period (T6: February–April 2021) but there was more variation across time periods for Black and Asian respondents compared to White respondents.

Supplemental Table B (Model 1b) presents results from the regression models adjusting for socioeconomic resources and, again for ease of interpretation, predicted probabilities of models are presented in Table 3. Notably, once accounting for socioeconomic resources, Black respondents exhibited lower probabilities of depression/anxiety at all time periods during the pandemic compared to White respondents, with the gap during the pandemic months comparable to the gap in 2019. Hispanic and Asian respondents, however, had statistically similar probabilities of depression/anxiety compared to White respondents in April–May 2020 despite having lower probabilities of these mental health issues than White respondents in 2019. However, by the end of the study period, Hispanic and Asian respondents once again exhibited a lower probability of depression/anxiety than White respondents, a similar gap as seen before the pandemic.

Racial/Ethnic Disparities in Mental Health Care

Our next set of analyses focused on addressing the patterning of mental health care between racia/ethnicl groups before and during the pandemic. We assessed baseline patterns of seeing a mental health professional, with predicted probabilities presented in Table 2, row 2. In 2019, Black, Hispanic, and Asian adults reported lower probabilities of receiving mental health care compared to White respondents. Although there were slightly larger probabilities of seeing a mental health professional in 2020–2021 compared to 2019 among all groups, this difference was much smaller relative to the difference in depression/anxiety discussed above. White respondents' greater probabilities of seeing a mental health professional persisted throughout the study period at similar levels as seen in 2019, compared to other racial/ethnic groups.

Comparing probabilities of not receiving mental health care among the subsample of respondents with depression/anxiety, which we interpret as a proxy for unmet mental health care needs, all racial/ethnic groups had statistically similar probabilities of unmet mental health care needs in 2019, between 0.75 and 0.84. These probabilities were larger for all groups during the pandemic period, with this positive difference again steeper for Black, Hispanic, and Asian adults relative to White adults. Consequently, although there was no statistically significant differences in unmet mental health care needs in 2019, there were statistically significant differences in the pandemic months such that Black, Hispanic, and Asian respondents had a significantly higher probability of unmet mental health care needs during the pandemic compared to White adults. For example, in August–October 2020, these probabilities of unmet mental health care needs were 0.83 for White adults, 0.86 for Black adults, 0.88 for Hispanic adults, and 0.91 for Asian adults. Figure 2 shows the differences in probabilities of unmet mental health care needs across the study period by race/ethnicity, illustrating the observed widening of differences. As shown in Table 3 (and Supplemental Table B), even after adjusting for socioeconomic resources, the greater probability for unmet mental health care needs for Black, Hispanic, and Asian respondents relative to White respondents remained statistically significant during the pandemic.

### Mental Health Surrounding Shared Racial Traumatic Events During the Pandemic

Finally, to examine the potential mental health consequences of a "pandemic on a pandemic" [8], we assess how patterns of depression/anxiety differed for specific racial/ethnic groups in the time surrounding two events—the killing of George Floyd by police on May 25, 2020, and the murder of six Asian women in Atlanta on March 23, 2021. Regression results with interaction terms between race/ethnicity and the focal time periods (including before, during/immediately after, and after the event) are shown with predicted probabilities in Fig. 3, based on coefficients estimated

Table 2 Predicted probabilities of mental health and mental health care by time period (confidence intervals in parentheses; National Health Interview Study, 2019; Household Pulse Survey)

Pr(Depression and/or Anxiety)

	2019 (NHIS) Pr(Depression and/or Anxiety[x])	Pairwise comparison: ___ v. White	April–May 2020 (T1) Pr(Depression and/or Anxiety)	Pairwise comparison: ___ v. White	August–September 2020 (T3) Pr(Depression and/or Anxiety)	Pairwise comparison: ___ v. White	December 2020–January 2021 (T5) Pr(Depression and/or Anxiety)	Pairwise comparison: ___ v. White
White	0.11 (0.11; 0.12)		0.35 (0.35; 0.36)		0.36 (0.36; 0.36)		0.41 (0.41; 0.42)	
Black	0.10 (0.09; 0.12)	−0.01 (−0.03; 0.00)	0.38 (0.37; 0.40)	0.03 (0.01; 0.04)	0.36 (0.35; 0.38)	0.00 (−0.01; 0.02)	0.43 (0.42; 0.45)	0.02 (0.00; 0.03)
Hispanic	0.09 (0.08; 0.10)	−0.02 (−0.04; −0.01)	0.40 (0.38; 0.41)	0.04 (0.03; 0.06)	0.39 (0.38; 0.40)	0.03 (0.02; 0.04)	0.43 (0.42; 0.45)	0.02 (0.01; 0.03)
Asian	0.05 (0.04; 0.06)	−0.07 (−0.08; −0.05)	0.33 (0.31; 0.36)	−0.02 (−0.05; 0.00)	0.29 (0.27; 0.30)	−0.07 (−0.09; −0.05)	0.33 (0.31; 0.35)	−0.08 (−0.10; −0.06)

Pr(Mental Health Care[+])

	2019 (NHIS)	Pairwise comparison: ___ v. White	April–May 2020 (T1)	Pairwise comparison: ___ v. White	August–September 2020 (T3)	Pairwise comparison: ___ v. White	December 2020–January 2021 (T5)	Pairwise comparison: ___ v. White
White	0.06 (0.06; 0.07)				0.09 (0.09; 0.09)		0.10 (0.10; 0.10)	
Black	0.04 (0.03; 0.05)	−0.02 (−0.03; −0.01)			0.07 (0.06; 0.08)	−0.02 (−0.03; −0.01)	0.08 (0.07; 0.09)	−0.02 (−0.03; −0.01)
Hispanic	0.03 (0.03; 0.04)	−0.03 (−0.04; −0.03)			0.06 (0.06; 0.07)	−0.03 (−0.03; −0.02)	0.07 (0.06; 0.08)	−0.03 (−0.04; −0.02)
Asian	0.02 (0.01; 0.03)	−0.04 (−0.06; −0.04)			0.05 (0.04; 0.05)	−0.05 (−0.05; −0.04)	0.06 (0.05; 0.06)	−0.05 (−0.05; −0.04)

Pr(Not receiving mental health care when have depression or anxiety*)

	2019 (NHIS)	Pairwise comparison: ___ v. White	April–May 2020 (T1)	Pairwise comparison: ___ v. White	August–September 2020 (T3)	Pairwise comparison: ___ v. White	December 2020–January 2021 (T5)	Pairwise comparison: ___ v. White
White	0.80 (0.78; 0.81)				0.83 (0.78; 0.82)		0.83 (0.82; 0.83)	
Black	0.75 (0.70; 0.81)	−0.05 (−0.10; 0.02)			0.86 (0.85; 0.88)	0.03 (0.02; 0.05)	0.86 (0.85; 0.88)	0.04 (0.02; 0.05)
Hispanic	0.81 (0.76; 0.85)	0.01 (−0.04; 0.06)			0.88 (0.87; 0.89)	0.05 (0.04; 0.06)	0.88 (0.87; 0.89)	0.05 (0.04; 0.07)
Asian	0.84 (0.75; 0.93)	0.04 (−0.05; 0.13)			0.91 (0.89; 0.92)	0.08 (0.06; 0.10)	0.87 (0.85; 0.90)	0.05 (0.03; 0.07)

[x] $N=30,368$ (NHIS) and 1,677,238 (HPS; April 2020–April 2021) for depression/anxiety and mental health care; [+] 30,368 (NHIS) and 926,182 (HPS; August 2020–April 2021) for mental health care; *$N=3,305$ (NHIS) and 360,976 (HPS; August 2020–April 2021) for not receiving mental health care when have depression or anxiety; weighted using sample weights. Post-estimation values were calculated using parameter estimates from logistic regression models shown in Models 1, 2, and 3 in Supplemental Table B, adjusting for gender and age and holding covariates at their means
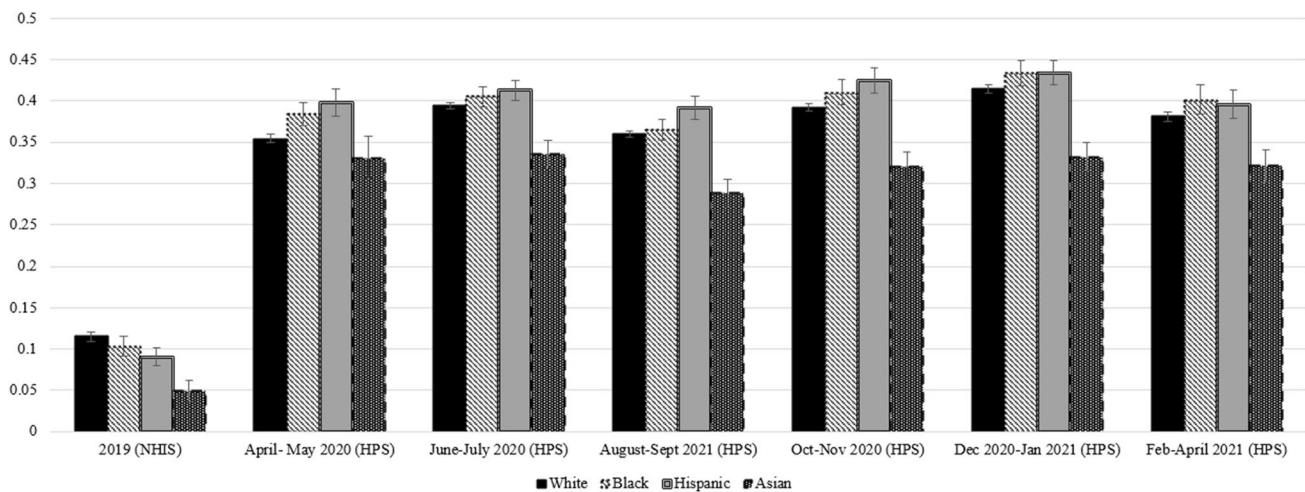
Fig. 1 Predicted probability of depression or anxiety with confidence intervals; National Health Interview Survey, 2019; Household Pulse Survey, April 2020–April 2021; $N = 1,707,606$. Weighted using sample weights. Post-estimation values were calculated using parameter estimates from logistic regression Model 1a in Supplemental Table A. Adjusted for gender and age with covariates held at their means

from regression models (see Supplemental Table C, Model 1× and Supplemental Table D, Model 2x). On the left of Fig. 3, we consider three time periods in 2020: May 14–19, May 28–June 2 (which immediately follows the death of George Floyd on May 25), and June 4–9. The predicted probabilities show that Black respondents were the only group to experience a larger probability of depression/anxiety in the May 28–June 2 time period (around the time of the murder of George Floyd) compared to the later period (June 4–9), with the pairwise comparison for these two periods statistically significant (-0.05, $p < 0.05$). For White, Hispanic, and Asian groups, there was no difference in mental health across these three periods. There was also not a statistically significant difference between the May 14–19 period (before the murder of George Floyd) and the May 28–June 2 time period, although the trend in these coefficients did suggest the possibility of higher rates of depression/anxiety immediately following George Floyd's murder compared to before his murder.

Second, the right panel in Fig. 3 shows the predicted probabilities for March 3–15, March 17–29 (which includes the date of the Atlanta spa murders), and April 14–26, 2021. Results indicated that for Asian respondents, the predicted probability of depression/anxiety was greater in the March 17–29 period compared to both before and after that period, suggesting worse mental health for this group around the date of the Atlanta spa murders. This pattern is not seen for White, Black, or Hispanic respondents.

Discussion

The COVID-19 pandemic resulted in unexpected and dramatic changes in daily life and demands for most of the US population with profound negative impacts on mental health [3–5]. This study assessed how the pandemic's mental health impact was unevenly experienced across racial/ethnic groups. Notably, we build on a framework of understanding the uneven mental health consequences of a "pandemic on a pandemic" that we observe as a result of systemic racism alongside other events as possible sources of shared racial trauma [2, 7, 9, 10, 30].

Our first set of findings points to how Black, Hispanic, and Asian adults experienced a greater difference in their mental health between 2019 and 2020 relative to White respondents. Specifically, Black, Hispanic, and Asian adults exhibited much worse mental health during the pandemic compared to before the pandemic. Our analysis also provides evidence that the relative mental health advantage experienced by non-White groups prior to the pandemic reversed during the pandemic. Findings from the 2019 NHIS data demonstrate that similar or even fewer mental health issues were present among Black, Hispanic, and Asian groups relative to White groups, a finding which matches previous studies [12–14]. However, our HPS findings—covering the period between April 2020 and April 2021—are more

Table 3 Predicted probabilities of mental health and mental health care by time period, adjusting for socioeconomic resources (confidence intervals in parentheses; National Health Interview Study, 2019; Household Pulse Survey)

	2019 (T0)		April–May 2020 (T1)		August–September 2020 (T3)		December 2020–January 2021 (T5)	
	Pr(Depression and/or Anxiety)ˣ	Pairwise comparison: ___ v. White	Pr(Depression and/or Anxiety)	Pairwise comparison: ___ v. White	Pr(Depression and/or Anxiety)	Pairwise comparison: ___ v. White	Pr(Depression and/or Anxiety)	Pairwise comparison: ___ v. White
White	0.12 (0.11; 0.12)		0.36 (0.36; 0.37)		0.37 (0.37; 0.38)		0.43 (0.43; 0.44)	
Black	0.07 (0.06; 0.08)	−0.05 (−0.06; −0.04)	0.32 (0.31; 0.34)	−0.04 (−0.06; −0.03)	0.32 (0.31; 0.33)	−0.05 (−0.06; −0.04)	0.38 (0.37; 0.40)	−0.05 (−0.06; −0.03)
Hispanic	0.06 (0.05; 0.07)	−0.06 (−0.07; −0.05)	0.36 (0.34; 0.37)	0.00 (−0.02; 0.01)	0.36 (0.35; 37)	−0.01 (−0.03; 0.00)	0.39 (0.37; 0.41)	−0.04 (−0.05; −0.02)
Asian	0.05 (0.04; 0.06)	−0.07 (−0.09; −0.05)	0.34 (0.32; 0.37)	−0.02 (−0.04; 0.00)	0.31 (0.29; 0.33)	−0.06 (−0.08; −0.05)	0.36 (0.34; 0.37)	−0.07 (−0.08; −0.05)
	Pr(Mental Health Care+)	Pairwise comparison: ___ v. White	Pr(Mental Health Care)	Pairwise comparison: ___ v. White	Pr(Mental Health Care)	Pairwise comparison: ___ v. White	Pr(Mental Health Care)	Pairwise comparison: ___ v. White
White	0.06 (0.05; 0.06)				0.09 (0.08; 0.09)		0.10 (0.09; 0.10)	
Black	0.04 (0.03; 0.05)	−0.02 (−0.03; −0.01)			0.07 (0.06; 0.07)	−0.02 (−0.03; −0.02)	0.07 (0.07; 0.08)	−0.03 (−0.03; −0.02)
Hispanic	0.03 (0.02; 0.03)	−0.03 (−0.04; −0.03)			0.06 (0.06; 0.07)	−0.03 (−0.03; −0.02)	0.07 (0.06; 0.07)	−0.03(−0.04; −0.02)
Asian	0.02 (0.01; 0.02)	−0.05 (−0.05; −0.04)			0.04 (0.04; 0.05)	−0.05 (−0.06; −0.04)	0.05 (0.04; 0.06)	−0.05 (−0.06; −0.04)
	Pr(Not receiving mental health care when have depression or anxiety+)	Pairwise comparison: ___ v. White	Pr(Not receiving mental health care when have depression or anxiety)	Pairwise comparison: ___ v. White	Pr(Not receiving mental health care when have depression or anxiety)	Pairwise comparison: ___ v. White	Pr(Not receiving mental health care when have depression or anxiety)	Pairwise comparison: ___ v. White
White	0.80 (0.78; 0.82)				0.83 (0.83; 0.84)		0.83 (0.83; 0.84)	
Black	0.77 (0.71; 0.82)	−0.03 (−0.09; 0.03)			0.86 (0.85; 0.88)	0.03 (0.02; 0.05)	0.87 (0.85; 0.88)	0.04 (0.02; 0.05)
Hispanic	0.81 (0.77; 0.86)	0.01 (−0.04; 0.07)			0.87 (0.86; 0.89)	0.04 (0.03; 0.06)	0.88 (0.86; 0.89)	0.05 (0.03; 0.06)
Asian	0.86 (0.78; 0.94)	0.06 (−0.02; 0.14)			0.92 (0.90; 0.93)	0.09 (0.07; 0.10)	0.89 (0.87; 0.91)	0.06 (0.03; 0.08)

ˣN=30,368 (NHIS) and 1,677,238 (HPS; April 2020–April 2021) for depression/anxiety and mental health care; +30,368 (NHIS) and 926,182 (HPS; August 2020–April 2021) for mental health care; *N=3,305 (NHIS) and 360,976 (NHIS) for not receiving mental health care when have depression or anxiety; weighted using sample weights. Post-estimation values were calculated using parameter estimates from logistic regression models shown in Models 1, 2, and 3 in Supplemental Table C. Adjusted for gender, age, and socioeconomic resources, holding covariates at their means
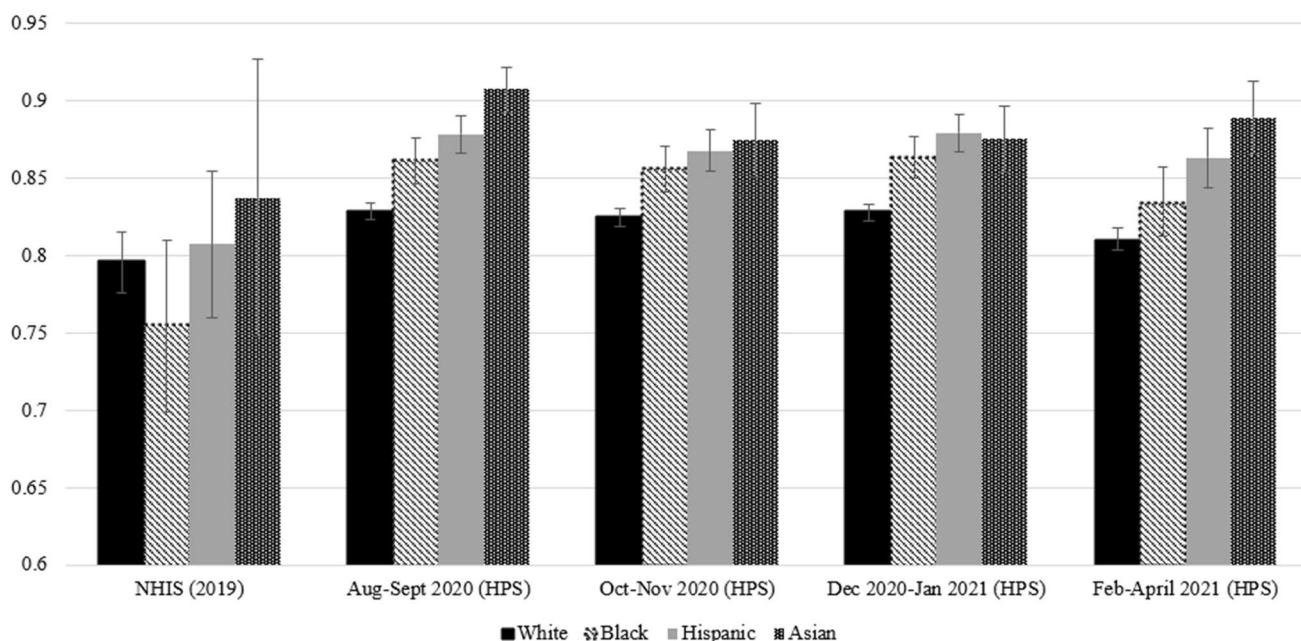
Fig. 2 Predicted probability of not receiving mental health care when categorized as having depression or anxiety with confidence intervals; National Health Interview Survey, 2019; Household Pulse Survey, August 2020–April 2021; $N = 364,281$. Weighted using sample weights. Post-estimation values were calculated using parameter estimates from logistic regression Model 3a in Supplemental Table A. Adjusted for gender and age with covariates held at their means
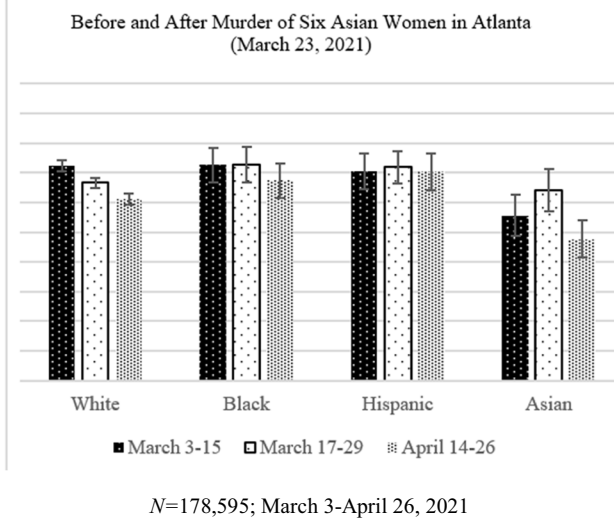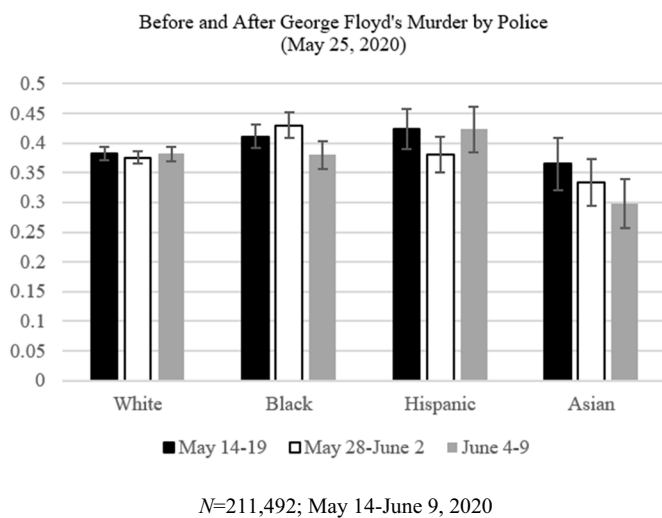
Fig. 3 Predicted probability of depression or anxiety with confidence intervals; Household Pulse Survey. Weighted using sample weights. Post-estimation values were calculated using parameter estimates from logistic regression Models 1× and 2× in Supplemental Tables D and E, adjusting for gender and age and holding covariates at their means

unusual, indicating a potential and meaningful shift in a long-observed epidemiological pattern. We suggest that our HPS analysis provides preliminary evidence that the "mental health paradox" was not present during the pandemic months, perhaps indicating that the pandemic contributed overwhelmingly to multiple types of racism-related disadvantages with negative mental health consequences for racial/ethnic minoritized people [2, 7, 20]. Moreover, our study findings depart from a recent study [15] which showed no mental health disparities during the early months of the pandemic. Instead, our use of a longer timeframe and a pre-pandemic time point, as well as a larger and more geographically representative sample of the USA, allowed for

a more extensive analysis of the patterning of racial/ethnic disparities.

We also show that Hispanic respondents' mental health was the most consistently harmed during the pandemic, with their disadvantage relative to White respondents in particular remaining throughout the study period and being demonstrably higher for most of the pandemic period compared to the mental health disadvantage of other respondents. During 2020–2021, Hispanic people in the USA faced high levels of deportation and family separation within their communities; continued discrimination from police, health care workers, educational organizations, and employers; political rhetoric that painted them as dangerous outsiders; and heightened risk of infection of death from COVID-19 with few protective resources [7, 9, 32]. Our study suggests that this translated into increased mental health issues for this group, and future research should continue to track this disparity and whether it lessens or widens moving forward.

Importantly, these shifts in disparities were not experienced equally across racial/ethnic minoritized groups, but showed variation in timing and size as connected to key events that may have served as sources of potential shared racial trauma. Around the time of the murder of George Floyd, Black respondents experienced a higher level of depression/anxiety compared to a later time period, and Asian respondents had a similar higher level around the time of the murder of six Asian women in Atlanta compared to the earlier and later period. Although the pandemic was characterized as a time of extremely heightened stressors for racial/ethnic minoritized people, concurrent events that further threatened well-being such as spikes in racist hate crimes and the continued killing of Black and Hispanic people by police [30, 38] contributed to a "pandemic on a pandemic" [8]. Perhaps surprisingly, the more significant shift in mental health issues is seen when comparing the findings during the event in question to the period after the event, not before. For example, the rate of depression/anxiety among Asian respondents was 15% higher during the period around the Atlanta spa murders compared to the prior period, but about 35% higher than the period after. Although understanding this more pronounced difference is beyond the scope of our available data, we encourage future research to unpack various strategies communities of color might use in the aftermath of shared racial traumatic events which may potentially lead to mental health resilience.

Our second major finding—that White respondents continued to have much higher rates of receiving professional mental health care during both periods than Black, Hispanic, and Asian groups even among the subsample with depression or anxiety and after adjusting for socioeconomic resources—suggests that the greater mental health burden for racial/ethnic minoritized groups may continue for some time as it is largely going untreated. Public health experts have already called attention to the current mental health crisis during the pandemic without a corresponding increase in mental health care [6]. Our analysis indicates that racial/ethnic minoritized respondents with depression or anxiety have less access to mental health care than White respondents during the pandemic, with this unmet health care disparity larger than in 2019. We suggest similar mechanisms operated during the pandemic as in 2019 to produce this inequity; for example, White respondents have more income to pay for mental health care and are more likely to have insurance that covers mental health care, more flexible jobs to allow time for mental health care visits, and face less discrimination from mental health care professionals [16, 20, 21].

The pandemic introduced additional factors that likely contributed to this unmet mental health care disparity for Black, Hispanic, and Asian adults, both in limiting access to mental health care professionals and in removing other forms of coping that may have substituted for mental health care prior to the pandemic. Racial/ethnic minoritized adults experienced much higher rates of employment and income loss than White adults as well as higher rates of childcare loss during the pandemic [2], likely limiting their ability to afford mental health care and to find time to see a mental health professional. Sources of informal support were likely also limited during the pandemic, as previous research suggests that Black adults in particular may rely on religious and spiritual resources and familial support as ways of coping with stressors [18, 39]. Yet in the early months of the pandemic, almost all religious organizations closed their doors, limiting engagement with their congregation to virtual services and visits. DeSouza and colleagues [40] argue that, given that Black churches have historically served an important role in the mental health of Black communities coping with experiences of racism and racialized stress exposure, the closure of these spaces almost certainly harmed the psychological well-being of this group. Similarly, contact with extended family members and fictive kin—specifically those living outside of one's household—was also limited during the pandemic [26], and preliminary evidence suggests that Black, Hispanic, and Asian families took these social distancing precautions more seriously than White families [41], reducing their COVID-19 infection risk but also possibly limiting their coping resources. Importantly, there are also many coping mechanisms that may have substituted for mental health care that have negative health implications, such as increased use of alcohol and opioids, and, although previous research research indicates this has been on the rise during the pandemic [42], we do not know much about racial/ethnic disparities regarding these harmful coping mechanisms during the pandemic.

As socioeconomic resources could act as a potential mechanism, our analyses demonstrated how the results

varied after adjusting for differences in socioeconomic status and resources. The findings suggest a reduced difference between racial/ethnic groups in depression/anxiety and indicate the role of socioeconomic resources as a suppressor that intensified the mental health disadvantage of White adults prior to the pandemic and reduced their mental health advantage during the pandemic. This finding parallels prior research on the mental health paradox [13] and indicates that socioeconomic resources are not the primary mechanism explaining the mental health disadvantage of racial/ethnic minoritized respondents during the pandemic. Considering the significance of these socioeconomic variables alongside our racial/ethnic identity measures is important for understanding mental health and mental health care disparities given that the "costs" of being minoritized by society are often tied up with economic disadvantages [38, 43]. Importantly, socioeconomic resources do not explain racial/ethnic differences in unmet mental health care needs. Thus, although we are not able to directly test the role of other proposed mechanisms within and across racial/ethnic minoritized groups given data limitations, we call for future studies to investigate not only the processes that account for the sharp increase in mental health challenges and unmet care disparities but also how these may have potentially changed across the pandemic months.

Limitations

Although the findings described here further our knowledge of racial/ethnic differences in mental health during the pandemic, we note limitations to the present study. Despite the large and rich datasets used in our analysis, several variables were unavailable in the HPS and NHIS that would have been useful in interpreting our results, specifically in considering mechanisms to help understand White respondents' mental health advantage during the pandemic as discussed above. Perhaps most importantly, within-person longitudinal analysis is needed to investigate changes in mental health or mental health care across time points. Longitudinal analysis would also help to identify how shifts in stressors and resources across the study period (e.g., changes in childcare availability, changes in housing, changes in contact with family members) matter for mental health outcomes. As an additional important mechanism, these datasets do not include measures of discrimination; yet, given survey research showing an increase in experiences of discrimination for communities of color during the pandemic [31, 32], discrimination measures would contribute to our understanding of how this mechanism leads to changes in mental health over the course of the pandemic. In considering these pathways, we encourage future research to draw on recent innovative methods aimed at explicitly identifying the impact of racism within society on health disparities,

perhaps especially during the pandemic [44]. Furthermore, although we noted that Asian and Hispanic respondents likely experience anti-immigrant status regardless of their immigration status [33], we are not able to consider the role of immigration status within our results, or even to separate these groups of respondents by country of origin (e.g., Mexican origin compared to Cuban origin). An additional limiting factor of our study is that we did not examine how place of residence potentially explains differences in mental health outcomes during the pandemic. Given that White people are more concentrated in rural areas, and Black, Asian, and Hispanic people are more concentrated in urban areas, it is possible that contextual differences related to the pandemic (e.g., rates and deaths from COVID-19, policies such as school closures) could act as potential mechanisms explaining disparities in anxiety and depression. Conversely, one recent study found that racialized minorities in rural areas experienced higher COVID-19 fatality rates compared to those in urban areas [45]. Subsequent research should therefore examine the role of place of residence as it relates to mental health disparities.

We also are only able to consider depression and anxiety as mental health outcomes, but given our framework of racial trauma, future studies would benefit from including measures of PTSD, substance use disorders, and other types of mental health issues and considering duration of mental health issues [13, 23]. There are also limitations in using the PHQ-2 and GAD-2, in that these screening instruments rely on scales which involve two items each. Although validated as appropriate measures of depressive symptoms and anxiety orders, both the PHQ-2 and the GAD-2 respectively consist of the initial two items from larger scales, the PHQ-9 and the GAD-7 [46, 47]. Future research should therefore explore the use of other screening instruments to assess mental health outcomes during the pandemic.

Additionally, although we compare the HPS to the NHIS data and control for key sociodemographic variables and use probability weights in both sets of analyses, there are still important differences between the two surveys, such as different rates of nonresponse, which lead us to see this comparison as exploratory. Compositional differences between the datasets are seen when comparing the descriptive statistics in Table 1, and likely reflect many factors, including different willingness to complete a survey before and during the pandemic and different modes of administering the survey. There are also differences in how some key measures were assessed; for example, the NHIS asked whether the respondent was currently seeing mental a health care professional, whereas the HPS asked about this in the past 4 weeks. Because the HPS question has a shorter and more specific time period for this question and for depression/anxiety, we expect HPS responses to be underestimates compared to the NHIS in prevalence of mental health issues

and care and possible overestimates of unmet care needs. Another limitation is that the NHIS data we discuss above covers an entire year. We conducted supplemental analysis (see Supplemental Figure A) comparing the same quarterly periods in the NHIS and HPS (e.g., April–June 2019 to April–June 2020), but due to small sample sizes, especially for Asian respondents, as well as differences between the datasets, we treat this as a preliminary robustness check. In our analysis of two specific events, we are not able to look at daily changes in mental health, only weekly shifts, and could only use the periods available in the HPS—an important limitation when interpreting the patterns. We suggest our findings be replicated using different surveys which include a pre- and post-pandemic sample, daily shifts in mental health around events (e.g., murder of George Floyd), and additional measures of mental health, mental health care, and unmet mental health needs.

Conclusion

The COVID-19 pandemic produced and continues to generate devastating consequences globally, including decreases in economic stability, increases in loneliness and social isolation, and deaths of loved ones [1, 26, 48]. In the USA, we provide evidence that the negative mental health impact of the pandemic was more strongly experienced by Black, Hispanic, and Asian people. The impact of the pandemic among racial/ethnic minoritized groups was compounded by the "pandemic within the pandemic" [8], namely the continued racism within the USA which was demonstrated in multiple traumatic racist events between 2020 and 2021 and coupled with the government's general inaction towards reducing racism and improving conditions for communities of color [30, 38]. A key intervention in improving mental health within the population is the widespread availability and affordability of mental health care; yet, our study provides evidence that racial/ethnic minoritized people with poor mental health had less access to this care during the pandemic than White people.

Our results underscore how the long-term social consequences of the COVID-19 pandemic will likely include widening mental health disparities between racial/ethnic groups, but there are interventions that could reverse this trend. How racism impacts mental health during and after the pandemic depends on public policies and organizational decisions, including eliminating the racial wealth gap, improving childcare and eldercare access and pay, protecting essential workers, preventing hate crimes, reforming the police, reducing student debt, improving health care access, addressing food and housing insecurity, and other important proposals targeted at improving the well-being of communities of color and aimed at promoting racial equity within

society [30, 38, 49]. Within the current environment, White adults are at a large and systemic advantage, which buffers them from unexpected crises and trauma—like the COVID-19 pandemic. Policies targeted at improving the well-being of racial/ethnic minoritized groups would contribute to a more equitable society, both during the pandemic and in its aftermath.

Declarations

Ethics Approval This analysis uses publicly available de-identified survey data that is not identifiable, and so it is not human subjects research. All authors adhered to the ethical responsibilities of authors, as described by COPE.

Competing Interests The authors declare no competing interests.

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