

**Anxiety and Depression Among Different Races
with Chronic Conditions in the US Prior to and
During COVID-19**

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The work presented in this thesis has been published by me and my coauthors in the following publication:

Wang H, Paul J, Ye I, Blalock J, Wiener RC, Ho AF, Alanis N and Sambamoorthi U. Coronavirus disease 2019 pandemic associated with anxiety and depression among Non-Hispanic whites with chronic conditions in the US. *J. of Affective Disorders Reports*. 2022; 8: 1-7.

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Abstract

Research Question:

Did different racial/ethnic groups with chronic conditions in the United States experience anxiety and depression differently during the COVID-19 pandemic, compared to pre-COVID?

Background, Significance, and Rationale for the Question:

There is no doubt that COVID affected many peoples' lives drastically. There is plenty of research that illustrates how COVID affected people's anxiety and depression levels. However, research is lacking when it comes to those who suffer from chronic diseases. People who suffer from chronic diseases not only might have been at higher risk for adverse COVID outcomes but were also those who may have lost access to certain medical care. This study will evaluate how anxiety and depression levels changed in those patients with chronic diseases pre-COVID compared to post COVID. It will also evaluate how COVID affected anxiety and depression levels in those with chronic diseases compared to people who have no chronic diseases.

Materials and Methods:

We conducted an analysis of the Health Information National Trend Surveys 5 (HINTS 5) Cycle 4 data. The survey administration time was categorized into pre-COVID-19 (before March 11, 2020, weighted N = 77,501,549) and during COVID-19 (on and after March 11, 2020, weighted N = 37,222,019) periods. Anxiety and depression were assessed using the Patient Health Questionnaire (PHQ), and a comparison was made between the two periods. To assess the association of the COVID-19 pandemic with anxiety/depression, separate multivariable logistic regression analyses were conducted. These analyses were adjusted for variables such as age, sex,

insurance, income, and education.

Results:

During the COVID-19 period, a higher percentage of non-Hispanic whites (NHW) with chronic conditions reported experiencing anxiety (24.3% vs. 11.5%, $p = 0.0021$) and depression (20.7% vs. 9.3%, $p = 0.0034$) compared to the pre-COVID-19 period. After adjusting for relevant factors, the adjusted odds ratio (AOR) for anxiety and depression among NHWs with chronic conditions during the COVID-19 pandemic was 2.02 (95% confidence interval: 1.10–3.73, $p = 0.025$) and 2.33 (95% confidence interval: 1.17–4.65, $p = 0.018$), respectively, when compared to NHWs surveyed before the onset of the COVID-19 pandemic.

Conclusions:

The prevalence of anxiety and depression increased among non-Hispanic white (NHW) adults with chronic conditions during the COVID-19 pandemic, but there was no similar association observed among people of color.

Research Question:

Did different racial/ethnic groups with chronic conditions in the United States experience anxiety and depression differently during the COVID-19 pandemic, compared to pre-COVID?

Hypothesis: We hypothesize that those with chronic diseases will experience a greater amount of anxiety and depression. We expect this to be supported objectively by self-reporting PHQ2 and PHQ4 data published in the HINTS 5, Cycle 4 Codebook.

Secondary question: Do non-Hispanic whites with chronic diseases have a lower increase in anxiety and depression compared to their Hispanic and people of color counterparts?

Hypothesis: We hypothesize that non-Hispanic whites with chronic diseases will experience a lower increase in anxiety and depression compared to Hispanics and other people of color with chronic diseases.

Introduction and Significance:

On March 11, 2020, the World Health Organization (WHO) officially declared the coronavirus 2019 (COVID-19) a global pandemic. This virus swiftly impacted not only the United States but also countries worldwide.¹ By the end of 2020 the United States had recorded 20,475,900 COVID-19 cases and 385,236 deaths.²

The COVID-19 pandemic has moved beyond just affecting people's physical health and has begun affecting individuals' mental well-being. The quick spread of the virus disrupted daily routines and contributed to heightened mental health concerns like anxiety and depression. There have been multiple global studies that have reflected this impact. In the Republic of Ireland, during the pandemic, General Anxiety Disorder (GAD) increased from 20% to 27.7%, and depression decreased from 28.8% to 27.7% due to the fear of contracting COVID-19.³ Similarly, a study from China reported that 28.8% of respondents experienced moderate to severe anxiety symptoms, while 16.5% reported moderate to severe depressive symptoms.⁴ In the US, approximately 1 in 4 adults without prior mental health conditions experienced psychological distress symptoms such as anxiety and depression during the early stages of the pandemic.⁵

Several factors have been reported to contribute to these increased rates of anxiety and depression during the COVID-19 pandemic, including concerns about personal and loved ones' health: younger age, sleep disturbances, food and economic insecurity, social isolation, and chronic conditions.^{6,7,8} Notably, individuals with chronic conditions face elevated levels of anxiety and depression compared to those without such conditions. For instance, individuals with diabetes exhibited a twofold increased odds of depression compared to those without diabetes.⁹ Similarly, a study done in Turkey depicted that patients with HIV and cancer experienced higher

levels of anxiety and depression during the pandemic.¹⁰ A meta-analysis also found that cancer patients had a higher level of anxiety during the pandemic compared to the general population.¹¹

Considering that approximately six out of ten individuals in the US have chronic conditions, these individuals face increased risks of detrimental health affects if they were to be infected by COVID-19. These health risks include hospitalization and mortality.^{12,13} Consequently, adults with chronic conditions are more susceptible to anxiety and depression due to COVID-19-related risks and their perception of these risks.^{14,15}

Studies have established a notable association between chronic disease and anxiety or depression during the pandemic. For instance, in Bangladesh a matched case-control study depicted those individuals with chronic conditions showed significantly higher prevalence rates of anxiety and depression, which was attributed partly to the increased risk of COVID-19 mortality.¹⁶ Similarly, individuals with cardiovascular diseases were particularly vulnerable to anxiety and depression symptoms during the pandemic.¹⁶ Moreover, individuals with cardiovascular disease symptoms, diabetes, asthma, or any combination of these diseases had increased odds of experiencing stress, anxiety, and depressive symptoms compared to healthy individuals during the pandemic. Studies from Brazil and Hong Kong also revealed increased anxiety and depression among individuals with diabetes and multiple comorbidities, respectively, due to COVID-19.^{14,15}

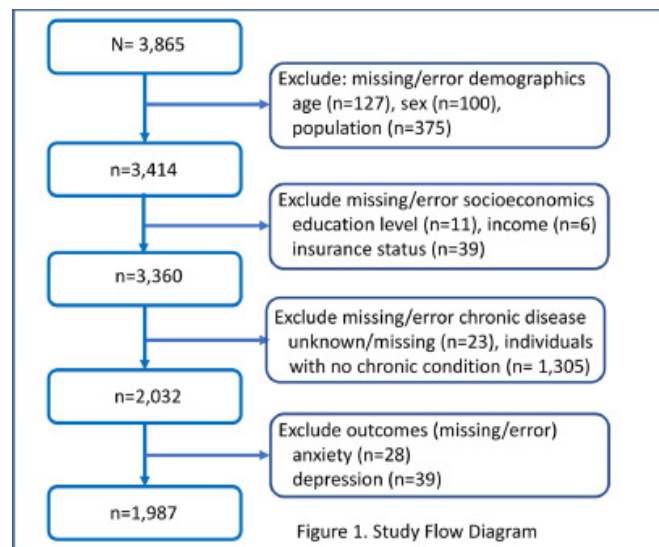
The differential impact of COVID-19 across various racial and ethnic groups might be a contributing factor to the different rates of anxiety and depression experienced among these groups. Some studies indicate higher anxiety and depression among Non-Hispanic White populations compared to people of color, while others highlight higher stress levels among Hispanic populations compared to their Non-Hispanic White counterparts.^{17,18,19,20} The specific effects of anxiety and depression among different race/ethnic groups with chronic conditions

during the pandemic remain uncertain. Therefore, the primary objective of this study is to assess whether different racial/ethnic groups with chronic conditions in the United States experienced anxiety and depression differently during the COVID-19 pandemic, compared to pre-COVID.

Research Materials and Methods:

Study Setting

This research constitutes a cross-sectional analysis utilizing secondary data derived from the National Cancer Institute's Health Information National Trends Survey 5 Cycle 4 (2020) (HINTS 5). HINTS 5 serves as a survey involving a nationally representative sample of US adults, aiming to evaluate the impact of the health information environment.²¹ Administered from February 2020 to June 2020, this survey targeted US adults aged 18 and above, utilizing a self-administered questionnaire. The results were released in March 2021, with 3,865 respondents providing complete data and a response rate of 37%. Notably, the survey did not offer a web-based option and was exclusively conducted via mail. The principal objectives of this study were to assess anxiety and depression levels among participants, with exclusion criteria applied to individuals with missing and/or inaccurate information regarding these measures. Figure 1 outlines the number of adults excluded. As HINTS 5 is a publicly accessible and de-identified database, the regional Institutional Review Board (IRB) determined that this project did not meet the definition of human subject research according to federal regulations (IRB No. 1,705,528–1).



As depicted in Fig. 1, our sample was limited to individuals with any chronic conditions (diabetes, hypertension, heart disease, lung disease, and cancer). Additionally, we excluded individuals with missing sociodemographic characteristics, including age, sex, education level, income level, and insurance status.

Anxiety and depression

To gauge anxiety and depression, we employed the PHQ-4 survey, encompassing two questionnaires for generalized anxiety disorder (GAD-2) and two for depression (PHQ-2). The GAD-2 questions assessed the frequency of feeling nervous, anxious, or on edge and the inability to stop or control worrying over the past two weeks. The PHQ-2 questions gauged the frequency of little interest or pleasure in doing things and feeling down, depressed, or hopeless during the same period. Responses were scored from 0 to 3, with higher scores indicating greater frequency. Individuals scoring 3 or above were classified as high risk, while those scoring 0–2 were deemed low risk for anxiety or depression.

COVID-19 Pandemic

We created a binary indicator (yes/no) to denote whether the survey was completed before or after the onset of the COVID-19 pandemic, determined by the World Health Organization's declaration on March 11, 2020. The pandemic flag was used to categorize surveys as received during (1) or before (0) the COVID-19 period.

Race/Ethnicity

The survey captured information on Non-Hispanic White (NHW), Non-Hispanic Black (NHB), Hispanic/Latino, and others. Due to small sample sizes, we combined NHB, Hispanic/Latino, and others into one category, labeled people of color.

Other Variables

Biological (age, sex), socioeconomic status (household income, individual education), and healthcare access factors (health insurance) were included. Categories included five age groups, two biological sex groups, two insurance level groups, three household income level groups, and four education level groups. Individuals with chronic conditions were further categorized into single or multiple conditions.

Analysis

Weighted percentages derived from replicate weights were utilized, and the comparison between groups was conducted using Rao-Scott chi-square tests. Distinct multivariable logistic regression analyses for both anxiety and depression were carried out, considering periods before and during the COVID-19 pandemic. These analyses were adjusted for various factors encompassing biological, socioeconomic, and healthcare access characteristics.

To ensure the reliability of the data, relative standard errors (RSE) were closely monitored, with RSEs below 30% indicating satisfactory reliability. The investigation revealed RSEs below 30%, indicating that the findings were not compromised by poor reliability due to sample size.

The statistical analyses were executed using STATA version 14.0, in adherence to the HINTS 5 guidelines for data analysis, and incorporated survey procedures along with replicate weights.²²

The reporting followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines designed for cross-sectional studies.²³

Results:

The final analysis encompassed 1,987 participants, representing a weighted population of 114,723,568 (as detailed in Table 1). This table presents the biological and socioeconomic characteristics of the study population concerning responses before or during the COVID-19 pandemic. Approximately two-thirds of the surveys were completed during the pandemic. Respondents during this period tended to be younger, with a higher proportion being Non-Hispanic Black (NHB) or Hispanic. However, no notable differences were found in terms of sex, education levels, insurance status, income levels, or the prevalence of chronic conditions between individuals who responded to the survey before the pandemic and those who responded during the pandemic (as outlined in Table 1).

The prevalence of anxiety and depression was higher among NHWs during the COVID-19 pandemic as compared to the pre-COVID-19 period ($p < 0.05$, Table 2, left panel) across individual items and summary measures. However, such findings were not found among people of color ($p > 0.05$, Table 2, right panel).

After accounting for biological factors such as age and sex, as well as socioeconomic status variables including income and education, along with access to healthcare through health insurance, NHW individuals with chronic conditions who responded during the COVID-19 pandemic were more prone to experiencing anxiety and depression compared to those who responded before the pandemic. The adjusted odds ratio (AOR) for NHW individuals with chronic conditions during the pandemic showed increased likelihood of anxiety, with a value of 2.02 and a 95% confidence interval (CI) of 1.10-3.73 ($p = 0.025$). Similarly, the AOR for NHW individuals with chronic conditions during the pandemic displayed higher odds of depression at

Table 1. Sociodemographic breakdown of the participants in our study based off responses prior to and during the pandemic (HINTS-5 Cycle 4).

| | Individuals who responded before the pandemic | | Individuals who responded during the pandemic | | p-value |
|-------------------------|---|------|---|------|---------|
| | N | Wt% | N | Wt% | |
| ALL | 787 | 36.8 | 1201 | 63.2 | |
| Sex | | | | | 0.3744 |
| Male | 355 | 52.2 | 511 | 48.8 | |
| Female | 432 | 47.8 | 690 | 51.2 | |
| Age in Years | | | | | 0.0095 |
| 18 – 34 years | 40 | 8.9 | 73 | 14.0 | |
| 35 – 49 years | 81 | 18.2 | 189 | 27.4 | |
| 50 – 64 years | 251 | 38.7 | 417 | 32.0 | |
| 65 – 74 years | 254 | 20.2 | 349 | 16.0 | |
| 75, and older | 161 | 14.0 | 173 | 10.6 | |
| Race/Ethnicity | | | | | 0.0015 |
| Non-Hispanic White | 557 | 76.3 | 692 | 62.5 | |
| Non-Hispanic Black | 95 | 9.2 | 222 | 16.3 | |
| Hispanic | 79 | 7.0 | 195 | 13.5 | |
| Others | 56 | 7.6 | 82 | 7.8 | |
| Education | | | | | 0.2829 |
| LT HS | 50 | 5.8 | 103 | 9.1 | |
| HS or similar | 209 | 33.0 | 330 | 30.6 | |
| Some College | 202 | 32.2 | 273 | 34.1 | |
| College and above | 326 | 29.1 | 495 | 26.2 | |
| Health Insurance | | | | | 0.5336 |
| Yes | 768 | 94.9 | 1152 | 93.7 | |
| No | 19 | 5.1 | 49 | 6.3 | |
| Income | | | | | 0.9795 |
| LT 50k | 370 | 44.0 | 564 | 43.3 | |
| 50k - < 100k | 236 | 30.9 | 349 | 30.9 | |
| 100k, + | 181 | 25.1 | 288 | 25.7 | |
| Chronic diseases | | | | | 0.9422 |
| One | 404 | 57.7 | 610 | 57.4 | |
| Multimorbidity | 383 | 42.3 | 591 | 42.6 | |

Note: This data is based on 1987 participants. Rao Scott chi-square tests were used to calculate weighted data for significant differences between groups. Replicate weights were then used to derive weighted percentages. HS: High School; LT: Less than; Wt.: weighted.

Table 2. Screening for anxiety and depression in those who suffer from chronic conditions before and during the COVID-19 pandemic (HINTS-5 Cycle 4).

| | NHW (n=1248) | | | | | People of color (n=739) | | | | |
|-------------------------------|--------------|------|--------|------|--------|-------------------------|------|--------|------|--------|
| | Before | | During | | P | Before | | During | | P |
| | N | Wt% | N | Wt% | | N | Wt% | N | Wt% | |
| Anxiety Screening | | | | | | | | | | |
| Nervous | | | | | 0.0142 | | | | | 0.4545 |
| Not at all | 358 | 61.3 | 391 | 49.0 | | 147 | 57.7 | 330 | 65.5 | |
| Several days | 149 | 28.8 | 196 | 29.8 | | 48 | 23.3 | 125 | 19.1 | |
| More than half the days | 27 | 4.0 | 46 | 10.1 | | 20 | 11.9 | 27 | 6.8 | |
| Nearly everyday | 23 | 5.9 | 58 | 11.1 | | 15 | 7.2 | 27 | 8.6 | |
| Worrying | | | | | 0.0221 | | | | | 0.6500 |
| Not at all | 406 | 69.1 | 449 | 57.3 | | 147 | 59.4 | 341 | 66.7 | |
| Several days | 105 | 22.4 | 141 | 23.4 | | 46 | 24.1 | 98 | 19.4 | |
| More than half the days | 27 | 4.5 | 56 | 9.8 | | 15 | 6.5 | 36 | 4.4 | |
| Nearly everyday | 19 | 4.0 | 45 | 9.5 | | 22 | 10.0 | 34 | 9.6 | |
| Anxiety GAD-2 score | | | | | 0.0021 | | | | | 0.2208 |
| Low risk of anxiety | 498 | 88.5 | 569 | 75.7 | | 186 | 77.4 | 438 | 83.7 | |
| High risk of anxiety | 59 | 11.5 | 122 | 24.3 | | 44 | 22.6 | 71 | 16.3 | |
| Depression Screening | | | | | | | | | | |
| Little interest | | | | | 0.0179 | | | | | 0.2980 |
| Not at all | 380 | 68.7 | 434 | 54.8 | | 144 | 53.4 | 329 | 64.8 | |
| Several days | 119 | 21.3 | 163 | 28.3 | | 42 | 27.4 | 96 | 22.1 | |
| More than half the days | 35 | 6.4 | 50 | 7.0 | | 19 | 8.5 | 43 | 4.7 | |
| Nearly everyday | 23 | 3.6 | 44 | 9.9 | | 25 | 10.8 | 41 | 8.5 | |
| Hopeless | | | | | 0.2567 | | | | | 0.1904 |
| Not at all | 407 | 68.9 | 459 | 60.5 | | 159 | 60.1 | 377 | 70.5 | |
| Several days | 107 | 22.3 | 155 | 25.4 | | 47 | 30.3 | 85 | 20.3 | |
| More than half the days | 28 | 6.4 | 47 | 7.9 | | 14 | 4.3 | 29 | 5.3 | |
| Nearly everyday | 15 | 2.4 | 30 | 6.2 | | 10 | 5.3 | 18 | 3.9 | |
| Depression PHQ-2 score | | | | | 0.0034 | | | | | 0.4648 |
| Low risk of depression | 500 | 90.8 | 587 | 79.3 | | 190 | 84.3 | 426 | 86.7 | |
| High risk of depression | 57 | 9.3 | 104 | 20.7 | | 40 | 15.7 | 83 | 13.3 | |

2.33 with a 95% CI of 1.17-4.65 ($p=0.018$, as depicted in Table 3). Additionally, elderly individuals tended to exhibit lower odds of both anxiety and depression compared to younger individuals, as highlighted in Table 3. However, when focusing on people of color with chronic conditions, the AOR within this group during the pandemic did not display significant increased odds of anxiety (AOR=0.59, 95% CI 0.26-1.34, $p=0.201$) or depression (AOR=0.77, 95% CI 0.39-1.52, $p=0.447$) compared to those before the pandemic, as outlined in Table 4.

Table 3. Anxiety and Depression among NWH individuals with chronic conditions in relation to the COVID-19 pandemic.

| | Anxiety | | Depression | |
|--------------------------------------|---------------------------------|-------|---------------------------------|-------|
| | Adjusted Odd Ratios (95% CI) | P | Adjusted Odd Ratios (95% CI) | P |
| COVID-19 Pandemic | 2.02 [1.10, 3.73] | 0.025 | 2.33 [1.17, 4.65] | 0.018 |
| Chronic condition | | | | |
| One condition | Reference | | Reference | |
| Multimorbidity | 1.07 [0.51, 2.25] | 0.862 | 0.71 [0.41, 1.21] | 0.199 |
| Age in Years | | | | |
| 18–34 years | Reference | | Reference | |
| 34–49 years | 0.73 [0.20, 2.66] | 0.630 | 0.58 [0.13, 2.51] | 0.458 |
| 50–64 years | 0.24 [0.08, 0.77] | 0.017 | 0.28 [0.08, 0.98] | 0.046 |
| 65–74 years | 0.13 [0.04, 0.42] | 0.001 | 0.23 [0.07, 0.77] | 0.019 |
| 75 years or older | 0.13 [0.03, 0.57] | 0.008 | 0.22 [0.05, 1.02] | 0.054 |
| Sex | | | | |
| Male | Reference | | Reference | |
| Female | 1.54 [0.92, 2.59] | 0.101 | 1.20 [0.68, 2.14] | 0.520 |
| Education level | | | | |
| Less than high school | Reference | | Reference | |
| High school or similar | 0.67 [0.18, 2.42] | 0.529 | 0.41 [0.11, 1.59] | 0.193 |
| Some college | 0.53 [0.15, 1.84] | 0.312 | 0.26 [0.07, 0.94] | 0.040 |
| College or above | 0.32 [0.06, 1.54] | 0.151 | 0.18 [0.05, 0.75] | 0.019 |
| Insurance | | | | |
| No | Reference | | Reference | |
| Yes | 0.59 [0.05, 6.36] | 0.656 | 0.55 [0.03, 8.88] | 0.666 |
| Household annual income level | | | | |
| <\$50K | Reference | | Reference | |
| \$50K to 100K | 1.26 [0.56, 2.87] | 0.569 | 0.79 [0.33, 1.86] | 0.577 |
| >\$100K | 1.88 [0.73, 4.82] | 0.186 | 0.82 [0.34, 1.97] | 0.653 |

Note: This data was based off 1248 adult NWH participants after those with missing information on sex, age, education, insurance, income and chronic diseases were removed. The final model was then adjusted for these variables.

Table 4. Anxiety and Depression among people of color with chronic conditions in relation to the COVID-19 pandemic.

| | Anxiety | | Depression | |
|--------------------------------------|---------------------------------|-------|---------------------------------|-------|
| | Adjusted Odd Ratios (95% CI) | P | Adjusted Odd Ratios (95% CI) | P |
| COVID-19 Pandemic | 0.59 [0.26, 1.34] | 0.201 | 0.77 [0.39, 1.52] | 0.447 |
| Chronic condition | | | | |
| One condition | Reference | | Reference | |
| Multimorbidity | 1.45 [0.65, 3.19] | 0.354 | 1.71 [0.88, 3.33] | 0.112 |
| Age in Years | | | | |
| 18–34 years | Reference | | Reference | |
| 34–49 years | 0.93 [0.15, 5.60] | 0.934 | 2.33 [0.41, 13.37] | 0.336 |
| 50–64 years | 0.53 [0.10, 2.90] | 0.456 | 1.90 [0.55, 6.54] | 0.301 |
| 65–74 years | 0.18 [0.02, 1.35] | 0.094 | 1.02 [0.21, 4.91] | 0.977 |
| 75 years or older | 0.50 [0.05, 5.63] | 0.572 | 1.73 [0.23, 12.98] | 0.589 |
| Sex | | | | |
| Male | Reference | | Reference | |
| Female | 2.43 [1.05, 5.60] | 0.038 | 1.56 [0.67, 3.60] | 0.294 |
| Education level | | | | |
| Less than high school | Reference | | Reference | |
| High school or similar | 0.66 [0.15, 2.93] | 0.577 | 0.74 [0.18, 3.16] | 0.683 |
| Some college | 0.88 [0.22, 3.42] | 0.846 | 0.82 [0.22, 3.10] | 0.764 |
| College or above | 0.30 [0.06, 1.52] | 0.142 | 0.83 [0.17, 4.02] | 0.817 |
| Insurance | | | | |
| No | Reference | | Reference | |
| Yes | 1.68 [0.30, 9.60] | 0.550 | 0.79 [0.21, 2.96] | 0.726 |
| Household annual income level | | | | |
| <\$50K | Reference | | Reference | |
| \$50K to 100K | 0.68 [0.28, 1.68] | 0.569 | 0.78 [0.37, 1.66] | 0.513 |
| >\$100K | 0.34 [0.12, 0.95] | 0.039 | 0.51 [0.15, 1.79] | 0.288 |

Note: This data was based off 739 adult individuals who identified as someone of color. These individuals were included after data points with missing information on sex, age, education, insurance, income, and chronic disease conditions were removed. The final model was then adjusted for age, sex, income, education, health insurance, and chronic conditions.

Discussion:

During this study, we examined the disparities between responses collected before the onset of the COVID-19 pandemic and those obtained during the pandemic. This was done by using the natural timing of a nationally representative survey. Our discernment from the analysis indicates a notable correlation between the COVID-19 pandemic and increased odds of anxiety and depression specifically among Non-Hispanic White (NHW) individuals with chronic conditions. Interestingly, we did not discern a statistically significant association between the COVID-19 pandemic and anxiety/depression among people of color.

The findings from our study imply that, within the subset of individuals burdened with chronic conditions, the impact of the COVID-19 pandemic on depression and anxiety appears to manifest differently across diverse racial and ethnic groups.

As previously stated, multiple different resources have reported different results on the association of race/ethnicity to depression and anxiety.¹⁸ One study reported that, people of color had similar or better mental health in general compared to NHWs. Although this study was done previous to COVID-19, there have been studies conducted during the pandemic that also support these findings.¹⁷

The insights from various studies conducted during historical events like 9/11 have consistently highlighted intriguing patterns in mental health outcomes among different racial and ethnic groups. These studies show a similar pattern to the ones conducted during the COVID-19 pandemic. Notably, these studies offer valuable perspectives on the experiences of NHB and NHW individuals in dealing with anxiety and depression.

One such study, utilizing the same methodology as our study to measure anxiety and depression during the COVID-19 pandemic, reported lower instances of these mental health challenges among NHB individuals when compared to their NHW counterparts.¹⁸ Similarly, another study conducted amid the pandemic, drawing data from the Understanding American Study, corroborated these findings, observing lower rates of anxiety and depression among NHB individuals.¹⁷

Interestingly, a historical parallel emerges from a study conducted after 9/11, which illustrates analogous trends. This research revealed that African American individuals residing in New York City during that period were less prone to suffering from depression compared to NHWs.²⁴ These consistent findings across different critical historical moments suggest a recurrent trend: NHB individuals exhibit a lower likelihood of experiencing anxiety and depression compared to their NHW counterparts during times of significant societal stressors or crises. The exploration of such patterns needs to include the importance of historical contexts and societal factors that might contribute to disparities in mental health outcomes among diverse racial and ethnic groups.

While these studies provide critical insights into observed disparities, further research is imperative to understand the underlying mechanisms behind these patterns. Having a better understanding of these protective factors or resilience mechanisms within NHB communities may significantly inform targeted interventions and support systems for mental health promotion across diverse populations.

Our study's discovery, revealing a higher likelihood of anxiety and depression among Non-Hispanic White (NHW) individuals with chronic conditions compared to people of color, contributes significantly to the existing body of knowledge regarding the intricate connections between race and mental health. This finding points towards what seems like a "mental health

paradox,” a situation wherein groups more severely impacted by the pandemic in other aspects, such as financial repercussions, appear to experience fewer mental health challenges.

While our study did not specifically investigate the underlying reasons for these observations, we draw insights from other published literature to provide potential explanations. For instance, individuals from racial and ethnic minority groups may possess certain protective factors that fortify their coping mechanisms during challenging times. These protective factors include but are not limited to higher self-esteem, robust social support networks, active religious engagement, and a stronger sense of ethnic identity.^{25,26} Additionally, these groups might exhibit greater resilience levels, which could potentially buffer the impacts of stressors like the COVID-19 pandemic on mental health outcomes.²⁷

This observed phenomenon emphasizes the need for a more comprehensive understanding of the multifaceted interplay between race, ethnicity, and mental health outcomes during crises. By acknowledging and exploring the presence of these protective factors within diverse communities, we can better tailor interventions and support mechanisms to address mental health disparities that manifest across different racial and ethnic groups, especially during times of heightened societal challenges like the COVID-19 pandemic. Further research endeavors are essential to unravel the complexities of these relationships and develop more effective strategies to promote mental well-being across diverse populations.

Nevertheless, there exists a noticeable discrepancy in the reporting of depression and anxiety between people of color and non-Hispanic whites, with the former displaying lower likelihoods of reporting such mental health issues according to studies like Huang et al.²⁸ This phenomenon could potentially stem from the resilience demonstrated by individuals from diverse racial

backgrounds, which might be attributed to their historical endurance of societal challenges such as stigma, discrimination, and limited opportunities for upward mobility.²⁹

Conversely, NHWs may encounter heightened levels of stress, mental health challenges, and a sense of despair when facing external adversities like the impact of COVID-19 or economic downturns. Several references have highlighted this trend, including a susceptibility to mental health struggles within the NHW community during such crises.^{30,31,32,33} Notably, NHWs with chronic conditions tend to consume more medications potentially leading to increased rates of medication-induced anxiety and depression among this demographic.^{34,35} This situation may exacerbate during pandemic-induced quarantines due to challenges in accessing necessary medications and medical appointments, consequently contributing to heightened anxiety and depression among NHWs with chronic health concerns. However, it's imperative to acknowledge that these findings necessitate further validation through comprehensive longitudinal studies aimed at determining the racial disparities in how the COVID-19 pandemic impacts anxiety and depression. Such robust study designs are crucial to provide more conclusive insights into these complex mental health dynamics across different racial groups.

Ultimately our research confirms the trend that Non-Hispanic Blacks tend to encounter lower levels of depression and anxiety during challenging periods. Our study contributes to this body of knowledge by specifically examining the influence of chronic health conditions on these mental health outcomes. Notably, even among individuals with chronic conditions, Non-Hispanic Blacks continue to exhibit lower rates of anxiety and depression compared to Non-Hispanic Whites.

Our study entails several limitations that should be acknowledged. Firstly, we worked with pre-existing data, which constrained our ability to choose and define variables. For instance, our

analysis of chronic conditions was limited to the five conditions available in the survey, excluding the possibility of examining other types of chronic ailments.

Secondly, our study relied solely on the PHQ-4 (GAD-2/PHQ-2) for anxiety and depression screening. However, individuals identified with higher odds may require additional confirmatory tests for diagnosing anxiety or depression, which is a crucial consideration.

Thirdly, as our survey was conducted exclusively among the US population, caution is advised when generalizing our results to other demographics or regions.

Moreover, our analysis only encompasses certain sociodemographic characteristics, excluding the exploration of potential factors like substance abuse or employment status that might influence individuals' anxiety and depression levels.³⁶

Lastly, the HINTS 5 Cycle 4 survey was conducted in June 2020, during the initial phase of the COVID-19 pandemic. Consequently, establishing a definitive causal relationship between the pandemic and anxiety/depression—whether it is episodic or persistent—remains largely unknown. Therefore, to comprehend the continual and long-term impact of the COVID-19 pandemic on anxiety and depression among individuals with chronic conditions, there is a need for a comprehensive large-scale prospective longitudinal study.

Future Directions:

The future trajectory of this study should delve deeper into the societal and historical factors contributing to the observed differences between NHB communities' lower susceptibility to depression and anxiety compared to their NHW counterparts amid challenging periods such as the COVID-19 pandemic. This study should include the potential reasons rooted in societal structures, historical contexts, and cultural dynamics that may underline the differences in mental health outcomes between NHBs and NHWs during tough times.

Possible areas of exploration could include the role of societal resilience within the NHB communities, considering historical experiences of adversity and resilience that might have shaped coping mechanisms. Historical and societal factors such as social support networks, community cohesion, cultural practices, access to resources, and experiences of systemic racism might also play pivotal roles in influencing mental health outcomes during crises.

Investigating how societal narratives, media representations, and access to healthcare resources impact mental health perceptions and help seeking behaviors within these communities could offer some significant insights. This is important because there may also exist a reporting bias among the NHB community in underreporting their level of anxiety and depression. The study could also consider factors like community empowerment, cultural identity, spirituality, and familial support systems as potential buffers to outside stressors.

These further studies are important to understand the nuances behind the lower anxiety and depression among NHB communities. This deeper understanding could pave the way for more targeted interventions and support systems tailored to the specific needs of diverse communities during times of external crises.

Conclusions:

The impact of COVID-19 pandemic extends beyond physical health, significantly affecting mental well-being. This widespread virus has disrupted daily routines, contributing to increased anxiety and depression among individuals. While those with chronic conditions exhibit higher rates of anxiety and depression, the effect of chronic conditions on various race and ethnic groups had not been studied. This study aimed to assess whether the association between COVID-19 and anxiety/depression varied among different racial and ethnic groups in the United States.

This was done by utilizing data from the National Cancer Institute's Health Information National Trends Survey 5 Cycle 4 (2020), which is a nationally representative survey assessing the health information environment. This cross-sectional analysis investigated responses from US adults aged 18 and above. The survey was conducted from February to June 2020 and had responses from 3,865 participants.

Our study adjusted for biological, socioeconomic, and access-to-care variables; the analysis revealed significant disparities. NHW individuals with chronic conditions who responded during the pandemic were notably more likely to experience anxiety and depression compared to those who responded before the pandemic. The adjusted odds ratio (AOR) for anxiety among NHW individuals with chronic conditions during the pandemic was 2.02 (95% CI: 1.10-3.73, $p=0.025$). Similarly, the AOR for depression among NHWs with chronic conditions during the pandemic was 2.33 (95% CI: 1.17-4.65, $p=0.018$, Table 3). Additionally, older individuals tended to have lower odds of anxiety and depression compared to younger individuals (Table 3). However, when analyzing people of color with chronic conditions, the cohort during the pandemic showed no significant increase in odds for anxiety (AOR = 0.59, 95% CI: 0.26-1.34, $p=0.201$) or

depression (AOR = 0.77, 95% CI: 0.39-1.52, p=0.447) compared to pre-pandemic times (Table 4).

This study's findings revealing higher anxiety and depression rates among NHWs compared to NHBs, contributes significantly to understanding the intricate relationship between races and mental health. This observation is unique in the fact that groups facing more severe pandemic-related challenges in other aspects seem to experience fewer mental health issues. To explore this further, future research should delve into societal, historical, and cultural factors influencing differences in mental health outcomes between NHBs and NHWs during challenging times like the COVID-19 pandemic.

Compliance:

As the HINTS 5 database is publicly accessible and de-identified, the local Institutional Review Board (IRB) concluded that this study did not align with the criteria for human subject research as outlined in federal regulations (IRB No. 1,705,528-1).

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