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Impact of Preexisting Hypertension and Demographic Factors on Pandemic-era Anxiety Using the Coronavirus Anxiety Scale

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Abstract

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Using the Coronavirus Anxiety Scale

by

Chukwuemeka Ogbonnaya Okpom

PhD, Walden University, 2024

MPH, Howard University, 2007

MBBS, Abia State University, 2003

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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Abstract

Anxiety affects millions of people globally. In the United States and during the COVID-19 pandemic, anxiety affected healthy individuals and those with preexisting hypertension. Though empirical studies have reported a relationship between pandemic-era anxiety and hypertension, there was no study found from the United States using the Coronavirus Anxiety Scale (CAS), which is specific to COVID-19. The purpose of this study was to examine the impact of preexisting hypertension and demographic factors on pandemic-era anxiety in the United States. The study used biopsychological and socioecological models to explain the relationship between health and disease origin and the impact of social and environmental factors on disease development. The study also used binomial logistic regression for statistical analysis. This quantitative secondary data analysis from the cross-sectional study using the COVID-19 Pandemic-Related Stress Data shows that people with preexisting hypertension are 2.039 times more likely to develop pandemic-era anxiety, controlling for age, sex, and race, and males compared to females are 2.185 times more likely to develop pandemic-era anxiety. Also, people with some college degrees compared to college graduates are .226 times less likely to develop pandemic-era anxiety. The results could drive social change by creating awareness of the relationship between preexisting hypertension and pandemic-era anxiety. This awareness can help develop intervention programs focusing on early screening, treatment, and policy changes, including counseling and mental health education on anxiety and hypertension.

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Dedication

This work is dedicated to my parents, Kenndey and Comfort Okpom, who

instilled in me the courage never to give up. I also dedicated this dissertation to my lovely

wife, Esther Okpom, and my children, Kenndy, Okpom, Munachimso Okpom, and

Zinachidi Okpom, for all their encouragement, including spiritual, mental, emotional, and

financial support throughout the entire process.

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I want to give all thanks and glory to God for making it possible for my family and me to go through this journey and come out victorious. I also want to thank the faculty and staff of Walden University for impacting me with immeasurable knowledge. Special thanks go to my Chair and Co-Chair, Dr. Srikanta Banerjee and Dr. David Michael Segal, for their support and guidance throughout the process. Without you, it would not be possible.

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Chapter 1: Introduction to the Study

Anxiety is known to affect many adults in the United States, impacting their overall health and, in some cases, worsening their existing health challenges (National Institute of Mental Health [NIMH], 2023; Szubany & Simon, 2022). Before the pandemic, the number of mild cases of anxiety among adults in the United States was about 9%, 3.4% for moderate anxiety, and 2.7% for the severe form of the disorder (Centers for Disease Control and Prevention [CDC], 2020a). The coronavirus spread caused an increase in anxiety levels. The overall prevalence of coronavirus-related anxiety increased up to 35% following COVID-19's assertion as a pandemic mainly because of complications, increased hospitalization, death, lockdown, and social distancing associated with the virus (Brooks et al., 2020; Delpino et al., 2022; Haliwa et al., 2021; Pieh et al., 2020; Salari et al., 2020; Turna et al., 2021). In the United States, among those with no history of anxiety, recent data shows that 1 in 4 adults experienced coronavirus-related anxiety after the declaration of the coronavirus infection as a pandemic (Holingue et al., 2020; Turna et al., 2021). Similar findings were reported in other countries. For example, in Ireland, the fear associated with contracting the virus was attributed to the increase in the prevalence of the disease from 20% to 27% (Hyland et al., 2020). Similar research conducted in China indicated that the prevalence of anxiety due to coronavirus increased above 25% in the general population, primarily due to health complications linked to the virus (Wang et al., 2020).

As the number of people suffering from coronavirus anxiety increased throughout the first wave of the disease, so did people with preexisting hypertension (Holingue et al.,

2020; Shuyan et al., 2022). People with preexisting diseases are particularly anxious and worried about contracting the virus because of the impact of the virus on their health, which may worsen their chronic disease condition (Gerhards et al., 2023; Rajkumar, 2020; Wang et al., 2022). Numerous study findings have argued that there may be a relationship between anxiety and hypertension. A recent study suggested that people with preexisting diseases are threatened by the coronavirus's pervasive nature and resulting health challenges (Gerhards et al., 2023). Considering the increased prevalence of coronavirus-related anxiety, evidence has shown that people with preexisting diseases like hypertension have an increased risk of contracting the virus, hospitalization, and death compared to those with no chronic disease (Kirby et al., 2021). Research has reported a high anxiety prevalence among people with preexisting hypertension (Badria et al., 2020).

The rise in anxiety levels during the pandemic in those diagnosed with hypertension is worth studying to determine if hypertension predicts pandemic-era anxiety. Understanding health issues like anxiety during a pandemic and the risk factors associated with any disease is the first step in identifying possible solutions. This study will effect positive change by creating awareness of the associated risk factors of anxiety during a pandemic. It will help healthcare professionals and public health advocates in modifying the current health policies on anxiety, creating better ways to identify and manage future anxiety crises during a pandemic and other public health emergencies. The study can also support public health policy changes and laws that emphasize the importance of anxiety intervention and risk reduction programs by creating awareness of

the disease and increasing accessibility to mental health education/counseling programs and treatment for hypertension and anxiety disorder.

In this chapter, I provide detailed background information on pandemic-era anxiety and its relationship with preexisting hypertension in other countries. I also provide information on demographic factors and the possible association between these factors and coronavirus-related anxiety. I present the problem statement surrounding the topic, the research purpose, and questions and the hypotheses that guided the study. I also address the conceptual framework of the study and detail the nature of the research. I describe the study's assumptions, scope, and delimitations. The chapter concludes with information on the significance and a chapter summary.

Background

Anxiety is a disorder characterized by fear, tension, and an increase in blood pressure resulting from what the person perceives as a problem or impending danger yet to occur, which may be temporal or persistent, impacting daily activity (National Institute of Mental Health [NIMH], 2023). Anxiety is a widespread psychological disturbance affecting over 300 million people globally pre-pandemic (Yang et al., 2021). The disorder increased prevalence during the coronavirus pandemic (Brooks et al., 2020; Delpino et al., 2022; Pieh et al., 2020; Salari et al., 2020; Haliwa et al., 2021; NIMH, 2023; Turna et al., 2021). Studies estimate that during the COVID-19 pandemic's first wave, anxiety disorder increased by about 25%, accounting for nearly 80 million new diagnoses globally (Page et al., 2021). In the United States, studies attributed the 35% rise in the prevalence of the disorder across the country to the impact of the disease on

health and public health measures (lockdowns and social distancing) implemented to reduce the disease spread (Brooks et al., 2020; Delpino et al., 2022; Pieh et al., 2020; Salari et al., 2020).

The increase in global anxiety levels in the United States affected not only those who are healthy but those with preexisting hypertension. Recent data shows that over 1 billion people have hypertension worldwide (Mills et al., 2020; World Health Organization [WHO], 2023). Likewise, current estimates indicate that about 40% of people with the disease are unaware (WHO, 2023). In the United States, about half of the cases are men and 39% are women, with age-adjusted prevalence of 45%, and across racial groups, Black individuals account for 57%, Hispanic individuals 44%, and White individuals 43% (CDC, 2020b).

Several studies from countries except the United States have argued that there may be an association between hypertension and anxiety, though others did not reach the same conclusion. People with preexisting conditions are particularly anxious about contracting the COVID-19 virus mainly because of its effect on the overall health and well-being of those affected (Gerhards et al., 2023; Rajkumar, 2020; Wang et al., 2022). In Malaysia during the pandemic, psychological challenges, including anxiety, impacted blood pressure management in people with confirmed diagnoses of hypertension (Loke & Ching, 2022). Other studies in Saudi Arabia (Said et al., 2023), Australia (Bonner et al., 2021), and China (Zhang et al., 2022) showed that during the pandemic pandemic-era anxiety prevalence increased among those with hypertension compared to the general population (Said et al., 2023). Similar findings were also reported in Germany (Gerhards

et al., 2023) and France (Berard et al., 2022) for people with preexisting cardiovascular risks (hypertension). In another study conducted in India, the authors reported an increase in pandemic-era anxiety in adults with hypertension and diabetes because of the COVID-19 lockdown (Arora et al., 2021), which was similar to results in Korea (Kim & Kim, 2020).

As these studies suggested a relationship between hypertension and anxiety during the pandemic, some studies argue that no relationship exists. For example, Sensory et al. (2021) argued that in Turkey, there was an independent association between pandemic-era anxiety and preexisting hypertension in people affected by the coronavirus and those hospitalized because of the virus. In Indonesia, Iswatum et al. (2023) noted that people with preexisting hypertension saw a decrease in pandemic-era anxiety.

Many studies have suggested that sociodemographic factors may be a risk factor for psychological disturbance (anxiety) during the pandemic, while others have argued that there is no link (Celikkalp et al., 2021; Nelson et al., 2020; Sharifi et al., 2022; Tomás et al., 2021). Some noted that pandemic-era anxiety impacted the older population and females more than the other groups (Caycho-Rodriguez, 2021; Caycho-Rodriguez et al., 2022; Loke & Ching, 2022; Saeed et al., 2023; Wong et al., 2020; Yarrington et al., 2021). However, others have suggested that females, compared to males and younger adults, have increased levels of mental health challenges and fear of contracting the virus than others (Andrade et al., 2022; Bauerle et al., 2020). Further, one study noted that anxiety levels did not vary across age groups (De & Sun, 2022). Similarly, other

researchers reported that gender is not associated with increased anxiety in people with hypertension during the pandemic (Said et al., 2023).

There are also conflicting results on the relationship between marital status and pandemic-era anxiety. Research have reported that people who are divorced, widowed, separated, and single may be predisposed to mental health frailty during the pandemic compared to those who are married (Smith et al., 2020; Ustun, 2020). Similarly, unmarried people are more prone to pandemic-era anxiety than others (Reema et al., 2023). Similar study findings suggested that marriage protects against mental health challenges (Dean et al., 2021; Hsu & Barrett, 2020; Rapp & Stauder, 2020). Nevertheless, other researchers have noted that people who are married experienced high anxiety levels during the pandemic (Chew et al., 2020; Karasu et al., 2022). The heterogeneous findings on the relationship between sociodemographic factors and pandemic-era anxiety are worth exploring.

Across racial groups, some studies acknowledge that there is an association between pandemic-era anxiety and race. Some reported that during the pandemic, Whites, compared to Blacks, experienced high levels of anxiety (Jacobs & Burch, 2021; Owen & Saw, 2021). In other research, findings show that as the pandemic progressed, racial minorities experienced high levels of anxiety compared to other racial groups (Hofman, 2021; Nguyen et al., 2022). There were similar findings across educational levels, and some authors reported that anxiety during the pandemic varied across educational levels (De & Sun, 2022). Researchers noted that people with higher education are less likely to suffer pandemic-era anxiety than those with low levels of education (Chlapecka et al.,

2023); however, others stated that a higher educational level is associated with pandemic-era anxiety (Gunjiganvi et al., 2022).

Numerous studies from different countries have investigated pandemic-era anxiety, hypertension, and mental health challenges during the pandemic. Some authors have explored the link between coronavirus-related anxiety and high blood pressure in the elderly population using anxiety measuring scales other than the CAS. Others have paid attention to hypertension in patients diagnosed with the coronavirus infection. At the same time, some have conducted an in-depth study on the association between high blood pressure and anxiety and the effect of high blood pressure on anxiety disorder. Recent health-related studies have suggested that there may be a correlation between hypertension and anxiety, which may be bidirectional. A study conducted in Australia suggested that people who are diagnosed with anxiety are at increased risk of hypertension, and those with preexisting hypertension may be predisposed to anxiety, which may exacerbate their hypertensive health problems (Bonner et al., 2021). Nevertheless, there is a gap in the literature on the link between hypertension and pandemic-era anxiety in the United States and whether hypertension predicts pandemic-era anxiety. In addition, most studies conducted outside the United States used the generalized anxiety scale instead of the CAS. The CAS measures anxiety levels during the pandemic based on five domains surrounding the symptoms of anxiety, such as difficulty sleeping, loss of appetite, nausea, stomach upsets, feeling paralyzed, and dizziness associated with exposure to coronavirus news.

Problem Statement

The research problem is that the impact of preexisting hypertension and demographic factors on pandemic-era anxiety in the United States is unknown. Before the pandemic, anxiety was estimated to affect about 300 million people globally (Yang et al., 2021). The prevalence of the disease increased by 25% following the announcement of COVID-19 as a pandemic and during the first wave of the virus spread, accounting for about 80 million new cases worldwide (Page et al., 2021). Pandemic-era anxiety affected not only people in the general population but also those who are vulnerable to preexisting diseases such as hypertension. A recent study at the beginning of the pandemic estimates that 1 in 4 American adults experienced pandemic-related anxiety (Holingue et al., 2020; Turna et al., 2021).

Additionally, demographic factors such as age, gender, educational levels, marital status, and race could contribute to the high prevalence of pandemic-era anxiety (Celikkalp et al., 2021; Nelson et al., 2020; Sharifi et al., 2022). But pandemic-era anxiety may vary across demographic factors (Haruhiko et al., 2021; McElroy et al., 2020). Inconsistencies in findings require further investigation, and more studies are needed to observe how demographic factors influence pandemic-era anxiety in the United States. Though researchers noted that people with anxiety might be susceptible to hypertension, and those with preexisting hypertension may have an increased risk for anxiety (Bonner et al., 2021; Iswatun et al., 2023; Sensory et al., 2021), currently, there are limited to no such studies in the United States.

Additionally, the CAS adds to the literature gap because most studies conducted

in other countries used mainly the Generalized Anxiety Scale and some other notable anxiety measuring scales apart from the CAS. With a high reliability and validity score, the CAS is unique in measuring pandemic-era anxiety because it measures coronavirus-related anxiety by focusing on five key elements surrounding anxiety symptoms, namely difficulty sleeping, feeling paralyzed, nausea, and stomach upsets, loss of appetite and dizziness associated with exposure to coronavirus news. The current study was significant because it highlights the impact of hypertension on anxiety, creating awareness among public health professionals on developing interventions that included screening and counseling for people with preexisting hypertension and anxiety during a pandemic.

Study Purpose

The primary reason for this quantitative nonexperimental study was to examine the impact of preexisting hypertension and demographic factors on pandemic-era anxiety in the United States and to determine if preexisting hypertension predicts pandemic-era anxiety. The dependent variable for the study is pandemic-era anxiety, and the independent variables are preexisting hypertension and demographic factors (age, gender, educational level, marital status, and race). The study used secondary data from grant-funded research at Walden University named COVID-19 Pandemic Related Stress. The secondary data contained information on pandemic-era anxiety measured using the CAS.

Research Questions and Hypotheses

Two research questions direct the study.

RQ 1: To what extent is preexisting hypertension a predictor of pandemic-era anxiety after controlling for age, sex, and race?

$H_0$1: Hypertension is not a predictor of pandemic-era anxiety after controlling for age, sex, and race.

H_a1: Hypertension is a predictor of pandemic-era anxiety after controlling for age, sex, and race.

RQ 2: To what extent are age, gender, educational level, marital status, and race associated with pandemic-era anxiety?

$H_0$2: Age, gender, educational level, marital status, and race are not associated with pandemic-era anxiety.

H_a2: Age, gender, educational level, marital status, and race are associated with pandemic-era anxiety.

Dependent Variable

The dependent variable was pandemic-era anxiety measured using the CAS score. A score greater or equal to nine was positive for anxiety, and a score less than nine was negative for anxiety. Anxiety was coded as Yes = 1, No =0.

Independent Variables

- Preexisting hypertension (categorical-nominal variable): Yes 1, No = 0

- Age (categorical-ordinal variable) was coded as follows: 18-24 years = 1, 25-34 years = 2, 5-44 years =3, 45-54 years = 4, 55-64 years = 5, 65-74 years = 6, 75 and above = 7.

- Gender was a categorical-nominal variable: Males = 1, females = 2.

- Race was a categorical-nominal variable: Non-Hispanic Whites = 1, Non-Hispanic Black = 2, Hispanic = 3, Asians = 4, and others = 5.

- Marital status (categorical-nominal variable): Married = 1, widowed = 2, divorced = 3, separated = 4, never married = 5, live with partner = 6.

- Educational level (categorical, ordinal variable): Less than a high school degree = 1, high school graduates = 2, some college degrees = 3, and college graduates = 4.

Conceptual Framework

The biopsychological and socioecological models are the theoretical framework that ground and inform this study.

Biopsychological Model

The biopsychological model explains the relationship between health and disease origin. Based on the biomedical model by Geroge Engel in 1977, the model posits that disease is a product of the complex relationship that involve life's biological, psychological, and social aspects (Engel, 1979). The biological factor in the model deals with how the disease interacts with the body's health (Engel, 1977), the psychological factors focus on an individual's mental health role and emotional state and how mental health influences one's behavior (Borrell-Carrio et al., 2004; Engel, 1977), and the social factor explains the influence of social interaction and support on an individual's health and well-being (Engel, 1977). A change in any of the factors may affect other factors, influencing the overall health of the individual negatively (Bolton & Gillet, 2019; Engel, 1979).

The biopsychological model provides a better understanding of how anxiety is a

result of complex interactions between biological, psychological, and social aspects of individuals' lives. Studies have shown that age, gender, and race are some of the risk factors for developing hypertension and anxiety and may influence the risk of developing these diseases (Farhane-Medina et al., 2023; Princewel et al., 2019). These risk factors also highlight the role of genetics and physiology in hypertension and anxiety origin (Bolton & Gillet, 2019; Engel, 1979). Psychological factors focus on how the brain perceives stimuli from the immediate environment, such as the threat from the coronavirus pandemic and its related health problems, making the affected individual more susceptible to pandemic-era anxiety (Bolton & Gillet, 2019; Engel, 1979). Additionally, the social aspect of the construct draws attention to the impact of sociocultural, social interactions, interpersonal, and environmental influences (marital status, educational level) on mental health (Bolton & Gillet, 2019; Engel, 1979). These factors, including social isolation, job insecurity, high level of uncertainty, and health concerns, are some of the elements that impacted mental health during the pandemic (Santomauro et al., 2021). Understanding the relationship between hypertension and pandemic-era anxiety and focusing intervention programs on these factors, including mitigating social and environmental stressors during a pandemic, may improve susceptible individuals' mental health challenges such as anxiety.

Socioecological Model

The socioecological model is a public health model created based on the notion that health is not biological alone but a combination of factors. First introduced by Bronfenbrenner in the 70s, it was later expanded to become a working framework by

McLeroy (Glanz et al., 2002). Bronfenbrenner posited that human development involves complex systems focusing on individuals, behavior, and the environment (McLeroy et al., 1988). Bronfenbrenner's original model divided an individual immediate environment into five systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem (McLeroy et al., 1988).

McLeroy further conceptualized the model, designing it to prevent diseases and reduce the mortality rate in the United States by noting that health is a biological factor, a complex system operating at multiple levels (Mc Leroy et al., 1988). McLeroy et al. (1988) explained the socioecological model as an interplay between social and environmental factors that center on five major components: intrapersonal, interpersonal, institutional, community, and public policy. The intrapersonal component centers on an individual's characteristics, such as knowledge, attitude, behavior, skills, age, gender, and ethnicity. The interpersonal component encompasses formal and informal social networks. These networks include friends, family, workgroups, culture, and social support. The institutional component covers social institutions that are well structured with a set operational rule. The community component focuses on the relationship between organizations and institutions and defined boundaries, providing access to social support and other resources that support healthy living. Public policy consists of local, state, and federal regulations and laws. It also includes policies that guide disease prevention and treatment protocols designed to improve health outcomes.

Numerous studies have used the socioecological model in many health-related studies. In a similar study, Hennein et al. (2021) used the socioecological model to

evaluate predictors of anxiety and other psychological disturbances during the pandemic, reporting social support needs as a predictor of anxiety during the pandemic. The theoretical model fits this study by focusing on multiple risk factors that may be associated with pandemic-era anxiety. The socioecological model's different components, the interrelated nature of components, and how they interact explain the relationship between preexisting hypertension and pandemic-era anxiety (Vink et al., 2008). The framework was used for understanding the complex relationship between preexisting hypertension, demographic factors, and pandemic-era anxiety. The intrapersonal component provides in-depth knowledge of how age, gender, and race influence disease. The interpersonal component accounts for the influence of marital status, and the institutional and community component represents the environmental factors, accounting for educational level and preexisting hypertension and how these factors impact disease outcome (pandemic-era anxiety; Vink et al., 2008). The model gives a detailed understanding of how these risk factors influencing the development of pandemic-era anxiety are critical in designing interventions that address the disorder (Glanz et al., 2002). By applying the conceptual framework to this study, the model could provide knowledge on the difference in risks and how these factors buffer each other at multiple levels to improve health outcomes, highlighting multiple-level intervention approaches and health promotion against anxiety during a pandemic.

Nature of the Study

This research was a quantitative nonexperimental study using secondary data called the COVID-19 Pandemic Related Stress in the United States. The secondary data

was grant-funded research at Walden University. The original data were collected via a cross-sectional design to survey and collect responses from study participants during the coronavirus pandemic. The secondary data helped examine the impact of preexisting hypertension and demographic factors on pandemic-era anxiety and determine if preexisting hypertension predicts pandemic-era anxiety. The selected research method fits the study because it allowed the use of public health theories and frameworks to conclude the relationship between independent variables (preexisting hypertension, demographic factors (age, sex, marital status, educational level, and race), and the dependent variable (pandemic-era anxiety). It was also suitable for my study because it allowed the use of extensive data, in which data are analyzed and reported in numeric form. The original data were collected using a convenient sample structured questionnaire.

I used binomial logistic regression analysis to determine the relationship between the dependent and independent variables. The statistical tool was suitable because the study is quantitative, and the dependent variable was categorical and binary. Binomial logistic regression uses a categorical dependent variable, a categorical (nominal or ordinal) variable, or a continuous independent variable. The study variables gender, race, marital status, and hypertension are nominal, while educational level and age are ordinal variables. The tool also accommodates the use of multiple independent variables and allows the prediction of the association between dependent and independent variables.

Definitions

Age: The length of time an individual has lived from when the individual was

born to the time of the survey.

Coronavirus-related anxiety: An anxiety or anxiety disorder diagnosed during the coronavirus pandemic which is because of the direct or indirect effect of the coronavirus pandemic.

Educational level: According to the U.S. Census Bureau (n.d.-a), educational level refers to the highest level of conventional education a person has completed.

Gender: Socially structured characteristics of a man and a woman (WHO, n.d.).

Marital status: An individual's state of being married, widowed, divorced, separated, never married, or living with a partner (National Library of Medicine, 2017).

Pandemic-era anxiety: Anxiety or anxiety disorder diagnosed during the coronavirus pandemic, which is because of the direct or indirect impact of the coronavirus pandemic.

Preexisting hypertension: Referred to as chronic hypertension or essential hypertension, is the elevation of systolic blood pressure greater than or equal to 140 mm Hg and diastolic blood pressure greater than 90 mm Hg (Unger et al., 2020).

Race: Represents a social structure used to group people for identification (National Human Genome Research Institute, 2023).

Assumptions

This quantitative nonexperimental study used secondary data to address specific research questions. The study used data collected on preexisting hypertension and pandemic-era anxiety. It also included demographic factors such as age, gender, educational level, marital status, and race. This research assumed that the primary data on

the COVID-19 Pandemic-Related Stress in the United States were collected using valid instruments. The study assumed that the data collection followed the ethical process acceptable by the Walden University Institutional Review Board and that the data quality met the standard required for a doctoral study. I assumed that the study participants' responses to the questionnaire were accurate and to the best of their ability. Additionally, I assumed that preexisting hypertension would predict pandemic-era anxiety, and being married, higher education, and young age may reduce the risk of developing pandemic-era anxiety.

Scope and Delimitations

This study was limited to people in the United States during the coronavirus pandemic. The study inclusion criteria included participants in the COVID-19 Pandemic Related Stress survey who are 18 years and above, living in the United States, and willing to provide information on their age, gender, educational level, marital status, history of hypertension, and anxiety. The exclusion criteria included those under 18 years of age and those living outside the United States. The study used the biopsychological and socioecological models to support the secondary data from the COVID-19 Pandemic-Related Stress in the United States. The socioecological model's environmental factor addressed the model's institutional and community components. However, the policy component of the model was outside the scope of this study and thus was not part of the study. The study was further limited to Blacks, Whites, non-Hispanic Whites, Asians, and other races. The study used a convenient sampling method to collect data from study participants. The above information guided the generalizability of the study findings on

the general population that shares similar characteristics with the study participants

(Khorsan & Crawford, 2014). Also, building on existing studies and performing an

extensive literature review helped reduce the threat of external validity in the study

(Burkholder et al., 2020).

Limitations

Some potential limitations to the study that could have impacted the validity of

findings are the accuracy of the data entries and interpretation of the primary data.

Because the study used secondary data from the COVID-19 Pandemic-Related Anxiety

in the United States, there are no assurances that the data were complete and accurate and

that the population the study intended to address was well represented. To address these

potential issues, I thoroughly examined the dataset to ensure the data variables align with

my study variables. I also reviewed the questionnaire used to collect the primary data to

ensure it met my study criteria.

Another challenge to using secondary data was ensuring that the data had enough

participants to achieve the desired outcomes and power for meaningful, significant

findings. Another potential challenge to the use of secondary data was obtaining IRB

approval to use it. Addressing this challenge involved early engagement with IRB, which

was necessary in addressing all issues and study standards. It also included ensuring

reduced bias and conflict of interest and that all ethical protocols were followed,

including ensuring there was a signed informed consent before data were collected.

The primary data used a convenient sampling method, which posed a selection

bias problem. To address this limitation and improve the external validity of the study, I

built on existing research through an extensive literature review on the relationship

between preexisting hypertension and demographic factors and pandemic-era anxiety.

The extensive literature revealed gaps and narrowed the research area to only adults in

the United States (Burkholder et al., 2020). Also, because of the non-randomization of

the study sample, the threat to external validity was mitigated by generalizing the study

result only to those that share similar characteristics with the study sample.

Significance

Studying this topic is that will create awareness and in-depth knowledge of the

association between coronavirus-related anxiety and hypertension. The study can inform

public health authorities, healthcare professionals, hospitals, and clinics on how to

develop and implement interventions. The intervention plan includes screening, early

diagnosis, and tailored treatment for people with preexisting hypertension experiencing

pandemic-era anxiety or may be susceptible to anxiety in future pandemics. It will also

include monitoring for other cardiovascular risk factors that may be associated with

hypertension and anxiety effects.

In addition, the study report will be advantageous to public health practitioners

and healthcare policymakers in crafting health policies on better ways to manage future

pandemics and public health emergencies. The policy changes associated with the study

report can help improve health measures and reduce anxiety and associated triggers in

people with hypertension and other chronic diseases. By encouraging support for policy

changes that improve health, the study effects positive social change by highlighting

anxiety intervention programs during a pandemic, focusing on anxiety and its triggers

and ways to prevent the disease in society. The study findings will also draw attention to increasing accessibility to mental health education and counseling on anxiety and hypertension during a pandemic, including coping mechanisms and ways to mitigate the risks.

Summary

Before the pandemic, a study showed that over 9% of adults in the United States had the disorder, with about 3% classified as moderate cases and 2.5% as severe forms of the disorder (CDC, 2020a). The prevalence of the disorder has increased up to 35% since the COVID-19 pandemic mainly because of complications associated with the virus, increased hospitalization, death, and lockdown (Brooks et al., 2020; Delpino et al., 2022; Pieh et al., 2020; Salari et al., 2020; Haliwa et al., 2021; Turna et al., 2021). Recent study estimates that 1 in 4 American experienced coronavirus-related anxiety which is higher than pre-pandemic level (Haliwa et al., 2020; Holingue et al., 2020; Turna et al., 2021). Recent data also revealed that as confirmed anxiety cases rose in the face of the pandemic, so did the number of people with preexisting disease experiencing the disorder (Holingue et al., 2020; Shuyan et al., 2022). People with preexisting hypertension are particularly anxious about contracting the virus and the impact it may have on their health. Studies from other countries have reported an increase in anxiety prevalence in people with preexisting hypertension (Badria et al., 2020). However, there is limited or no study regarding the relationship between preexisting hypertension and pandemic-era anxiety in the United States, especially using the CAS, presenting a gap in the literature. The present study will focus on the impact of preexisting hypertension and demographic

factors on pandemic-era anxiety using the CAS in the United States. The social change implication of this study is that it will create awareness of anxiety and anxiety risk factors during a pandemic. The findings will help drive policy changes that increase access to mental health education, counseling, and treatment of anxiety and hypertension, improving the overall health of the population.

In this chapter, I introduced the research topic by explaining the prevalence of anxiety before and during the pandemic. I explained the study background, including the problem statement and research gap, which centered on limited or lack of studies on the relationship between preexisting hypertension and pandemic-era anxiety using the CAS. I also explained the study problem, purpose, and research questions and hypotheses that guide the study. To further understand the study, I explained the theoretical framework (biopsychological and socioecological models). I also provided information on the nature of the study, including the study methodology and data analysis using binomial logistic regression. Additionally, I provided definitions for the study's key terms. I closed out the chapter by explaining the assumptions and scope of the study, including delimitation, limitations, and the significance and social change implications of the study.

In the next chapter, I explain the literature review process and literature search strategies. I also explain in detail the theoretical model which informs the study. I then provide a detailed literature review that supports and addresses the research topic and gaps in the literature. I close by summarizing the major theme of the chapter.

Chapter 2: Literature Review

The primary purpose of this quantitative cross-sectional study was to understand the extent to which preexisting hypertension and demographic factors predict pandemic-era anxiety in the United States using the CAS. People with preexisting conditions were anxious about contracting the coronavirus (Gerhards et al., 2023). Specifically, evidence has shown that there is a relationship between anxiety and hypertension. As the prevalence of coronavirus-related anxiety increases, so does the relationship with preexisting hypertension (Zhang et al., 2022). The COVID-19-associated lockdown may also be linked with an increase in the prevalence of anxiety and worsened cardiovascular risk (Berard et al., 2022). People who experience anxiety may have an increased risk for hypertension, and people with preexisting hypertension may be predisposed to anxiety, impacting their hypertensive disorder (Bonner et al., 2021; Gerhards et al., 2023).

While many studies in different countries have focused on coronavirus-related anxiety and hypertension in older populations using the Generalized Anxiety Disorder Scale, other countries have information on pandemic-era anxiety, associated mental health challenges, and treatment of hypertension. For example, Bonner et al. (2021) noted in their study conducted in Australia that there is a possible relationship between anxiety and hypertension, and people with preexisting hypertension may be predisposed to anxiety, further impacting their hypertensive disorder. Despite research on the relationship between anxiety and hypertension, there is a gap in research surrounding preexisting hypertension and anxiety in the United States. Additionally, other studies use a generalized anxiety scale instead of the CAS, which is specific to pandemic-era anxiety

to evaluate anxiety, requiring further investigation.

In Chapter 2, I explore specific literature search research databases related to coronavirus-related anxiety and preexisting hypertension. I review and synthesize the existing literature, exploring evidence related to anxiety and the relationship between pandemic-era anxiety and preexisting hypertension. I also review past and current literature on biopsychological and socioecological models as the main theoretical framework to guide the study and highlight the relationship between the study's independent variables and coronavirus-related anxiety. Finally, this chapter provides concise summary of findings from the literature review, including relevant information on what is known and what is not known regarding preexisting hypertension relationship, demographic factors, and pandemic-era anxiety.

Literature Search Strategy

The literature review was conducted by first reviewing essential literature and research papers through the Walden University Library database. It also included reviewing published dissertations, textbooks, and seminal, all published within the last 5 years, which were accessed using databases such as Embase, PubMed, CINAHL, CINAHL Plus with full text, CINAHL & MEDLINE combined search Science Direct, and Google Scholar. Other sources included Cochrane collection publications, CDC database, MEDLINE with full text, Academic Search Complete, Directory of Open Access Journal, APA PsycINFO, ProQuest Nursing, and Allied Health Database.

I searched previously published and peer-reviewed studies using the following keywords/search terms: *Anxiety* OR *Anxiety disorders in the general population*, *Anxiety*

prevalence, *Anxiety during Pandemic* OR *COVID-19* OR *Coronavirus*, *COVID-19* OR *Sars-cov-2*, *Hypertension* and *Anxiety*, *Preexisting Hypertension* and *Coronavirus-Related Anxiety using CAS*, and *Pandemic-Era Anxiety*. Other terms used in the search include *Age*, *Race*, *Gender*, *Marital status*, and *educational level*. Selected articles were filtered to only pertinent articles published from 2018 to 2023, guaranteeing that only relevant current data are available within the standard and acceptable timespan for the proposed study. Over 48 peer-reviewed full-text articles published between 2018 and 2023 related to anxiety, pandemic-era anxiety, preexisting hypertension, CAS, and demographics such as age, gender, educational level, marital status, and race were selected and applied to the literature review. Additionally, I evaluated the authenticity and applicability of my critical theories to the study, and those deemed appropriate and fitting the study concept were selected and incorporated, providing a better understanding of the study.

Conceptual Framework

This study is grounded and informed by the biopsychological and socioecological models. The biopsychological model is one of the theories that shed light on understanding health and disease origins. Developed from the biomedical model by George Engel in 1977 to account for both illness and patienthood, the model powers on three constructs: (a) biological, (b) physiological, and (c) social (Engel, 1979). The biological factor focuses on the disease's relationship with the body's health (Engel, 1977). The psychological factor explains the role of mental health, an individual's emotional state, and how mental health can influence one's behavior (Borrell-Carrio et

al., 2004; Engel, 1977). A change in one of these factors may result in changes in other factors impacting the overall health of the individual (Bolton & Gillet, 2019). The complex interaction of the concepts and their overlaps gives a clearer understanding of an individual's health and the potential risk of disease and illness, which, when properly considered, paves the way for better treatment.

In the context of this study, the biopsychosocial model highlights the impact of multiple levels of events as a contributing factor to disease development, diagnosis, and treatment, which explains the complex relationship between hypertension and pandemic-era anxiety (Borrell-Carrio et al., 2004). As illustrated in Figure 1, the study variables as they relate to the model are as follows. The biological factors (age, gender, and race) of the model reveal the role genetics and physiology play in the origin of hypertension and anxiety (Bolton & Gillet, 2019; Engel, 1979). The psychological factor centers on anxiety, which is based on how the brain perceives external stimuli, such as the threat from the COVID-19 virus, predisposing the individual to anxiety during the pandemic (Bolton & Gillet, 2019; Engel, 1979). The social factor explains how sociocultural, interpersonal, social interactions, and environmental influences such as marital status and educational level impact mental health (Bolton & Gillet, 2019; Engel, 1979). Social isolation, as experienced during the pandemic, may have adverse effects on people, affecting their ability to mingle, socialize, and maintain healthy relationships in the face of adversity, further impacting their mental health. Additionally, addressing these social and environmental stressors may improve the mental health of people who experience coronavirus-related anxiety.

Figure 1

Biopsychological Model Showing Interaction of the Major Components
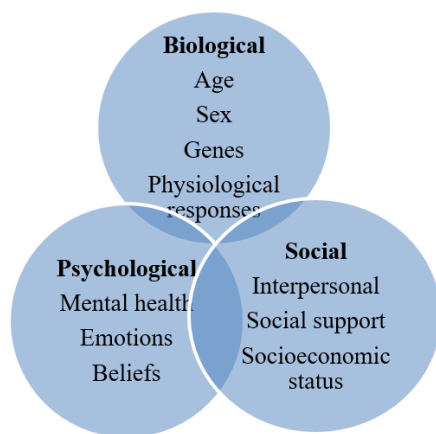
Note. Biopsychological model showing how the several factors interact to impact physical and mental health. Adapted from "Establishing a Theoretical Basis for Research in Musculoskeletal Epidemiology: A Proposal for the Use of Biopsychological Theory in Investigation of Back Pain and Smoking," by B. N. Green and C. C. Johnson, 2013, *Journal of Chiropractic Humanities 20*(1), p. 4 https://doi.org/10.1016/j.echu.2013.10.004. Copyright 2013 by National University Health Science. Adapted with permission.

Use of Biopsychological Model

In practice, the biopsychological model has been used in many public health studies to evaluate how disease origins are affected by the multiple levels of organization, ranging from biological components to societal factors that influence our existence (Bolton & Gillet, 2019). This model is instrumental in designing multilevel intervention programs that reduce disease risk in individual, societal, and healthcare settings. The broad use of the model has received attention in many medical fields and subspecialties,

including the application to mental health and pain management (Anrasik et al., 2005; Cohen et al., 2021). For example, Rosignoli et al. (2022) applied the biopsychological model to evaluate migraine origin and understand the clinical implications and strategic management measures to mitigate the risk of the disease. They acknowledged that the worsening of migraine could be because of environmental and social factors such as stigma, lack of support, and complex influences from a working environment. They concluded that a holistic approach to migraine management is needed. While pharmacotherapy is needed, it is best to tailor migraine management to individual needs, incorporating a nonpharmacological approach to treat the multiple biopsychological factors associated with migraine that could trigger the disease.

Bilgin et al. (2022) also used the biopsychological to evaluate coronavirus-related anxiety and pain management. They attributed pain during the pandemic as a complex interaction that compromises biological, physiological, and social factors based on the biopsychological model. Similarly, Nurnberger et al. (2022) used the model to examine factors that contribute to worsening fear of the coronavirus, examining the relationship and interaction between somatic risk, anxiety, depression, phobias, and social support, social media news, and social interactions and contact with people with confirmed cases of coronavirus.

Rationale For Using the Biopsychological Model

To help improve coronavirus-related anxiety, the biopsychological model is essential in understanding the different factors and variables that affect disease origins and outcomes of coronavirus-related anxiety. The model's components can help public

health authorities and healthcare systems understand the relationship between

hypertension and pandemic-era anxiety, assisting in providing targeted intervention to

reduce the risk of the negative outcome of anxiety. For example, public health authorities

may counsel people with chronic diseases such as preexisting hypertension and anxiety

and ways to mitigate the risk of the disorder during a pandemic. They could also

encourage people to seek social support to increase their resilience against the disorder.

Socioecological Model

The socioecological model of health promotion runs on the premise that health is

not biological but a combination of other factors. First pioneered in public health in the

70s by Bronfenbrenner, the model was expanded to become a working framework a year

later by McLeory after examining the model and the impact on social interest in

preventing disease (Glanz et al., 2002). The Bronfenbrenner model framework addressed

the interaction of behavior, individuals, and the environment as a complex system that

influences human development (McLeroy et al., 1988). Bronfenbrenner's original model

divided an individual immediate environment into five systems: microsystem,

mesosystem, exosystem, macrosystem, and chronosystem (McLeroy et al., 1988).

McLeroy et al. (1988) conceptualized the model to evaluate its ability to prevent

disease and reduce the mortality rate in the United States. They noted that health is a

biological factor and a complex system operating at various levels. The authors

concluded that the model can best be applied if it can induce behavioral changes that

positively reduce the risk of chronic and debilitating diseases and promote health.

McLeroy et al.'s socioecological model of health centers on the interaction of social and

environmental factors that cover four major components as illustrated in Figure 2: (a)

intrapersonal factor, which centers on the characteristics of an individual such as

knowledge, attitudes and behavior, skill, age, gender, ethnicity; (b) interpersonal which

they described to include formal and informal social networks such as friends and family,

workgroups; (c) institutional factors consist of a social institution that has organizational

features with operational rules; (d) community factors which they described as a

relationship between organizations and institution with defined boundaries in which a

person lives, which may provide access to resources and social support; (e) public policy

consisting local, state and federal laws and policy which may be critical to health

outcomes (McLeroy et al., 1988).

Figure 2

Levels of the Socioecological Model
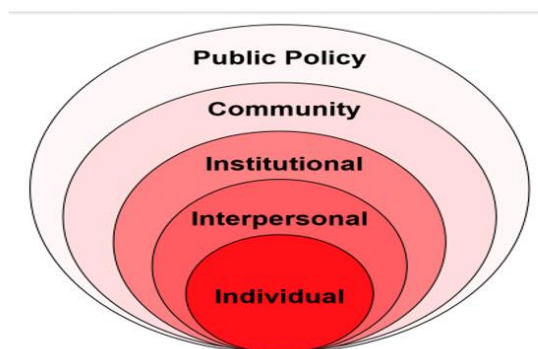
Note. Based on "The Social Ecology of Health Promotion Interventions," by K. R.

McLeroy, A. Steckler, and D. Bibeau, 1988, *Health Education Quarterly, 15*(4), 351–

377. Adapted with permission.

The socioecological model of health is a valuable public health theory that

highlights the several interactive factors at different levels that can affect health

(Shimamoto et al., 2022). The model's components are interrelated, interact, and do not operate in isolation. Because of the interrelated nature of the components, the model provides a better understanding of the contributing factors surrounding the development of chronic diseases such as hypertension, coronavirus-related anxiety, and diabetes. The socioecological model sets the stage and presents the best approach to health promotion, disease prevention, and intervention designs that mitigate health risks using various means, including the healthcare system (Nguyen et al., 2022). It also includes the sociocultural environment and how focusing on community engagement in situations like the COVID-19 pandemic may reduce anxiety (Caperon et al., 2022). The multilevel approach of the model informed my decision to adopt the theoretical framework in explaining that disease is not only biological but rather a combination of factors interacting to affect the health of individuals with preexisting hypertension experiencing coronavirus-related anxiety (Hreha, 2023). This concept shows the role social and environmental factors play in the complex relationship between pandemic-era anxiety and hypertension.

Intrapersonal Level

The intrapersonal level is the physical, biological, and psychological traits of an individual that predispose one to developing mental health challenges like anxiety (Bronfenbrenner, 1977; McLeroy et al., 1988). The physical attributes related to this study that fall under the intrapersonal level are age, gender, race, and ethnicity. Other notable attributes outside the scope of this study include genetics, previous medical conditions, knowledge, and attitude toward anxiety and hypertension, which fall under

psychological traits (Scarneo et al., 2019). The intrapersonal level-associated factor may result from interpersonal interaction and sociocultural factors (Scarneo et al., 2019).

Interpersonal Level

The interpersonal level centers on an individual's relationship and social network; the level may influence behavior based on the relationship surrounding the individual (Glanz et al., 2002). Examples of the social network relevant to this study are marital and employment status. Other examples of social networking not included in this study but relevant to the concept are parents, families, friends, and work groups (Glanz et al., 2002). Intervention strategies at this level can help build strong resilience against anxiety and hypertension during the pandemic by creating an environment where problems are shared and mitigated through social support and encouragement to seek medical attention when needed. The concept runs on the fact that social networking interpersonal relationships with others can influence an individual's attitude and perception towards anxiety and hypertension during a pandemic, influencing when to seek medical attention or how to mitigate the risks associated with the disease.

Institutional Level

This level of socioecological model aims at institutions and organizational characteristics that center on set rules and regulations, which, when enforced, influence behaviors (Golden & Earp, 2012). An example of organizational level is the workplace, which, for this study, is addressed through the educational level. Guidelines, rules, and regulations in educational institutions guide the behavior of an organization, which may influence behavior against contracting the coronavirus (Bronfenbrenner, 1977; McLeroy

et al., 1988). Understanding set guidelines such as social distancing, handwashing, and getting vaccinated against the virus may be critical in helping reduce the anxiety associated with contracting the coronavirus.

Community Level

This level of socioecological model aims at both the physical environment and the social institutions with organizational characteristics with a strong network and relationship between these organizations, creating a larger community (Golden & Earp, 2012). The community level is critical in determining behavior, including understanding the social culture norms in that environment. It also provides insight into acceptable attitudes and behaviors in the community. The level is vital in determining the origins of healthy behavior.

For the sake of this study, educational level is an essential variable that will help determine how people in a community receive knowledge about coronavirus and the available resources, such as the coronavirus vaccine within the built environment, which is critical in reducing the palpable anxiety levels in the community. Oianiyan et al. (2021) noted that educational level is essential in understanding community leaders' impact on community members during COVID-19 public health outreach to educate and reduce the spread of the virus. The lack of education may be a hindrance to adopting a health promotional program against pandemic-era anxiety and treatment of hypertension.

Policy Level

The last level of the socioecological model is the policy level. This level comprises laws, policies, and regulations from local, state, and federal governments

designed to allocate resources to promote health and prevent diseases (Golden & Earp, 2012). It also includes protecting communities and vulnerable populations by enforcing laws and regulations that may help reduce community health inequalities. The policy level can reach and impact larger communities, making it an effective target when designing health promotion strategies. Actions taken at this level will provide resources and access to mental health education and counseling for people with pandemic-era anxiety and preexisting hypertension.

Use of the Socioecological Model

The socioecological model has been used in numerous studies to show the interaction between individuals, the community where they live, and the environment and how the relationship shapes human behavior (Glanz et al., 2008). The framework broadens the understanding of the factors associated with the relationship between chronic diseases such as preexisting hypertension, demographic factors, and pandemic-era anxiety and mental health challenges, providing needed strategies in disease prevention and behavioral modifications at multiple levels to improve health and promote a better quality of life (Cowan et al., 2021: Gaspar et al., 2022; Woodgate et al., 2020).

One research work applied the socioecological model by examining the predictors of anxiety disorder and other psychological disturbance outcomes among the healthcare workforce during the COVID-19 pandemic (Hennein et al., 2021). Using data analyzed from 1092 participants to inform intervention that supports the target population, Hennein et al. (2021) identified social support needs as a predictor of anxiety and other mental health challenges during the pandemic. They noted that decreased social support is

associated with psychological distress during the pandemic, increasing odds of experiencing major depression, generalized anxiety, posttraumatic stress disorder, and alcohol use disorder. Operating at the interpersonal level of the socioecological model, the decrease in individual relationships with others and lack of social network creates poor social interaction with others, limiting resilience building in people going through adversity. The authors emphasized the need to strengthen social support and resilience to protect mental health against future disease outbreaks. They also reported that maintaining social support during lockdown and social distancing during the pandemic is one way to build resilience against mental health challenges. Therefore, public health professionals can target strengthening social support network intervention at the interpersonal level of the model during a pandemic. The targeted intervention may include a wellness check, social distancing in-person meeting, or a virtual town hall meeting that actively vocalizes and listens to people's feelings, encouraging resilience against psychological challenges during a pandemic.

On the other hand, another study centered on controlling the factors that directly or indirectly influence human behavior at all levels, leading to negative consequences on mental health. For example, Aruta. (2022) study to examine the socioecological determinants of psychological distress (anxiety and depression) among Filipino adults during the COVID-19 pandemic. The author noted that building resilience at individual and national levels and financial challenges at the family level are strong predictors of psychological distress. By focusing attention on social networks that encourage social support at individual, family, and national levels, people who are predisposed to anxiety

and other mental health can build solid resilience against mental health challenges.

Furthermore, it paved the way for all-inclusive mental health policies and intervention protocol that is protective against mental health crisis during disease outbreaks. Taking this approach, the rationale based on this model highlights the level of influential factors from the model that contribute to anxiety and how targeting each level allows for improvement in intervention strategies encompassing individual, political, and sociocultural foundations in society. While there are five components of the model (intrapersonal, interpersonal, institutional, community, and policy), as illustrated in Figure 2, the primary concern of this study is the intrapersonal, interpersonal, institutional, and community levels of the model, as described in Table 2. The institutional and community levels represent the environmental factors.

Rationale for Using the Socioecological Model

My proposed study's use of the socioecological model and the relationship with coronavirus-related anxiety centered on the systemic review of studies on risk factors of anxiety that concluded that a combination of multidimensional factors influences the disorder (Ramey-Moore et al., 2021). The model's framework demonstrates how the interaction of several factors within the five components of the model (interpersonal, such as age, gender, and race; interpersonal, such as marital status; environmental factors, such as educational level; and medical conditions like hypertension) could influence disease outcomes (Vink et al., 2008). These factors identified are part of significant components of the socioecological model, which also aligns with my dissertation variables of age, gender, hypertension, educational level, marital, race, and pandemic-era

anxiety.

The model is vital in health promotion because it allows target intervention to reduce disease risk. It also allows for the simultaneous implementation of health promotion and intervention at every level of the framework for effective disease mitigation and risk reduction. Based on these facts, adopting the framework to create awareness of coronavirus-related anxiety and its relationship to hypertension in people with preexisting hypertension is critical in reducing the outcome of the disease. Also, acting at the policy level provides resources for anxiety intervention during a pandemic, increasing accessibility to mental health education, counseling, and treatment for everyone, including the most vulnerable in society.

Literature Review

Anxiety is one of the most documented emotional disorders, affecting over 300 million people worldwide before the pandemic (Yang et al., 2021). At the beginning of the pandemic's first wave, current data indicated that the disorder increased by 25%, equivalent to about 80 million new cases worldwide (Page et al., 2021). Pre-pandemic data in 2019 estimated that about 9.5% of adults in the United States experienced mild anxiety symptoms, with 3.4% accounting for moderate cases and 2.7% experiencing severe symptoms (CDC, 2020a). However, during the pandemic, it was estimated that the anxiety prevalence in the general population was about 35%, attributed to the coronavirus and its complications, including public health measures such as lockdowns and social distancing that limited the spread of the virus (Brooks et al., 2020; Delpino et al., 2022; Pieh et al., 2020; Salari et al., 2020).

Anxiety is a severe public health concern characterized by fear, worries, panic, tension, and increased blood pressure, which may be temporary or persist, affecting everyday activities (NIMH, 2023). The condition may be associated with restlessness, increased respiration, and heartbeats over things that a person perceives as a problem or, in some cases, results from the anticipation of fear of potential danger yet to occur (NIMH, 2023). The disorder is a significant concern to public health practitioners and health care professionals, affecting many adults in the United States and predisposing them to health problems (NIMH, 2023; Szuhany & Simon, 2022).

Haliwa et al. (2021) and Turna et al. (2021), in their research on psychological disturbance during the COVID-19 pandemic, found that anxiety increased after declaring COVID-19 a pandemic. Also, the high level of worry because of the virus and its complications was associated with high levels of anxiety in the general population (Gerhards et al., 2023). The threat from the virus was equally palpable in those with preexisting diseases. People with preexisting chronic diseases were under enormous psychological stress, and many in this vulnerable group saw an increase in anxiety because of the threat of the COVID-19 virus (Gerhards et al., 2023; Rajkumar, 2020).

Hypertension

Hypertension is one of the common diseases affecting the cardiovascular system, estimated to affect over 1.2 billion people worldwide, and is one of the factors responsible for premature death and all-cause mortality globally (Mills et al., 2020; WHO, 2023). The disease is common in people between the ages of 30-79. Approximately 40% of people with the disease are unaware, and only about 40% are

diagnosed and treated (WHO, 2023). In the United States, the prevalence of the disease

based on age-adjusted figures was 45%, affecting over 50% of men and about 39% of

women (CDC, 2020b). The disease is predominantly common among blacks, accounting

for 57%, and Hispanics, 44%, compared to whites 43% (CDC, 2020b).

Over the years, several studies have suggested that there is a relationship between

anxiety and hypertension. One study suggested anxiety as a risk factor for hypertension

and proposed that the link between anxiety and hypertension may be bidirectional

(Johnson, 2019). Others suggested screening people with a confirmed diagnosis of

hypertension, especially during the COVID-19 pandemic, for anxiety to mitigate the risk

and mortality rate outcome (Loke & Ching, 2022). Additionally, several factors are

implicated in the increase in pandemic-era anxiety levels in the general population and

among those with chronic disease. One study found that the increase in pandemic-era

anxiety was because of increased hospitalization following COVID-19 infection,

especially for patients with preexisting diseases (Khairy et al., 2022).

Findings from several research studies have shown that there may be a

relationship between preexisting hypertension and anxiety, and others have refuted the

findings. In Malaysia, Loke and Ching. (2022) showed that psychological distress, such

as anxiety, worsened hypertension management. Said et al. (2023) finding showed that in

Saudi Arabia and during the COVID-19 pandemic, the prevalence of anxiety among

patients with a confirmed diagnosis of hypertension was high when compared to the

general population. They attributed the increase in anxiety levels in the general

population to smoking, Khat chewing, older age, high body mass index, and lack of

compliance to medication to those with preexisting hypertension.

Arora et al. (2021), in their study in India to examine people with preexisting hypertension and diabetes and the relationship with depression, anxiety, and stress during the COVID-19 pandemic lockdown, reported that lockdown was associated with increased pandemic-era anxiety and mental stress for people with hypertension. They concluded that people with preexisting conditions (hypertension and diabetes) may be predisposed to more significant psychological challenges compared to others with no disease. A report from another study in Korea indicated that people with chronic disease (hypertension and diabetes) have increased coronavirus-related anxiety and depression, with poor handwashing measures than those without hypertension and diabetes (Kim & Kim, 2020). The authors attributed the increase in anxiety levels to fear of contracting COVID-19 and death, which was responsible for increased handwashing before food.

In another study to examine the relationship between chronic disease and pandemic-era anxiety, Gerhards et al. (2023), in their study in Germany, evaluated the link between sociodemographic factors, social support, and resilience during the COVID-19 pandemic with old age depression and anxiety. The authors reported that depression and anxiety in old age were significantly higher in people with cardiovascular risk, such as hypertension, compared to the general population. They attributed the high level of depression and anxiety among people with preexisting cardiovascular risk factors because of threats from the virus. A similar study conducted in Australia, reported that pandemic-era anxiety was higher in people with preexisting hypertension, which also demonstrated higher vaccination intention (Bonner et al., 2021). According to Zhang et al. (2022), older

patients between the ages of 60 and 80 with a confirmed diagnosis of hypertension in China showed an increased level of coronavirus-related anxiety, which in turn negatively impacts their morning systolic blood pressure, worsening blood pressure control and increasing cardiovascular risk.

A study conducted in Turkey by Celik et al. (2021) showed that anxiety levels were high among people with preexisting hypertension using the Hospital Anxiety and Depression Scale (HADS) questionnaire. Authors also reported that the pandemic-era anxiety experienced among preexisting hypertensive patients contributed to poor blood pressure control among those whose treatment regimens did not change. Likewise, a study conducted in France by Berard et al. (2022) on the effect of pandemic-related lockdowns on cardiovascular risks such as hypertension and mental health reported an increase in anxiety among patients with cardiovascular risks. They also reported that a COVID-19-related lockdown was associated with worsening of the cardiovascular risk factor.

Unlike studies that showed a link between hypertension and coronavirus-related anxiety, Sensory et al. (2021) reported that in Turkey, there was an independent association between anxiety symptoms and hypertension in people with confirmed cases of coronavirus infection and those hospitalized because of the viral infection. They also acknowledged that the Beck Anxiety Inventory (BAI) was used to assess anxiety state in study participants. The BAI measures anxiety using 21 evaluation sentences that cover symptoms of anxiety such as tingling, numbness, sweating, heat, fear, inability to relax, dizziness, increase in heart rate, nervousness, choking feeling, and trembling hands

within the last seven days (Lee et al., 2018; Oh et al., 2021). The measuring tool is a self-reporting inventory used to measure the frequency and severity of anxiety symptoms in adolescents 18 years and older and adults on a four-point intensity scale in which the final score ranges from 0 to 63 (Lee et al., 2018). Sensory et al. (2021) also reported that sociodemographic factors were not associated with depressive and anxiety symptoms, regardless of the patient's hospitalization status. Additionally, Iswatun et al. (2023) reported that people with preexisting hypertension saw decreased anxiety levels and increased spiritual well-being in Indonesia during the pandemic. Based on the findings from countries other than the United States and the discrepancies in study outcomes on the relationship between hypertension and pandemic-era anxiety, further investigation is required to explore the association between the two variables in the United States of America.

Demographic Factors

Age and Gender

Sociodemographic factors such as age and gender are essential factors often considered in public health research, providing vital data on determinants of health and health status and reducing bias estimates in population-based health studies (Vo et al., 2023). Previous studies' findings have shown no link between age, gender, and anxiety; however, others have acknowledged an association between these variables (Celikkalp et al., 2021; Nelson et al., 2020; Sharifi et al., 2022). Numerous studies have reported significant inconsistencies in the relationship between age, gender, and anxiety. For example, recent studies have shown there is a correlation between age, gender, and

pandemic-era anxiety with older population experiencing anxiety more than other age groups and women more likely to experience anxiety compared to men (Caycho-Rodriguez, 2021; Caycho-Rodriguez et al., 2022; Loke & Ching, 2022; Saeed et al., 2023; Wong et al., 2020; Yarrington et al., 2021). However, Bauerle et al. (2020), in their study to examine the anxiety and other psychological challenges during the COVID-19 pandemic in Germany, reported that younger people and females are more likely to experience pandemic-era anxiety than men and older adults. A similar published result also showed that females developed anxiety 2.5 times compared to men 1.6 times (Arora et al., 2023).

During the COVID-19 pandemic in China, Li et al. (2020) revealed that the prevalence of COVID-19-related anxiety varied across gender and age. The authors reported a high prevalence of coronavirus-related anxiety in men over 60 years of age and females who are between 50 and 60 years of age. They noted that those between 18 and 50 years had a lower prevalence of the disorder. Gunjiganvi et al. (2022) noted in their study in India on anxiety and depression during the COVID-19 pandemic that males, compared to females and middle age groups, are at high risk of developing coronavirus-related anxiety and depression. However, in another study, De and Sun. (2022) reported that although a proportion of adults reported anxiety during the COVID-19 pandemic, the anxiety level did not vary across age groups. They also reveal that female and unmarried people were more likely to experience anxiety during the COVID-19 pandemic. In addition, research conducted by Said et al. (2023) on anxiety factors and the relationship with hypertension reported that anxiety was associated with age, impacting the older

population more than others. They also reported that gender was not associated with anxiety in patients with preexisting hypertension. These heterogeneous reports on the impact of age and gender on pandemic-era anxiety are worthy of further exploration to determine how these variables interact.

Race/Ethnicity

Race/ethnicity is one of the critical factors used in various public health research to understand the level of disparities in a community (Frey, 2023). It centers on people's unique characteristics and physical attributes that divide them into various groups. It shows why some groups are impacted more by diseases or who is affected more by disease distribution, health disparities, and inequities (Frey, 2023). During the COVID-19 pandemic, many thought that the disease was a great equalizer of health inequalities; however, research has revealed that the distribution of COVID-19 disease and its related mental health (anxiety) varied across race and ethnicity as the disease progressed (CDC, 2021).

Researchers have suggested that there may be a robust link between anxiety and race/ethnicity. Many studies have investigated the relationship between race/ethnicity and coronavirus-related anxiety. Some researchers, based on their findings, acknowledge that a disparity exists across races, affecting blacks and Hispanics more than whites, while others rebutted the finding. In the study conducted by Owens and Saw (2021), they argued that despite the economic hardships and threats from diseases, Blacks experienced less anxiety and mental health challenges than whites during the pandemic. The authors did not find any difference in the level of anxiety across other races (white, Hispanic, and

Asian). The finding adds to another study in which the authors reported that anxiety among blacks was low compared to other races/ethnicities at the beginning of the pandemic (Jacobs & Burch, 2021). However, as the pandemic progresses, the prevalence of anxiety increases by 20% across all races because of the rising unemployment rate, lack of access to healthcare, and the economic impact of the pandemic on ordinary citizens (Ueda et al., 2020).

Nguyen et al. (2022) noted that racial minorities may experience a disproportionate level of coronavirus-related anxiety when compared to other racial groups. The result is similar to the findings reported by Hofmann. (2021), in which they examined the prevalence of racial differences in anxiety during the COVID-19 pandemic and suggested that blacks and indigenous people of color may be at greater risk of coronavirus-related anxiety than whites. The author attributed the high prevalence among blacks to the negative impact of the virus. Similar study results were reported by Wen et al. (2023) in their study on racial-ethnic differences in psychological challenges. In their findings, the authors noted that racial minorities in the United States experienced higher levels of anxiety and psychological distress than their white counterparts, mainly because of socioeconomic problems and discrimination. The research supports the understanding that black and other minority groups experience economic hardship due to their socioeconomic status, limited access to healthcare, and a higher rate of unemployment compared to whites (Magesh et al., 2021). These experiences, together with the government-mandated lockdown, the devastating impact of the pandemic, and the rising COVID-19 mortality rate, may add to their anxiety level, impacting their health status

and general well-being.

Unlike the study outcomes above, Breslau et al. (2021) reported that Hispanics experienced a higher level of anxiety and psychological distress than other race/ethnic groups. Contrary to all the findings, Adzrago et al. (2022), in their study on anxiety among adults, reported that non-Hispanic whites with poor health experienced anxiety and were more likely to report anxiety symptoms compared to other races. They also noted that older populations of blacks and Asians who engage in moderate physical activities were less likely to report anxiety during the pandemic. However, the authors also noted that young blacks and Asians with poor health experienced levels of anxiety than their counterparts. The variations in reports from these studies on the relationship between race/ethnicity and coronavirus-related anxiety require further research to determine how the demographic factor impacts coronavirus-related anxiety in the United States.

Educational Level

Educational level is one demographic factor that may influence an individual in various aspects and may serve as a source of resources that influence people's socioeconomic status, particularly during a pandemic. It plays a critical role in health outcomes such as anxiety in an individual both at the intrapersonal and interpersonal levels. Researchers have suggested that a high level of education may protect against chronic diseases such as hypertension and reduce mortality rates because of increased access to jobs, resources, and healthcare services (Grytten et al., 2020). Others have suggested it may help protect against mental health challenges like anxiety, which may be

lacking in people with low levels of education (Chlapecka et al., 2023). The demographic

factor is an added advantage for people with preexisting hypertension, offering them an

understanding of the risk the COVID-19 virus poses to their health and when to seek help

in the face of adversity.

Sharifi et al. (2020) suggested in their recent study report that educational level is

associated with anxiety before and during the pandemic. Another study reported that

pandemic-era anxiety varies across educational levels (De & Sun, 2022). However, the

level of anxiety based on the educational level remains controversial to researchers. For

example, Gunjiganvi et al. (2022) reported that people with high education are at

increased risk of anxiety. The high prevalence of anxiety in people with high educational

levels was associated with increased access and awareness of mental health information

and its related challenges, including health information on how to mitigate the risk

associated with the disorder (Lemuel et al., 2021).

In addition, studies have shown that those with higher levels of education have

access to information and resources that inform them of the symptoms of anxiety,

including health promotions and interventions, than those with low education (Lopez et

al., 2018). Another study attributed the increased prevalence of anxiety among people

with high educational levels to being anxious more than those with low educational levels

(Said et al., 2023). Unlike the studies that show a correlation between high educational

levels and coronavirus-related anxiety, Arora et al. (2023), during the COVID-19

lockdown, showed that pandemic-era anxiety may be related to low educational levels.

The authors report that psychological challenge (anxiety) is more likely to affect people

with minimal to no formal education than graduates and postgraduates.

Furthermore, in another study conducted in France during the COVID-19 pandemic to determine if educational level is associated with anxiety, Joannes et al. (2023) reported that people with low educational levels may be at greater risk of anxiety compared to those with higher education. The anxiety level may be because people with low levels of education are exposed to stressful environments, poverty, lack of access to health care, and poor resilience (Inoue et al., 2023). In addition, people with low levels of education may be impacted more because of limited access to basic needs, given that the COVID-19 pandemic has caused challenging situations (Inoue et al., 2023). One example of the challenging situation includes nationwide lockdown, which limited access to food, health, and social services, creating a negative psychological and social effect impacting their overall well-being (Inoue et al., 2023; Neimeyer et al., 2020). Although there are reports that link educational level to anxiety, these reports are not without inconsistencies. The variations in reporting on who experiences a high level of anxiety among different levels of education require further investigation to determine the relationship between educational level and coronavirus-related anxiety.

Marital Status

Marriage is a social feature that is significant in mental health and may serve as a valuable tool in determining the likelihood of developing a disease (Grundstorm et al., 2021). Researchers have argued that marital status is a predictor of psychological challenges such as anxiety, with unmarried people experiencing a more significant burden of psychological distress than others (Reema et al., 2023). Those who are married

and those engaged in a stable intimate relationship are more likely to have better mental well-being protective against anxiety than those who are not (Dean et al., 2021; Hsu & Barrett, 2020; Rapp & Stauder, 2020). The sound mental health among those who are married may be because of access to social and financial support and the ability to build resilience against coronavirus-related anxiety.

Sarikaya. (2021) studied the impact of pandemic-era anxiety and burnout among music teachers and reported that anxiety and burnout differ by marital status. The author noted that coronavirus-related anxiety and burnout were more significant among single and unmarried teachers than those who were married. Hooyeon et al. (2022) reported that being married is protective against poor mental health. They acknowledged that people who are married are less likely to experience anxiety than single or divorced people. Likewise, Said et al. (2023) reported a strong relationship between marital status and anxiety, mainly impacting widowers more than others in the group. Similarly, Kumar et al. (2023) also noted that being single is a predictor of anxiety compared to those who are married.

Contrary to the finding above, Karasu et al. (2022) reported that people who are married and those married with children experience significantly higher levels of anxiety than those who are single. Also, Chew et al. (2020) noted that married healthcare workers experienced higher levels of coronavirus-related anxiety symptoms than those who identified as single. The less consistent finding, as reported by Karasu et al. (2022) and Chew et al. (2020), on the relationship between marital status and anxiety requires further investigation. The investigation will explore and distinguish which marital status group

(married, widowed, divorced, separated, never married, and live with partner) is affected mainly by coronavirus-related anxiety, adding value to the current literature.

Coronavirus Anxiety Scale

The CAS measure anxiety level in people during the COVID-19 pandemic. Developed by Sherman A. Lee in 2020 to aid in diagnosing anxiety dysfunction during the pandemic, the measuring scale centers on five domains that cover symptoms of anxiety, namely difficulty sleeping, feeling paralyzed, nausea and stomach upset, loss of appetite and dizziness associated with exposure to coronavirus news (Lee, 2020a). The scale was developed based on the assessment of 775 adult participants with anxiety associated with the COVID-19 virus. It distinguishes those with dysfunctional anxiety from those without dysfunctional anxiety. A score of greater or equal to 9 (90% sensitivity and 85% specificity) is positive for coronavirus anxiety, and any score less than nine is negative for anxiety (Lee, 2020a).

Clinicians and researchers around the globe widely support the use of the measuring scale as an excellent and effective tool to measure coronavirus anxiety (Lee, 2020a; Lieven, 2023). A published study using the instrument, using 775 adult participants, shows that the CAS has strong reliability with a reliability of ($\alpha= 0.92$) (Lee, 2020a; Lee et al., 2020b). Also, a study on the correlation between CAS scores and demographics, COVID-19 diagnosis, anxiety history, hopelessness, suicidal ideation, fear of coronavirus, functional impairment, coping, and social attitude showed a strong validity of the scale to screening for mental health anxiety challenge for COVID-19 (Lee et al., 2020; Silva, 2022).

The scale has been used in many studies to evaluate the level of pandemic-era anxiety around the globe. For example, Graziella et al. (2021) used the CAS to examine if sociodemographic factors influenced the anxiety and fear associated with the coronavirus in Italy. They reported that demographic factors of age, sex, educational level, and cohabitation influenced coronavirus-related anxiety. In another study conducted in China, Qiaoping et al. (2022) used the CAS to evaluate the psychological disturbance (anxiety) level linked with the COVID-19 delta variant. They assessed the measuring instrument's internal consistency, convergent, and validity. They concluded that the measuring instrument's validity and reliability to the delta variant COVID-19-associated anxiety is high.

Similarly, Myung et al. (2020) study examining coronavirus disease in cancer patients used the Stress and Anxiety to Viral Epidemics (SAVE-6) and the CAS. The authors reported that the CAS was successful in assessing the anxiety level of cancer patients with COVID-19 disease. They also suggested using the scale in moderate to severe cases of mental health challenges during viral outbreaks.

The CAS is relevant to my study because it is vital in testing pandemic-era anxiety. The scale is specific to coronavirus anxiety, making it a unique tool to assess COVID-19-related anxiety. Studies on the relationship between anxiety and hypertension during the pandemic used different measuring instruments that measure anxiety but not specific to coronavirus anxiety. For example, Delpino et al. (2022), in their systemic review of 2 million people on the prevalence of coronavirus-related anxiety, noted that many studies used the Zung Self Rating Anxiety Scale (SAS), the State-Trait Anxiety

Inventory (STAI), and the Generalized Anxiety Disorder -2 to measure COVID-19

associated anxiety in the population. Similarly, Bonner et al. (2021), in their study report

on the impact of mental health challenges on hypertension in Australia, acknowledged

that the study used the State-Trait Anxiety Inventory (STAI) to measure pandemic-

related anxiety among their study participants.

Other studies have used several notable instruments to measure COVID-19

anxiety. For example, in a study on the relationship between hypertension and COVID-

related anxiety in Korea and India, the authors did not use any standard anxiety

measuring scale to evaluate the association between the two variables (Kim & Kim,

2020). Also, in a study conducted in India on the relationship between anxiety, stress, and

depression on hypertension during the pandemic, the authors used the Depression

Anxiety Stress Scales to measure Anxiety (Arora et al., 2023). In Indonesia, a similar

study on the relationship between anxiety and hypertension used the Geriatric Anxiety

Scale (GAS) to evaluate anxiety across the study participants (Iswatun et al., 2023).

Despite all the notable measuring instruments mentioned above, none is specific

to coronavirus-related anxiety. The new instrument is proven valid and reliable in

measuring coronavirus-related anxiety. The instrument is exceptional because it measures

anxiety related to the news surrounding the COVID-19 pandemic. Applying it to the scale

of my study will present a unique understanding of the relationship between the variables.

It will also help address the gap in the literature, providing in-depth knowledge and a

different perspective on how to approach anxiety during future pandemics. The CAS uses

a Likert scale format that scores 0 for not all, 1 for rare, less than a day or two, 2 for

several days, 3 for more than seven days, and 4 for nearly every day over the last two weeks to evaluate five specific fields that assess difficulty sleeping, loss of appetite, nausea, stomach upsets, feeling paralyzed, and dizziness associated with exposure to coronavirus news.

Synthesis of Articles

Several study reports used in the literature review demonstrated a link between preexisting hypertension and anxiety during the pandemic. It is essential to note that not all study findings came to the same conclusion. Current studies conducted around the world, except in the United States, to understand the relationship between preexisting hypertension and anxiety during the pandemic found that psychological challenge prevalence was high among people with hypertension compared to people with no history of hypertension (; Arora et al., 2021; Berard et al., 2022; Bonner et al., 2021; Celik et al., 2021; Loke & Ching, 2022; Said et al., 2023; Zhang et al., 2022). Some of the identified contributing factors to the increased anxiety levels in people with preexisting hypertension are lockdowns that limited social support and interaction within the community and the fear of contracting the coronavirus and its related health complications and death (Arora et al., 2021; Berard et al., 2022; Kim & Kim, 2020). Additionally, others attributed the increase in the pandemic-era anxiety level among people with chronic hypertension to old age and lack of medication compliance (Gerhard et al., 2023; Loke & Ching, 2022; Said et al., 2023; Zhang et al., 2022). The coronavirus impact on health across the globe increased virus-related hospitalization, particularly among those with chronic diseases, buttressing the report that the virus-associated fear,

health complications, and death are factors responsible for the high prevalence of anxiety in people with hypertension (Khairy et al., 2022).

On the other hand, some studies argued that there is no link between chronic hypertension and pandemic-era anxiety. Iswatum et al. (2023) reported an inverse relationship between preexisting hypertension and pandemic-era anxiety. The authors acknowledged in their report that the anxiety level among people with hypertension during the pandemic decreased as the virus spread across the country, with an increase in spiritual well-being. Similarly, Sensory et al. (2021) reported an independent association between pandemic-era anxiety and preexisting hypertension in people diagnosed with the coronavirus infection, including those hospitalized because of the viral infection. The relationship between pandemic-era anxiety and preexisting hypertension is inconclusive. While these studies are critical in understanding the best approach to mitigate the risk of the disorder during a pandemic, the heterogeneous nature of the study findings remains a concern requiring further investigation by public health professionals.

The relationship between age, gender, and pandemic-era anxiety is critical in understanding the disease distribution. Numerous studies in the past have reported a link between age, gender, and anxiety during the pandemic. Evidence shows that women compared to men are more likely to experience anxiety during the pandemic (Arora et al., 2023; Bauerele et al., 2023; Caycho-Rodriguez, 2021; Caycho-Rodriguez et al., 2022; De & Sun, 2022; Loke & Ching, 2022; Gunjiganvi et al., 2022; Li et al., 2020; Saeed et al., 2023; Wong et al., 2020; Yarrington et al., 2021). Also, several studies reported that older people compared to younger adults are susceptible to anxiety during a pandemic

(Caycho-Rodriguez, 2021; Caycho-Rodriguez et al., 2022; Li et al., 2020; Loke & Ching, 2022; Saeed et al., 2023; Said et al., 2023; Wong et al., 2020; Yarrington et al., 2021). However, some studies argued against the report. For example, according to Bauerle et al. (2020) and Gunjiganvi et al. (2022), younger and middle-aged people are more likely to experience pandemic-era anxiety compared to older adults. In another study, recent evidence shows that while anxiety prevalence was high among adults during the pandemic, the anxiety level did not vary across age groups (De & Sun, 2022). These studies present different findings, impacting the interpretation of the exact relationship between age, gender, and pandemic-era anxiety. Therefore, an in-depth investigation is needed to explore the relationship between these variables.

Race/ethnicity is a vital public health information, allowing the understanding of the association between race and pandemic-era anxiety and its distribution in the communities. Recent data obtained during the pandemic indicated that Blacks experienced less coronavirus-related anxiety compared to Whites (Adzrago et al., 2022; Jacobs & Burch, 2021; Owens & Saw, 2021). However, studies from other researchers failed to reach the same conclusion, reporting that minorities experienced higher levels of pandemic-era anxiety compared to their White counterparts (Hofmann, 2021; Nguyen et al., 2022; Wen et al., 2023). Although COVID-19 was initially considered a balance in health disparities, the increase in anxiety levels among minority groups was attributed to the infectious nature of the virus and its associated health complications, socioeconomic problems, discrimination, lack of access to health care, and high unemployment rate (Magesh et al., 2023). Unlike the other studies, Breslau et al. (2021) study differs by

reporting that Hispanics experienced anxiety during the pandemic more than other races. The inconsistencies in the study findings make it challenging to understand the impact of anxiety on race. Consequently, further study is required to understand the distribution of coronavirus-related anxiety across races in the United States.

The relationship between educational level and pandemic-related anxiety is a subject of debate. Some study reports argue that a high educational level is protective against anxiety during the pandemic (Chlapecka et al., 2023; Grytten et al., 2020). The protective nature of high educational level is attributed to access to jobs, resources, health care, and health promotional programs (Grytten et al., 2020; Lopez et al., 2018). However, other studies debated that higher educational level is associated with increased anxiety during the pandemic (Gunjiganvi et al., 2023). People with high education have access to mental health information, which may negatively impact their anxiety levels compared to people with low educational levels (Lamuel et al., 2021; Said et al., 2023).

On the other hand, other studies during the pandemic found that people with low educational levels are more likely to experience anxiety than people with high educational levels (Arora et al., 2023; Joannes et al., 2023;). The high anxiety level in this group is because of stressful environments, poverty, and lack of access to healthcare (Inoue et al., 2023). The mixed finding within the empirical studies is a public health challenge. Thus, further research is needed to evaluate the relationship between the variables.

Empirical studies have shown that being married is protective against mental health challenges compared to unmarried people (Dean et al., 2021; Hooyeon et al., 2022;

Hsu & Barrett, 2020; Kumar et al., 2023; Rapp & Stauder, 2020; Said et al., 2023). The

solid mental health experienced by those who are married may be because of intense

social and financial support, encouraging resilience against psychological challenges.

Contrary to these findings, other studies conducted during the pandemic indicated that

people who are married and those married with children are more susceptible to high

anxiety levels during the pandemic than those who are single (Chew et al., 2020; Karasu

et al., 2022). The heterogeneous findings make it challenging to acknowledge an

association between marital status and pandemic-era anxiety. Hence, more in-depth study

and analysis are needed to understand the association.

Based on the result of my article search, I reviewed recent studies, less than five

years old, on the relationship between preexisting hypertension, demographic factors, and

coronavirus-related anxiety. All the identified articles on preexisting hypertension are

studies conducted outside the United States. Also, most of the articles on the relationship

between demographic factors (age, gender, educational level, marital status, and race)

presented heterogeneous outcomes, raising concerns about the association between

preexisting hypertension, demographic factors, and coronavirus-related anxiety.

Additionally, some data was collected during the third wave of the pandemic, when most

people were well-adjusted to the pandemic. Some studies fail to collect data on the

severity of hypertension and assess anxiety multiple times since anxiety states vary with

time. While some studies use a large sample size representing the general population,

others use a smaller sample size, sampling only a particular geographical area, making

the generalization of the study findings challenging. In addition, most of the studies are

cross-sectional, making causal conclusions unattainable.

Summary and Transition

Coronavirus-related anxiety is one of the common psychological challenges that has increased in prevalence during the pandemic. Studies have shown that people with preexisting diseases like hypertension are particularly anxious (Gerhards et al., 2023). Several studies from different countries have shown that there may be a relationship between preexisting hypertension and coronavirus-related anxiety. However, research to explore the relationship between preexisting hypertension and anxiety in the United States is limited. While demographic factors play a crucial role in determining anxiety prevalence, its impact on the distribution of pandemic-era anxiety across age, sex, race, marital status, and educational level is not fully understood.

In addition, all the relevant articles I used for the literature used the generalized anxiety scale, not the CAS, which addresses anxiety based on five domains, namely difficulty sleeping, feeling paralyzed, nausea and stomach upsets, loss of appetite, and dizziness associated with exposure to coronavirus news. The lack of CAS as a coronavirus-related anxiety measuring tool presents a unique gap in the literature. Therefore, further investigation on preexisting hypertension and demographic factors on coronavirus-related anxiety using the CAS is required to provide a novel understanding of the relationship between these variables of interest.

In chapter two, I evaluated the literature from different parts of the world on the relationship between preexisting hypertension and the impact of demographic factors on coronavirus-related anxiety. The literature review sheds light on the current topic and its

exploration in the field of public health, identifying a gap in the literature for further

investigation. I searched for relevant literature using databases such as Embase, PubMed,

CINAHL, and CINAHL Plus with full text. I described two theoretical frameworks

(biopsychological and socioecological models) that help inform my research

investigation. The theory explains why disease (pandemic-era anxiety) occurrence is not

based solely on biological but rather on the interaction of complex systems.

In Chapter 3, I discussed the research design and rationale for the study. I discussed the

methodology, data collection, sampling tools, the data's nature, and the study's

instrument. Also, I provided detailed information on the ethical procedures and a chapter

summary.

Chapter 3: Research Method

People with preexisting diseases like hypertension were anxious and experiencing high levels of COVID-19-induced psychological distress (Rajkumar, 2020). Studies have suggested that there may be a relationship between anxiety and hypertension (Johnson, 2019). Recent studies from other countries have further suggested a possible relationship between preexisting hypertension and anxiety during the pandemic; however, there is limited or no research on the connection between the variables in the United States. Additionally, the CAS adds to the literature gap because it varies from studies from other countries that used the Generalized Anxiety Scale or other instruments to measure anxiety because of its specificity to coronavirus-related anxiety. The purpose of this study was to examine the impact of preexisting hypertension and demographic factors on coronavirus-related anxiety and if preexisting hypertension predicts coronavirus anxiety in the United States. The demographic factors relevant to this study are age, gender, race, marital status, and educational level, and the covariates for the study are anxiety risk factors such as age, gender, and race. The research design used secondary data from grant-funded research at Walden University named COVID-19 Pandemic Related Stress in the United States. I tested the association between preexisting hypertension and pandemic-era anxiety and the association between age, gender, race, marital status, and educational level and pandemic-era anxiety in the United States.

In this chapter, I clarify the research design and methodology necessary to answer the research questions. I also describe the type of data and source used in the study, including the target population, sampling method, and recruitment process. The

information also includes the instrumentation used in the study, the data collection method, the rationale surrounding the sampling method, the data collection process, and the study's dependent and independent variables. In the Data Analysis section, I describe the data analysis plan. In addition, I address the threat to validity and ethical concerns surrounding the research.

Research Design and Rationale

The research design used to answer the research questions for the study is a quantitative, cross-sectional study, which was used for examining the impact of preexisting hypertension and demographic factors on pandemic-era anxiety in the United States. A quantitative research method is appropriate for the study because it allows for multiple variables and hypothesis testing, providing the necessary tools to address research questions that examine the relationship between preexisting hypertension and demographic factors and pandemic-era anxiety (Creswell, 2009; Kesmodel, 2018). A cross-sectional study allows for data collection from samples of the population at a specific time, allowing for research finding generalization of outcomes relative to the more significant population (Kesmodel, 2018). Cross-sectional research design has been used in other studies to evaluate the relationship between mental health challenges and hypertension (Arora et al., 2023). The only research time and constraints were in searching for relevant articles and compiling them to produce a grounded literature review.

The research used a secondary dataset from grant-funded research at Walden University named COVID-19 Pandemic Related Stress. The COVID-19 Pandemic

Related Stress Data were collected using a convenient sample technique, which contained information on the sample of the American population and specific variables related to the study. Using the secondary data, I analyzed quantitative inferential data using the SPSS. The secondary data contains information on the dependent and independent variables to determine the effect of preexisting hypertension and demographic factors on pandemic-era anxiety. The dependent variable is pandemic-era anxiety. The independent variables are preexisting hypertension and demographic factors. The independent variables (demographic factors) are age, gender, race, marital status, and educational level.

Methodology

Population

The study population consisted of 339 adults of different races and ethnicities in the United States who participated in the COVID-19 pandemic-related stress study. Participants included people with preexisting hypertension and pandemic-era anxiety. Study participants who are eligible and selected for the study are ages 18 and above. The 298 participants who completed the original data questionnaires comprised males and females from different races, including White, Black, Hispanic, Asian, and others). Other information contained in the original data collected from the participants that addressed their specific characteristics includes marital status, which consists of married, widowed, divorced, separated, never married, live with partners, and educational level, consisting of less than high school, high school graduate, some college, and college graduate.

Sampling Methods

Using a convenient sample method, the COVID-19 Pandemic Related Stress Data contained data from Americans collected during the COVID-19 pandemic. A population-based convenient sample uses a non-probability sampling method. Selecting participants using this method centers on how accessible they are to the researcher (Andrade, 2021). The sampling method is appropriate because it makes data collection easy, allowing accessible data collection settings such as at home, work, and clinics. It allows researchers to collect data that otherwise would have been difficult at that period. Previous studies have used the sampling technique successfully in investigating mental health challenges (Wei & Dominick, 2022). The COVID-19 Pandemic Related Stress Data has the required dependent and independent variables, including demographic characteristics, to address the study's research questions. The data are available to the public, and no permission is required to use the secondary data.

Inclusion and Exclusion Criteria

The eligibility criteria for the study participants are that (a) all participants must be 18 years and above; (b) participants must be living in the United States; (c) participants must reveal their age, gender, educational level, marital status, and race; (d) participants were surveyed to see if they have a history of hypertension and pandemic-era anxiety. All participants must understand English and answer the survey to the best of their ability. The exclusion criteria for the COVID-19 pandemic-related stress data included people below 18 years of age. It also included people who lived outside the United States and those who did not identify as male or female.

Power Analysis

To estimate and calculate the sample size of my research, I used G*Power 3.1.9.7 software with specific attention to the effect size, the desired set alpha level, and the power, which is critical in the statistical analysis. I selected Binomial logistic regression as my preferred statistical method to answer the research questions. The parameters established for the power calculation are as follows: For the test family, I selected the Z test and the a priori power analysis that allows for computing the sample size, effect size, given alpha, and power. I selected model Z tests, two-tailed, and logistic regression because of the specific alternative hypothesis. The study chose a statistically significant alpha level of 0.05 to estimate the relationship strength between the dependent and the independent variables. The G*power software set confidence level was 95% with a margin of error set at 5% and an effect size of 0.20. The sample size necessary to establish a statistically significant finding based on the G*Power analysis and the parameters is 134 participants (G*Power 3.1.9.7, 2021). An output of 0.95 drastically reduces the likelihood of making a type 2 error, improving the chances of detecting an effect during the data analysis.

Data Collection

The secondary data used for this study is the COVID-19 Pandemic Related Stress Data in the United States, which was grant-funded data from Walden University (Banerjee et al., 2022). Initially, the data collection was to examine the stress levels and other psychological challenges of Americans during the COVID-19 pandemic. The original information was collected using an electronic survey in English. Participants

received information on the purpose of the study and their right to participate, and the study informed consent was signed electronically. Information from the secondary data, such as relevant questions and participants' responses that align with my study variables (pandemic anxiety, hypertension, age, gender, educational level, marital status, and race), are obtained from the COVID-19 Pandemic-Related Stress database and used for the study. The data is available through Walden University, and no permission is required.

Instrumentation and Operationalization of Constructs

I used secondary data called the COVID-19 Pandemic Related Stress Data in the United States. The data contained information on coronavirus-related anxiety in America based on five domains that centered on symptoms of anxiety, namely difficulty sleeping, feeling paralyzed, nausea, stomach upsets, loss of appetite, and dizziness associated with exposure to coronavirus news (Lee, 2020). The data collection process used a well-structured survey for human subjects to collect data from participants via an online platform. As illustrated in Table 1, the original research survey contained a questionnaire that evaluated coronavirus-related anxiety using the CAS. The measuring instrument is known to have strong reliability ($\alpha = 0.92$) and validity and has been used by numerous researchers worldwide (Lee, 2020a; Lee et al., 2020b).

Table 1

Coronavirus Anxiety Scale Showing the Scoring

			Coronavirus Anxiety Scale			
	How often have you experienced the following activities over the last 2 weeks	Not at all	Rare, less than a day or two	Several days	More than 7 days	Nearly every day over the last 2 weeks
1	I felt dizzy, lightheaded, or faint when I read or listened to news about the coronavirus	0	1	2	3	4
2	I had trouble failing or staying asleep because I was thinking about the coronavirus	0	1	2	3	4
3	I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus	0	1	2	3	4
4	I lost interest in eating when I thought about or was exposed to information about the coronavirus	0	1	2	3	4
5	I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus	0	1	2	3	4
	Column Total					
	Total Score					

Note. From "Coronavirus anxiety scale: A brief mental health screener for COVID-19 related anxiety," by S. A Lee, 2020, *Death Studies, 44*(7), p. 393-401(https://doi.org/10.1080/07481187.2020.1748481). No permission needed.

Variables

This study has one dependent and two independent variables. The dependent variable is Pandemic-era anxiety, and the independent variables are preexisting hypertension and demographic factors (age, gender, educational level, marital status, and race). The dependent variable was pandemic-era anxiety, measured using the CAS. Participants with total coronavirus anxiety score greater or equal to nine are positive for anxiety, and scores less than nine is negative for anxiety. Pandemic-era anxiety was a nominal dichotomous variable. The coding for the participants is as follows: Yes to

anxiety =1, No to anxiety = 0.

One of the study's independent variables is preexisting hypertension. The variable is a categorical nominal variable, with coding designated as Yes = 1 and No = 0. Other independent variables include age, which was treated as an ordinal variable, ranking them based on specific age ranges. Coding for those between 18-24 years is 1, 25-34 years = 2, 5-44 years =3, 45-54 years = 4, 55-64 years = 5, 65-74 years = 6, 75 and above = 7. Gender is a categorical variable of the nominal level of measurement. The coding for males is 1, and for females, it is 2. Another essential variable of the study is race. The race variable is a categorical variable with a nominal level of measurement. The coding for Non-Hispanic Whites is 1, Non-Hispanic Black = 2, Hispanic = 3, Asians = 4, and others = 5. Marital status is also a categorical variable with a nominal level of measurement. The coding for those who are married is 1, widowed 2, divorced 3, separated 4, never married 5, live with partner 6. The last independent variable for the study is the educational level variable. The variable is categorical with an ordinal level of measurement. For those with less than a high school degree, the coding is 1, high school graduates 2, some college degrees 3, and college graduates 4.

Data Analysis

The COVID-19 Pandemic Related Stress data was imported to IBM SPSS Statistics version 28 and used for the analysis. The SPSS v.28 software is suitable for analysis because it can hold large volumes of data and allows for data visualizing, coding, and recording of variables to address the research questions for the study. It is also appropriate because it provides access to labeling, transformation, and weighting of

variables, if need be, to improve the estimate's accuracy (Chadia et al., 2022).

Data cleaning is an essential procedure to undertake while using secondary data. Data cleaning is a careful and meticulous method of improving data quality for a more reliable and accurate result in data analysis (Ridzuan & Zainon, 2019). Upon receiving approval from the IRB to use the secondary data, I imported the data to SPSS software and inspected the entire data for incorrect, missing values, or duplicates. I also inspected for formatting errors, identifying any need for reverse coding and addressing it accordingly. The data analysis consisted of a descriptive frequency analysis, which addressed the characteristics of the participants. Additionally, I used the binomial logistic regression to determine if preexisting hypertension predicts pandemic-era anxiety in the United States and to determine if demographic factors are associated with pandemic-era anxiety.

Research Questions and Hypotheses

Two research questions and hypotheses direct the study.

RQ1: To what extent is preexisting hypertension a predictor of pandemic-era anxiety after controlling for age, sex, and race?

$H_0$1: Hypertension is not a predictor of Pandemic-era anxiety after controlling for age, sex, and race.

Ha1: Hypertension is a predictor of Pandemic-era anxiety after controlling for age, sex, and race.

RQ2: To what extent are age, gender, educational level, marital status, and race associated with pandemic-era anxiety?

$H_0$2: Age, gender, educational level, marital status, and race are not associated with pandemic-era anxiety.

Ha2: Age, gender, educational level, marital status, and race are associated with pandemic-era anxiety.

Descriptive Statistics

To understand the characteristics of the participants, I used descriptive statistics to report the count, percentage, and frequency of distribution of the participants for the ordinal and categorical variables. Descriptive statistics help understand the distribution of the participants and the variables.

Binomial Logistic Regression. A binomial logistic regression, also known as logistic regression, was used to determine if preexisting hypertension predicts pandemic-era anxiety. The statistical tool allows the use of one or more independent variables that are either categorical or continuous and a dichotomous dependent variable (Laerd Statistics, 2018). The model is appropriate for the study to answer research questions 1 and 2 because there is more than one independent variable (preexisting hypertension, age, gender, educational level, marital status, and race) and one dependent variable (pandemic-era anxiety), which is dichotomous (yes/no) (Laerd Statistics, 2018). It allows researchers to estimate the association between one or more variables (Laerd Statistics, 2018). For example, in research question 1. To what extent is preexisting hypertension a predictor of pandemic-era anxiety after controlling for age, gender, and race? Preexisting hypertension is considered a risk factor for developing pandemic-era anxiety after controlling for age, gender, and race. By controlling the covariates, I ensure that the

dependent variable is free of any influence since these covariates have a statistical

relationship with anxiety. In addition, the study meets the assumption of binomial logistic

regression because the research questions that the statistical tool addressed had

independent variables (preexisting hypertension, age, gender, educational level, marital

status, and race) and one dependent variable (pandemic-era anxiety).

I set the study's significance level at 0.05 and 95% confidence interval (CI),

meaning a p-value < 0.05 rejects the null hypothesis and accepts the alternate hypothesis.

Also, with a $p > 0.05$, the null hypothesis is accepted. Before applying the binomial

logistic regression, I tested for the assumptions of the logistic regression to determine if

there are any outliers. I used SPSS v.28 to test linearity. The logit represents the

logarithm of the ratio that tells the probability of the presence or absence of pandemic-era

anxiety (In (p/1-p).) The odds ratio (OR) quantifies the relationship between the

independent and dependent variables. The exponentiated coefficient exp (β) or the odds

ratio calculates the change in odds based on a unit increase in the independent variable

(Lin & Lee, 2016).

Threats to Validity

Researchers are responsible for controlling all possible threats to validity,

complications, and problems that may arise with study participants while conducting a

study. However, the threat to validity remains a concern, requiring proper attention while

designing a study to reduce bias (Khorsan & Crawford, 2014). By ensuring that the threat

to validity is eliminated or reduced to its minimum, researchers are well-positioned to

ensure that their findings are reliable and meaningful to serve a public health purpose

(Burkholder et al., 2020; Patino & Ferreira, 2018). Two types of threats to validity exist: internal and external threats.

Internal validity ensures that the study findings are due to the impact of the independent variables on the dependent variable and not a result of other external factors or confounding that can provide an alternate explanation to the finding (Flannelly et al., 2018; Patino & Ferreira, 2018). It also provides insight into whether the study result is reliable based on how the study was conducted (Andrade, 2018; Flannelly et al., 2018). Some examples of threats to internal validity are history, maturation, testing instrumentation, and research bias. These threats are addressed and controlled through adequate quality control measures, data collection procedures, and analysis (Patino & Ferreira, 2018).

External validity centers on generalizing research findings, allowing for a broader result application (Andrade, 2018). Some threats to external validity include population, setting, selection bias, Hawthorne effect, and situation factors, which center on time, location, and researcher traits (Khorsan & Crawford, 2014). Threats to external validity can occur when the study participants do not represent the general population, affecting the degree to which the study finding across different settings, times, and places is generalized (Burkholder et al., 2020; Steckler & McLeroy, 2008). It may occur due to the interaction of observed causal relationships with sample units or differences in treatment and type of research-finding measures (Burkholder et al., 2020).

Additionally, the threat can occur because of several incomplete answers to questionnaires and surveys, leading to misclassification of the research findings. Another

threat is response bias, which occurs when the participants' responses center on what they perceive the researcher wants and not what is true. The threat leads to false representation and negatively impacts the study findings. One of the study's primary objectives is to generalize the findings to the United States adult population. A significant threat to the objective of the external validity of this study is the selection bias. The secondary data used for this study was collected using a convenient sampling method. By not randomly selecting the study participants, the study is exposed to a threat to external validity, impacting the general population representation (Khorsan & Crawford, 2014). The impact of selection bias was mitigated by generalizing the study findings only to the population that shares similar characteristics with the study sample. Also, the threat from external validity in my study was mitigated by building on existing literature through a thorough literature review, revealing gaps, narrowing the research area to only adults living in the United States, and comparing the findings to similar studies (Burkholder et al., 2020).

Ethical Procedures

This study received approval from the Walden University Institutional Review Board (IRB) to use the secondary data (COVID-19 Pandemic Related Stress in the United States). The secondary data was grant-funded research data at Walden University. The data for the research contained information on adults living in the United States and their mental health challenges (anxiety) during the pandemic. Although there is no need for informed consent since it is secondary data and human participant was not a factor, it is vital to note that participants signed informed consent electronically before data

collection. Also, secondary data dramatically minimizes the time, effort, and possible confidentiality breaches. In a situation where the participants have identifying information, proper steps are necessary to protect the participant's identity by ensuring that electronic data is in a password-protected personal computer. Further review by the IRB are required, and all data are held securely until the study's completion before destruction.

Summary

Anxiety is a significant mental health concern, affecting millions of people in the United States. This study aims to examine the impact of preexisting hypertension and demographic factors on pandemic-era anxiety in the United States and if preexisting hypertension predicts pandemic-era anxiety. In this chapter, I discussed the research design, methodology, threat to validity, and ethical procedures. The methodology section consisted of the type of data and data source, the study participants, the variables, and the data analysis plan. I also outlined the research questions and the study population demographics. This study used secondary data from COVID-19 Pandemic Related Stress in the United States. The data analysis centers on binomial logistic regression analysis. Chapter 4 presents the results of the data analysis that answered the research questions.

Chapter 4: Results

The goal of this cross-sectional study was to examine if preexisting hypertension and demographic factors predict pandemic-era anxiety using the CAS in the United States. The anxiety levels of the study participants during the COVID-19 pandemic were measured using the CAS. The demographic factors relevant to the study include age, race, sex, marital status, and educational level. I used a secondary dataset from grant-funded research at Walden University called the COVID-19 Pandemic Related Stress dataset for my study data analysis to evaluate anxiety during the pandemic. This study summarized data and the research findings that answered the following research questions:

- RQ 1: To what extent is preexisting hypertension a predictor of pandemic-era anxiety after controlling for age, sex, and race?

- RQ 2: To what extent are age, sex, educational level, marital status, and race associated with pandemic-era anxiety?

In this chapter, I discuss the data collection process and method used to collect the data. I also discuss the descriptive statistics of the study sample, including the independent and the dependent variables. I also interpret the assumption of logistic regression. I also explain the study effect size and the result of the study findings. Finally, I summarize the chapter with the conclusion of my study findings.

Data Collection

I used a cross-sectional nonexperimental study design to investigate if preexisting hypertension and demographic factors predict pandemic-era anxiety. The secondary data

for the study is from COVID-19 Pandemic-Related Stress data. The dataset was initially

collected using a survey method between February 2021 and October 2021, in which the

participants signed informed consent electronically. Survey responses for the secondary

data were from participants 18 years old and above who responded to questions

surrounding hypertension and demographic factors (age, sex, race, marital status, and

educational level). They also responded to the pandemic-era anxiety assessment using the

CAS, making it easy to calculate the total score. A score less than 9 indicates no anxiety,

and a score greater or equal to 9 indicates anxiety. Before accessing the secondary data, I

obtained IRB approval (# 02-14-24-1036284) and obtained age, sex, marital status,

educational level, race, hypertension, and pandemic-era anxiety data points for my study.

The COVID-19 Pandemic-Related Data consisted of $N = 339$ participants from different

demographic profiles with a history of hypertension and anxiety and a response rate of

100% and no missing data.

<div align="center">

Results

</div>

Descriptive Statistics

A descriptive and frequency analysis of the study participants was conducted

using SPSS v. 28 to highlight the participants' demographic background (secondary data)

surveyed between February 2021 and October 2021. As displayed in Table 2, the age

variable has an ordinal level of measurement, and the sex variable has two groups, male

and female. Descriptive statistics on race indicate five groups, with non-Hispanic Whites

accounting for 234 (69%) of the participants, non-Hispanic Blacks accounting for 39

(11.5%) of the participants, Hispanics accounting for 42 (12.4%) of the participants,

Asians accounting for 11 (3.2%) of the participants, and Others accounting for 13 (3.8%)

of the study participants, $N = 339$. The sample for the study closely represents the

population of the United States. The population estimates in April 2020 indicate that non-

Hispanic Whites account for 75.5% of the total population, non-Hispanic Blacks

represent 13.6% of the United States population, Hispanics 19.1%, and Asians represent

6.3% of the population (U.S. Census Bureau, n.d.). The marital status variable has six

groups: married, widowed, separated, divorced, never married, and lived with a partner.

Table 2 also summarizes descriptive statistics for educational level variables.

Table 2

Study Participants Demographic Characteristics and Frequency

Variable	Frequency	Percent
Age		
18-24	30	8.8%
25-34	55	16.2%
35-44	81	23.9%
45-54	76	22.4%
55-64	62	18.3%
65-74	30	8.8%
75+	5	1.5%
Sex		
Female	270	79.6%
Male	69	20.4%
Race		
Non-Hispanic White	234	69%
Non-Hispanic Black	39	11.5%
Hispanic	42	12.4%
Asian	11	3.2%
Others	13	3.8%
Marital status		
Married	200	59%
Widowed	8	2.4%
Divorced	35	10.3%
Separated	7	2.1%
Never Married	70	20.6%
Live With Partner	19	5.6%
Educational level		
Less than High School	9	2.7%
High School	24	7.1%
Some College	73	21.5%
College Graduate	233	68.7%

Note. N = 339

Preexisting hypertension is another independent categorical variable with a nominal level of measurement. The variable is coded "yes" for history of hypertension and "no" for no history of hypertension. Two hundred and sixty-seven (78.8%) of respondents indicated that they did not have hypertension, and 72 (21.2%) said yes to a history of hypertension, $N = 339$.

Additionally, the dependent variable, pandemic-era anxiety, a dichotomous categorical (nominal) variable, is the only dependent variable for the study. Participants were evaluated for anxiety using the CAS. A score less than 9 is negative for anxiety, and a score greater than or equal to 9 is indicative of anxiety. Those who received a score less than nine were coded "No" for pandemic-era anxiety, and scores greater than or equal to nine were coded "Yes" for pandemic-era anxiety. Two hundred and forty-nine (73.5%) of the participants did not have pandemic-era anxiety, and 90 (26.5%) of the participants had pandemic-era anxiety, $N = 339$.

Two research questions guided the study to determine if preexisting hypertension and demographic factors predict pandemic-era anxiety using the CAS in the United States. The study sets a 95% confidence interval and a 5% margin of error for the data analyses with a significance level set at $p < 0.05$. The dependent variable, pandemic-era anxiety, was coded 0 for "No anxiety" and 1 for "Yes" to pandemic-era anxiety. Also, the independent variable, preexisting hypertension, was coded 0 for "No" hypertension and 1 for "Yes" to hypertension. Also coded are the controlling variables of age, sex, and race. For example, females were coded 0, and males were coded 1. Race was coded 1 for non-

Hispanic Whites, 2 for non-Hispanic Blacks, 3 for Hispanics, 4 for Asians, and 5 for

Others. Also, Age (categorical -ordinal variable) is coded as follows: 1 for 18-24 years, 2

for 25-34 years, 3 for 5-44 years, 4 for 45-54 years, 5 for .55-64 years, 6 for 65-74 years,

and 7 for 75 and above.

Binary Logistic Regression Analysis

Research Question 1

RQ1: To what extent is preexisting hypertension a predictor of pandemic-era

anxiety after controlling for age, sex, and race?

$H_0 1$: Hypertension is not a predictor of Pandemic-era anxiety after controlling for

age, sex, and race.

$Ha1$: Hypertension is a predictor of Pandemic-era anxiety after controlling for

age, sex, and race.

A binary logistic regression was conducted to answer research question one: To

what extent does preexisting hypertension predict pandemic-era anxiety while controlling

for age, sex, and race using SPSS v.28. The data analysis comprised 339 cases. The data

met logistic regression assumptions, including having a dichotomous dependent variable

(categorical), an independent variable that is categorical, independent of observation with

a dependent variable that is mutually exclusive, and an adequate sample size ($n > 134$)

(Laerd Statistics, 2018). Preliminary analyses were conducted to examine the

assumptions of linearity, multicollinearity, and outliers; there were no violations. The

independent variable (preexisting hypertension) and the dependent variable (pandemic-

era anxiety) were tested and analyzed to determine if the independent variable predicted

the outcome variable (pandemic-era anxiety). The control variables (age, sex, and race) were entered at step one, and the model was statistically significant. X^2 (11, $N = 339$) = 22.171, $p < 0.23$. The Hosmer-Lemeshow goodness-of-fit was not statistically significant ($p = .367$), indicating the model was correctly specified. The model explained between 6% (Cox and Snell R^2) and 9% (Nagerlkerke R^2) of the variance in pandemic-era anxiety and correctly classified 74.3% of the cases, with a sensitivity of 8%, specificity of 98%, positive predictive value of 8%, and negative predictive value of 98%. As shown in Table 3, the controlling variable of sex significantly contributed to the model. The Unstandardized beta weight for the sex variable is B = (771), SE = .366, $Wald$ = 4.447, p = .035. The odds ratio is that males, compared to females, are 2.163 times more likely to experience pandemic-era anxiety. OR= [2.163, 95% CI (1.056-4.430)]. However, the controlling variables of age ($p = .249$) and race ($p = .077$) did not significantly contribute to the model.

Table 3

Logistic Regression Predicting the Pandemic-era anxiety With the Controlling Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	OR	95% C.I. for OR Lower	Upper
Step 1ª	Age:			7.851	6	.249			
	Age: 18-24	-1.926	1.090	3.120	1	.077	.146	.017	1.235
	Age:25-34	-1.029	1.017	1.023	1	.312	.357	.049	2.625
	Age: 35-44	-1.104	1.000	1.218	1	.270	.332	.047	2.355
	Age:45-54	-1.131	1.003	1.272	1	.259	.323	.045	2.303
	Age:55-64	-1.130	1.005	1.265	1	.261	.323	.045	2.315
	Age:65-74	-2.354	1.139	4.270	1	.039	.095	.010	.886
	Age: 75+	Rf Cat	-	-	-	-	-	-	-
	Sex: Male	.771	.366	4.447	1	.035	2.163	1.056	4.430
	Female	Rf Cat	-	-	-	-	-	-	-
	Race:			8.441	4	.077			
	Race: Non-Hispanic Whites	-1.453	.614	5.602	1	.018	.234	.070	.779
	Race:(Non-Hispanic Blacks	-1.215	.696	3.044	1	.081	.297	.076	1.162
	Race: Hispanics	-.736	.691	1.136	1	.286	.479	.124	1.854
	Race: Asians	-1.141	.928	1.513	1	.219	.320	.052	1.968
	Race Others	Rf Cat	-	-	-	-	-	-	-
	Constant	.824	1.117	.545	1	.461	2.280		

a. Variable(s) entered on step 1: Age: , Gender:, Race/Ethnicity:.

Preexisting hypertension (predictor variable) was entered at step 2, and the model was statistically significant, X^2 (12, N = 339) = 26.489, p = 0.09. Hosmer-Lemeshow goodness-of-fit was not statistically significant (p = .713), indicating the model was correctly specified. The model explained between 7% (Cox and Snell R^2) and 11% (Nagerlkerke R^2) of the variance in pandemic-era anxiety is explained by preexisting hypertension after controlling for age, gender, and race and correctly classified 74.0% of the cases, with a sensitivity of 9%, specificity of 98%, positive predictive value of 9%, and negative predictive value of 97.5%. The analysis in Table 4 shows that in the final model, gender (p = .018, OR = 2.419) and preexisting hypertension (p = .037, OR = 2.039) significantly contributed to the model, therefore rejecting the null hypothesis. The Unstandardized beta weight for the predictor variable (preexisting hypertension) is B = (712), SE = .341, $Wald$ = 4.366, p = .037. The odds ratio is that people with preexisting hypertension compared to those without preexisting hypertension are 2.039 times more likely to experience pandemic-era anxiety, controlling for age, sex, and race. OR = [2.039, 95% CI (1.045 - 3.977)]. However, the controlling variables of age (p= .249) and race (p =.077) did not contribute to the model.

Table 4

Logistic Regression Predicting the Pandemic-era Anxiety with the Predictor Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	OR	95% C.I.for OR Lower	Upper
Step 1[a]	Age:			8.244	6	.221			
	Age: 18-24	-1.771	1.130	2.454	1	.117	.170	.019	1.560
	Age: 25-34	-.838	1.062	.623	1	.430	.432	.054	3.469
	Age: 35-44	-.939	1.045	.809	1	.369	.391	.050	3.028
	Age: 45-54	-1.138	1.043	1.191	1	.275	.320	.042	2.474
	Age: 55-64	-1.235	1.049	1.385	1	.239	.291	.037	2.275
	Age: 65-74	-2.329	1.176	3.919	1	.048	.097	.010	.977
	Age: 75+	Rf Cat	-	-	-	-	-	-	-
	Sex: Males	.884	.373	5.597	1	.018	2.419	1.164	5.031
	Females	Rf Cat	-	-	-	-	-	-	-
	Race:			9.429	4	.051			
	Race: Non-Hispanic Whites	-1.548	.622	6.196	1	.013	.213	.063	.720
	Race: Non-Hispanic Blacks	-1.302	.703	3.426	1	.064	.272	.069	1.080
	Race: Hispanics	-.770	.696	1.226	1	.268	.463	.118	1.810
	Race: Asians	-1.223	.945	1.676	1	.196	.294	.046	1.875
	Race: Others	Rf Cat	-	-	-	-	-	-	-
	Preexisting Hypertension	.712	.341	4.366	1	.037	2.039	1.045	3.977
	No Hypertension	Rf Cat	-	-	-	-	-	-	-
	Constant	.584	1.161	.253	1	.615	1.794		

a. Variable(s) entered on step 1: Preexisting Hypertension.

Research Question 2

RQ2: To what extent are age, sex, educational level, marital status, and race associated with pandemic-era anxiety?

$H_0$2: Age, sex, educational level, marital status, and race are not associated with pandemic-era anxiety.

*Ha*2: Age, sex, educational level, marital status, and race are associated with pandemic-era anxiety.

The independent variables of age, sex, race, educational level, and marital status were examined for multicollinearity. The finding indicates there was no violation of multicollinearity and linearity assumptions. Hosmer-Lemeshow goodness-of-fit was not statistically significant ($p = .906$), indicating that the model is a good fit. The binomial regression analysis results show the model was statistically significant, X^2 (19, $N = 339$) $= 40.087$, $p < 0.03$. The model explained that between 11% (Cox and Snell R^2) and 16% (Nagerlkerke R^2) of the variance in pandemic-era anxiety is explained by age, sex, race, educational level, and marital status. The model correctly classified 74.9% of the cases, with a sensitivity of 13.3%, specificity of 97.2%, positive predictive value of 86%, and negative predictive value of 97.1%. Table 5 shows that sex and educational level significantly contributed to the model, $p = 0.041$ and $p = 0.008$, respectively. Therefore, reject the null hypothesis.

The unstandardized beta weight for the predictor variable Sex is $B = (782)$, *SE* = .382, *Wald* = 4.193, $p = .041$. For the sex variable, the odds ratio is that males, compared to females, have 2.185 times the odds of developing pandemic-era anxiety. OR = [2.185,

95% CI (1.034 - 4.618)]. Also, for the educational level variable, the odds ratio is that people with some college compared to college graduates are .226 times less likely to develop pandemic-era anxiety. OR = [.226, 95% CI (.090-.563)]. The unstandardized beta weight for the predictor variable educational level is B = (-1.488), SE = .466, $Wald$ = 10.185, p = .001. People with high school compared to college graduates are .663 times less likely to develop pandemic-era anxiety. However, the result is not statistically significant, OR = [.663, 95% CI (.22-1.979)], p = .461. Also, people with less than high school compared to college graduates are 2.164 more likely to experience pandemic-era anxiety; however, the result is not statistically significant, OR = [.2.164, 95% CI (.483-9.690)], p = .313. Age, race, and marital status did not contribute to the model and are not statistically significant, p > 0.05.

Table 5

Logistic Regression on the Association of the Independent Variable on Pandemic-Era

Anxiety

Variables in the Equation									
								95% C.I.for OR	
		B	S.E.	Wald	df	Sig.	OR	Lower	Upper
Step 1ᵃ	Age:			5.822	6	.443			
	Age: 18-24	-.620	1.231	.254	1	.615	.538	.048	6.010
	Age: 25-34	-.673	1.083	.387	1	.534	.510	.061	4.258
	Age: 35-44	-1.018	1.062	.920	1	.337	.361	.045	2.894
	Age: 45-54	-1.028	1.059	.941	1	.332	.358	.045	2.854
	Age: 55-64	-.954	1.056	.816	1	.366	.385	.049	3.053
	Age: 65-74	-2.230	1.185	3.544	1	.060	.107	.011	1.096
	Age: 75+	Rf Cat	-	-	-	-	-	-	-
	Sex: Male	.782	.382	4.193	1	.041	2.185	1.034	4.618
	Female	Rf Cat	-	-	-	-	-	-	-
	Race:			7.495	4	.112			
	Race: Non-Hispanic Whites	-1.545	.648	5.681	1	.017	.213	.060	.760
	Race: Non-Hispanic Blacks	-1.275	.747	2.915	1	.088	.279	.065	1.208
	Race: Hispanics	-.949	.737	1.659	1	.198	.387	.091	1.641
	Race: Asians	-1.093	.972	1.264	1	.261	.335	.050	2.254
	Race: Others	Rf Cat	-	-	-	-	-	-	-
	Educational Level:			11.829	3	.008			
	Less than High School	.772	.765	1.018	1	.313	2.164	.483	9.690
	High School	-.411	.558	.543	1	.461	.663	.222	1.979
	Some College	-1.488	.466	10.185	1	.001	.226	.090	.563
	College Grad	Rf Cat	-	-	-	-	-	-	-
	Marital Status:			3.075	5	.688			
	Married	.390	.636	.376	1	.540	1.477	.425	5.140
	Widowed	.408	1.064	.147	1	.701	1.504	.187	12.096
	Divorced	.746	.721	1.072	1	.300	2.109	.514	8.660
	Separated	1.068	1.022	1.094	1	.296	2.911	.393	21.555
	Never Married Lived W/P	-.068	.681	.010	1	.920	.934	.246	3.549
		Rf Cat	-	-	-	-	-	-	-
	Constant	.564	1.272	.197	1	.657	1.758		

a. Variable(s) entered on step 1: Age: , Gender:, Race/Ethnicity:, Educational Level:, Marital Status:.

Summary

In the study to examine if preexisting hypertension and demographic factors predict Pandemic-era anxiety using the CAS, I investigated if preexisting hypertension is associated with pandemic-era anxiety and if age, sex, marital status, educational level, and race are associated with Pandemic-era anxiety. Three hundred thirty-nine participants met the study inclusion criteria, hence appropriate for the analysis. non-Hispanic Whites comprise 69% of the study participants; non-Hispanic Black, 11.5%; Hispanics, 12.4%; Asians, 3.2%; and others, 3.8%. The racial makeup is closely similar to the population distribution of the United States, where non-Hispanic Whites account for 75.5% of the total population, non-Hispanic Blacks account for 13.6% of the United States population, Hispanics, 19.1%, and Asians represent 6.3% of the population (United States Census Bureau, n.d.).

The first research question to examine if preexisting hypertension predicts pandemic-era anxiety, after controlling for age, sex, and race ($n = 339$) using logistic regression, the result shows a statistically significant finding designating that people with preexisting hypertension are 2.039 times more likely the odds of having pandemic-era anxiety after controlling for age, sex, and race. The study accepted the alternate hypothesis that preexisting hypertension is a predictor of pandemic-era anxiety after controlling for age, sex, and Race. The second research question examines if age, sex, marital status, educational level, and race are associated with pandemic-era anxiety ($n = 339$). The study findings indicated that sex and educational level statistically significantly contributed to the model, $p = 0.041$ and $p = 0.008$, respectively, rejecting the null

hypothesis. The result indicates that males, compared to females, are 2.185 times more likely to develop pandemic-era anxiety, and people with some college degree compared to college are .226 times less likely to develop Pandemic-era anxiety.

In conclusion, my research findings indicated that preexisting hypertension is a predictor of pandemic-era anxiety after controlling for age, sex, and race and males are more likely to be associated with developing pandemic-era anxiety than females. However, having some level of a college degree helps reduce the likelihood of pandemic-era anxiety. The independent variables of age, race, and marital status had a non-statistically significant association with pandemic-era anxiety. Chapter 5 centers on the discussion and interpretation of the study results, study limitations, implication of social change, recommendation of future studies, and the study conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

Anxiety affects millions of people in the United States and around the world (Yang et al., 2021). The prevalence of the condition increased by 35% following the COVID-19 pandemic and some strict public health measures, affecting 1 in 4 Americans, including previously healthy people and those with preexisting diseases like hypertension (Brooks et al., 2020; Delpino et al., 2022; Holingue et al., 2020; Pieh et al., 2020; Salari et al., 2020; Turna et al., 2021). People with preexisting hypertension are particularly anxious because of the threat of the virus on health and widely implemented public health measures such as social distancing, social isolation, and lockdowns (Kindred & Bates, 2023). While several studies investigating the relationship between preexisting hypertension and pandemic-era anxiety have been conducted around the world (Arora et al., 2021; Bernard et al., 2022; Bonner et al., 2021; Celik et al., 2021; Iswatum et al., 2023; Loke & Chin, 2022; Said et al., 2023; Sensory et al., 2020; Zhang et al., 2022), no such studies have been performed in the United States. In addition, none used the CAS, which is specific to COVID-19 pandemic-related anxiety. To better understand the relationship between preexisting hypertension and pandemic-era anxiety, it was essential to examine whether preexisting hypertension is associated with pandemic-era anxiety. Additionally, it is critical to examine the relationship between demographic factors and pandemic-era anxiety.

The primary purpose of this cross-sectional, non-experimental study was to investigate the impact of preexisting hypertension and demographic factors on pandemic-era anxiety in the United States using the CAS and to determine if preexisting

hypertension predicts pandemic-era anxiety. Using secondary data (the COVID-19 pandemic Related Stress Data), I examined several independent variables such as preexisting hypertension, age, sex, marital status, race, and educational level and their relationship with one dependent variable, pandemic-era anxiety, using the binomial logistic regression. The outcome of my study supports that there is a relationship between the two variables. My study outcome suggests that preexisting hypertension is a predictor of pandemic-era anxiety, controlling for age, sex, and race. The results also suggest that sex is a critical factor in developing pandemic-era anxiety, affecting males more than females. Additionally, the results suggested that having some form of college education is critical in decreasing the odds of developing pandemic-era anxiety when compared to those with a college education.

Interpretation of the Study Findings

The total number of participants for the study was 339. Non-Hispanic Whites represent most participants, followed by Hispanics, non-Hispanic Blacks, Asians, and others representing the smallest in the race group. Across sexes, there were four times the number of female participants than male participants. Across marital status, married participants accounted for most of the group, followed by those who have never been married, those who live with partners, divorced, widowed, and separated. Most of the participants are in the 35–44 age group, and the smallest are people 75 years and above. People who are college graduates represent the majority in the educational level groups, followed by some college, high school, and less than high school. Also, most of the

respondents did not have hypertension; only 21.2% said yes to a history of hypertension. Likewise, most of the participants did not have pandemic-era anxiety.

The controlling variables for the study are age, sex, and gender. The logistic regression findings indicated that the independent variable predicts the dependent variable after controlling for the confounding variables. The first logistic regression examined if preexisting hypertension is a predictor of pandemic-era anxiety after controlling for age, sex, and race. The findings indicated a statistically significant relationship between preexisting hypertension and pandemic-era anxiety after controlling for confounders (age, sex, and race). The second logistic regression finding indicated that sex and educational level are associated with pandemic-era anxiety.

Research Question 1

Research Question 1 focused on whether preexisting hypertension is associated with pandemic-era anxiety after controlling for age, sex, and race. The study findings indicate that preexisting hypertension is a predictor of pandemic-era anxiety after controlling for age, sex, and race. The result of the first data analysis on the covariates (age, sex, and race) without the predictor variable (preexisting hypertension) using logistic regression indicated that of the three covariates, only sex was a statistically significant result ($p = 0.035$). The analysis with the predictor variable (preexisting hypertension) and the controlling variable indicated that preexisting hypertension was statistically significant ($p = 0.037$) after controlling for age, sex, and race. The unstandardized beta weight for the predictor variable (preexisting hypertension) is $B =$ (712), $SE = .341$, $Wald = 4.366$, $p = .037$. The odds ratio is that people with preexisting

hypertension compared to those without preexisting hypertension are 2.039 times more likely to experience pandemic-era anxiety, controlling for age, sex, and race. OR = [2.039, 95% CI .045-3.977]. This suggests that preexisting hypertension is a predictor of pandemic-era anxiety.

Demonstrating that preexisting hypertension is a predictor of pandemic-era anxiety is consistent with previous findings. Loke and Ching (2022) reported that people with preexisting hypertension in Malaysia experienced high levels of psychological distress, such as anxiety, depression, and stress. In Saudi Arabia, Said et al. (2023) similarly concluded that the anxiety prevalence among people with chronic hypertension was higher than the general population. The authors also noted that participants who have preexisting hypertension and anxiety were less committed to taking their antihypertensive medication, predisposing them to additional health risks, those with chronic disease reported high anxiety levels. It is also worth noting that the Omicron virus strain was the predominant strain in circulation in Saudi Arabia and around the world during the study, described as very virulent compared to the Mu, delta, and Iota variants at the time of my study data collection (AlBahrani et al., 2022; Sheikh et al., 2023). In a study in India, Arora et al. (2021) reached a similar conclusion, reporting higher levels of stress, anxiety, and depression in people with chronic diseases such as hypertension and diabetes compared to others. The Delta variant remained the dominant strain, possibly impacting the anxiety level of the study participants (Katella, 2023). Further, a study on the mental health impact on people with hypertension during the COVID-19 pandemic in Australia reached a similar conclusion, noting a higher level of anxiety in people with hypertension

(Bonner et al., 2021). The authors expressed concern that common antihypertensive medications (angiotensin-converting enzyme inhibitors and angiotensin II Type 1 receptor blockers) may be associated with increased risk of COVID-19 outcomes in people with preexisting hypertension, impacting anxiety levels. However, they did not investigate whether there is any association between anti-hypertensive medication and COVID-19 outcome or the respiratory and cardiovascular nature of the COVID-19 virus and the impact on anxiety levels, even though most of their participants were on an antihypertensive regimen. Additionally, while this is beyond the scope of this dissertation, at the time of the Australian study, the Australian National Heart Foundation concluded that there is no evidence tying antihypertensive medication to COVID-19 outcomes. It is also vital to note that the study was conducted during the third wave of the pandemic, and the Alpha strain was the predominant viral strain in circulation in Australia and around the world. In China, Zhang et al. (2022) also confirmed that preexisting hypertension predicts pandemic-era anxiety. Additionally, Celik et al. (2021) linked anxiety with the COVID-19 pandemic and its effect on hypertensive patients in Turkey. Finally, in France, people with preexisting cardiovascular risk (hypertension) experienced increased levels of pandemic-era anxiety, which they attributed to the lockdown (Berard et al., 2022). While the risk factors associated with increased anxiety levels in people with preexisting hypertension in France are beyond the scope of this study, it is worth noting that the study data collection by Berard and colleagues occurred a few weeks after the COVID-19 lockdown and when the SARS-Cov-2 strain was the

predominant strain, compared to the Mu, delta, and Iota variants at the time of my study

(Sheikh et al., 2023).

Despite these similar findings, the results contradict other findings. For example,

in their study in Indonesia, Iswatum et al. (2023) argued that there is no link between

chronic hypertension and pandemic-era anxiety and reported an inverse relationship

between preexisting hypertension and pandemic-era anxiety, with the anxiety level

among people with hypertension during the pandemic decreasing as the virus spread

across the country. However, the study occurred when people had already adjusted to the

threat of the virus, and the COVID-19 vaccine was readily available. Similarly, Sensory

et al. (2021) reported an independent association between pandemic-era anxiety and

preexisting hypertension in people diagnosed with the coronavirus infection, including

those hospitalized because of the viral infection, contradicting this report's findings.

However, their data collection period was between April and May of 2020, with the

SARS-Cov-2 strain in circulation, and fewer people in Turkey were infected, with

approximately 170,000 cases and fewer than 5000 deaths recorded (Statista, n.d.).

Research Question 2

The second research question focused on to what extent are age, sex, educational

level, marital status, and race associated with pandemic-era anxiety. The result of the

logistic regression indicates that sex and educational level significantly contributed to the

model, $p = 0.041$ and $p = 0.008$, respectively. Therefore, reject the null hypothesis. The

table also shows that age ($p = .444$), marital status ($p = .688$), and race ($p = .112$) did not

contribute significantly to the model and, hence, are not associated with pandemic-era

anxiety. For the sex variable, the odds ratio is that males, compared to females, have 2.185 times the odds of developing pandemic-era anxiety, OR = [2.185, 95% CI 1.034 - 4.618]. The unstandardized beta weight for the predictor variable sex is B = (782), SE = .382, $Wald$ = 4.193, p = .041. The odds ratio for the educational level variable is that people with some college compared to college graduates are .226 times less likely to develop pandemic-era anxiety. OR = [.226, 95% CI .090 -.563]. The unstandardized beta weight for the predictor variable educational level is B = (-1.488), SE = .466, $Wald$ = 10.185, p = .001. These findings strengthen the evidence that sex and educational level are associated with pandemic-era anxiety. While many studies show that sex is associated with anxiety, the findings from this study indicate strong evidence of higher odds of anxiety in men during the COVID-19 pandemic compared to women. The study findings contradict previous studies in which several authors reported that while sex is a factor in pandemic-era anxiety, women compared to men are more likely to experience anxiety during the COVID-19 pandemic (Arora et al., 2023; Bauerele et al., 2023; Caycho-Rodriguez, 2021; Caycho-Rodriguez et al., 2022; De & Sun, 2022; Gunjiganvi et al., 2022; Li et al., 2020; Loke & Ching, 2022; Saeed et al.,2023; Wong et al., 2020; Yarrington et al., 2021). While the factors associated with increased anxiety levels in men compared to women are beyond the scope of this study, it is critical to highlight that the higher male susceptibility to pandemic-era anxiety compared to females may be because of exposure to COVID-19 information in the media, which in turn influenced their perceived risk and severity of the virus on overall health (Curtis et al., 2022).

On the other hand, the result of this dissertation supports previous studies that

report that a higher educational level is protective against anxiety during the pandemic. Chlapecka et al. (2023) noted in their study that higher education is protective against anxiety when examining the relationship between educational attainment and anxiety. The report supports this study's findings by confirming that people with higher education are less likely to develop anxiety during the COVID-19 pandemic. The study finding is also consistent with other studies in which the authors noted that people with low educational levels are more likely to experience anxiety compared to those with higher education (Arora et al., 2023; Joannes et al., 2023). The alignment in study findings may be because people with some higher education have adequate information about the COVID-19 virus, including ways to prevent infection and spread of the virus (Saravanan et al., 2020). However, the dissertation findings also contradict other studies. For example, Gunjiganvi et al. (2023), in their study to examine depression and anxiety in patients diagnosed with the COVID-19 virus and in the intensive care unit, concluded that people with higher education are at risk of developing anxiety during the pandemic.

The statistically non-significant finding surrounding the age variable suggests that age is not associated with pandemic-era anxiety, and the result failed to align with other empirical studies that reported that older people compared to younger adults are susceptible to anxiety during a pandemic (Caycho-Rodriguez, 2021; Caycho-Rodriguez et al., 2022; Li et al., 2020; Loke & Ching, 2022; Said et al., 2023; Saeed et al., 2023; Wong et al., 2020; Yarrington et al., 2021). It did not support Bauerle et al. (2020) and Gunjiganvi et al. (2022) studies in which they reported that younger and middle-aged people are more likely to experience pandemic-era anxiety compared to older adults. It

also did not align with the study conducted by De and Sun (2022), in which they reported

that while anxiety prevalence was high among adults during the pandemic, the anxiety

level did not vary across age groups. The lack of support for other empirical studies on

the relationship between age and pandemic-era anxiety may be because of widely

implemented public health preventive measures and vaccine rollout across the country.

The race variable did not contribute significantly to the study model, meaning

race is not associated with pandemic-era anxiety. The findings did not support empirical

studies report that Blacks experienced less coronavirus-related anxiety compared to

Whites (Adzrago et al., 2022; Jacobs & Burch, 2021; Owens & Saw, 2021). It did not

align with studies that concluded that minorities experienced higher levels of pandemic-

era anxiety compared to their White counterparts (Hofmann, 2021; Nguyen et al., 2022;

Wen et al., 2023). It also failed to support findings reported by Breslau et al. (2021), in

which the authors noted that Hispanics experienced anxiety during the pandemic more

than other races. Despite the findings, it is vital to state that the non-significant finding

across races may be because, at the time of the study data collection, people across all

races had already well adjusted to the pandemic with significant availability and

accessibility of the COVID-19 vaccine across the country.

Recent studies have shown that marital status is associated with pandemic-era

anxiety, with reports favoring being married as protective against mental health compared

to unmarried people (Dean et al., 2021; Hooyeon et al., 2022; Hsu & Barrett, 2020;

Kumar et al., 2023; Rapp & Stauder, 2020; Said et al., 2023). However, the dissertation

findings failed to support the findings and showed no association between marital status

and pandemic-era anxiety. The current dissertation findings also did not support other empirical findings that suggested that people who are married and those married with children are more susceptible to high anxiety levels during the pandemic than those who are single (Chew et al., 2020; Karasu et al., 2022). The lack of support or alignment with other studies on the relationship between marital status and pandemic-era anxiety may be because individuals, irrespective of marital status, had adjusted to the pandemic, and accessibility of the COVID-19 vaccine across the country was significant.

The socioecological model and the biopsychological model ground this study to examine the impact of preexisting hypertension and demographic factors of age, sex, race, educational level, and race on pandemic-era anxiety. The results of the study findings support the biopsychological model and socioecological model. Preexisting hypertension, educational level, and sex are the only statistically significant independent variables for the study, with preexisting hypertension predicting pandemic-era anxiety. The biopsychological model reinforces the role of biology, psychology, and social aspects. The biological factor emphasizes hypertension, the psychological factor draws attention to pandemic-era anxiety, and the social aspect of the model provides knowledge on the impact of educational level on anxiety. The framework provides understanding and awareness of the relationship between hypertension and anxiety, which is essential in reducing the risk of developing anxiety during a pandemic. The socioecological model centers on social and environmental risk factors in disease development. The study reemphasizes the role of intrapersonal factors such as individual traits (sex) and the environmental (educational level) component of the model in understanding the risk

factors associated with developing pandemic-era anxiety. Focusing on these components is critical in understanding the risk factors, and changes in environmental factors (improvement in educational attainment) may help reduce the risk of anxiety, improving overall health outcomes.

Study Limitations

One limitation of the study is that it is a cross-sectional study, which can only show association and not causality between dependent and independent variables. Another limitation that may impact the validity of findings is the use of secondary data. There is the risk of inaccuracies in data or recall bias, which may lead to overrating or underrating how the respondents feel when exposed to anxiety news, impacting the overall CAS score. Also, there is a risk of response bias, typically when studies rely on information that studies participants offer during data collection (Creswell, 2009). Also, the secondary data collection process used a convenient sampling method, which poses selection bias, impacting the generalization of the result. The generalizability of the study centers on building on existing research through an extensive literature review on the relationship between preexisting hypertension and demographic factors and pandemic-era anxiety. Also, because of the non-randomization of the study sample, the threat to external validity is mitigated by generalizing the study result only to those that share similar characteristics with the study sample.

The initial data collection was online because that was the only available option during the period because of public health measures on face-to-face contact, including masking and limited outdoor activities, which may significantly contribute to high levels of

anxiety. Therefore, when interpreting the result, the limitations of an online survey should be considered. Participants received assurance that their information will remain confidential and private. I evaluated the secondary data to ensure that the data met the criteria set for my study to answer the research questions. I also examined the codebook to ensure the information in the data matches. Participation in the initial data collection was voluntary, and all participants signed informed consent. The study did not include those with confirmed cases of the COVID-19 virus, which could have provided insight into their perceived threat associated with the virus and how it may impact their anxiety level. Additionally, the secondary data used for the study did not have information on people with mental illness, which could have also informed the study on the impact of the perceived threat of the COVID-19 pandemic on mental health, including their anxiety level during the pandemic.

Furthermore, the data was limited to the Mu variant, delta variant, and the Iota variant, which were the COVID-19 predominant variants in the United States during the time of data collection (February 2021 to October 2021) (Sheikh et al., 2023). Although people may have adjusted to the pandemic, the effect of the virus remained relatively strong as the rollout of the COVID-19 vaccines in the United States continued to improve the health and mortality rate associated with the virus (Suthar et al., 2022). It is vital to note that the primary data did not include information about the COVID-19 strain. Therefore, it is imperative to apply caution when interpreting the study findings based on the COVID-19 viral strain and comparing the dissertation study results with other studies across the globe based on the viral strain in circulation at the time of data collection. The

COVID-19 variants spread at any point in time during the pandemic may influence how participants perceive the threat from the virus, in turn impacting their anxiety level. In addition, the rollout of the COVID-19 vaccine in December 2020 is also critical because of the effect the vaccine may have had on people, providing some measure of confidence and assurance of possible protection against the virus, allowing people to adjust to their current circumstances (American Journal of Managed Care [AJMC], 2021)

Recommendation

The limitations addressed above drive the recommendation for future studies. There is a need to replicate this dissertation study using a large sample size and a randomized sampling technique. The sample size should include other races, such as Native Americans and adolescents who may also have experienced some form of anxiety during the pandemic. It should also include those with mental illness and those with confirmed cases of the COVID-19 viral infection. Future studies should focus on the long-term effect of preexisting hypertension on pandemic-era anxiety and the effect of pandemic-era anxiety on hypertension across demographics. It should also include conducting research studies that include those without hypertension and comparing the results with those with preexisting hypertension. The outcome of the study analysis, notably the non-significant variables of age, marital status, and race, needs further investigation using a large sample size. The race variable may require studying individual races separately, including people living in underserved populations in each racial community.

In addition, more research is needed with particular attention to the COVID-19

variants and the availability of the COVID-19 vaccines, as it may impact people's anxiety perceptions. Replicating this study will provide insight into understanding the impact of age, marital status, and race on pandemic-era anxiety and if a change in behavior or modification of lifestyle through counseling and education that creates awareness of the risks will lead to a positive health outcome. Additionally, the research findings may help develop a survey that seeks to understand why high educational attainment is protective against anxiety during a pandemic, exploring other demographic factors that may be associated with pandemic-era anxiety in the United States. Healthcare providers and public health practitioners should work together to create awareness of the relationship between preexisting hypertension and pandemic-era anxiety, providing counseling on ways to manage hypertension and anxiety during a crisis using evidence-based programs and interventions. The intervention program should also center on community involvement and social interactions, increasing the acceptability of any intervention designed to reduce these diseases.

Implications

Anxiety is one of the mental health challenges that affects many adults in the United States, causing significant health problems and affecting the quality of life for the affected person (Szuhany & Simon, 2022). Despite growing awareness of anxiety disorder before the pandemic, the prevalence of the disease increased by 35% during the pandemic, affecting millions of adults in the United States, including previously healthy individuals and those with preexisting hypertension (Brooks et al., 2020; Delpino et al., 2022; Pieh et al., 2020; Salari et al., 2020). Several empirical studies have suggested that

there may be a relationship between preexisting hypertension and pandemic-era anxiety, and many who have the disorder may not be aware of their disease. Some of the issues with the disorder include a lack of awareness of anxiety and the relationship it has with hypertension and, in some cases, the inability to utilize all the resources available in the community. While hypertension could lead to severe complications such as stroke, heart disease, and premature death, impacting all-cause mortality, those with anxiety are equally at risk of mental health breakdown, including worsening of any chronic disease and exposure to serious health complications (Meuret et al., 2020; Mills et al., 2020; WHO, 2023). Despite the availability of resources, there is a need for more help to deal with anxiety problems now and in future public health emergencies.

In order to drive positive social change, public health authorities must continue to create awareness of the relationship between preexisting hypertension and pandemic-era anxiety. The research outcome is critical at the organizational level in informing public health practitioners, healthcare providers, hospitals, mental health clinics, and community health centers on developing intervention measures that serve the community. Additionally, it will involve providing resources for early screening for anxiety and hypertension, leading to early diagnosis of the disorders and monitoring for other cardiovascular risk factors associated with hypertension. It will also help provide access to treatment for hypertension, anxiety, and other mental health challenges, including those who are susceptible to anxiety in future pandemics.

At the policy level, the study outcome report will guide public health policymakers, in collaboration with public health organizations, public health

practitioners, and healthcare providers, in developing health policies that better serve the people during a pandemic and future health crisis in the country. Changes in current health policies and adopting culturally tailored healthcare policies will increase the acceptability of the new policies and reduce anxiety and its risk factors in people with chronic hypertension. The policy level change will drive social change by drawing attention to anxiety risk factors, triggers, and coping mechanisms in an intervention program, increasing accessibility to health education, and counseling on chronic diseases in underserved communities.

Furthermore, at the individual level, the awareness program would encourage at-risk populations living in underserved communities to participate in community-based health educational programs for anxiety and hypertension. Therefore, creating awareness of the disorders and providing access to education, counseling, and treatment will reduce the prevalence of anxiety and hypertension during a pandemic and may serve as a model to address future health crises. Future studies must focus on anxiety triggers during a pandemic, particularly in underserved communities, including the relationship between race and pandemic-era anxiety among people with preexisting hypertension, with particular attention to non-Hispanic Blacks who are more susceptible to hypertension (CDC, 2020b).

Conclusion

This study emphasized the relationship between hypertension and anxiety during the coronavirus pandemic, deducing that hypertension is a predictor of pandemic-era anxiety, and males, compared to females, are more susceptible to pandemic-era anxiety.

The study also concluded that having some form of higher education is protective against pandemic-era anxiety. The study outcome supports numerous empirical research studies conducted around the world, which show that there is a relationship between preexisting hypertension and pandemic-era anxiety. Future studies should focus on developing strategies on how to mitigate the risk of anxiety during a pandemic in people with chronic hypertension. The strategy could come in the form of creating awareness about the relationship between preexisting hypertension and pandemic-era anxiety and encouraging men and women to change their perception of anxiety during a pandemic. It should also include facilitating higher educational attainment, as it reduces the likelihood of developing coronavirus-related anxiety and may create an opportunity to understand the virulent nature of the virus, its complications, and preventive measures to mitigate the risk of contracting the disease in the United States. Intervention programs grounded in the socioecological model are critical in identifying the risk factors and implementing preventive measures that center on creating awareness, screening, and access to care at the individual, environmental/organizational, and policy levels. Although this study did not find a statistically significant relationship between marital status, age, race, and pandemic-era anxiety, future studies may explore the relationship between the variables using a larger sample size, putting into consideration the strain of the COVID-19 virus in circulation and the availability of the COVID-19 Vaccines at the time of data collection.

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