2021

Racial Disparities in Hypertension Self-Awareness and Hospitalizations for Hypertension-Related Illnesses Among Adult Arkansans

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Walden University
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Abstract

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MPH, Walden University, 2012

BS, Nova Southeastern University, 2008

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

June 2021

Abstract

Black individuals in the United States are twice as likely as White individuals to die of cardiovascular diseases. Between 2010 and 2016 in Arkansas (AR), hypertension (HTN) and HTN-related diseases had an age-adjusted death rate of 230.4 deaths per 100,000 population compared to 173.6 deaths per 100,000 population for Whites. The purpose of this quantitative, cross-sectional study was to explore the potential association between HTN self-awareness and emergency department (ED) visits and hospitalization rates for HTN and HTN-related illnesses between Black and White individuals in AR. The socioecological framework was used to explore sociodemographic (SDF) and socioeconomic (SES) factors as drivers of racial health disparities in the state. The Behavioral Risk Factor Surveillance System and AR Hospital Discharge Database were secondary data, and binary logistic regression and Chi-square analyses were used to examine the differences between HTN self-awareness and ED visits and hospitalizations for HTN and HTN-related diseases between Black and White adults in the state. The study results were statistically significant and showed that Black adults were 77.9% less likely to be aware of their HTN status and twice as likely to be unaware when controlling for SDF and SES (N = 27,438). They were also more likely to visit the ED (27.5%) and be admitted (53.0%) for HTN and HTN-related illnesses even when confounding for SDF and comorbidities. Eliminating racial disparities in HTN awareness will require targeted and intentional mechanisms that directly address health inequities. Equity-based, community-oriented, and individualized interventions and policies can reduce disparities, advance health equity, and promote positive social change.

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Dedication

To my four angel babies who were too beautiful for earth and got their wings before I could ever hold them. You all inspired this journey and kept me going. You reminded me every day that I am strong and resilient. Even though you didn't get to call me mom, you made me a mom, and I am forever grateful.

To my husband, Grant, for being my biggest cheerleader and holding down the fort while I went through this journey.

You all are my world, and I will forever love you.

Acknowledgments

My doctoral journey would not have been possible without the support and prayers of my family and friends.

My heartfelt gratitude goes to my parents, Obiajulu and Theodora Nwanze, and my parents-in-law, Jimmy, and Carol Smith. Thank you for your constant prayers and all the food you cooked and sent to us when we were too busy to remember to eat. To my siblings, Obi, Godwin, Tobe, and Kay, you all have been my partners in crime (not literally) from day one, and to my brother-in-law, Jimmy Jr., thank you for pushing me and reminding me to have fun no matter how stressed out I was. To my amazing husband, Grant, my ride or die, I love you to the moon and back, and I'm so grateful that I went through this journey with you by my side. To Skylar, my prissy fur baby, and my nephew pooches, Stewie and Bianco, you bring light to my life and comfort I sometimes didn't know I needed, particularly on my worst days. Life with you all has been a majestic ride, and if I were to do it all over, I would pick you all again, on purpose.

To my amazing lifelong friends, Jessica, Chidinma, Kelechi, Ijeoma, and Uche, you are the best girlfriends a girl could ever wish for. Thank you for supporting me and dragging me off on girls' get-togethers because you knew I needed to unwind, recoup, and recharge.

To my team members at work, Shakia, Danny, Cain, Rosa, Moises, and Linda, thanks for holding it down for me when I needed days off to focus on writing my doctoral study. To my director, Dr. Michelle R. Smith, who believed in me when I sometimes did not believe in myself, thank you. To Dr. Austin Porter, the original MVP, thank you for

guiding me and allowing me to bounce ideas off you from my prospectus phase till the final phase, and thank you for being my data geek when those data felt absolutely foreign to me. To Dr. Rahma Mkuu, I am grateful for your friendship, support, and encouragement throughout this journey. Thank you for replying to my late-night messages and directing me to various resources whenever I needed them.

To my Minority Leadership Program (MLP) family, you were 23 strangers who became an integral part of my life by consistently reminding me of my power, strength, and resilience. You remind me that I belong in any space, and most importantly, you always remind me of who I am. Thank you all from the bottom of my heart. We are MLPers for life.

To my Walden classmates, Tia, Jeff, and Zacquia, this journey was much easier with you all. You kept me from feeling isolated and alone as we shared our joys and frustrations about being in school as full-time working adults. You all are amazing, and I would not have made it without you.

Finally, to my chair, Dr. Chester Jones, my committee member, Dr. Stacy-Ann Christian, and my URR, Dr. W. Sumner Davis. Thank you for your guidance and patience throughout my doctoral study phase. I sincerely appreciate your contributions to my growth during this journey. To Dr. Zin, who made data and statistical analysis look like a walk in the park, I'm not sure I would have made it through my proposal and final study without you, so thank you.

Table of Contents

List of Tables

Section 1: Foundation of the Study and Literature Review

Introduction

Hypertension (HTN), also known as high blood pressure, occurs when the force of blood against the blood vessel walls is always high (American Heart Association [AHA], 2016). HTN increases the risk for cardiovascular diseases (CVDs) such as heart disease and stroke, which are two of the leading causes of death globally (Centers for Disease Control and Prevention [CDC], 2020a). HTN is usually referred to as the "silent killer" because it has no symptoms, and as a result, millions of people are unaware of their status and only learn of their HTN status by getting their blood pressure checked (CDC, 2020a). Blood pressure is measured in units of millimeters of mercury (mmHg) and is made of systolic (top) and diastolic (bottom) values (CDC, 2020a). In 2017, the American Heart Association published new guidelines for managing blood pressure. According to the AHA guidelines, HTN is measured in four blood pressure categories – normal (< 120/< 80mmHg), elevated (120-129/< 80mmHg), stage 1 (130-139/80-89mmHg), and stage 2 (≥ 140/≥ 90mmHg) – to determine an individual's risk level (Whelton et al., 2018). These guidelines have increased the number of people diagnosed with HTN, but they also allowed for both medication and non-medication interventions to begin at an early stage, thus preventing conditions that are difficult to control or manage (Whelton et al., 2018).

HTN is a major risk factor for developing CVD, and it is prevalent globally as well as in the United States (U.S.). Almost 45% of U.S. adults have an HTN diagnosis, and about 24% of those have their HTN properly controlled (CDC, 2020a). The number

of individuals in the U.S. with HTN increased from 87.0 million in 2000 to 108.2 million in 2016, and of those, 43.5% were taking antihypertensive medication and working to manage their conditions in 2016 (Dorans et al., 2018). In 2017, HTN was the main or impelling cause of death for almost 500,000 individuals in the U.S., and this condition costs the U.S. economy between $109 billion and $131 billion annually (CDC, 2020a; Zhang et al., 2017).

HTN affects various demographic groups differently. The prevalence of the condition increases with age, is higher in older women than older men, is higher among non-Hispanic Blacks compared with Whites, and is more controlled among Whites than Blacks (Fryar et al., 2017). HTN self-awareness occurs when an individual knows their HTN status (Raj et al., 2017). Blacks are, however, least likely to be aware of their HTN status because of social and environmental factors than biological factors (Cole et al., 2017; Musemwa & Gadegbeku, 2017). Socioeconomic and sociodemographic barriers such as income, health insurance, and access to quality care can inhibit individuals from being aware of their HTN status or seeking appropriate care for their HTN (Norris, 2016). These can increase the likelihood of the affected individuals having more emergency department (ED) visits and hospitalizations (Janke et al., 2016).

The impact of HTN on communities, especially minority communities, can be reduced through intentional strategies and targeted interventions that address the social determinants of health that drive disparities (Foti et al., 2019). Being open and honest with communities to understand the obstacles or barriers that drive adverse health outcomes can result in equity-based, community-oriented interventions that promote

health equity, promote positive social change, and improve the overall health outcomes of the populations involved.

Problem Statement

Blacks in the U.S. are twice as likely as Whites to die of preventable diseases such as strokes, heart disease, and end-stage renal disease (Ferdinand et al., 2017). Black males have an HTN rate of 48.0% compared to White males, whose HTN rate is 38.0%, and the HTN rate of Black females is 54.0% compared to the 27.0% rate for White females (Benjamin et al., 2019). Further, between 2012 and 2018, disparities in HTN-related deaths for Blacks were two times higher than Whites (Rethy et al., 2020), which can also relate to higher ED visits and hospitalizations for HTN and HTN-related diseases. HTN-related diseases or illnesses are defined as complications of HTN resulting in heart failure, aneurysm, coronary artery disease, stroke, including transient ischemic attack (TIA), among others (Colgrove et al., 2017; Vienneau et al., 2017; Weltermann et al., 2016).In 2017, 49.2% of Arkansas adults who were 18 years and older had been told by a healthcare provider that they had HTN (Arkansas Department of Health [ADH], 2017). According to America's Health Rankings (2018), cardiovascular deaths in Arkansas increased from 311.7 to 330.2 deaths per 100,000 population in 5 years. HTN is a risk factor for cardiovascular diseases (Ferdinand et al., 2017) and was attributed to healthcare costs of $21 million in 2014, with 35% of that cost incurred by Blacks alone (ADH, 2018).

Between 2010 and 2016, HTN and HTN-related diseases such as hypertensive heart and renal disease, myocardial infarction (MI), stroke, heart failure, hypertensive

renal disease, and other acute ischemic heart diseases had an age-adjusted death rate of 230.4 deaths per 100,000 population among Blacks compared to 173.6 deaths per 100,000 population for Whites in Arkansas (CDC, 2017). In 2015, the hospitalization rate for heart failure for Black individuals who were 65 years or older was 31.62 cases per 1,000 population compared to Whites at 18.04 cases per 1,000 population (CDC, 2016).

According to the 2018 US census, the population of Arkansas was 3,013,825, with 15.7% being non-Hispanic Blacks and 79.3% being non-Hispanic Whites. In examining the number of Black HTN and HTN-related deaths to the population of Blacks in the state, it is evident that disparities and inequities exist, and they must be addressed through education, interventions, and policies.

Interventions to combat racial disparities in HTN rates and awareness have been ineffective at addressing the underlying cause as they mostly do not address social determinants of health and systemic or institutional racism (Fei et al., 2017). This is partly due to the lack of collaboration among stakeholder groups (Harris et al., 2016). The consequences of the lack of awareness and management of HTN in this population are dire and should be addressed through interventions and policies that include multi-level participants such as community-based groups, researchers, policymakers, health care providers, payers, and the members of the target population (Brown et al., 2019). This collaborative effort can significantly address the disparities issues and substantially impact attempts to close the racial disparities gaps in HTN rates (Mills et al., 2016). Blacks in the United States have a higher risk of HTN and HTN-related diseases, which can increase their hospitalization rates (Waldron et al., 2019), but controlling HTN

through medication adherence, increased physical activity, alcohol abstinence, weight reduction, and the identification and management of comorbidities might reduce the prevalence of HTN and the risk for HTN-related hospitalizations (Gebremichael et al., 2019). Thus, it is possible that ED visits and hospital admission rates among Black adults in Arkansas may be reduced if they become more aware of their HTN status and adopt behaviors that allow them to better manage their conditions and adhere to their medication or treatment protocols. There may also be improvements in self-awareness levels when systems and policies are put in place to target and alleviate the burdens of social, structural, and political determinants of health.

Purpose of the Study

The purpose of this study was to explore the potential association between HTN self-awareness and ED visits and hospitalization rates for HTN and HTN-related illnesses between Black and White adults in Arkansas. In this study, socioeconomic status (SES) and sociodemographic factors (SDFs) such as age, sex, race, income, education, employment, and access to care were explored for possible associations with HTN self-awareness and hospitalization rates between both racial groups. Studies have shown that racial disparities exist in HTN rates, but none have examined the racial disparities in HTN self-awareness and how they may be associated with ED visits and hospital admission rates for HTN and HTN-related illnesses in the state of Arkansas (Fei et al., 2017; Sripipatana et al., 2019; Zhang et al., 2020). This study was distinctive and unique because it addressed this gap in the research.

Research Questions and Hypotheses

1. Is there a difference in HTN self-awareness between Black and White adults in Arkansas?

   $H_0$1: There is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas.

   $H_1$1: There is a statistically significant difference in HTN self-awareness between Black and White adults in Arkansas.

2. Is there a difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES?

   $H_0$2: There is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for sociodemographic factors SDFs and SES.

   $H_1$2: There is a statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES.

3. Is there a difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas?

   $H_0$3: There is no statistically significant difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

$H_1$3: There is a statistically significant difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

Theoretical Foundation for the Study

The theoretical framework that was used for this study is the socioecological model (SEM). The SEM is based on evidence that multiple factors influence health behaviors (Kilanowski, 2017). The model emphasizes interactions with the physical and sociocultural environments on the intrapersonal, interpersonal, organizational, community, and public policy levels (Kilanowski, 2017). The core principles of the SEM highlight how various factors drive health behaviors and how those behaviors can stem from the physical environment and span across multiple groups (Kilanowski, 2017). Sociocultural beliefs can impact how individuals interact with their environments and how likely they would be willing to change their behaviors (Williams, 2017).

This model is appropriate for this study because it can be used to assess social, structural, and political determinants, racial disparities, and other social factors that hinder Black adults in Arkansas from understanding how their lack of HTN self-awareness can potentially increase their likelihood of being hospitalized for HTN or HTN-related diseases (Sripipatana et al., 2019). These factors can be assessed at individual, interpersonal, institutional, community, and policy levels (Noonan et al., 2016). The SEM was used to describe how these intrapersonal, interpersonal, and public policy factors can potentially influence disparities in HTN self-awareness. This

framework can be used to create interventions to overcome these social structural, and systemic factors and make recommendations for policy development (Kilanowski, 2017).

Nature of the Study

The nature of this study was a quantitative research with a cross-sectional research design consistent with understanding how racial disparities might be associated with HTN self-awareness among Black adults in Arkansas. The Behavioral Risk Factor Surveillance System (BRFSS) database was used to examine SES and SDFs such as age, race, gender, income, employment status, and education levels. The Arkansas Hospital Discharge Database (HDD) system, made up of ED visits and inpatient admissions, was used to compare the proportion of ED visits and hospitalizations for HTN and HTN-related diseases (essential HTN, hypertensive heart disease, hypertensive chronic kidney disease, hypertensive heart and chronic kidney disease, hypertensive cerebrovascular diseases, and hypertensive retinopathy) between Black and White adults in the state.

According to the United States Census Bureau (2018), 79.3% of non-Hispanic Whites and 15.7% of non-Hispanic Blacks live in Arkansas. As previously stated, 42.9% of Arkansas adults have HTN; between 2011 and 2015, Black adults had the highest HTN prevalence rate among all racial and ethnic groups in the state at 42.8% compared to 38.7% for White and 18.2% for Hispanic adults (ADH, 2018). The age-adjusted HTN mortality rate for Black within the same period was 15.7 deaths per 100,000 compared to 7.3 for Whites (ADH, 2018). This higher risk for developing HTN and HTN-related conditions may be influenced by socioeconomic and sociodemographic factors as well as

health behaviors driven by social, structural, and political determinants of health (Graham, 2017).

Literature Search Strategy

I sought to examine any potential association between HTN self-awareness, ED visits, and hospitalization rates for HTN and HTN-related illnesses between non-Hispanic Black and non-Hispanic White adults in Arkansas. The peer-reviewed articles used for this study were found through search engines and websites such as PsycINFO, EBSCO, PubMed, PMC, ProQuest, Walden Library database, the CDC, the ADH, and Google Scholar. The keywords used to search these databases included *hypertension, high blood pressure, BP, hypertension awareness, cardiovascular risk factors, cardiovascular diseases, Arkansas, racial/ethnic disparities, racism, race, African Americans, Blacks, hospitalization, emergency department visits, hospital admission rates, discrimination, socioeconomic status (SES), sociodemographic factors, social determinants of health* and *socio-ecological model*. Recent literature published between 2016 and 2021 was used to help identify the problem, existing interventions, and knowledge gaps. Several other non-literature resources, including the committee chair, committee member, methodologists, statisticians, epidemiologists, librarians, the writing center, workshops, and professional practitioners, were used to provide structure and guidance for this study.

Literature Review Related to Key Concepts and Variables

This section provides a comprehensive review of relevant articles to justify the importance of this study. HTN is a risk factor for developing CVD, and Blacks have a higher risk for HTN than whites. In addition to HTN, Blacks also have a higher rate of

other risk factors for CVD, such as obesity, diabetes, tobacco use, and lack of physical activity (Carnethon et al., 2017). In this literature review, these risk factors for CVD are explored to determine trends and associations for racial disparities between Blacks and Whites. Additionally, the literature on HTN rates of Blacks, disparities in access to care, differences in the proportion of ED visits and hospital admissions between White and Black adults in Arkansas, and socioeconomic influence on HTN self-awareness are discussed. To conclude the section, the knowledge about this problem and the gaps to inform future research are summarized.

Hypertension Prevalence in the United States

HTN in the United States remains a challenging public health issue, as it increases the possibility for individuals to develop CVD. Between 2015 and 2016, adults in the United States had an HTN prevalence of about 29.0%, with women being a little over 28.0% and men at 30.0% (Fryar et al., 2017). HTN prevalence increases with age, as adults 60 and older had a prevalence rate of almost 65.0% compared to adults 18–39 at 7.5% and adults 40–59 at about 33.2% (Fryar et al., 2017). Overall, men have a higher HTN prevalence than women in all adult age groups except age 60 and older (Fryar et al., 2017). The HTN prevalence rates in the United States demonstrate the need for continuous education and interventions to raise awareness, control, treat, and manage HTN to reduce the incidence of cardiovascular-related diseases and death.

Racial Disparities in Hypertension Awareness

Racial disparities exist in HTN awareness, treatment, control, and management between Black, White, and other racial groups in the United States. Between 2015 and

2016, the prevalence of HTN in the United States remained at about 29.0%, increased with age, and was higher among Black adults at about 43.0% than White adults at approximately 28.0% (Fryar et al., 2017). The rates for Asian adults and Hispanic adults were also considerably lower than Blacks at 25.0% and 27.8%, respectively (Fryar et al., 2017). In some studies, the HTN awareness (85.7%, 82.7%) and treatment (77.4%, 76.7%) rates between Blacks and Whites were comparable, but Whites had a better HTN control rate at 51.0% compared to Blacks at 45.0%, who were less likely to adhere to their medications and have their blood pressure under control (Ferdinand et al., 2017; Fryar et al., 2017; Gu et al., 2017).

Impacts of Sociodemographic Factors and Socioeconomic Status on Racial Disparities in Hypertension Self-Awareness

Sociodemographic and socioeconomic factors play a role in HTN prevalence and awareness among the Black population. Factors including race, age, sex, income, education level, employment status, and health insurance status, as well as health behaviors such as smoking and lack of physical activity, contribute to their lack of awareness or limited knowledge of their risk for CVDs (Beatty Moody et al., 2019; Gu et al., 2017; Jalali-Farahani et al., 2017; Kilic et al., 2016; Jehan et al., 2018).

Race, Age, and Gender

CVD mortality rates have been declining in the United States for several decades; however, among minority populations, the slower decline in CVD mortality rates demonstrate the disparities in the burden of CVD risk factors such as HTN. Previous studies indicate that uncontrolled HTN among minority populations has led to higher

mortality rates for CVD-related illnesses such as coronary heart disease, congestive heart failure, kidney disease, heart attack, and stroke (Carnethon et al., 2017; Erqou et al., 2017; Huang et al., 2020; Ofori-Marfoh et al., 2018). Between 2015 and 2016, the age-adjusted HTN prevalence rate for Blacks was 59.0% compared to Whites at 45.7% (Al Kibria, 2019), and in 2018, Black adults were 32.0% more likely to die from CVD, with 289.9 deaths per 100,000 population compared to 219.8 deaths per 100,000 population for White adults (AHA, 2020a). The age-adjusted death rate from coronary heart disease in 2017 was 1.05 per 100,000 for Blacks compared to Whites at 0.80 per 100,000 (Lopez et al., 2020). For stroke, the age-adjusted death rate was 52.3 and 35.9 for Black and White adults, respectively (AHA, 2020b). Among CVD risk factors, HTN leads to CVD deaths at 41% compared to tobacco use, diabetes, and inadequate diet at 14%, 9%, and 13%, respectively (Carnethon et al., 2017). With these statistics, 41% of CVD deaths can likely be prevented if HTN levels are ideally controlled, and this may decrease the disparity gaps that exist in HTN prevalence (Carnethon et al., 2017).

Regarding gender, the prevalence of HTN among adult men and women is higher in Blacks than Whites, Latinx, and Asians. At a rate of 51%, White adults in the United States had better control of their blood pressure compared to 45% of Black and 37% of Asian adults (Fryar et al., 2017). White women have been shown to have better controlled HTN (57%) compared to Black women (49%). Additionally, although women had higher control rates than men overall, White men had a significantly higher control rate at 48% compared to Black men at 40% (Fryar et al., 2017).

Further, HTN prevalence rates increase with age (Fryar et al., 2017). Data collected by the CDC showed the HTN prevalence rate for adults 18–39 at 7.5%, 40–52 at 33.2%, and 63.1% among those 60 and older. The increasing trend was similar for both men and women, with men 18–39 having a rate of 9.2% compared with women of the same age at 5.6% (Fryar et al., 2017). For adults 40–59, men had an HTN rate of 37.2%, while women in that age group had a rate of 29.4%. However, the prevalence of HTN increases for women over 60 at 66.8% compared with men in the same group at 58.5% (Fryar et al., 2017). In contrast, younger adults generally have a lower rate of HTN prevalence and lower HTN self-awareness levels compared to older adults. However, increased HTN and other CVD risks can result from poor health management due to racial discrimination experienced at younger ages (Cuevas et al., 2019). Limited access to health services, lack of adequate health insurance, unemployment, and overall nonchalance to health issues among young adults contribute to higher CVD events as they age (Fang et al., 2017). Rates are even higher among young Black adults because of the previously mentioned reasons as well as low SES, environmental conditions, and lower educational levels (Fang et al., 2017).

Employment Status

An individual's employment status may have a positive or negative impact on their health and well-being. Being employed may improve a person's health by giving them a sense of social safety and income security. Full-time employment usually comes with significant benefits, including health coverage and access to worksite wellness programs for individuals and their families (Healthy People 2020, n.d.). Literature has

shown positive associations with employment and improved health, as well as negative associations with unemployment and health (Angier et al., 2019; Birgisdóttir et al., 2017; Clemow et al., 2018; Doyle et al., 2019; Mosquera et al., 2016; Schultz et al., 2018). Unemployed people have an increased risk of cardiovascular events and poor health than those who are employed (Schultz et al., 2018). For example, during the 2008 global economic crisis, the loss of jobs and income was associated with increased cardiovascular mortality and morbidity among Icelandic residents (Birgisdóttir et al., 2017). Similar trends were noted in various high-income countries during the recession period (Habibov et al., 2019; Karanikolos et al., 2016; Mattei et al., 2017).

Unemployment and underemployment can impact a person's ability to access health services and maintain healthy behaviors. The burden of being unemployed can increase adverse health behaviors such as alcohol use, tobacco use, lack of physical activity, and in some cases, violence, including domestic violence and intimate partner violence (Khuhawar & Shah, 2019; Schneider et al., 2016; Shultz et al., 2018). Lack of employment also prevents people from going for wellness visits and checkups dues to costs related to medical care. These barriers increase the likelihood of the affected individuals developing HTN, obesity, and other CVD risk factors (Brydsten et al., 2018; Healthy People 2020, n.d.; Norström et al., 2019; Schultz et al., 2018).

In addition to not being employed, employment quality can positively or negatively impact an individual's health. Some jobs can bring an added level of stress to an individual's life, which can negatively impact their health (Clemow et al., 2018; Henseke, 2018). Workplace stressors include hostile environments, long work shifts,

night shifts, inflexible work schedules, and lack of paid sick leave or family leave policies. These stressors can increase fatigue, reduce work productivity, lead to injuries, and increase cardiovascular risk factors such as HTN, diabetes, and obesity (Clemow et al., 2018). However, several employers have begun to acknowledge the impact of the quality of jobs on employee health and have started putting measures in place to decrease the burden of the work on the health of their employees (Mazur & Mazur-Małek, 2017). Worksite wellness or health promotion programs are offered to employees by their employers voluntarily—although some employers require employee participation as an incentive for lower health insurance premiums—to help employees focus on improving their health and well-being (Huang et al., 2016). Research has noted the benefits of worksite wellness programs. One study shows a reduction in HTN rates among more than 1,000 employees over 6 years due to behavior modification interventions and medication therapy (Eng et al., 2016). Workplace health promotion programs can also connect employees with health care providers, thereby increasing access to health care services (Cheon et al., 2020; Eng et al., 2016).

Employer-provided health coverage can help reduce the cost for employees seeking health care services. Also, the availability of worksite wellness programs encouraged and supported by employers can yield positive health outcomes as employees can participate in health activities, lunch and learn sessions, and other worksite-related wellness events. Knowledge gained from these events can encourage employees to seek medical care to manage their conditions through medication therapies in addition to health behavior changes.

Income

An individual's risk for CVD may be attributed to their income levels. In several countries, the increased risk for CVD among people with lower incomes has led to public health initiatives that focus on non-behavioral factors such as occupation, income, and education (Psaltopoulou et al., 2017). Researchers have found that adults with school-aged children in low-income communities had higher rates of undiagnosed HTN and were mostly unaware of their conditions (Markham et al., 2019). Other research has shown that when income levels drop by half or more than half, there was a significant risk for CVD, and when income levels rose by half or more than half, the risk for CVD significantly reduced (Wang et al., 2019). However, although low income is generally associated with a higher risk of CVD, it could be difficult to determine causality because health behaviors (such as tobacco use and physical inactivity) can contribute to a higher CVD risk (Wang et al., 2019). In developing interventions and policies to address the prevalence of HTN among minority communities, public health researchers should consider the wealth of the household and how income inequality can play a role in influencing the health of the members of these populations (Gu et al., 2017; Palafox et al., 2016).

Education Attainment

Researchers have frequently debated whether there is an association between educational levels or attainment and increased CVD risks. Several articles have arrived at different conclusions ranging from statistically significant associations to non-significant associations (Bell, Thorpe, Bowie, & LaVeist, 2018; Eguchi et al., 2017; Psaltopoulou et

al., 2017; Rosengren et al., 2019; Trudel et al., 2016). For example, Veronesi et al. (2017) studied a sample of 77,918 CVD-free individuals between the ages of 35 and 74 across some European nations and found that individuals with higher education attainment who smoke cigarettes had a decreased risk for CVD compared to smokers with less educational attainment. When adjusting for health insurance, Fang et al. (2017) also found that adults with lesser levels of education were more likely to have HTN as they could not afford medical care or had limited access to quality care. Research has also suggested that Blacks are less likely to graduate from high school (72.5%) and college (18.6%) than Whites (87.2%, 32.5%) and, this can lead to higher unemployment rates and potentially increased poverty and poorer health for Blacks (Noonan et al., 2016). Public health researchers should consider low education attainment as a barrier to care and work to develop policies, programs, and interventions that will reduce barriers that hinder access to care, especially among communities with low levels of education.

Health Insurance Status

Lack of self-awareness of HTN status can also be driven by health insurance, as being uninsured or underinsured can greatly reduce an individual's access to health care services. HTN prevalence rates can be impacted by health insurance status as those who lack adequate coverage are often unaware of their status due to decreased or nonexistent visits to healthcare providers (Norris, 2016). A study by Fang et al. (2017) assessed the impact of inadequate health insurance on access to care among adults with HTN and found that individuals who have adequate health insurance coverage are more likely to be 65 or older (due to Medicare), have higher educational attainment, be non-Hispanic

Whites, and adhere to their antihypertensive care regimen (Fang et al., 2017). In contrast, uninsured people experience more significant barriers to care and are least likely to be on any form of anti-HTN medication or have routine checkups due to their inability to afford the cost of health services (Fang et al., 2017).

In 2010, the Patient Protection and Affordable Care Act (ACA) put into place requirements for insurance plans to extend coverage for dependents 26 and younger under their parents or legal guardians' existing health plans. Up to 3 million young adults gained health insurance coverage due to this requirement and increased the insurance rate among this group from 64.4% to 74.8% between September 2010 and December 2011 (Fang et al., 2017; Obama, 2016). Research has also shown that utilization of health services, including preventive services (such as vaccinations and CVD screenings), has increased among this group since the inception of the ACA requirement (Chait & Glied, 2018; Eno et al., 2016; Reynolds & Fisher, 2020). In addition to increased utilization of preventive services, studies show that emergency room visits among this age group decreased significantly (Fang et al., 2017).

With an increased number of people having health insurance under the ACA, significant benefits, including improving and managing HTN, have been afforded. The expansion of health insurance coverage can also be beneficial in narrowing racial/ethnic health disparities and considerably decrease HTN prevalence and mortality rates among these populations (Buchmueller et al., 2016; Chen, Vargas-Bustamante, et al., 2016; Griffith et al., 2017). The health insurance benefits included in the ACA cover essential preventive care, which have allowed people to utilize HTN prevention and management

services, thereby increasing the number of people who could afford to access health services and decreasing their out-of-pocket costs (Chait & Glied, 2018). One of the primary objectives of the ACA is to improve the prevention of diseases through increased access to preventive services (Skinner & Chandra, 2016). There are public health benefits to this, as studies have shown that improving the treatment rates of HTN can prevent new heart disease and stroke cases (Benjamin et al., 2017; Frieden & Jaffe, 2018; Richman et al., 2016).

Racial Disparities in Cardiovascular Disease Risk Factors Awareness

HTN is one of the risk factors for CVD; other CVD risk factors include obesity, diabetes, tobacco use, and physical inactivity (Psaltopoulou et al., 2017). This section of the literature review strengthens the case for the importance of health equity in all aspects of illnesses relating to CVD by highlighting associations between the awareness of CVD risk factors and racial/socioeconomic disparities.

Obesity, Nutrition, and Physical Activity

Obesity is a major public health concern that disproportionately impacts Blacks and Latinx in the United States. With the increase in the rate of obesity in the country, it is imperative to understand what factors contribute to the rise and how racial/ethnic factors can be addressed. Body mass index (BMI) is often used to determine an individual's risk of obesity (CDC, 2017). Measured in kg/m^2, healthy body weight is defined as <24.9; overweight is defined as 25.0–29.9, and >30.0 is defined as obese (Apovian, 2016). Although BMI is widely used to determine a person's risk for obesity, researchers have argued that it is not a dependable method of measurement as an

individual's body makeup may not fit into the criteria or method by which BMI is calculated (Gutin, 2018). For example, according to Byrd et al. (2018), BMI underestimates the body fat composition of South Asian children and overestimates it in Black children. This, in addition to multiple natural and contrived factors, adversely contributes to the levels of obesity in the Black population. Disparities in the prevalence of obesity among minority populations can be seen in the early stages of life and can be influenced by genetic, social, and environmental factors such as diet, stress, income, racism, etc. (Byrd et al., 2018). Weight gain among Black children can be influenced by social and environmental factors such as food deserts, inadequate access to quality care, lack of built environments, lack of access to or expensive healthier food options, and lack of education (Eldridge et al., 2016; Psaltopoulou et al., 2017; Suglia et al., 2016).

Dietary patterns can also influence obesity because of food literacy (Rush & Yan, 2017). Health guidelines in the U.S and around the world often recommend meals that comprise of all food groups (carbohydrates, proteins, vitamins, fats and oil, water, mineral salts) to attain a balanced and nutrient-rich diet (Drewnowski, 2017; Drewnowski, 2018; Rush & Yan, 2017). However, in most low-income, minority-populated areas, food deserts and lack of healthy food options have left a plethora of carb-rich foods and an absence of foods rich in proteins and vitamins necessary for healthy growth (Drewnowski, 2017). Although genetics can play a role in a person's body makeup, cultural factors brought on mainly by the kinds of foods available to individuals in the population can affect food literacy and increase the risk for obesity as well as other CVD risk factors (Rush & Yan, 2017). With poor dietary habits leading to

increased risks for HTN, diabetes, CVD, and some cancers, public health researchers must develop targeted interventions and policies that will build supportive environments and increase food literacy.

Sedentary lifestyles are prevalent among minority populations. Studies have shown that Blacks are less likely than their White counterparts to engage in regular – 30 minutes per day – physical activities (Cockerham et al., 2017; Li et al., 2017; Noonan et al., 2016; Ray, 2017). Blacks experience barriers to physical activities, particularly those living in rural and low-income areas (Joseph et al., 2018; Li et al., 2017; Ray, 2017). Security and safety concerns in high-crime neighborhoods and lack of built environments such as parks or well-equipped school gymnasiums contribute to their low levels of physical activity (Ray, 2017). In a study conducted by Joseph et al. (2018), Black women cited hairstyles and difficulty maintaining hairstyles as a barrier to engaging in physical activity. With societal pressure on their appearance, Black women tend to avoid activities (such as swimming) due to hair-related issues (Huebschmann et al., 2016; Joseph et al., 2018; Siahpush et al., 2019). These societal pressures have recently led some states in the U.S to pass the CROWN (Create a Respectful and Open Workplace for Natural Hair) Act banning race-based hair discrimination (Donahoo & Smith, 2019). Black women mostly avoid rigorous exercises that can promote cardiovascular health and reduce their chances of obesity because of the cost of maintaining society-approved hairstyles (Huebschmann et al., 2016; Joseph et al., 2018).

Overall, several barriers prevent Blacks and other racial/ethnic minority populations from adopting healthier nutrition and physical activity habits to reduce their

risks for developing CVD. Educational interventions and policies to promote proper nutrition and physical activity can positively influence health behaviors and may be instrumental in decreasing the incidence and prevalence of obesity among minority populations, particularly Black Americans.

Tobacco Use

According to the CDC (2020), smoking rates in the U.S have been declining since 1964; however, stark disparities exist across racial and ethnic groups, SES, and educational levels. Black Americans start smoking at an older age and smoke fewer cigarettes overall than their White counterparts, but they are more likely to die from diseases related to smoking than Whites (Roberts et al., 2016). Among Black Americans, tobacco use significantly contributes to three leading causes of death – heart disease, cancer, and stroke – and those who smoke are about 40% more likely to develop diabetes than non-smokers (CDC, 2019). Even with the lower smoking rates among Blacks, they are less likely than Whites to receive quitting advice from their healthcare providers (Landrine et al., 2018).

In a study by Weinberger et al. (2019), the quit rate for Blacks was significantly lower than that of their White and Hispanic counterparts over 15 years. The disparities in access to quitting also lies in educational interventions as Black smokers (72%) were more likely to believe that using e-cigarettes will help them quit smoking compared to Whites (53%) and Hispanics (47%) (Webb Hooper & Kolar, 2016). Among nonpoor Blacks and Hispanics, Colen et al. (2018) noted that higher education attainment, better access to health services, and economic resources did not improve racial discrimination

in health advice or services received from providers among an array of health and health behavior issues.

Targeted marketing by tobacco companies focused on minority populations contributes to higher smoking rates among Blacks. A study by Mills et al. (2018) determined that retail marketing for menthol tobacco products was highly concentrated in Black neighborhoods and low-income neighborhoods. Kong et al. (2019) also noted that over 84% of all Black smokers use menthol products.

Future research should focus on developing policies to curtail and diminish targeted marketing for tobacco products. Public health program practitioners should also develop interventions to better understand the existing racial disparities and inequities, particularly concerning tobacco use, prevention, and cessation.

Diabetes

Between 2011 and 2016, the prevalence of diabetes in Blacks and Latinx were higher (20.4%, 22.1%) compared with Whites (12.1%) (Cheng et al., 2019). Race, ethnicity, social, and lifestyle factors can contribute to disparities in undiagnosed prediabetes or diabetes in minority populations (Lo et al., 2017). Disparities and lack of awareness are further driven by distrust of the healthcare system by minority communities and traditional beliefs about masculinity, especially among Black and Latino men (Gibbons, 2019; Lo et al., 2017).

Diabetes is a chronic disease that requires continuous management through medication, behavioral changes, and social support (Lo et al., 2017). Social factors and social support can worsen racial disparities, especially among Black men compared with

White men (Hawkins & Mitchell, 2017). According to Hawkins and Mitchell (2017), Black men who have great social support are more likely to see a healthcare provider than those who do not, and when compared to White men, Black men had lower social support overall, which may be one of the reasons they tend to neglect seeking care for diabetes and other conditions.

Structural barriers also contribute to the lack of disease awareness among minority populations (Ali & Suwaidi, 2019). Limited access to primary care facilities or providers, lack of transportation, and poverty are some of the contributing factors to low disease awareness among ethno-racial populations (Bell, Thorpe, & LaVeist, 2017; Bell, Thorpe, Bowie, & LaVeist, 2018; Gibbons, 2019; Heidemann et al., 2016). Addressing racial disparities in diabetes awareness will require social, structural, and policy change as well as intentional community engagement to build trust and encourage collaborations between impacted communities and public health researchers.

Hypertension Awareness and the Socioecological Model

The SEM, as previously stated, asserts that multiple factors influence health behaviors (Kilanowski, 2017). The model analyzes interactions with the physical and sociocultural environments at the intrapersonal, interpersonal, organizational, community, and public policy levels (Kilanowski, 2017). In this research study, the intrapersonal, interpersonal, and public policy level factors were considered to examine how social, cultural, and structural/systemic elements may influence an individual's HTN self-awareness.

Intrapersonal Level Factors

Intrapersonal factors include a person's skills, normative beliefs, preferences, self-efficacy, knowledge, attitudes, traits, and perceived barriers, among other characteristics (Odum et al., 2018). These factors can play an important role in how individuals make decisions about their health or how receptive they are to health advice from healthcare providers (Chung et al., 2018; McCormack et al., 2017). In a study conducted by Odum et al. (2018), intrapersonal factors largely impacted the variance between men and women and their perceptions of fruit and vegetable intake. Because of normative beliefs and food preferences, men were less likely to consume fruits and vegetables compared to women; and women consumed fewer fruits and vegetables because of perceived barriers such as access to affordable, healthier options (Odum et al., 2018). Similarly, several studies indicate that women are more likely to be aware of their HTN status than men because when there is proper access, women tend to visit their healthcare providers more than men (Ahmad & Oparil, 2017; Rahman et al., 2017; Schlichthorst et al., 2016).

Part of the influence of intrapersonal factors on health behaviors can include an individual's perceived risk or benefit. Aycock, Clark, and Araya (2017) examined the perceived risk for stroke among participants who had HTN and diabetes. The authors found that participants were likely to underestimate their risks because they did not think it would happen to them.

Intrapersonal factors can be associated with lower HTN or CVD risk awareness. Public health education and intervention programs should focus on improving factors (social and structural determinants of health) that hinder individuals from adopting

healthier behaviors and provide individuals with the tools to change their health behaviors, which can improve health outcomes.

Interpersonal Level Factors

Interpersonal factors include interactions and relationships with others, social support and networks, peer influence, family environment, associations, and emotional support (Kilanowski, 2017). Individuals can be heavily influenced by factors around them, including other individuals (Wright, 2016). Interpersonal influence on health behaviors can be positive or negative, meaning that an individual's interaction with other people who use tobacco, for example, may influence them to start using tobacco and vice versa (Kubzansky et al., 2018). In their study, Maercker and Hecker (2016) found that treatment for posttraumatic stress disorder (PTSD) should not only be delivered at the individual level but also at the interpersonal level because a person's environment can contribute to their positive or negative response to treatment, and should, therefore, be included in the treatment plan to improve their mental health.

Interpersonal relationships and interactions can also improve or lead to a decline in an individual's health. Several studies (Giena et al., 2018; Hong, 2019; Wright, 2016) have shown that a strong social or support network for an individual can decrease their risk of mortality while a person with lower social support can have a higher mortality risk. Positive support networks can encourage or strengthen positive changes in health behaviors, while negative or a lack of social support can encourage adverse health behaviors (Wright, 2016). Group activities can also promote healthier behaviors or positive changes in health behaviors, as highlighted in a study by Ybarra Sagarduy et al.

(2018). In addition to clinical interventions, study participants with HTN who attended physical activity classes in groups showed an improvement in managing their disease, adhering to medications, and implementing changes to enhance their quality of life (Ybarra Sagarduy et al., 2018).

Public health researchers are ever more mindful of the need to factor interpersonal interactions into health behavior interventions. Considering interpersonal influence while developing programs and policies or medical interventions can be beneficial in improving individual or population health.

Public Policy Level Factors

Public policy factors include federal, state, or local policies and laws that control or reinforce health practices, programs, or interventions (Kilanowski, 2017). Although intrapersonal and interpersonal factors can influence health outcomes, public policies strongly contribute to health outcomes can particularly impact minority communities adversely (Algeria et al., 2021). A study by Pirkle et al. (2018) asserted that individual and interpersonal health behaviors were weak predictors of HTN awareness when environmental and policy factors were considered and should therefore be included in plans and implementation of public health interventions. One such policy change was the change in HTN diagnosis guidelines by the American College of Cardiology (ACC) and the AHA that occurred in 2017. The change in HTN diagnosis from 140/90mmHg to 130/80mmHg drastically increased the number of people who have HTN, and despite the increase, the policy change allowed more people to become aware of their HTN status

and start taking steps – behavior change interventions or antihypertensive medications – to get their blood pressures under control (Ioannidis, 2018).

The implementation of the ACA also allowed individuals who would not normally have or be able to afford health insurance to have health coverage through the expansion of Medicaid (Obama, 2016). This law allowed over 20 million people to acquire health insurance and increase their utilization of available health services (Wherry & Miller, 2016). In some states that did not expand Medicaid or passed laws to repeal the expansion after a change of administration, adverse impacts occurred as several millions of people lost health coverage which caused them to lose access to critical health services, including HTN treatment (Sommers et al., 2020). Reduction in the patient utilization also led to some closures of community clinics in majority of rural areas, which in turn widened the health access gaps for residents who still had some health coverage but could not seek services elsewhere due to other factors such as distance, cost, and time away from work, among others (Sommers et al., 2020).

Public policies can positively and negatively impact health behaviors, and therefore, public health practitioners must work with policymakers to ensure that health policies enacted do not adversely affect specific populations or groups of people. Measures should be taken to ensure that policies remove structural, economic, and social barriers that may impede individuals from accessing and utilizing health and other services that can positively impact their behaviors and eventually improve health outcomes.

Association Between Higher Rates of ED visits and Hospitalization due to Disparities in Awareness of HTN Status

Emergency department visits for HTN -related illnesses in the U.S. doubled between 2013 and 2016, according to Janke et al. (2016). The higher prevalence of HTN among Blacks can essentially contribute to a higher number of visits to the ED as well as increased hospitalization rates for HTN -related illnesses. According to Waldron et al. (2019), Blacks are more likely to die from or be hospitalized for HTN-related diseases because of their increased risk for CVDs and the increased possibility of comorbidities.

The implementation of the ACA in 2010 greatly reduced the number of uninsured Americans but being insured did not necessarily translate into the utilization of health services. In their study, Allen et al. (2017) examined some of the barriers that prevented Minnesotans with health insurance from utilizing health care services. Some of the barriers were system-level, including lack of access to health services, racial discrimination, and cost (Allen et al., 2017). Black Americans and other racial minorities often have low healthcare utilization rates, increasing their risk for comorbidities, including HTN (Chen et al., 2016). Social determinants of health can prevent racial minorities from seeking preventive care leading to more severe illnesses and ED visits or hospitalizations over time (Daniel et al., 2018). Choosing between taking off from work and risking losing their jobs, several Black and ethnic minorities say they would rather go to work sick than lose their jobs (Allen et al., 2017). The study further highlights some patient-level barriers to healthcare utilization, such as family/work responsibilities or childcare availability (Allen et al., 2017).

Lack of access to quality healthcare services, especially in low-income areas, can also increase ED visits. Previous literature has shown that for some racial/ethnic minorities, including Black Americans, the first time they seek medical care for their conditions is either at an urgent care facility or an ED and after their conditions have become acute (Daniel et al., 2018; Virapongse & Misky, 2018; Wallace et al., 2016). For those who have access to some healthcare services, unproductive interactions with healthcare providers, institutional racism, and cultural barriers such as language differences can prevent them from returning or getting follow-up care (King & Redwood, 2016).

Unavailability or underutilization of community health education programs in low-income or rural areas may contribute to the increased lack of awareness of health conditions among minority populations. Goodling et al. (2019) assessed awareness of CVD prevention programs among young women and found that most of them were unaware of community prevention programs targeting CVD, and a majority were also unaware that CVD is the leading cause of death for women.

With increased unawareness of health conditions and barriers that prevent Blacks and other ethnic minorities from seeking preventive/primary care, it is understandable that these populations can have higher numbers of ED visits and hospitalization rates than their White counterparts.

Improving HTN Awareness and Addressing Gaps in Research

To reduce racial disparities in HTN prevalence, public health and clinical interventions should focus on increasing awareness, control, treatment, and management.

In addition to community-focused interventions, interventions should also focus on attitudes and implicit biases of health care providers and public health practitioners.

In both the healthcare and public health settings, practitioners are mostly unaware of health disparities that negatively impact the health outcomes of the patients and communities they serve. This is seen through limited or lack of adequate cultural humility trainings available to health care providers and public health practitioners (Taylor et al., 2019). In cases where there is some cultural awareness training provided, there is some ambiguity in the training, which can confuse providers about interacting with patients with different cultural backgrounds (Cai, 2016). Cultural awareness training, done online or in-person, should utilize relevant communication tools and be tailored to prepare providers to address the needs of communities served to encourage patients to participate in their health care (Jongen et al., 2018; Min-Yu Lau et al., 2016; Taylor et al., 2019). In addition, incentivizing health providers to adopt health equity measures to address health and racial disparities in their practices can help reduce those disparities and increase health equity (Anderson et al., 2018).

To advance health equity and reduce health disparities, the health workforce (healthcare and public health) should implement and utilize targeted and intentional mechanisms that directly address inequities, including the social, structural, and political determinants of health. In addressing these determinants with regards to HTN self-awareness, emphasis should be placed on increasing access to quality health services, expanding health insurance and increasing its affordability, and implementing policies that directly address the structural determinants that adversely impact the health of

minority populations. Norris (2016) asserts that health insurance is one of the largest barriers to quality health services in the U.S., especially for communities of color who are more likely to have lesser education attainment, low-paying jobs, and have higher risks for comorbidities. A large proportion of Blacks compared with Whites are either uninsured or underinsured and are less likely to be aware of their HTN diagnosis or be taking antihypertensive medications (Norris, 2016; Sohn, 2017). The financial burden of health due to being uninsured or underinsured also increases the disparities in HTN self-awareness, control, and treatment for Blacks compared to Whites (Fang et al., 2016). The health insurance debate in the U.S. has been growing since the inception of the ACA. With policymakers and presidential candidates focusing on affordable health insurance, public option, and Medicare for all, public health and health care researchers should continue developing targeted policies to ensure that all communities are adequately insured.

Blacks are greatly underrepresented in the healthcare decision-making process, and policies or decisions often neglect to analyze the impacts of underrepresentation on Blacks and other minority communities (Noonan et al., 2016). An assessment of HTN control among Whites, Blacks, and Latinx populations of all ages over 6 years showed that HTN control for Blacks was steadily lower than all other subgroups (Foti et al., 2019). Foti et al. (2019) suggested that a targeted approach to improving HTN awareness among Blacks can improve treatment adherence, control, and adequate self-management of their conditions. Targeted interventions should include members of the target population as they are in the best position to provide guidance on what they need to

address the health and racial disparities that exist in the health of their communities (Harris et al., 2016). Community-based participatory research (CBPR) can be instrumental in reducing health inequities and eliminating health disparities by engaging members of Black communities equally in all stages of health interventions targeted at their communities (Harris et al., 2016). Utilizing CBPR in working with ethnic minority communities can be valuable in addressing racial health disparities and may enhance the possibility of implementing culturally appropriate interventions that fit and are sensitive to the needs of the target community (Tucker et al., 2017).

Efforts to eliminate health and racial disparities will require input from all levels of the health care system and their partners (Anderson et al., 2018). Research partnerships with Black communities can increase their interest and engagement in health behavior research and interventions (Tucker et al., 2019). Because of the underrepresentation of Blacks and other ethnic minority groups in clinical research and trials, a research partnership is essential to increase participation and help utilize results to improve health outcomes (Tucker et al., 2019). This can eventually lead to an increased awareness of health conditions among Blacks and a reduction in racial health disparities and inequities. Advancing health equity is instrumental in achieving positive social change and social justice. The health workforce shares a great responsibility in ensuring that all communities, regardless of race, gender identity, income/education level, faith, or sexual orientation, have access to resources that will enable them to improve and maintain healthy behaviors.

Definitions

Cardiovascular diseases: Are a group of conditions that affect the heart and blood vessels. Some of these conditions include heart attack, stroke, congenital heart disease, pulmonary embolism, and peripheral arterial disease, among others (World Health Organization [WHO], 2017).

Health disparities: The differences in health associated with economic, social, and/or environmental disadvantage. Health disparities predominantly affect marginalized groups and can be because of a combination of factors, including racial, ethnic, and gender discrimination, among others (Healthy People 2020, 2020).

Health equity: The attainment of full health potential for all people regardless of racial or social differences (Healthy People 2020, 2020).

Hypertension: Also known as high blood pressure, occurs when the force of blood against the blood vessel walls is always high (AHA, 2016).

Hypertension self-awareness: A person's knowledge of their HTN status ascertained mainly through a confirmed diagnosis by a healthcare provider (Raji et al., 2017).

Hypertension-related illnesses: Are cardiovascular complications resulting from uncontrolled HTN (WHO, 2019). They can be identified in International Classification of Disease (ICD) 9 (401 Essential HTN; 402 Hypertensive heart disease; 403 Hypertensive chronic kidney disease; 404 Hypertensive heart and chronic kidney disease; 437.2 Hypertensive Cerebrovascular diseases; 362.11 Hypertensive retinopathy) and ICD 10 (I10, Essential (primary) HTN; I11, Hypertensive heart disease; I12, Hypertensive chronic

kidney disease; I13, Hypertensive heart, and chronic kidney disease; I60-I69 Hypertensive Cerebrovascular diseases; H35.03 Hypertensive Retinopathy) diagnosis codes as specified by the WHO (WHO, 2018).

Racial disparities: Are inequities that occur as a result of an individual's race or ethnicity. These disparities can occur in health, education, sex, gender, age, wealth, and the criminal justice system, among others (Healthy People 2020, 2020).

Sociodemographic factors: Are factors such as age, race, marital status, language, etc., that may or may not influence health outcomes (Rajani et al., 2019).

Socioeconomic status (SES): typically quantified as a consortium of occupation, education, and income, SES is the social position or class of an individual or group (American Psychological Association [APA], n.d.).

Assumptions

The sample selected for this study, Black and White adults 18 years and older, truly represented the target population considered for the study. The socio-ecological model (SEM) was an appropriate theoretical framework to determine how intrapersonal, interpersonal, and public policy factors potentially impact an individual's awareness of their health status. The SEM is also appropriate to determine how health behaviors can be altered by social or environmental influence. The variables selected were suitable to establish how SDFs and SES can affect health behaviors through actions or inactions based on awareness, cultural dynamics, and public policies. These assumptions were necessary to develop meaningful study outcomes that respond to the research questions (RQs), contribute to existing literature, and highlight areas for future research studies.

Scope and Delimitations

HTN and HTN-related illnesses burden the healthcare systems and financially impact the economy due to increased healthcare costs. This study focused on the disparities in HTN self-awareness levels between Black and White adults in Arkansas and how these disparities may influence increases in the proportion of ED visits and hospitalizations for HTN and HTN-related illnesses among Black adults in the state.

This was a cross-sectional study, and therefore causality could not be inferred as there were no control groups for comparison. The data used for this study were time-specific from 2011-2017 and may not have reflected the exact picture of the current impacts of disparities in HTN awareness on hospitalizations or ED visits. The sample size did not include individuals below the age of 18, and the use of dichotomous questions did not allow for unrestricted responses by the participants.

Significance, Summary, and Conclusions

Meador et al. (2020) suggest that over 14 million people in the United States do not participate in HTN interventions or medication therapies to manage their blood pressures because they are unaware of their HTN status. This study was important because more Blacks than Whites are dying from CVDs at alarming rates (Ferdinand et al., 2017). HTN is a risk factor for CVDs and is higher among Black populations (Ferdinand et al., 2017), which puts them at a greater risk for developing various HTN-related illnesses (Ferdinand et al., 2017). Several socioeconomic and sociodemographic factors such as education, employment status, income, and access to health services also impact the ability of Blacks to be more aware of their risks for HTN-related illnesses and

learn healthy ways to change their behavior and improve their overall health outcomes (Gu et al., 2017; Kilic et al., 2016). This study focused primarily on HTN because, as stated previously, Blacks in Arkansas have a higher mortality rate from HTN and HTN-related diseases compared to their White counterparts (ADH, 2018). To my knowledge, this was the first study that examined the racial disparities in HTN self-awareness and ED visits/hospitalization rates between Black and White adults in Arkansas.

The results of this study highlighted the disparities in HTN self-awareness between Black and White adults in Arkansas, showed the disparities in HTN prevalence rates for Black Arkansans, and outlined how social intrapersonal and interpersonal factors, as well as public policies, may influence these disparities. The results also offered insights into how HTN awareness can be increased among Blacks in Arkansas, potentially reducing the number of ED visits and hospital admissions for HTN and HTN-related diseases. Additionally, the results from this study can be used in the state of Arkansas to develop policies and interventions that focus on social, structural, and political determinants of health to reduce disparities and inequities that disproportionately affect Blacks and other minority populations in the state. These results can also encourage equitable and culturally appropriate practices among healthcare providers, which can advance health equity and promote social change.

Section 2: Research Design and Data Collection

Introduction

The purpose of this study was to explore the potential association between HTN self-awareness and ED visits and hospitalization rates for HTN-related illnesses between Black and White adults in Arkansas. In this study, SES and SDFs such as age, sex, race, income, education, employment, and access to care were explored for possible associations with HTN self-awareness and hospitalization rates between both racial groups. This study filled a gap in research by examining racial disparities in HTN self-awareness and how they may be associated with ED visits and hospital admission rates in the state of Arkansas, which previous research has not addressed (Fei et al., 2017; Sripipatanaet al., 2019; Waldron et al., 2019; Zhang et al., 2020).

Research Design and Rationale

The research design consisted of a cross-sectional research design. This type of research design is descriptive and cannot determine causation (Setia, 2016). Therefore, it was consistent with understanding the association between HTN self-awareness and the rate of ED visits and hospitalizations for HTN-related illnesses among the target population. Using the cross-sectional research design, the confidence interval and odds ratio (OR) further explained the association between the phenomenon (Setia, 2016). The dependent variable for the first and second RQ was “HTN self-awareness,” and for the third RQ, the dependent variables were “ED visits and hospital admissions for HTN and HTN-related diseases.” The independent variable for the first research question was “race,” and for the second RQ, the independent variable was race, and the covariates are

age, sex, income, education, employment status, and health coverage. The independent variable for the third RQ was "race," and the covariates were age, sex, comorbidities, and health coverage. The dependent, independent, and covariate variables for the first and second RQs were extracted from multiple fields in BRFSS (2011–2017), and the variables for the third RQ were obtained from the Arkansas HDD System (2012–2017 for ED visits; 2011–2017 for inpatient admissions).

Methodology

Population

The target population for this research was non-Hispanic Black and non-Hispanic White adults, 18 years and older, living in Arkansas. BRFSS is a telephone survey conducted by the CDC in partnership with states. BRFSS data between 2011 and 2017 were utilized for this study. Additionally, the Arkansas HDD contains ED and inpatient admissions from all hospitals in the state (ADH, n.d.). ED visits and hospital admissions for HTN and HTN-related illnesses between 2011 and 2017 were used for this study.

Sampling and Sampling Procedures

The BRFSS entails an annual partnership between the CDC and all the U.S states and some U.S. territories. The system uses telephone surveys to collect data on health-associated risk behaviors, the use of preventive services, and chronic health conditions from U.S residents who are 18 years and older and are not incarcerated or in confinement (ADH, n.d.-a). In Arkansas, BRFSS respondents are selected randomly by the state health department using computer programs that generate home and mobile phone numbers (ADH, n.d.-a). Selected participants receive a thorough explanation of the BRFSS

collection process, the information collected on the survey, and how the data collected would be used (ADH, n.d.-a). To alleviate the issues of a potential scam, selected respondents are provided the phone number that would be used to call them as well as the name and phone number of the state BRFSS coordinator. Interviewers use random digit dialing techniques for both landlines and cellphones to call each respondent to ask questions from the survey and record the participants' responses (ADH, n.d.-a). The survey includes standardized core questions required by the CDC for all states and optional state-added modules.

The BRFSS is a publicly available database system that can be accessed with or without prior permission; however, the CDC requires that researchers acknowledge the BRFSS database as the source for their data analysis (CDC, 2018). The BRFSS annual survey questionnaires, codebooks, data files, methodology, and design materials are publicly available for access on the CDC's BRFSS website. The BRFSS data are currently weighted using the iterative proportional fitting or raking statistical weighting method (CDC, 2018). Variables such as age, race, ethnicity, sex, and educational level are weighted using this statistical method.

The HDD between 2012–2017 for ED visits and 2011–2017for inpatient admissions were also used to conduct this study. The HDD is an important tool used for addressing extensive policy issues in Arkansas, and all hospitals in the state are mandated by law (Act 670 of 1995, A.C.A. 20-7-201 et seq.) to report information as stipulated by the state's board of health (ADH, n.d.-b). The information contained in the HDD system is obtained from hospital billing data (ADH, n.d.-b.). The HDD can be accessed by

submitting an institutional review board (IRB) approval, study protocol, and data request form to the Science Advisory Committee at the state's health department (ADH, n.d.-c). The committee meets twice a month to review data access requests. Upon submitting the required documents, I appeared before the advisory committee members to explain the nature of this study and why the data being requested was vital to the study. They reviewed the document submissions and the presentation and granted my request.

Inclusion and Exclusion Criteria

Only non-Hispanic Black and non-Hispanic White adults were included in this study. This is because they make up about 95% of the state's population. Including other races was therefore insignificant. Additionally, the BRFSS excludes individuals who are under the age of 18, incarcerated, or institutionalized, which were exclusion criteria also applied to this study.

For the Arkansas HDD, only the ICD admitting diagnosis codes for HTN and HTN-related illnesses were included in the study. The International Statistical Institute adopted the international list of causes of death in 1893 and delegated the list to the WHO at its creation in 1948. WHO authorized the use of ICD codes to standardize health information (mortality and morbidity statistics) for easy storage, retrieval, and study of health data, sharing and comparing health information worldwide, and comparing data across various times within the same location (WHO, 2018). The following ICD-9-CM and 10-CM codes were used to define HTN and HTN-related diseases for this study:

- ICD-9-CM Coding for HTN
    - 401 Essential HTN

  - 402 Hypertensive heart disease
  - 403 Hypertensive chronic kidney disease
  - 404 Hypertensive heart and chronic kidney disease
  - 437.2 Hypertensive Cerebrovascular diseases
  - 362.11 Hypertensive retinopathy
- ICD-10 CM Coding for HTN
  - I10, Essential (primary) HTN
  - I11, Hypertensive heart disease
  - I12, Hypertensive chronic kidney disease
  - I13, Hypertensive heart, and chronic kidney disease
  - I60-I69 Hypertensive Cerebrovascular diseases
  - H35.03 Hypertensive Retinopathy

Secondary HTN (405, I15), such as HTN caused by pregnancy, was excluded from the study.

Power Analysis

The sample size is important in any study as it represents a subset of the target population and allows researchers to arrive at reliable and valid conclusions (Frankfort-Nachmias & Leon-Guerrero, 2018). To ensure the reliability and validity of this study, the power level, alpha level, effect size, confidence levels, and margin of error were thoroughly considered. The sample size of a study can significantly influence the level of precision of the results estimate, the probability of retaining or rejecting the null

hypothesis, and whether the difference between the population of study is small or large (Vasileiou et al., 2018).

This study used z-tests (binary logistic regression and multiple binary logistic regression) and a chi-squared test for association. Using the G*Power analysis software created by Faul et al. (2009), a power analysis was performed to estimate the sample size that would be appropriate to achieve statistically significant results in this study. Pr(Y = 1 | X = 1) H_1 and Prob(Y =1 | X = 1) H_0 was estimated using the percentage of White and Black Arkansans who have been told by a health care provider that they have HTN. The alpha level was set to 0.05, which is the accepted level of significance in research; the power level was set to 0.80, which is the typically desired power level; and the effect size was 0.5. The power analysis performed using the G*Power software estimated that the sample size for this study had to be at least 22 (N = 22) to attain valid and reliable results.

Instrumentation and Operationalization of Constructs

Instrumentation

The BRFSS and Arkansas HDD data collected between 2011 and 2017 were used for this study. As stated, BRFSS is a publicly available database; however, requests for access to both the BRFSS and the Arkansas HDD system were submitted to the state health department's Science Advisory Committee. Survey questionnaires are used to collect the BRFSS data, and billing data are used to collect data in the Arkansas HDD system. These instruments used for collecting the data in the databases are appropriate because they collect information regarding SES and SDFs, health-risk behaviors, chronic disease conditions, and admitting diagnosis for HTN and HTN-related illnesses. The

information collected in these databases was pertinent to this study as they helped determine whether there was a significant relationship between HTN self-awareness and ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

Operationalization

There were three RQs in this study. The dependent variables, independent variables, and covariates are shown in Tables 1, 2, and 3.

Table 1

Dependent Variables

Variables	Variable type	Instrument	Data Value
HTN-Awareness	Categorical	Ever told by healthcare provider that you have high blood pressure?	0 = Yes 1 = No
ED Visits	Categorical	ED visits for HTN and HTN-related illnesses for White and Black adults between 2012 and 2017	0 = Yes 1 = No
Hospital Admissions	Categorical	Hospital admissions for HTN and HTN-related illnesses for White and Black adults between 2011 and 2017	0 = Yes 1 = No

Table 2

Independent Variable

Variables	Variable Type	Instrument	Data Value
Race	Categorical	Non-Hispanic Race	0 = NH White* 1 = NH Black or African American

Note. *Only Non-Hispanic Whites and non-Hispanic Blacks were included in this study.

Table 3

Covariates

Variables	Variable Type	Instrument	Data Value
Sex	Categorical	Indicate sex of respondent	0 = Female 1 = Male
Age	Categorical	Age in years	0 = 18 to 24 1 = 25 to 34 2 = 35 to 44 3 = 45 to 54 4 = 55 to 64 5 = 65 and older
Educational Level	Categorical	What is the highest grade or year of school completed?	0 = Never attended school or only kindergarten 1 = Elementary 2 = Some high school 3 = Highs school graduate 4 = Some college or technical school 5 = College graduate
Employment Status	Categorical	Are you currently…?	0= Employed 1 = Unemployed
Income Level	Categorical	Is your annual income from all sources…?	0 = < $15,000 1 = < $25,000 2 = < $35,000 3 = < $50,000 4 = $50,000 and higher
Health Insurance Coverage	Categorical	Do you have any kind of health care coverage	0 = No 1 = Yes
Comorbidities	Categorical	Do you have diabetes with or without complications? Do you have renal failure? Are you obese?	0=No 1=Yes

Data Analysis Plan

The International Business Machines corporation's (IBM) Statistical Package for the Social Sciences (SPSS) version 25 was used to import data from BRFSS and the Arkansas HDD System for analysis and management. Quality assurance in research entails data monitoring, error prevention, data cleaning, and documentation (Kumar & Khosla, 2018). Data screening and cleaning procedures included detecting errors, identifying outliers, double entries, and missing data (Chai, 2020). Descriptive statistics were used to report all missing data and outliers observed in the data, and the SPSS listwise deletion function was used to manage missing data. The data analysis performed for this study was used to answer the following quantitative RQs:

1. Is there a difference in HTN self-awareness between Black and White adults in Arkansas?

   $H_0$1: There is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas.

   $H_1$1: There is a statistically significant difference in HTN self-awareness between Black and White adults in Arkansas.

2. Is there a difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES?

   $H_0$2: There is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for sociodemographic factors SDFs and SES.

$H_1$2: There is a statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES.

3. Is there a difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas?

$H_0$3: There is no statistically significant difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

$H_1$3: There is a statistically significant difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

Statistical Analysis Plan

Statistical analysis is important in research because it provides meaning to numbers that lack meaning on their own. In other words, the ability to understand the results of a study and the conclusions drawn from that study depends on the statistical analysis performed, which is why it is important to ensure that accurate statistical tests are used to conduct research studies (Ali & Bhaskar, 2016).

For the first RQ in this study, a binary logistic regression analysis was conducted to determine if there was a difference in HTN self-awareness between Black and White adults in Arkansas. Both the dependent variable (HTN self-awareness – [yes or no]) and the independent variable (race – [Black or White]) were dichotomous variables. Binary

logistic regression analysis was appropriate to answer this RQ because it allowed for predicting the relationship between the dependent and independent variables (Dargaso Dana, 2018). A Hosmer-Lemeshow goodness-of-fit was be used to determine whether the model is correctly specified and showed whether there was a statistically significant association with HTN-self-awareness and race (Fagerland & Hosmer, 2017). The OR was analyzed to show if there was a positive or negative relationship for every unit increase of HTN-self-awareness.

For the second RQ, a multiple binary logistic regression analysis was conducted to determine if there was a difference in HTN-self-awareness between Black and White adults in Arkansas when controlling for SDF and SES. The dependent variable was HTN self-awareness. The independent variable was race. The covariates were SDF and SES, including age, sex, educational attainment, income level, health insurance status, and employment status. This test was appropriate because it allowed for understanding the functional relationship between the covariates, independent variable, and the dependent variable; it also helped bring clarity to what may cause the independent variable to change (Ali et al., 2020). A Hosmer-Lemeshow goodness-of-fit was also used to indicate whether the model was correctly specified. This model showed whether there was a statistically significant association with HTN-self-awareness and race when controlling for SDF and SES.

A chi-square test for association and a multiple binary logistic regression was performed in examining the third RQ. The analysis was conducted in two parts (for ED visits and inpatient admissions) and showed whether the difference in the proportion of

ED visits and hospital admissions between Black and White adults in Arkansas was statistically significant while controlling for SDF. The dependent variables were ED visits and hospital admissions, and the independent variable was race, and the covariates were age, gender, health coverage/insurance, and comorbidities (diabetes w/wo complications, renal failure, obesity). It allowed for understanding the functional relationship between the covariates, independent variable, and the dependent variable; it also helped bring clarity to what may cause the independent variable to change (Ali et al., 2020). A Hosmer-Lemeshow goodness-of-fit was also used to indicate whether the model was correctly specified. This model showed whether there was a statistically significant difference in the proportion of ED visits and hospital admissions between Black and White adults in Arkansas. The analysis helped determine if the null hypothesis was rejected or retained. A detailed outlook of the RQs can be seen in Table 4.

Table 4

Statistical Analysis Plan

Research Questions	Statistical Tests	Variables
Is there a difference in HTN self-awareness between Black and White adults in Arkansas?	Binary logistic regression analysis	DV: HTN self-awareness IV: Race
Is there a difference in HTN self-awareness between Black and White adults in Arkansas when controlling for sociodemographic factors (SDF) and socioeconomic status (SES)?	Multiple binary logistic regression analysis	DV: HTN self-awareness IV: Race Covariates: age, sex, educational attainment, income level, health insurance status, and employment status
Is there a difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas?	Chi-square test for association and Multiple binary logistic regression analysis	DV: Emergency Department visits and Hospital admissions for HTN and HTN related illnesses IV: Race Covariates: age, gender, health coverage/insurance, comorbidities (diabetes w/o complications, diabetes w/complications, renal failure, obesity

Threats to Validity

Internal and external validity are systems that indicate whether inferences from a study are reliable and significant (Kenny, 2019). Internal validity verifies the structure of a study, and external validity infers whether the results of a study can apply to the real world (Kenny, 2019).

Threats to internal validity in quantitative research occur when several concepts can make an outcome possible (Burkholder et al., 2016). These concepts can include instrumentation, attrition, confounding, and statistical regression (Burkholder et al., 2016). Addressing threats to internal validity in a study is important to ensure accuracy. This study utilized a cross-sectional research design, and because this research design cannot prove causal relationships, there were minimal threats to the internal validity of this research study.

Threats to external validity occur when the results of a study do not hold true across similar environments (Burkholder et al., 2016). Factors that threaten external validity include selection bias, situational factors, and sample features, among others. The BRFSS data collection method utilizes random selection, which ensures that survey respondents are representative of the population of study and decrease selection bias. This selection criterium reduces threats to external validity by allowing for the generalizability of the results of the study (Burkholder et al., 2016). The specific protocols for the research design and statistical tests selected for this study were strictly adhered to so as to reduce the probability of introducing effects that may impact the result of the study.

Statistical conclusion validity refers to the practicality or logic of the results of a research study (Kenny, 2019). Threats to conclusion validity can include low statistical power, unreliable or incorrect measures, violation of assumptions for statistical tests, and data mining, among others (Grigsby & McLawhorn, 2019; Rutkowski & Delandshere, 2016). These threats (Type I or II errors) can incorrectly infer statistical significance or lack thereof when improper or unreliable treatment implementation protocols are utilized (Kenny, 2019). Addressing conclusion validity requires researchers to ensure that missing data are correctly reported and indicated in the observations, assumptions for statistical tests are applied appropriately, and precise measures are instituted to ensure reproducible study results (Grigsby & McLawhorn, 2019; Kenny, 2019).

Ethical Procedures

BRFSS data is publicly available, and the Arkansas HDD system requires Institutional Review Board (IRB) submission to ensure that human subjects are protected or that the study would not be using human subjects. Requests for access and use of secondary data were submitted to Walden University's IRB and the state health department for both databases. All guidelines put forth by the institution that owns the databases were strictly followed. The IRB at Walden University approved this study (IRB# 08-26-20-0146049).

Secondary data were used for this study; therefore, no human subjects were involved. The Arkansas HDD collects identifiers because the information in the database is curled from the patient's billing data (ADH, n.d.-b.). To ensure that no human subjects are identified during this research process, all protected health information identifiers

were deleted from the dataset by the partner agency using the safe harbor method as stipulated in the privacy rule of the Health Insurance Portability and Accountability Act (HIPAA). The safe harbor method requires all protected health information to be deleted to ensure that there would be little to no risk for identifying an individual patient (Kayaalp, 2018). All datasets were stored on devices encrypted with BitLocker. Once the research project was concluded, the code key and datasets were deleted using DBAN, a software used for irreversible data wiping.

Summary

This section covered the cross-sectional research design and methodology that allowed for analyzing the relationship between HTN self-awareness and ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas. The dependent, independent, and covariate variables were identified and defined by utilizing the codebooks for the CDC's BRFSS and the Arkansas HDD. The Statistical analysis and data analysis plans were laid out to demonstrate how the identified variables were used in the study to determine whether the null hypotheses for the RQs were rejected. Threats to the validity of the study, as well as ethical considerations, were also discussed.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this study was to explore the potential association between HTN self-awareness and ED visits and hospitalization rates for HTN and HTN-related illnesses between Black and White adults in Arkansas. In this section, SES and SDFs such as age, sex, race, income, education, employment, and access to care are explored for possible associations with HTN self-awareness and hospitalization rates between both racial groups. Racial disparities in HTN self-awareness were explored to examine if there was an association with a higher proportion of ED visits and hospital admission rates in Arkansas between Black and White adults. The data analysis performed for this study was used to answer the following quantitative RQs:

1. Is there a difference in HTN self-awareness between Black and White adults in Arkansas?
2. Is there a difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES?
3. Is there a difference in the proportion of ED visits and hospital admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas?

Data Collection of Secondary Dataset

Timeframe for Data Collection

BRFSS data between 2011 and 2017 were utilized for this study. Additionally, the Arkansas HDD contains ED and inpatient admissions from all hospitals in the state

(ADH, n.d.). ED visits and hospital admissions for HTN and HTN-related illnesses between 2012 and 2017 were used for this study.

Response Rate

There were 36,304 respondents who participated in the BRFSS survey between 2011 and 2017 (N = 36,304). It is unclear if the data collected each year were deduplicated to account for repeat respondents over the given period. The total average response rate for the Arkansas BRFSS survey between 2011 and 2017 was 4,829.

For the Arkansas HDD, 5,130,036 ED records were inputted in the system between 2012 and 2017 (N = 5,130,036), and 2,100,390 inpatient admissions were inputted in the system between 2011 and 2017 (N = 2,100,390). Records of all ED visits and inpatient admissions for all diseases are included in these numbers. The average number of all ED visits between 2012 and 2017 was 855,006, and the average number of all inpatient admissions between 2011 and 2017 was 300,056. Because the collection of this data is mandated by Arkansas state law, the response rate from all hospitals in the state is 100%. However, it is unclear if the data collected each year were deduplicated for individuals who visited the ED or were admitted for the same conditions in the given period.

Demographic Characteristics of the Sample

Tables 5–7 show the demographic characteristics of the BRFSS study's sample. Among the respondents (N = 36,304), 42.7% stated that they were aware of their HTN status (n = 15,514) compared to 38.3% who were not (n = 13,888). Of the respondents, most were non-Hispanic White (78.3%, n = 28,408), and 14.9% were non-Hispanic Black

(n = 5,398). More than half of the respondents were female (62.8%), and there were more respondents in the 65 and older age category (43.9%) compared to other age groups. Only 27.6% of the respondents earned $50,000 or more, and a majority had some form of health coverage (90.0%). About 36% of the total respondents were high school graduates, whereas 27.2% had a college degree or higher. Approximately 62.0% of respondents were unemployed compared to 37.6% who were employed. For simplicity and clarity, respondents who stated they were employed for wages or self-employed were classified as “employed,” and those who stated that they were out of work for less than a year, out of work for over a year, a student, a homemaker, retired, or unable to work were classified as “unemployed.”

Table 5

BRFSSS Demographic Characteristics

		Frequency	%	Valid %	Cumulative %
Race					
Valid	White	28,408	78.3	78.3	78.3
	Black	5,398	14.9	14.9	93.1
	Other race	2,498	6.9	6.9	100.0
	Total	36,304	100.0	100.0	
Sex					
Valid	Female	22,808	62.8	62.8	62.8
	Male	13,496	37.2	37.2	100.0
	Total	36,304	100.0	100.0	
Age category					
Valid	18-24	1,184	3.3	3.3	3.3
	25-34	2,496	6.9	6.9	10.1
	35-44	3,226	8.9	8.9	19.0
	45-54	5,282	14.5	14.5	33.6
	55-64	8,166	22.5	22.5	56.1
	65 and older	15,950	43.9	43.9	100.0
	Total	36,304	100.0	100.0	
Income level					
Valid	< $15,000	4,822	13.3	16.3	16.3
	< $25,000	6,491	17.9	22.0	38.3
	< $35,000	3,860	10.6	13.1	51.3
	< $50,000	4,382	12.1	14.8	66.1
	$50,000 and higher	10,016	27.6	33.9	100.0
	Total	29,571	81.5	100.0	
Missing	System	6,733	18.5		
Total	36,304	100.0			
Education level					
Valid	Never attended school or only attended kindergarten	42	.1	.1	.1
	Grades 1 through 8 (Elementary)	1,341	3.7	3.7	3.8
	Grades 9 through 11 (Some high school)	2,859	7.9	7.9	11.7
	Grade 12 or GED (High school graduate)	12,933	35.6	35.6	47.3
	College 1 year to 3 years (Some college or technical school)	9,270	25.5	25.5	72.8
	College 4 years or more (College graduate)	9,859	27.2	27.2	100.0
Employment status					
Valid	Unemployed	22,372	61.6	62.1	62.1
	Employed	13,660	37.6	37.9	100.0
	Total	36,032	99.3	100.0	
Missing	System	272	.7		
Total	36,304	100.0			

Table 6

BRFSS: Ever Told Blood Pressure High

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	15,514	42.7	52.8	52.8
	No	13,888	38.3	47.2	100.0
	Total	29,402	81.0	100.0	
Missing	System	6,902	19.0		
Total		36,304	100.0		

Table 7

BRFSS: Have Any Health Care Coverage

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3,536	9.7	9.8	9.8
	Yes	32,687	90.0	90.2	100.0
	Total	36,223	99.8	100.0	
Missing	System	81	.2		
Total		36,304	100.0		

Tables 8–16 show the demographic characteristics of the HDD ED study's sample. For simplicity and clarity, only non-Hispanic Black and White adults were included in the study analysis. Among HDD ED patients, (N = 5,130,036), 77.5% were non-Hispanic White (n = 3,973,908), 22.5% were NH Black (n = 1,156,128). Most of the patients (59.6%) who visited the ED were female (n = 3,973,908), and 81.7% had some form of health coverage or health insurance. About 22.5% of the total ED visits by non-Hispanic Blacks and Whites were for HTN and HTN-related illnesses, and most of the patients were between the ages of 25–34 (21.8%). Additionally, most of the patients with ED visits did not have any comorbidities. The comorbidities considered for this study

included diabetes without chronic complications, diabetes with chronic complications, renal failure, and obesity.

Table 8

HDD ED Visits: Non-Hispanic Black or White

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	3,973,908	77.5	77.5	77.5
	Black	1,156,128	22.5	22.5	100.0
	Total	5,130,036	100.0	100.0	

Table 9

HDD ED Visits: Patient Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	3,057,495	59.6	59.6	59.6
	Male	2,072,537	40.4	40.4	100.0
	Total	5,130,032	100.0	100.0	
Missing	System	4	.0		
Total		5,130,036	100.0		

Table 10

HDD ED Visits: Health Coverage or Insurance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	911,906	17.8	17.9	17.9
	Yes	4,193,714	81.7	82.1	100.0
	Total	5,105,620	99.5	100.0	
Missing	System	24,416	.5		
Total		5,130,036	100.0		

Table 11

HDD ED Visits: HTN And HTN Related Diseases

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1,152,808	22.5	22.5	22.5
	No	3,977,228	77.5	77.5	100.0
	Total	5,130,036	100.0	100.0	

Table 12

HDD ED Visits: Patient Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 – 24	803,902	15.7	15.7	15.7
	25 – 34	1,119,095	21.8	21.8	37.5
	35 – 44	897,489	17.5	17.5	55.0
	45 – 54	789,182	15.4	15.4	70.4
	55 – 54	587,217	11.4	11.4	81.8
	65 and older	933,151	18.2	18.2	100.0
	Total	5,130,036	100.0	100.0	

Table 13

HDD ED Visits: Diabetes Without Chronic Complications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4,147,443	80.8	92.4	92.4
	Yes	338,737	6.6	7.6	100.0
	Total	4,486,180	87.4	100.0	
Missing	System	643,856	12.6		
Total		5,130,036	100.0		

Table 14

HDD ED Visits: Diabetes with Chronic Complications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4,450,546	86.8	99.2	99.2
	Yes	35,634	.7	.8	100.0
	Total	4,486,180	87.4	100.0	
Missing	System	643,856	12.6		
Total		5,130,036	100.0		

Table 15

HDD ED Visits: Renal Failure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4,425,026	86.3	98.6	98.6
	Yes	61,154	1.2	1.4	100.0
	Total	4,486,180	87.4	100.0	
Missing	System	643,856	12.6		
Total		5,130,036	100.0		

Table 16

HDD ED Visits: Obesity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4,430,579	86.4	98.8	98.8
	Yes	55,601	1.1	1.2	100.0
	Total	4,486,180	87.4	100.0	
Missing	System	643,856	12.6		
Total		5,130,036	100.0		

Tables 17 through 25 show the demographic characteristics of the HDD inpatient study's sample. Among HDD inpatient admissions, (N = 2,100,390), 84.8% were non-Hispanic White (n = 1,781,931), and 15.2% were non-Hispanic Black (n = 318,459). Most of the patients (59.6%) admitted were female (n = 1,251,092), and 95.7% had some form of health coverage or health insurance. Individuals 65 and older had the highest number of admissions (45.0%), and 52.0% of the total non-Hispanic Blacks and Whites' inpatient admissions were for HTN and HTN-related illnesses. Again, the comorbidities considered for this study include diabetes without chronic complications, diabetes with chronic complications, renal failure, and obesity. Most of the patients admitted for HTN, and HTN-related diseases did not have comorbidities.

Table 17

HDD Inpatient Admissions: Non-Hispanic Black or White

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	1,781,931	84.8	84.8	84.8
	Black	318,459	15.2	15.2	100.0
	Total	2,100,390	100.0	100.0	

Table 18

HDD Inpatient Admissions: Patient Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	1,251,092	59.6	59.6	59.6
	Male	849,287	40.4	40.4	100.0
	Total	2,100,379	100.0	100.0	
Missing	System	11	.0		
Total		2,100,390	100.0		

Table 19

HDD Inpatient Admissions: Health Coverage or Insurance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	89,974	4.3	4.3	4.3
	Yes	2,009,103	95.7	95.7	100.0
	Total	2,099,077	99.9	100.0	
Missing	System	1,313	.1		
Total		2,100,390	100.0		

Table 20

HDD Inpatient Admissions: Patient Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	146,831	7.0	7.0	7.0
	25 - 34	225,459	10.7	10.7	17.7
	35 - 44	183,669	8.7	8.7	26.5
	45 - 54	256,852	12.2	12.2	38.7
	55 - 64	342,814	16.3	16.3	55.0
	65 and older	944,765	45.0	45.0	100.0
	Total	2,100,390	100.0	100.0	

Table 21

HDD Inpatient Admissions: HTN and HTN-Related Diseases

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1,091,553	52.0	52.0	52.0
	No	1,008,837	48.0	48.0	100.0
	Total	2,100,390	100.0	100.0	

Table 22

HDD Inpatient Admissions: Diabetes Without Chronic Complications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1,742,389	83.0	83.0	83.0
	Yes	358,001	17.0	17.0	100.0
	Total	2,100,390	100.0	100.0	

Table 23

HDD Inpatient Admissions: Diabetes with Chronic Complications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1,981,628	94.3	94.3	94.3
	Yes	118,762	5.7	5.7	100.0
	Total	2,100,390	100.0	100.0	

Table 24

HDD Inpatient Admissions: Renal Failure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1,864,175	88.8	88.8	88.8
	Yes	236,215	11.2	11.2	100.0
	Total	2,100,390	100.0	100.0	

Table 25

HDD Inpatient Admissions: Obesity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1,884,356	89.7	89.7	89.7
	Yes	216,034	10.3	10.3	100.0
	Total	2,100,390	100.0	100.0	

Results

Simple descriptive statistical analyses were used to determine the demographic characteristics included in the data. Binary logistic regression was used to determine if there was a significant difference in HTN self-awareness between Black and White adults in Arkansas (RQ1). Multiple binary logistic regression was used to determine if there was a significant difference in HTN-self-awareness between Black and White adults in Arkansas when controlling for SDF (age, gender) and SES (income, education, employment status, health coverage) (RQ2). Chi-squared test for association was utilized to determine if an association exists between ED visits and inpatient admissions for HTN and HTN-related diseases and race (RQ3). To further analyze the strength of the relationship, a multiple binary logistics regression analysis was conducted to test if the relationship between the dependent and independent variables changed with confounders (age, gender, health coverage, comorbidities).

Statistical Assumptions

Assumptions for binary logistic regression are met in this study as the dependent variables used for all the RQs are dichotomized. The sample size used for the study is large, and observations in the datasets are assumed to be independent of each other. Finally, little to no multicollinearity exists between the independent variables (Frankfort-Nachmias & Leon-Guerrero, 2018).

Assumptions for the chi-square test for association are met in this study in that the dependent and independent variables are categorical and measured at a nominal or ordinal level. The independent variable (race) and confounders (age, gender, etc.) also

consist of two or more categorical independent groups (Frankfort-Nachmias & Leon-Guerrero, 2018).

Statistical Analyses Findings

Research Question 1

Research question 1: Is there a difference in HTN self-awareness between Black and White adults in Arkansas? The dependent variable (HTN awareness – ever told by a health provider that you have high blood pressure) was dichotomized as "Yes = 0" and "No = 1." The independent variable (race) was grouped into three categories: White = 0, Black = 1, other race = 2. "Other race" was excluded in the binary logistic regression analysis. A total of 27,438 (*N*) cases were included in the analysis, and there were 6,368 missing cases. SPSS automatically excludes missing cases from data analysis (Pampaka et al., 2016). The model was statistically significant and revealed the variance that occurred in the dependent variable -HTN awareness- is explained by the independent variable -race, i.e., $X^2(1, N=27{,}438) = 284.99$, $p < .0001$. This means that the null hypothesis, which states that there is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas, was rejected.

The -2Log likelihood (-2LL) and R^2 values for the analysis were 37615.440 and .014, respectively. This shows that the independent variable explains only about 1.4% of the variance in the dependent variable. The Hosmer and Lemeshow test of the goodness of fit suggested the model did not fit the data as $p < 0.001$ (< .05). However, this can be explained by the sample size, as the power of the chi-squared statistics can increase as the sample size increases (Nattino et al., 2020). Slight or inconsequential changes between

true and estimated probabilities may allow for the hypothesis to be rejected (Yu et al., 2017). Because of this, the Hosmer and Lemeshow test of the goodness of fit was not considered for this analysis.

In Table 26, the OR is 1.779 (95% CI 1.662-1.904), meaning that Black adults were 77.9% more likely to be unaware of their HTN status than their White counterparts. This analysis is statistically significant with a *p*-value of <.0001. This *p*-value is significantly less than the .05 threshold, and therefore, the null hypothesis that there is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas was rejected.

Table 26

Logistic Regression Model Predicting HTN Self-awareness for Black Adults in Arkansas

							95% C.I. for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Non-Hispanic Black or White (1)	.576	.035	275.264	1	.000	1.779	1.662	1.904
	Constant	-.631	.032	385.106	1	.000	.532		

Note. a. Variable(s) entered on step 1: Non-Hispanic Black or White.

The analysis of RQ1 using binary logistic regression showed a statistically significant difference in HTN self-awareness between Black and White adults in Arkansas, and the null hypothesis that there is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas was rejected.

Research Question 2

Research question 2: Is there a difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES?

Covariates or confounders were included in the analysis of RQ2 to determine if there were changes to the dependent variable. In addition to the independent variable (race), the covariates included SDF (age, gender) and SES (income, education, employment status, health coverage). The "age" variable was categorized into five; "gender" was categorized into female and male; "health coverage" was dichotomized into yes and no; and "education was categorized into six groups "Income" was categorized into five groups, and "employment status" was dichotomized into unemployed and employed. A multiple binary logistic regression was utilized to determine if there was a difference in HTN-self-awareness between Black and White adults in Arkansas when controlling for SDF and SES. A total of 22,451 (*N*) cases were included in the analysis, and there were 11,355 missing cases. As stated earlier, SPSS automatically excludes missing cases from data analysis.

The model was statistically significant and revealed the variance that occurred in the dependent variable -HTN awareness- is explained by the independent variable -race, whiles controlling for SDF and SES, i.e., $X^2(18, N=22{,}451) = 3493.971$, $p<.0001$. This means that the null hypothesis, which states that there is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SES and SDF, was rejected.

The -2Log likelihood (-2LL) and R^2 values for the analysis were 27551.717 and .192, respectively. This shows that about 19.2% of the variance in the dependent variable is explained by the independent variable when controlling for confounders. For the analysis of RQ2, the X^2 value for the Hosmer and Lemeshow test of the goodness of fit is 9.184 with p=.327 (>.05). The insignificant p-value suggests that the model is a good fit for the data.

The inclusion of covariates or confounders in the analysis allowed for the examination of their effect (if any) on the dependent variable. Table 27 shows the logistic regression model predicting HTN self-awareness for Black adults in Arkansas while controlling for SDF and SES. The analysis showed that being a Black adult is a positive and significant (p<.0001) predictor of the odds of being unaware of their HTN status. The OR (2.224) indicates that Black adults are twice as likely to be unaware of their HTN status compared to their White counterparts (CI 95% 2.044-2.419). Only 38% of Black adults who had health coverage were unaware of their HTN status (p < .0001, OR=1.388, CI 95% 1.240-1.554). The analysis also shows that 30% of those who were unaware of their HTN status were males (p < .0001, OR=1.303, CI 95% 1.228-1.383).

Additionally, being employed is a negative and significant (p < .0001) predictor of the probability of HTN unawareness keeping all other predictors constant. The OR (.726) shows that for every unit of increment in employment status (employed = 1 yes), the odds of being unaware of their HTN status decreases (.726 < 1). This means that Black adults who are employed are more likely to be aware than unaware of their HTN status controlling all other predictors. All categories for education level, except those

with only elementary school education (1= grades 1-8), were negative and significant (p < .0001) predictors of the probability of HTN unawareness keeping all other predictors constant. OR < 1 for all the statistically significant categories meaning that for every higher education level attained, the odds of being unaware of their HTN status decreased.

The age covariate was positive and significant ($p < .0001$) at all category levels—however, the younger the individual, the higher their odds of being unaware of their HTN status. Adults in the 25-34 age category were 16 times ($p < .0001$, OR=16.578, CI 95% 13.605-21.803) more likely to be unaware of their HTN status. As age increased, HTN unawareness decreased as shown with those in the age category of 65 and older, with only 23% being unaware of their HTN status ($p < .0001$, OR=1.235, CI 95% 1.145-1.332).

Income at all levels is a negative and significant (p<.0001) predictor of the probability of HTN self-awareness. The OR < 1 for all categories meaning that as income levels increased, the odds of being unaware of their HTN status decreased.

Table 27

Logistic Regression Model Predicting HTN Self-awareness for Black Adults in Arkansas while controlling for SDF and SES

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
Non-Hispanic Black or White (1)	.799	.043	346.102	1	.000	2.224	2.044	2.419
Have Any Health Care Coverage (1)	.328	.058	32.541	1	.000	1.388	1.240	1.554
Respondents Sex (1)	.265	.030	76.233	1	.000	1.303	1.228	1.383
Employment Status (1)	-.320	.036	80.283	1	.000	.726	.677	.779
Education Level			45.101	5	.000			
Education Level (1)	.390	.502	.602	1	.438	1.476	.552	3.950
Education Level (2)	-.215	.101	4.565	1	.033	.807	.662	.982
Education Level (3)	-.351	.068	26.610	1	.000	.704	.616	.804
Education Level (4)	-.226	.040	32.389	1	.000	.798	.738	.862
Education Level (5)	-.185	.040	21.058	1	.000	.831	.768	.899
Age Category			1480.034	5	.000			
Age Category (1)	2.808	.140	403.566	1	.000	16.578	12.605	21.803
Age Category (2)	2.104	.077	748.234	1	.000	8.198	7.051	9.532
Age Category (3)	1.448	.060	591.795	1	.000	4.253	3.785	4.779
Age Category (4)	.703	.046	231.313	1	.000	2.020	1.845	2.212
Age Category (5)	.211	.039	29.813	1	.000	1.235	1.145	1.332
Income Level			80.365	4	.000			
Income Level (1)	-.457	.053	73.531	1	.000	.633	.570	.703
Income Level (2)	-.250	.045	30.412	1	.000	.779	.713	.851
Income Level (3)	-.272	.049	30.124	1	.000	.762	.692	.840
Income Level (4)	-.156	.046	11.792	1	.001	.855	.782	.935
Constant	-.927	.061	230.517	1	.000	.396		

The analysis of RQ2 using multiple binary logistic regression showed a statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDF and SES. Therefore, the null hypothesis, which states that is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SES and SDF, was rejected.

Research Question 3

Research question 3: Is there a difference in the proportion of ED visits and hospital admissions for HTN-related illnesses between Black and White adults in Arkansas? This question was analyzed in two parts: ED visits for HTN and HTN-related diseases and inpatient admissions for HTN and HTN diseases as the dependent variables with the "race" as the independent variable and confounders, which include SDF and comorbidities. The DVs were dichotomized as yes = 0 and no = 1. Race, the independent variable, was grouped into two, White = 0 and Black = 1, gender was also grouped into two, female = 0 and male = 1, and age was categorized into five groups. Health coverage and comorbidities were dichotomized as no = 0 and yes = 1. For the multiple binary logistic regression analysis, a total of 4,461,884 (*N*) cases were included in the analysis for ED visits, and there were 668,152 missing cases, and a total of 2,099,067 (*N*) cases were included in the analysis for inpatient admissions, and there were 1,323 missing cases. As stated earlier, SPSS automatically excludes missing cases from data analysis.

ED Analysis: Chi-Square Analysis and Binary Logistic Regression.

Table 28 shows the crosstabulation for the dependent variable "ED visits for HTN and HTN-related illnesses" and the independent variable "race." Of the total number of

ED visits for HTN and HTN-related diseases for Black and White adults over the period, 27.5% were Black compared to 21.0% who were White.

Table 28

Crosstabulation for Non-Hispanic Black or White

			HTN and HTN Related Diseases?		
			Yes	No	Total
Non-Hispanic Black or White?	White	Count	834454	3139454	3973908
		% within Non-Hispanic Black or White?	21.0%	79.0%	100.0%
	Black	Count	318354	837774	1156128
		% within Non-Hispanic Black or White?	27.5%	72.5%	100.0%
Total		Count	1152808	3977228	5130036
		% within Non-Hispanic Black or White?	22.5%	77.5%	100.0%

Note. * ED Visits for HTN and HTN Related Diseases?

A Pearson's chi-square test for association was conducted (Table 29) and determined that there was an association between ED visits for HTN and HTN-related diseases and Black adults $X^2(1, N=5,130,036) =21972.705$, $p<.0001$. The significance level of $p<.0001$ indicates that Black adults were more likely to visit the ED for HTN and HTN-related illnesses.

Table 29

Chi-Square Tests for Association Between ED visits for HTN and HTN-Related Diseases and Race

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	21972.705[a]	1	.000		
Continuity Correction[b]	21972.330	1	.000		
Likelihood Ratio	21245.839	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	21972.701	1	.000		
N of Valid Cases	5130036				

Note. a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 259802.0.

b. Computed only for a 2x2 table

Cramer's V is a measure of the strength of the association between the outcome and predictor variables. A value of "0" indicates no relationship, and a value of "1.0" indicates a perfect relationship (Laureate Video, 2016). For this analysis, the value of Cramer's V is .065 for 5,130,036 cases, which shows that, although there is a statistically significant association between the dependent and independent variables, the strength of the association is weak

The model was statistically significant and revealed the variance that occurred in the dependent variable -ED visits for HTN and HTN-related diseases- is explained by the independent variable -race, i.e., $X^2(12, N = 5{,}130{,}036) = 1028224.849$, $p < .0001$. Therefore, the null hypothesis was rejected because there is a statistically significant difference in the proportion of ED visits for HTN and HTN-related illnesses between Black and White adults in Arkansas.

The -2Log likelihood (-2LL) and R^2 values for the analysis were 3733691.046 and .314, respectively. This shows that the independent variable explains about 31.4% of the variance in the dependent variable. The Hosmer and Lemeshow test of the goodness of fit suggested the model did not fit the data as $p < 0.001$ (< .05). As previously stated, this can be explained by the sample size, as the power of the chi-squared statistics can increase as the sample size increases (Nattino et al., 2020). With sample sizes larger than 25,000, the Hosmer and Lemeshow test can be significant with slight or inconsequential changes between true and estimated probabilities (Yu et al., 2017). Because of this, the Hosmer and Lemeshow test of the goodness of fit was not considered for this analysis.

The inclusion of covariates or confounders in the analysis allowed for the examination of their effect (if any) on the dependent variable. Table 30 shows the logistic regression model predicting ED visits for HTN and HTN-related illnesses for Black adults in Arkansas while controlling for age, gender, health coverage, and comorbidities (diabetes without chronic complications, diabetes with chronic complications, renal failure, and obesity). The OR (2.016) indicates that Black adults are twice as likely to visit the ED for HTN or HTN-related illnesses compared to their White counterparts (CI 95% 2.003-2.028). Only 2% of Blacks who visited the ED for HTN and HTN-related illnesses were male ($p < .0001$, OR = 1.024, CI 95% 1.019-1.029), which confirms results of numerous studies that Black females tend to seek medical care more than Black males (Huebschmann et al., 2016; Joseph et al., 2018; Siahpush et al., 2019). The age confounder was positive and significant ($p<.0001$) at all category levels—however, the younger the individual, the higher their odds of having ED visits. Adults in the 25-34 age

category were 29 times (p<.0001, OR=29.797, CI 95% 29.313-30.289) more likely to visit the ED for HTN and HTN-related diseases. As age increased, the odds of ED visits for HTN and HTN-related illnesses decreased as shown with those in the age category of 65 and older, with only 44.8% having ED visits for HTN conditions (p < .0001, OR = 1.448, CI 95% 1.437-1.459).

Health coverage was a positive and significant (p < .0001) predictor of the probability of visiting the ED for HTN and HTN-related conditions. The OR (1.337) showed that Black individuals who had health coverage or insurance only visited the ED for HTN and HTN-related conditions 33% of the time compared to those who did not have any health coverage (CI 95% 1.326-1.349). The comorbidities analyzed - diabetes without chronic complications, diabetes with chronic complications, renal failure, and obesity – were all positive and significant predictors of the odds of having ED visits for HTN and HTN-related diseases. Those with diabetes without chronic complications were five times more likely to visit the ED (p < .0001, OR = 5.678, CI 95% 5.631-5.725). Individuals who had diabetes with chronic complications were three times more likely to visit the ED for HTN and HTN-related illnesses (p < .0001, OR = 3.864, CI 95% 3.771-3.959) while those with renal failure were four (4) times more likely to visit the ED for HTN and HTN-related conditions (p < .0001, OR = 4.486, CI 95% 4.394-4.580). Additionally, those with obesity were three (3) times more likely than those without obesity to visit the ED for HTN and HTN-related conditions (p < .0001, OR = 3.549, CI 95% 3.479-3.621).

Table 30

Logistic Regression Model Predicting ED Visits for HTN and HTN-Related Diseases Among Black and White Adults in Arkansas

							95% C.I. for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Non-Hispanic Black or White? (1)	.701	.003	51443.134	1	.000	2.016	2.003	2.028
	Patient Gender (1)	.024	.003	80.571	1	.000	1.024	1.019	1.029
	Patient Age			353524.788	5	.000			
	Patient Age (1)	3.394	.008	165060.618	1	.000	29.797	29.313	30.289
	Patient Age (2)	2.189	.005	213732.784	1	.000	8.926	8.844	9.010
	Patient Age (3)	1.268	.004	100316.536	1	.000	3.555	3.527	3.583
	Patient Age (4)	.721	.004	36776.294	1	.000	2.057	2.042	2.072
	Patient Age (5)	.370	.004	8923.156	1	.000	1.448	1.437	1.459
	Health Coverage or Insurance? (1)	.291	.004	4704.368	1	.000	1.337	1.326	1.349
	Diabetes w/o chronic complications? (1)	1.737	.004	169004.658	1	.000	5.678	5.631	5.725
	Diabetes w/ chronic complications? (1)	1.352	.012	11835.849	1	.000	3.864	3.771	3.959
	Renal Failure? (1)	1.501	.011	20139.635	1	.000	4.486	4.394	4.580
	Obesity? (1)	1.267	.010	15212.885	1	.000	3.549	3.479	3.621
	Constant	-6.010	.019	98850.162	1	.000	.002		

Note. a. Variable(s) entered on step 1: Non-Hispanic Black or White, Patient gender, Patient age, Health coverage or insurance?, Diabetes w/o chronic complications?, Diabetes w/ chronic complications?, Renal failure?, Obesity?

Inpatient Analysis: Chi-Square Analysis and Binary Logistic Regression.

Table 31 shows the crosstabulation for the dependent variable "inpatient admissions for HTN and HTN-related illnesses" and the independent variable "race." Of the total number of inpatient admissions for HTN and HTN-related diseases for Black and White adults over the given period, 53.0% were Black compared to 51.8% who were White.

Table 31

Crosstabulation for Non-Hispanic Black or White

			HTN and HTN Related Diseases?		
			Yes	No	Total
Non-Hispanic Black or White?	White	Count	922,890	859,041	1,,781,931
		% within Non-Hispanic Black or White?	51.8%	48.2%	100.0%
	Black	Count	168,663	149,796	318459
		% within Non-Hispanic Black or White?	53.0%	47.0%	100.0%
Total		Count	109,155 3	1,008,837	2,100,390
		% within Non-Hispanic Black or White?	52.0%	48.0%	100.0%

*Note. * Inpatient Admissions for HTN and HTN Related Diseases?*

A Pearson's chi-square test for association was conducted (Table 32) and showed that there was an association between inpatient admissions for HTN and HTN-related diseases and race $X^2(1, N = 2,100,390) = 148.335$, $p < .0001$. The significance level of $p < .0001$ indicates that Black adults were more likely to be admitted for HTN and HTN-related illnesses.

Table 32

Chi-Square Tests for Association Between Inpatient Admissions for HTN and HTN-Related Diseases and Race

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	148.335[a]	1	.000		
Continuity Correction[b]	148.288	1	.000		
Likelihood Ratio	148.407	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	148.335	1	.000		
N of Valid Cases	2100390				

Note. a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 152958.8.

b. Computed only for a 2x2 table

The value of Cramer's V in this analysis is .008 for 2,100,390 cases. As stated, Cramer's V is a measure of the strength of the association between the outcome and predictor variables with a value of "0" indicating no relationship and a value of "1.0" indicating a perfect relationship (Laureate Video, 2016). The Cramer's V value of .008 shows that, although there is a statistically significant association between the dependent and independent variables, the strength of the association is weak.

The model was statistically significant and revealed the variance that occurred in the dependent variable—inpatient admissions for HTN and HTN-related diseases—is explained by the independent variable -race, i.e., $X^2(12, N = 2{,}100{,}390) = 653855.638$, $p < .0001$. Therefore, the null hypothesis was rejected because there is a statistically significant difference in the proportion of inpatient admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

The -2Log likelihood (-2LL) and R^2 values for the analysis were 2252780.064 and .357, respectively. This shows that the independent variable explains about 35.7% of

the variance in the dependent variable. The Hosmer and Lemeshow test of the goodness of fit suggested the model did not fit the data as $p < .0001$ (< .05). This, as previously stated, can be explained by the sample size, as the power of the chi-square statistics can increase as the sample size increases (Nattino et al., 2020). With sample sizes larger than 25,000, the Hosmer and Lemeshow test can be significant with slight or inconsequential changes between true and estimated probabilities (Yu et al., 2017). Because of this, the Hosmer and Lemeshow test of the goodness of fit was not considered for this analysis.

Table 33 shows the logistic regression model predicting inpatient admissions for HTN and HTN-related illnesses for Black adults in Arkansas while controlling for age, gender, health coverage, and comorbidities (diabetes without chronic complications, diabetes with chronic complications, renal failure, and obesity). The OR (1.582) indicates that Black adults are 58.2% more likely to be admitted for HTN or HTN-related illnesses compared to their White counterparts (CI 95% 1.567-1.598) with about 11.1% of Blacks who were admitted for HTN and HTN-related illnesses were male ($p < .0001$, OR = 1.111, CI 95% 1.104-1.119). Age was positive and significant ($p < .0001$) at all category levels, with adults who were 65and older having 46.7% odds of being admitted for HTN and HTN-related conditions ($p < .0001$, OR = 1.467, CI 95% 1.455-1.480).

Health coverage was a negative and significant ($p < .0001$) predictor of the probability of being admitted for HTN and HTN-related conditions. The OR < 1 (.962) showed that Black individuals who had health coverage or insurance were less likely to be admitted for HTN and HTN-related conditions compared to those who did not have any health coverage (CI 95% .946-.979). The comorbidities analyzed - diabetes without

chronic complications, diabetes with chronic complications, renal failure, and obesity – were all positive and significant predictors of the odds of being admitted for HTN and HTN-related diseases. Those with diabetes without chronic complications were twice as likely to be admitted for HTN and HTN-related diseases ($p < .0001$, OR = 2.478, CI 95% 2.455-2.500). Individuals who had diabetes with chronic complications were also twice as likely to be admitted for HTN and HTN-related illnesses ($p < .0001$, OR = 2.701, CI 95% 2.657-2.745), while those with renal failure were three times more likely to be admitted for HTN and HTN-related conditions ($p < .0001$, OR = 3.143, CI 95% 3.104-3.183). Additionally, those with obesity were twice as likely than those without obesity to be admitted for HTN and HTN-related conditions ($p < .0001$, OR = 2.109, CI 95% 2.085-2.133).

Table 33

Logistic Regression Model Predicting Inpatient Admissions for HTN and HTN-related Diseases among Black and White Adults in Arkansas

							95% C.I. for EXP(B)	
		B	S.E.	Wald	Df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Non-Hispanic Black or White? (1)	.459	.005	8789.803	1	.000	1.582	1.567	1.598
	Patient Gender (1)	.106	.003	1016.185	1	.000	1.111	1.104	1.119
	Patient Age			228002.509	5	.000			
	Patient Age (1)	3.841	.014	72684.316	1	.000	46.562	45.280	47.881
	Patient Age (2)	2.778	.008	135855.629	1	.000	16.091	15.855	16.330
	Patient Age (3)	1.472	.006	63625.516	1	.000	4.360	4.310	4.410
	Patient Age (4)	.756	.005	24055.055	1	.000	2.129	2.109	2.150
	Patient Age (5)	.383	.004	7535.310	1	.000	1.467	1.455	1.480
	Health Coverage or Insurance? (1)	-.038	.008	20.388	1	.000	.962	.946	.979
	Diabetes w/o chronic complications? (1)	.907	.005	38737.109	1	.000	2.478	2.455	2.500
	Diabetes w/ chronic complications? (1)	.994	.008	14196.222	1	.000	2.701	2.657	2.745
	Renal Failure? (1)	1.145	.006	32166.344	1	.000	3.143	3.104	3.183
	Obesity? (1)	.746	.006	16543.065	1	.000	2.109	2.085	2.133
	Constant	-4.668	.012	144106.777	1	.000	.009		

Note. a. Variable(s) entered on step 1: Non-Hispanic Black or White?, Patient gender, Patient age, Health coverage or insurance?, Diabetes w/o chronic complications?, Diabetes w/ chronic complications?, Renal failure?, Obesity?.

The first and second parts of the analysis for RQ3 supports prior research that Black adults are more likely to have ED visits and inpatient admissions for HTN and HTN-related illnesses and other diseases even when controlling for various factors and that Arkansas trends the same way as most states in the United States (Marcozzi et al., 2018; Waldron et al., 2019; Zhang et al., 2020). The null hypothesis was therefore rejected as there was a statistically significant difference in the proportion of ED visits and inpatient admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

Summary

The first RQ examined the potential association between HTN self-awareness and race (Black and White adults). The results showed a statistically significant difference in HTN self-awareness between Black and White adults in the state, with Black adults being 77.9% more likely to be unaware of their HTN status compared to their White counterparts. The null hypothesis that there is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas was rejected.

The second RQ examined the potential association between HTN self-awareness and race (Black and White adults) when controlling for SDF and SES factors. It was determined that there was a statistically significant difference, and the presence of confounders made Black adults in the state twice as likely to be unaware of their HTN status compared to their White counterparts. The null hypothesis, which states that is no statistically significant difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SES and SDF, was rejected.

The third RQ, answered in two parts, examined the potential association between the proportion of ED visits and inpatient admissions for HTN and HTN-related diseases among Black and White adults in the state. Using chi-square analysis and multiple binary logistic regression, the null hypothesis was rejected as there was a statistically significant difference in the proportion of ED visits and inpatient admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas.

In Section 4, an in-depth interpretation of the statistical findings was discussed, and the application of the socio-ecological model, the limitations of the study, recommendations, and the implications for professional practice and positive social change.

Section 4: Application to Professional Practice and Implications of Social Change

Introduction

I conducted this cross-sectional study to examine how racial disparities might be associated with HTN self-awareness as well as ED visits and hospitalization rates for HTN and HTN-related illnesses among Black adults in Arkansas compared to White adults. The BRFSS database was used to examine socioeconomic factors and SDFs such as age, race, gender, income, employment status, and education levels. The Arkansas HDD (ED and inpatient) was also used to compare the proportion of ED visits and hospitalizations for HTN-related diseases (essential HTN, hypertensive heart disease, hypertensive chronic kidney disease, hypertensive heart and chronic kidney disease, hypertensive cerebrovascular diseases, and hypertensive retinopathy) between Black and White adults in the state. This study showed that Black adults in Arkansas were less likely to be aware of their HTN status compared to White adults, and they also had a higher proportion of ED visits and inpatient admissions or hospitalizations for HTN and HTN-related diseases.

Interpretation of Findings

The intent for RQ 1 was to determine if there was a significant difference in HTN self-awareness between Black and White adults in Arkansas. The results revealed a significant difference in HTN self-awareness between Black and White adults in the state ($p < .0001$), with Black adults having 77.9% odds (or a probability of 0.64) of being unaware of their HTN status. Previous research has also shown that racial disparities exist in HTN self-awareness between Black and White adults (Al Kibria, 2019; Fryar et al.,

2017; Parcha et al., 2020); thus, the findings from this study align with existing research on the differences in HTN self-awareness based on race.

The second RQ went further to build on the findings of RQ 1 to determine if there was a difference in HTN self-awareness between Black and White adults in Arkansas when controlling for SDFs and SES. The SDFs and SES included in the analysis were age, gender/sex, income, education level, employment status, and health insurance status. The analysis for this RQ showed that there was still a statistically significant difference ($p < .0001$) in HTN self-awareness between both racial groups when controlling for SDFs and SES. The results showed that the odds of Black adults in the state being unaware of the HTN status increased two-fold with the presence of confounders (SDFs and SES). Only 38.0% of those who had health insurance were unaware of their status, while HTN awareness increased as education levels increased. Younger Black adults were most likely to be unaware of their HTN status compared to older adults, and females had a higher HTN self-awareness than males. These results align with previous and current research, which has shown that SES and SDFs can worsen racial disparities in disease awareness (Carnethon et al., 2017; Fryar et al., 2017).

The third RQ considered if there was a difference in the proportion of ED visits and hospital or inpatient admissions for HTN and HTN-related illnesses between Black and White adults in Arkansas. The results of the analysis showed that there was a significant difference ($p < .0001$) in the proportion of ED visits and hospital or inpatient admissions for HTN and HTN-related illnesses as Black adults in the state had a higher

proportion of ED visits (27.0%) and inpatient admissions (53.0%) for HTN and HTN-related diseases compared to White adults in the state.

The analysis for this question was taken a step further to determine if SDF and comorbidities such as diabetes, renal failure, and obesity potentially caused an increase in ED visits and inpatient admissions for HTN and HTN-related illnesses among Black adults. Based on the results, Black adults were twice as likely to visit the ED and 58.0% more likely to be admitted for HTN and HTN-related illnesses when confounders such as SDF and comorbidities were present. Those with diabetes (with or without complications) and obesity were twice as likely to be admitted, while those with renal failure were three times as likely to be admitted for HTN and HTN-related illnesses compared to White adults with the same conditions. Black adults with comorbidities were up to five times more likely to have ED visits compared to White adults, and younger Black females had higher rates of ED visits than Black males. The results of this analysis align with current and previous studies, which have shown that Black people are more likely to have higher ED visits and inpatient admissions for several conditions due to disparities and inequities in access to quality healthcare services, quality education, quality employment, and lower incomes (Gu et al., 2017; Noonan et al., 2016; Palafox et al., 2016). Overall, this study shows that Arkansas follows nationwide trends with racial disparities in HTN self-awareness and higher proportions of ED visits and inpatient admissions for HTN and HTN-related diseases.

Application of the Socioecological Model

The theoretical framework used for this study is the SEM, which emphasizes interactions with the physical and sociocultural environments on an intrapersonal level, interpersonal level, organizational level, community level, and public policy level (Kilanowski, 2017). This model was used in this study to assess social and policy factors that hinder Black adults in Arkansas from understanding how their lack of HTN self-awareness can potentially increase their likelihood of being hospitalized for HTN or HTN-related diseases (Sripipatana et al., 2019). The core principles of the SEM highlight how various factors drive health behaviors and how those behaviors can stem from the physical environment and span across multiple groups (Kilanowski, 2017). Sociocultural beliefs can impact how individuals interact with their environments and how likely they would be willing to change their behaviors (Williams, 2017).

From the results of the analysis, Black adults in Arkansas lag behind White adults in HTN self-awareness and have a higher proportion of ED visits and inpatient admissions for HTN and HTN-related diseases. Previous studies have shown that intrapersonal and interpersonal relationships can affect individuals' attitudes to their health (Giena et al., 2018; Hong, 2019; Odum et al., 2018; Wright, 2016). Environments where people live, work and play and their sociocultural interactions can influence their health outcomes, including their knowledge or lack thereof, of their HTN status. When people do not perceive the risk or benefit of a disease, they tend to underestimate the potential impact of that disease on their wellbeing and livelihoods (Aycock et al., 2017). Cultural beliefs, including some religious beliefs, can deter people from seeking medical

care, and interpersonal relationships can potentially influence individuals to develop healthy or unhealthy habits (Ahmad & Oparil, 2017; Rahman et al., 2017; Schlichthorst et al., 2016). Public policies can also drive individual action or inaction on health issues. Through outreach and education, the implementation of the ACA allowed over 250,000 Arkansans to become insured through Arkansas' modified private option (Maylone & Sommers, 2017). However, the addition of the Medicaid work requirement (until a federal judge halted it) discouraged people from maintaining their coverage. Tens of thousands of people (particularly poor Arkansans) lost their health insurance coverage. That policy alone led to adverse outcomes in health as people postponed or canceled critical care essential for their wellbeing (Sommers et al., 2020).

Limitations of the Study

This study was successful in identifying significant differences in HTN self-awareness between Black and White adults in Arkansas, and it was also successful in showing that Black adults in the state were more likely to have higher rates of ED visits and inpatient admissions for HTN and HTN-related diseases compared to their White counterparts. However, because this was a cross-sectional study, a causal inference could not be made (Wang & Cheng, 2020), i.e., the results of the study did not determine whether low rates of HTN self-awareness among Black Arkansans directly influenced higher proportions of ED visits and inpatient admissions for HTN and HTN-related diseases. Also, trends, over time, were not assessed, and the impact or lack thereof of the implementation of the ACA was not considered in this study. Arkansas did not expand Medicaid in the traditional sense of the ACA but instead opted to use federal dollars to

purchase private insurance (the private option) for low-income Arkansans (Maylone & Sommers, 2017). The impact of implementing the Medicaid work requirement, which led to several poor Arkansans losing health coverage (Sommers et al., 2020), was also not examined in the study.

Although the results of the study could not show causality, they can be generalized across comparable populations and applied to real-world situations, particularly because the outcome of analyses aligned with similar studies that have been done across the country. The sample size was representative of Arkansas's Black and White population, and this also allowed for the generalizability of the study results. Also, because of the study design utilized and the credibility of the secondary datasets used, there were minimal threats to its internal and external validity.

Recommendations

Racial disparities in health drive health inequities across minority populations in the United States (Adinkrah et al., 2020). These disparities are not only attributable to health behaviors and social interactions but have also been driven by systems and policies that continue to marginalize the affected populations. Poverty, social isolation, lack of adequate transportation, and inadequate housing contribute to health inequities mostly experienced by communities of color (Bergmark & Sedaghat, 2017). This study assessed one aspect of an array of possible determinants that drive health disparities. Future studies should examine how structural and systemic racism and policies can potentially impact individual health outcomes, particularly CVD risk factors. Access to quality health services, lack of built environments, food/nutrition deserts, inadequate

transportation, unemployment/low-income employment, being uninsured or underinsured, among others, can greatly impact the health of both individuals and communities (Angier et al., 2019; Bergmark & Sedaghat, 2017; Brydsten et al., 2018; Clemow et al., 2018; Wang et al., 2019). Studies to address these structural inequities can shed more light on their potential impacts on diseases, including HTN and other CVDs in communities of color.

To build upon this study, researchers should conduct a case-control study and monitor trends to determine if lack of HTN self-awareness can directly influence ED visits and inpatient admissions for HTN and HTN-related diseases and address ways the trends can be mitigated. The current coronavirus disease 2019 (COVID-19) pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has exposed existing racial health disparities that have long plagued communities of color. COVID-19 unduly affects minority communities by infection rates, hospitalizations, deaths, and now, vaccine administration, and it is especially severe in individuals who have underlying conditions such as HTN, diabetes, obesity, and asthma (Gupta et al., 2021). Studies have shown that Black people and other people of color are disproportionately affected by CVD risk factors such as HTN, diabetes, and obesity which puts these groups at a higher risk of contracting, being hospitalized, and dying from COVID-19 (Alcendor, 2020; Gupta et al., 2021; Highton et al., 2020; Moore et al., 2020). Future studies should now explore the impact of COVID-19 on existing racial disparities in health care access and underlying diseases such as HTN and HTN-related illnesses to determine how fixes to structural and systemic health and health care

policies/practices can alleviate the undue burden overly experienced by Blacks, Latinx, American Indians, Native Hawaiians, Pacific Islanders and other communities of color.

Implications for Professional Practice and Social Change

Professional Practice

To reduce racial disparities and adverse health outcomes of HTN and HTN-related disease, public health and clinical interventions should focus on increasing awareness, control, treatment, and management of HTN, particularly among marginalized and underserved populations. In addition to individualized medical treatments and community-focused interventions, policy-based solutions should be implemented to address the root causes (social and structural barriers) that drive health inequities.

Tackling systemic and institutionalized racism and implicit bias through cultural awareness and humility trainings for the health workforce will go a long way to bridge the gap between healthcare providers and communities of color (Doubeni et al., 2021; Hughes et al., 2020; Ogedegbe, 2020; Ray, 2019). Studies have shown that instituting cultural humility policies and trainings, not just cultural competency trainings, can have a positive impact on provider-patient relationships and engagement with communities, particularly those of color (Hughes et al., 2020; Jongen et al., 2018; Min-Yu Lau et al., 2016; Shepherd, 2019; Taylor et al., 2019).

Increasing the number of Blacks and other minority populations who are represented in the decision-making would contribute towards reducing health disparities and advancing health equity. Noonan et al. (2016) stated that underrepresentation of Blacks in decision and policymaking often worsens the disparities that affect their

communities as those who have lived experiences from the direct impact of policies and decisions are not present to offer recommendations that will improve health outcomes for Black communities.

Team-based care approaches can be instrumental in the control, treatment, and management of HTN. Team-based care is a collaboration between several healthcare providers to give patients tools such as non-medication interventions and antihypertensive interventions to manage their HTN (Santschi et al., 2017). This approach can be advantageous in communities of color as the health workforce can partner with trusted community organizations to provide interventions such as case management, group physical activities, or nutritional classes that will engage individuals in their care and allow them self-efficacy to make and maintain changes to their health behaviors that will improve their overall health.

Community-based participatory research should also be utilized to engage and include Black communities from the planning to the evaluation stages of all health interventions, as this can be particularly valuable in ensuring that culturally appropriate interventions that are sensitive to the needs of the communities are implemented. Research partnerships with Black communities can increase their interest and engagement in health behavior research and interventions and potentially increase their participation in clinical trials (Tucker et al., 2019). Community-based participatory research effectively identifies social and structural inequities that foster health disparities and can be valuable in reducing health inequities and eliminating health disparities (Harris et al., 2016; Tucker et al., 2017). Engaging communities in issues that affect them

can foster trust, increase awareness of health conditions, and encourage changes in health behaviors, thus improving health outcomes.

Social Change

To advance health equity and reduce health disparities, targeted and intentional mechanisms that directly address inequities, including the social, structural, and political determinants of health, should be utilized and implemented. The results of this study reiterate that improving HTN self-awareness will require interventions focused on increasing access to quality health services, expanding health insurance and increasing its affordability, and implementing policies that directly address the structural determinants that adversely impact the health of Blacks and other minority populations.

Openly communicating with communities to understand the obstacles or barriers that drive adverse health outcomes can result in equity-based, community-oriented, and individualized interventions that promote health equity, promote positive social change and improve the overall health outcomes of the populations involved.

Conclusions

HTN continues to be a risk factor for CVD, such as heart disease and stroke, which are two of the top leading causes of death in the U.S. Due to the unawareness of the HTN status, over 14 million people in the U.S. have blood pressures that are not managed by behavioral or medication interventions (Meador et al., 2020). Black Americans die from CVD at higher rates than their White counterparts as they are more adversely affected by socioeconomic and sociodemographic factors (Ferdinand et al., 2017; Gu et al., 2017).

The study results show the need to address health disparities in HTN self-awareness in Arkansas, as well as the social and structural causes of inequities that may result in adverse health outcomes and increased ED visits and inpatient admissions. Addressing HTN awareness at the intrapersonal and interpersonal levels with culturally appropriate interventions can inform and encourage behavior change. Policy level interventions can also address structural and systemic barriers that inhibit changes in health behaviors.

Advancing health equity is instrumental in achieving positive social change and social justice. The health workforce shares a great responsibility in ensuring that all communities, regardless of race, gender identity, income/education level, faith, or sexual orientation, have access to resources that will enable them to improve and maintain healthy behaviors.

With COVID-19 ravaging the United States and the world and its harmful impact on those with underlying conditions such as HTN, diabetes, obesity, and other cardiovascular-related conditions, it is more important than ever to ensure that individuals are given the tools to make decisions that positively impact their health outcomes and gives them equitable access to health services.

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Appendix: BRFSS Questions Relating to Key Variables

Target Population: **Non-Hispanic Black and non-Hispanic White** Arkansans, 18 years and older.

Section: Hypertension Awareness

Question: Have you EVER been told by a doctor, nurse, or other health professional that you have high blood pressure? (Hypertension self-awareness)

Response:

- Yes
- No

Section: Demographics

Question: Are you Hispanic or Latino/a or Spanish origin? (Ethnicity)

Response:

- Yes
- No

Question: Which one or more of the following would you say is your race? (Race)

Response:

- White
- Black or African American
- Asian
- American Indian or Alaska Native

- Pacific Islander

Question: What is your age? (Age)

Response: [Age in years]

Question: What is the highest grade or year of school you completed? (education attainment)

Response:

- Never attended school or only attended kindergarten
- Grades 1 through 8 (Elementary)
- Grades 9 through 11 (Some high school)
- Grade 12 or GED (High school graduate)
- College 1 year to 3 years (Some college or technical school)
- College 4 years or more (College graduate)

Question: Are you currently…? (Employment Status)

Response:

- Employed (Employed for wages and Self-employed)
- Unemployed (Out of work for more than 1 year and Out of work for less than 1 year)

Question: Is your annual household income from all sources ____? (Income level)

Response:

- Less than $15,000

- Less than $25,000 ($20,000 to less than $25,000)
- Less than $35,000 ($25,000 to less than $35,000)
- Less than $50,000 ($35,000 to less than $50,000)
- $50,000 or more

Question: Are you___? (Sex)

Response:

- Male
- Female

Section: Health Care Access

Question: Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare or Indian Health Services? (Health Coverage)

Response:

- Yes
- No