4-25-2024

Factors That Influence African American Millennials' Knowledge of Risk Factors for Cardiovascular Disease

Ta'Leitheia K. Boutin
Walden University

Walden University

College of Education and Human Sciences

This is to certify that the doctoral dissertation by

Ta'Leitheia K. Boutin

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Deneen Long-White, Committee Chairperson, Health Education and Promotion
Faculty
Dr. Honora Swain-Ogbonna, Committee Member, Health Education and Promotion
Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2024

Abstract

Factors That Influence African American Millennials' Knowledge of Risk Factors

for Cardiovascular Disease

by

Ta'Leitheia K. Boutin

MA, University of New Orleans, 2015

BS, William Carey University, 2013

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Education and Promotion

Walden University

May 2024

Abstract

Findings have begun to identify that millennials have predispositions that significantly increase their risk of cardiovascular disease (CVD). This quantitative study, grounded in the socioecological model (SEM), addressed a gap of African American millennials' knowledge about CVD risk factors and the relationship of this knowledge to sociodemographic factors. Utilizing Survey Monkey, primary data was obtained through personal connections and social media such as Facebook, and participants were directed to a Heart Disease Knowledge Questionnaire (HDKQ). The requirement to participate was that they had to be African American, born between 1981 and 1996, and reside in Louisiana; the total number of respondents was 136. Multiple linear regression was used to analyze the five variables individually, and there was a significant relationship between participants with graduate-level degrees, an income of $100,000-$199,999, and knowledge of CVD risk factors in African American millennials. However, there was no statistical significance in individuals with a history of CVD in their family, participants who reside in urban communities, participants who live in suburban neighborhoods, and participants who have not discussed risk factors for CVD with a doctor or other health care provider and knowledge of CVD risk factors in African American millennials. When analyzing the five variables together, there was statistical significance in participants with an income of $25,000-$49,999, an annual income of $100,000-$199,999, and participants with a graduate-level degree. This study's contribution to positive social change is data-driven recommendations for relevant health education and promotion strategies to combat CVD in African American millennials at all levels associated with SEM.

Factors That Influence African American Millennials' Knowledge of Risk Factors

for Cardiovascular Disease

by

Ta'Leitheia K. Boutin

MA, University of New Orleans, 2015

BS, William Carey University, 2013

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Education and Promotion

Walden University

May 2024

Dedication

This is dedicated to my family. I would like to express my deepest gratitude to my

husband and his outstanding leadership. His dedication, integrity, and passion have

inspired me to reach new heights. To my children, thank you for bringing me more joy

than I could ever have imagined possible. I will love you forever and then forevermore.

To my parents and siblings, your support means the world to me. I would not have

completed this program without you. To my younger self, life can be so beautiful, and at

the same time, so hard. The blessing is that you were strong enough to get through it all.

You did not let your fear hold you back from living your life and instead stepped out

boldly into the world. You have so many gifts to give; do not let fear prevent you from

sharing these gifts with the world. Your ability to never stop searching for the blessings

all around you assisted in the realization of the abundance of blessings that surrounded

you. To my maternal grandparents, so many doubted your abilities. However, you learned

to accept this and pressed forward. Thank you for your tenacity. For without you, there is

no me.

Acknowledgments

Firstly, I acknowledge Dr. Deenen Long-White, my chair, who has been the best facilitator. Her advice, encouragement, and support turned what I thought was doom to bloom. Her guidance and vision have helped me grow and thrive. I am truly grateful for her dedicated service to education. My thanks and appreciation are to Dr. Swain for serving as method expert on my committee. Thank you for all that you do. May God bless you abundantly for your commitment.

To the UFC family and friends, thank you for your faithful prayers. Their intercession and spiritual support are deeply appreciated. They are the greatest gift I could have ever asked for. They love my family as if they were their own, and I am eternally grateful.

Table of Contents

iii

List of Tables

Chapter 1: Introduction to the Study

Introduction

Cardiovascular disease (CVD) describes various conditions affecting the heart. Some of these conditions are atherosclerosis, blood vessel disease, arrhythmia, heart rhythm disease, and heart valve disease (Mayo Clinic, 2022). According to the most recent report by the American Heart Association (AHA), 70% of major CVD events in 2021 resulting in death or hospitalization could have been prevented by a mild to moderate increase in cardiovascular health (Tsao, 2022).

In this study, I sought to address the gap in understanding knowledge of risk factors for CVD and the relationship of this knowledge to income, education, family history of CVD, geographic residence, and whether a doctor or healthcare provider had talked with a patient about risk factors for CVD. This research topic is significant because this study may provide insight into what health education related to CVD is needed for this population. In addition, the study's results may be used to develop culturally relevant health promotion programs to effectively change the health behaviors of African American millennials, thereby reducing the risk of CVD.

Chapter 1 addresses the background of the study, the problem, as well as the significance and purpose of the study. It also includes definitions of key terms used in the study, my assumptions as the researcher, and the study's scope, delimitations, and limitations. The chapter concludes with a summary of the chapter and a preview of Chapter 2.

Background

CVD is the leading cause of death in the United States, with an estimated 655,000 Americans dying from heart disease yearly (Centers for Disease Control and Prevention [CDC], 2017). CVD is an umbrella term that includes all conditions that affect the heart. With such a broad definition, many scholars have examined one or multiple types of CVD. As such, the discussion of CVD in this study may sometimes reference individual cardiovascular diseases. An example of this can be identified in reports of up-to-date statistics from the AHA in conjunction with the CDC, the National Institutes of Health, and other government agencies. While Americans saw decreases in the prevalence of some cardiovascular diseases, the AHA reported alarming statistics, stating that the burden of the disease remains high, with 364.7 deaths per 100,000 men and 256.9 deaths per 100,000 women, or 310.8 deaths per 100,000 Americans in 2012 (Rodger et al., 2012). In 2017, the situation moderately improved, with CVD reported as the underlying cause of death for 868,622 Americans, or 267.2 deaths per 100,000 Americans (AHA, 2021). These statistics highlight an interesting trend indicating that the frequency and severity of CVD in the United States appears to cycle throughout the years. Furthermore, scholars and clinicians have declared that the prevalence of risk factors for CVD underlies the severity of CVD (AHA, 2021; Ford et al., 2007; Rodger et al., 2012). Therefore, the American public must be educated about the risk factors for CVD in an effort to lessen the burden and severity of the disease.

African Americans constitute 12.8% of the U.S. population, yet there is a striking difference in how CVD has affected African Americans compared to other populations

(Das et al., 2020). Compared to their Caucasian counterparts, African Americans have a 3 times higher risk of developing CVD and twice the risk of CVD-related mortality (Das et al., 2020). In addition, African Americans tend to have an earlier onset of CVD disease than Caucasians, as well as increased premature CVD-related deaths (Aminde et al., 2017). In one report, African American adults in the United States were shown to be twice as likely to die from CVD than their Caucasian counterparts (Javed et al., 2022). Furthermore, according to the AHA (2021), 60.1% of males and 58.8% of female African Americans over the age of 20 are affected by CVD, which was reported as the cause of death for 110,586 African Americans in 2018.

Compared to other ethnic groups in the United States, African Americans have a higher risk of being diagnosed with CVD and its related comorbidities (Zilbermint et al., 2019). For instance, the U.S. Department of Health and Human Services (2021) stated that in 2018, African Americans were more likely to die from CVD than Caucasians and 40% more likely to have high blood pressure, an essential determinant in the progression of CVD. However, this study also showed that African Americans are less likely to have adequately regulated blood pressure, perhaps due partly to a lack of knowledge about the prevalence and severity of CVD (U.S. Department of Health and Human Services, 2021). Despite this, little is known about the knowledge held by young African American adults regarding the prevalence of, severity of, and risk factors associated with CVD.

The disparity in access to quality health care, dietary intakes, lifestyle factors, neighborhood characteristics, socioeconomic status, sociocultural attitudes toward disease, persistent racial discrimination, and genetics have all been associated with

African Americans' poor CVD health outcomes (Das et al., 2020). However, some, but not all, of these factors contribute to increased CVD risk for every African American. Many disease risk factors, including dietary choices, lifestyle factors such as smoking or use of alcohol, socioeconomic status, and attitude towards disease, are modifiable. According to the CDC (2017), most, if not all, individuals can reduce their risk of CVD morbidity and mortality, especially if healthy behaviors are established in childhood or changed in young adulthood. However, a significant lack of knowledge of CVD and methods to protect against CVD poses a considerable threat to the African American community (CDC, 2017). Therefore, increasing public knowledge of CVD, CVD-related comorbidities, and the risk factors of CVD is critical, especially for the African American population.

Knowledge of CVD risk factors is essential for decreasing the likelihood of engaging in or continuing modifiable behaviors that may increase disease risk, such as smoking, lack of exercise, or consuming high-fat foods (Negesa et al., 2020). Brothers et al. (2019) suggested that environmental factors, including lack of access to health care, poor infrastructure, and poor quality of water, should also be included when exploring variables related to CVD, as such factors also impact the prevalence of the disease.

There are national initiatives to collect data and support partnerships with the federal government to address the disproportionate rate of CVD in African Americans (CDC, 2017). However, it is vital to understand and implement strategic plans centered on variables such as gender, environmental factors, and socioeconomic status and their possible relationships to CVD in African Americans. A health promotion program's

successful development and implementation depend upon identifying the scope and breadth of baseline knowledge among the targeted group members (Negesa et al., 2020). For example, regional differences in beliefs and knowledge may exist, and culturally appropriate and salient programs for the target audience must be developed (Das et al., 2020). Thus, it is essential to understand the factors contributing to CVD disease progression in African Africans so that clinicians, social workers, and government agencies can create new and appropriate treatments and disease prevention programs.

Youth and young adulthood are generally when individuals believe they are invincible, and the possibility of severe disease is generally not considered (Millstein & Halpern-Felsher, 2002; Nagata, 2022). However, Das et al. (2020) identified that millennials, or individuals born between 1981 and 1996, could be diagnosed with CVD before older generations. However, millennials often are not monitored as closely for CVD and its related comorbidities due to their younger age bracket. Thus, the lack of CVD monitoring may place millennials at unnecessary and preventable risk of CVD. Early intervention is necessary to prevent the threat of increased prevalence of CVD in millennials (Das et al., 2020). This study is needed to assess the awareness and associated factors of CVD and risk factors in an effort for the result to be beneficial in the combined efforts to achieve reductions in CVD among African American millennials.

Problem Statement

African American millennials face a greater risk for CVD because it is simply overlooked in this population due to their age. Little is known about African American millennials' knowledge of CVD risk factors. African Americans, in general, have higher

rates of deaths caused by CVD than other ethnic groups. However, statistics regarding CVD and current studies dedicated to African American millennials highlight persistent difficulties regarding gaps in healthcare coverage, racial discrimination, and high prevalence rates of health conditions (Das et al., 2020; Nayak et al., 2020, Zeller et al., 2019). In particular, African American millennials show alarming generational health decline, faster than previous generations, partly due to a lack of monitoring (Tricas-Vidal et al., 2022). Millennials' ethnic predisposition and modern lifestyle significantly increase their vulnerability to CVD risk compared to their older counterparts (Das et al., 2020). CVD is a chronically progressive disease, better prevented when early interventions are implemented (Zeller et al., 2019). Therefore, millennials are prime targets for intervention strategies to prevent and reduce CVD disease risk. In this study, I sought to investigate the knowledge of CVD risk factors in African Americans born between 1981 and 1996. The results of this study may help guide the development of programs and intervention strategies to prevent CVD in African American millennials.

Purpose of the Study

This quantitative correlational study explored African American millennials' knowledge of risk factors for CVD and the relationship of this knowledge to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with them about risk factors for CVD. Patton-López (2022) found that focusing on structuring factors such as demographic variables is more effective when addressing health disparities among African Americans than looking at health risks alone. Often, younger African Americans live with or die of many conditions

typically not found in Caucasians until later in life due to demographics and socioeconomic status health differences (CDC, 2017). Der Ananian et al. (2018) suggested that persistent disparities in CVD found in African Americans are extensive and span from the individual level to the social environment, thus indicating the need for potential associations to be examined. This cross-sectional study examined knowledge of CVD risk factors in relation to educational level, income, family history of CVD, and residence discussions with doctors and healthcare providers about CVD risk. The dependent variable measured in the study was the CVD knowledge score. The independent variables correlated with CVD knowledge were educational level, income, family history of CVD, geographical residence, and discussions with doctors and healthcare providers about CVD risk.

Research Questions

Through this cross-sectional, correlational, quantitative study, I sought to identify knowledge of CVD risk factors and its relationship to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD, utilizing the following research questions and hypotheses:

RQ1: Is there a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{01}:   There is not a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A1}:   There is a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ2:   Is there a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{02}:   There is not a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A2}:   There is a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ3:   Is there a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{03}:   There is not a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A3}: There is a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ4: Is there a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{04}: There is not a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A4}: There is a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ5: Is there a significant relationship between whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{05}: There is not a significant relationship between having a doctor or other health care provider talk to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A5}: There is a significant relationship between having a doctor or other health care provider talk to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ6: Is there a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{06}: There is not a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A6}: There is a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Theoretical Foundation

Bronfenbrenner's ecological systems theory (1979) was used as a framework for understanding African American millennials' knowledge of CVD and the association of their knowledge to demographics and the likelihood of seeking healthcare services. Bronfenbrenner's ecological systems theory provides an approach to understanding contextual variables, such as environmental variables, and evaluating demographics and CVD within Bronfenbrenner's ecological systems. I used this framework to address the hypothesis that there is a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to a patient about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Bronfenbrenner's ecological systems is a useful framework to research the association of African American knowledge to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked to a patient about risk factors for CVD. This theory is essential to research investigating CVD knowledge in African American millennials and its association with income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD because ecological systems theory allows for interactions between family, community groups, and external systems, such as medical institutions, to be examined. In addition, investigation of African American millennials' CVD knowledge juxtaposed with its association with risk factors for CVD can lend deep insight into interventional programs

congruent with the principles outlined by ecological systems theory. For example, a researcher may determine from participants' specific demographics that this may relate to one portion of the ecological system but not others. The data gathered from the participants were studied within this framework to inform the development of health behavior and promotion programs to prevent CVD.

Urie Bronfenbrenner first introduced the socioecological model (SEM) as a conceptual model for understanding human development (Kilanowski, 2017). SEM is a theoretical framework that may be used to inform relevant health education and promotion needs to decrease CVD in African Americans. Kilanowski (2017) stated that solutions must be acted on at each level simultaneously to solve issues using SEM and that SEM could be helpful with potential prevention strategies. This statement's primary reasoning is that prevention requires understanding factors that influence negative results. For example, this strategy has been used as a framework to analyze studies focused on global and national physical health plans (Rutter et al., 2019). This behavior, one of many that can contribute to the mitigation of the risk of CVD, was shown to highly depend on personal, social, cultural, and environmental factors (Rutter et al., 2019). Analyzing the complex interplay of individuals and communities facilitates understanding the various determinants that put individuals at risk for CVD. For instance, millennials may be able to provide insight into their CVD knowledge related to childhood obesity and other medical complications that are predictors. In addition, research that uses SEM as a framework might render results suggesting that it is necessary to act across multiple levels of the model simultaneously for prevention to effectively occur (CDC, 2017).

Investigation of the research problem through the lens of SEM helps to show how CVD in African American millennials is associated with a combination of lack of knowledge, sociodemographics, and other risk factors. Scheier and Carver (2018) reported that biological aspects and physical elements could affect and determine health. For instance, the cardiovascular system is the central hub of the human body. Thus, it is critical to understand the physical domains within the ecosystem. Each of the human body's organ systems is interconnected, and the biological and medical dynamics can be seen within the ecosystem. The SEM framework for comprehending multifaceted and interactive aspects within the ecosystem allows for examining the many elements that influence and contribute to the "prevalence, prevention, and revaluation of programming and policies" (Arash et al., 2022).

The logical connection presented includes examining the relationship between knowledge of CVD and independent variables. An interdependent relationship indicates that one level will influence the components of the other levels (CDC, 2017). If problems occur at one level, these problems will transfer into and affect other parts of the SEM. Using the SEM will help in exploring variables that impact demographics and their possible attributions to CVD in African Americans.

Nature of the Study

Through this cross-sectional, correlational, quantitative study, I sought to identify the knowledge of CVD risk factors and its relationship to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD. The research study used multiple

linear regression to identify relationships between CVD knowledge and independent variables of African American millennials. Multiple linear regression helped in determining which of the five independent variables had the strongest relationship to the knowledge of CVD risk factors. The five independent variables were income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD. African American millennials residing in Louisiana were recruited through churches, community events, and social media websites such as Facebook. Potential participants were provided with a link to an online questionnaire either as a part of the online recruitment process or via a handout provided in person.

Definitions

The following terms are defined to provide alignment and clarity:

CVD knowledge: A psychometric factor that is in the Heart Disease Knowledge Questionnaire (HDKQ) that measures knowledge of heart disease (Bergman et al., 2011).

CVD risk factors: Modifiable and nonmodifiable characteristics that enhance the risk of CVD. CVD risk factors are often ignored because most are modifiable, making them less dreadful than unmanageable risks.

Education: A demographic factor that relates to obtaining knowledge and development through schooling (Hudson et al., 2020). In the study, education was an independent variable.

Family history of CVD: Family history of CVD has been affiliated with increased cardiovascular risk. Insufficient family CVD history can confuse the appearance of risk factors and lead to a blunder of cardiovascular risk and diagnosis (Grauman et al., 2021).

Income: A demographic factor that defines the social standing of a person or group. Inadequate income leads to insufficient self-reported health concerns and increased rates of diseases and injuries because of a pattern of risk factors, such as smoking, unhealthy diet associated with food vulnerabilities, agony, and job insecurity (Avanceña et al., 2021).

Millennial: An individual born between the years 1981 and 1996. Millennials were the general population of the study.

Geographical residence: The place where someone lives. Socioeconomic indicators associated with race, employment, wages, poverty, and residence reflect African American millennials' health (Vilar-Compte et al., 2021).

Assumptions

A fundamental assumption based on the nature of quantitative research is that participants are honest. This includes the assumption that participants are honest about inclusion criteria and demographic information. Specifically, it was assumed that participants would be honest about their knowledge of CVD, educational level, income, family history of CVD, residence, and discussions with doctors and healthcare providers about CVD risk. Recognition of these assumptions is important to ensure that the collected data is valid and reliable.

Scope and Delimitations

Researchers determine and set delimitations to achieve a study's goals and research outcomes (Theofanidis & Fountouki, 2018). The scope of this study was aimed at assessing CVD knowledge in relation to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD among African Americans born between 1981 and 1996 residing in Louisiana. The study population was further delimited to individuals residing in the state of Louisiana. Louisiana residents were selected for multiple reasons. First, Louisiana health ranked 50th in 2022 with economic hardship ranked as the most impactful determinant (The United Health Foundation, 2022). Second, Louisiana has the third highest proportion (33%) of resident African Americans in the United States (U.S. Census Bureau, 2021). Moreover, Louisiana is in the bottom half of states when ranked by gross domestic product, suggesting that there may be large socioeconomic differences in the population (U.S. Bureau of Economic Analysis, 2022). The results of the study are thus not necessarily generalizable to individuals outside of this geographic region or to other racial or age groups.

Limitations

Limitations of the study included excluding individuals of other races or age groups and relying on self-reporting. Other limitations included the delimitation of the study to Louisiana, which limited the generalizability of the study. The study's cross-sectional research design also carried limitations because it was not possible to establish a causal relationship between variables without longitudinal data. The convenience

sampling employed in this study also served as a limitation because nonprobability sampling methods do not allow the researcher to generalize the results of a study to a general population (Stratton, 2021).

The integrity and honesty of participants' responses can impact the validity and reliability of research, while the location in which the participants are recruited can induce bias. Self-reporting is commonly used and involves participants answering researcher inquiries without interference. Some examples of self-reporting are questionnaires and surveys. However, bias can arise from participants as a result of long recall periods, selective recall bias, social desirability, and nonrepresentative sampling (Peebles, 2020). To reduce or eliminate bias, I followed a bracketing procedure.

Moreover, there is a need to perform several procedures when designing self-reporting instruments, such as assessing the instrument's accuracy and validity before data collection (Fuller et al., 2018). These had been previously established for the instrument used in the present study (Bergman et al., 2011). Further limitations may have included confounding factors that were not included in the study. Furthermore, the location of the recruitment of participants, the participants' willingness to participate in the study, the truthfulness of the participants' responses, and the generalizability of the sample to the larger population were all potential limitations to the study.

Significance

This study is significant because understanding the knowledge of CVD and dependent variables provides insight that might inform future CVD health education and health promotion strategies for the target population. The demographics of the United

States are changing rapidly. In 2015, the Generation Z and baby boomer populations were majority Caucasian (U.S. Census, 2019). In contrast, the Census Bureau (2021) reported that 44.2% of millennials belong to minorities. African Americans represent 14.4% (47.9 million) of the total U.S. population, and 14% (about 11.5 million) are millennials (Moslimani, et al., 2024). With African American millennials representing such a significant percentage of the U.S. population, a downward trend of health amongst this group threatens future prosperity due to rising health costs and reduced ability to pay such premiums due to poverty and the continued racial wealth gap.

Summary

Early intervention is necessary to prevent the threat of increased prevalence of CVD in African American millennials born between 1981 and 1996 due to their ethnic predisposition and modern lifestyle, significantly increasing their vulnerabilities to CVD risk. The lack of monitoring for CVD in African American millennials compared to people of older ages puts African American millennials at a higher risk of CVD. This study examined the association between knowledge of CVD in relation to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD in African American millennials residing in Louisiana.

Chapter 2 will describe the literature review relevant to this study, including the literature search strategy. In it, I will examine the historical background and theoretical framework guiding this study. It will conclude with a summary of the literature and present gaps identified.

Chapter 2: Literature Review

Introduction

This quantitative study explored African American millennials' knowledge of CVD and its association with income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD. Der Ananian et al. (2018) suggested that persistent disparities in CVD found in African Americans are extensive and span from the individual level to the social environment, thus demonstrating a need for an association to be examined. Chapter 2 will describe the literature review relevant to African American millennial health outcomes, variables that influence those health outcomes, and present gaps identified.

Literature Search Strategy

The most recent and relevant literature about CVD in African American millennials was searched during the study. The publications used were PubMed, Walden Library, ERIC, CINAHL, and Directory of Open Access Journal. Every search was limited to publications from 2017 and later. I used term search methods focusing on possible contributions to CVD (using terms such as *sociodemographic, age, health education, health insurance, household income, medical care deferred, primary care provider, African Americans, heart health, health disparities, demographic, millennials*), cardiovascular disease (using the following terms: *cardiovascular disease history, cardiovascular disease statistics, cardiovascular disease present-day prevalence, cardiovascular disease history in millennials, cardiovascular disease statistics in*

millennials, cardiovascular disease present-day prevalence in millennials), and additional concepts of focus using terms (using terms *socioecological model, health belief model, knowledge of CVD among millennials*, and *beliefs of cardiovascular disease among millennials*).

Theoretical Foundation

Socioecological Model

The SEM has been utilized in numerous studies to analyze relationships between variables and health-related behaviors in order to advise on health-related interventions. For example, Cerulli et al. (2019) explored a public health concept of suicide prevention by analyzing laws that influence risk factors of suicide across the SEM. Cerulli et al. (2019) established that when one is examining laws that impact suicide prevention at the individual, relationship, community, and societal levels, interchangeable interventions fall between two levels. Furthermore, the authors found that the risk for suicide and potential legal interventions across the SEM was beneficial when analyzing associated risk factors to create cohesive plans to improve overall health. The construct of suicide was broadly conceptualized in the SEM and focused on legal interventions that might affect health.

Lisnyj et al. (2021) sought to identify if any of the SEM levels prompted undergraduate students' stress and academic success at postsecondary institutions. Findings indicated that undergraduate students' stress levels and academic success were impacted at various levels, with many overlapping factors across the SEM levels (Lisnyj et al., 2021). In addition, participants identified a higher concentration of factors at the

individual, interpersonal, and institutional levels, suggesting that stress is predominantly perceived negatively among undergraduate students, demonstrating that stress is complex, with various sources impacting various levels (Lisnyj et al., 2021). SEM brought to the forefront the many facets of undergraduate students' stress levels that contribute to the determinants of academic success.

SEM was utilized to assess associations between the many facets of demographics contributing to cardiovascular knowledge determinants in African American millennials. Findings imply that African American millennials have predispositions that significantly increase their vulnerabilities to CVD. The CDC (2019) suggested that enhancing continuous prevention includes awareness of the complex interactions between individuals, relationships, community, policy, and societal factors. SEM's factors have interdependent relationships. An interdependent relationship indicates that one level will influence the components of the other levels (CDC, 2019). Utilizing the SEM offers multiple possibilities for a new appeal to improve CVD health outcomes at numerous levels among African American millennials. Mensah (2018) mentioned that implementing programs to prevent CVD in African Americans will promote preventive medicine and give insight into understanding health disparities.

Guided from a prevention perspective utilizing SEM, it is proposed that CVD in African American millennials may arise from various internal factors, including lack of knowledge and external factors that may influence human behaviors. The SEM for health promotion helped in classifying the study's findings to demonstrate the complex interplay of the association to income, education, family history of CVD, geographic residence,

and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD.

<div align="center">**Literature Review Related to Key Concepts**</div>

Historical Background of African Americans in the United States

The country's oldest nonnative racial minority, African Americans, still suffers due to the residual effects of forced migration to America during the transatlantic slave trade (Carnethon et al., 2017). The first African Americans were brought to the United States in chains as enslaved people. The transatlantic slave trade triggered a system perpetuating social hierarchal norms, privilege, power, and resources (Carnethon et al., 2017). Notably, the state chosen for participant selection, Louisiana, has a long history of slavery, especially on plantations before the Civil War (Stevenson, 2024).

Once enslaved in the United States, African Americans were forced to live in physical and social conditions where their health had little value. For more than 250 years, enslaved African Americans suffered physical, social, and mental brutalization. Means of survival following the forced migration to America have contributed to customs, health beliefs, food practices, food insecurities, barriers to economic opportunity, and lack of access to healthcare among African Americans. This is unfortunate due to food practices, food insecurities, obstacles to economic opportunity, and lack of access to healthcare, compromising critical systems in fending off disease (Hudson et al., 2020). Without proper conditions, fending off disease can be impossible.

The role of food is a vital element of cultural identity and speaks to the history of African Americans. African Americans utilized food as an agent to bolster intimacy,

appreciation, and kinship. However, established practices passed down from generation to generation have negatively impacted healthy food habits and lifestyle choices. To compound this issue, negatively established food practices through tradition and socioeconomic levels prevent some African Americans from having healthy food choices. The lack of grocery stores and food deserts for African Americans with low-level socioeconomic statuses often expose residents to less nutritious food. The food available in low-income and impoverished areas is usually high in cholesterol and fat (Hudson et al., 2020). For example, food security is still a prominent issue in Louisiana, especially in African American marginalized Louisianian communities (Holston et al., 2020). More recently, during the COVID-19 pandemic, Louisiana had the highest proportion of families living under food-restriction conditions (Gunderson et al., 2021). This food insecurity, in turn, has been correlated with multiple chronic diseases, including malnutrition, hypertension, and obesity, in the Louisiana population (Ardoin, et al., 2023). In the 150 years since slavery was abolished, African Americans have been subjected to systematic discrimination and oppression, which continue today (Carnethon et al., 2017). Healthwise, this history may be viewed as resulting in two outcomes. With so much suffering and early death, those who survived this subjection may be this group's most robust and resilient members. However, with the history of slavery and current racial discrimination, this group suffers from African Americans' inexcusably poor health status.

Reliable predictors of better health outcomes affiliated with lowering CVD morbidity and mortality include social support stress, employment, unemployment,

lifestyle, addiction, and food (Uchino et al., 2020). Increasing African American millennials' knowledge of CVD, social support, and methods to protect against CVD may decrease disproportionate rates of CVD in the African American community. This study's contribution to social change may be data-driven recommendations for relevant health education and promotion strategies to combat CVD in African American millennials.

African American Millennials and Health Outcomes

Blue Cross Blue Shield (2019) identified that millennials are in worse health than baby boomers despite their reputation for valuing health and wellness. According to the "Blue Cross Blue Shield (BCBS) Health Index," millennials possessed 11% more general adverse health with an increase of 21% increase in cardiovascular conditions (BCBS, 2019). Adverse health risks contribute to a more significant burden of disease resulting from individual, behavioral, and lifestyle choices as well as institutional, socioeconomic, policy, and environmental influences (Mensah, 2018). Economic indicators, hierarchal social norms, privileges, power, and resources dating back to the transatlantic slave trade have evolved into the burden of pervasive cardiovascular disparities in African Americans. Cardiovascular disparities in African Americans range from differences in cardiovascular treatment to the prevalence of cardiovascular risk factors, hospitalization rates, revascularization procedures, life expectancy, outcomes, and a lack of epidemiological studies (Hudson et al., 2020). On account of these disparities, African American millennials show alarming generational health decline faster than the previous generation as they age.

The greater prevalence of adverse health behaviors such as unhealthy eating habits, sedentary lifestyles, sleep deprivation, and untreated disorders in African Americans is also associated with poverty established across economic indicators (Hudson et al., 2020). Even with increased education and income, African Americans are more likely to die from CVD than Caucasians (Mensah, 2018). Often a reflection of demographics and socioeconomic status, African American millennials live with or die of many conditions typically found in older Caucasians. A downward health trend among millennials threatens future prosperity (Hudson et al., 2020). Current studies dedicated to millennials highlight persistent difficulties in terms of gaps in healthcare coverage, racial discrimination, and high prevalence rates of health conditions, indicating higher CVD risk in African Americans (CDC, 2017; Churchwell et al., 2020; Mensah, 2018).

Millennials have faced a greater risk for CVD for over 10 years. However, Zeller et al. (2019) suggested that doctors are more likely to track risk factors related to heart disease in middle-aged or older adults and assess a person's risk for heart disease or stroke. Although social media has increased the health information available to millennials, the significance of this blend of health-related information among millennials is uncertain. Understanding the knowledge of CVD and demographics that raise risk entails determining how millennials acquire accurate health knowledge and if this knowledge becomes stagnant or influential. The attainment of accurate health knowledge and putting the knowledge into practice can assist in avoiding adverse health risks that contribute to the burden of pervasive cardiovascular disparities.

Knowledge of Cardiovascular Disease

Adequate knowledge of CVD and its threatening characteristics may help reduce exposure to modifiable risk factors (Aminde et al., 2017). CVD prevalence among African American millennials can be reduced through sufficient research that uncovers determinants that prevent adequate knowledge regarding health risks associated with CVD (Aminde, 2017; BCBS, 2019). Millennial health is declining and needs to be addressed due to its considerable influence on the future of many industries (BCBS, 2019). Millennials are the first generation to grow up in a nontraditional learning environment where health-related information is widely available through the internet, television, and other electronic media (Aminde et al., 2017). Due to the recency of this learning landscape, the scope of accurate CVD knowledge among African American millennials is relatively unknown.

Moreover, the presence of health-related disinformation on electronic platforms further convolutes millennials' knowledge or perceived knowledge of important health risks (Melchior & Oliveira, 2022; Wang et al., 2019). With increased vulnerabilities and disproportionate rates for CVD, one must understand the lack of knowledge associated with African American millennials' risk for CVD. Therefore, research is needed to identify African American millennials' knowledge of CVD and the relationship between specific demographic variables.

Galeshi et al. (2018) sought to understand the behavior diversities among young millennial subgroups and the ways members seek healthcare knowledge. The independent variables were subgroups of gender, ethnicity, immigration status, and

college status. The outcome variables were sources of health information, including print, traditional media, internet, family, and health professionals (Galeshi et al., 2018). Galeshi et al. ran several analyses on the 2012–2014 U.S. Program for the International Assessment of Adult Competencies (PIAAC) data using Stata. The study's results indicated that the internet was the primary source for millennials to seek knowledge (Galeshi et al., 2018). Other available resources included printed material, traditional media, and close friends and family, while a low percentage of millennials sought health knowledge from a health professional (Galeshi et al., 2018).

Furthermore, the authors found that millennials' health-seeking behavior is complex and influenced by gender, ethnicity, immigration status, and education. The study's strength was its ability to capture how subgroups affect knowledge of health. However, the study's implications were limited due to the authors not considering the effect of literacy skills, cognitive skills, and ability to claim causation. These findings provide data that support the attainment of accurate health knowledge, and putting the knowledge into practice can assist in avoiding adverse health risks that contribute to the burden of pervasive cardiovascular disparities.

Muhihi et al. (2021) indicated that in order to resist the increasing overload of CVD risk factors, it is essential to establish and actualize interventions that will enhance knowledge of risk factors. Using a qualitative design and surveys, the study examined the knowledge of risk for CVDs among young and middle-aged adults in Morogoro, Tanzania. Muhihi et al. established the relationship between a need to enhance an individual's awareness and behavior change toward a healthy lifestyle and a need to

maximize the potential of healthcare providers as channels of health information to increase public knowledge of risk factors of CVD. Furthermore, the authors found that knowledge of risk factors and warning signs was associated with sociodemographic and economic characteristics (Muhihi et al., 2021). Similar to the previous study, healthcare providers were not identified as critical sources of information and knowledge about CVDs (Muhihi et al., 2021). Due to predictors of adequate knowledge of risk factors and warning signs for CVDs signifying that a lack of knowledge is related to the long-term development of CVD risk factors, increasing knowledge may help decrease the pace of risk factor development. Findings emphasize the need to implement effective educational interventions, which should be perceptive to the targeted population's consciousness, mental outlook, and abilities.

Cardiovascular Disease Risk Factors

Social hierarchal norms, privileges, power, and resources dating back to the transatlantic slave trade have evolved into the burden of pervasive cardiovascular disparities in African Americans. This can be identified through CVD being a primary driver of inequalities between African Americans and Caucasians. For example, among the 25 leading causes of death, six of the ten conditions identified as substantial contributors to years of life lost are CVD risk factors (The U.S. Burden of Disease Collaborators, 2018). When studied by ethnic group and gender, Caucasian women have the longest life expectancy at 80.6 years, followed by African American women at 75.8 years, Caucasian men at 75.5 years, and African American men at 68.3 years (Arias et al., 2021). Cardiovascular disparities in African Americans range from differences in

cardiovascular treatment, the prevalence of cardiovascular risk factors, hospitalization

rates, revascularization procedures, life expectancy, and outcomes to a lack of

epidemiological studies (Hudson et al., 2020). Due to these disparities, African American

millennials show a faster generational health decline than the previous generation

(Hudson et al., 2020).

African Americans tend to have an earlier onset of CVD disease than Caucasians,

as well as increased premature CVD-related deaths (Aminde et al., 2017). Differences in

access to quality of health care, dietary intakes, lifestyle factors, neighborhood

characteristics, socioeconomic status, sociocultural attitudes toward disease, persistent

racial discrimination, and genetics have all been associated with African Americans' poor

CVD health outcomes (Das et al., 2020). However, some, but not all, of these factors

contribute to increased CVD risk for every African American. Many disease risk factors,

including dietary choices, lifestyle factors such as smoking or use of alcohol,

socioeconomic status, and attitude towards disease, are modifiable. According to the

CDC (2017), most, if not all, individuals can reduce their risk of CVD morbidity and

mortality, especially if healthy behaviors are established in childhood or changed in

young adulthood. Therefore, increasing public knowledge of CVD, CVD-related

comorbidities, and the risk factors of CVD is critical, especially for the African American

population.

Carnethon et al. (2017) reported a higher prevalence of CVD risk factors such as

"hypertension, diabetes mellitus, obesity, and atherosclerotic cardiovascular risk that

underlies the relatively earlier age of onset of cardiovascular diseases among African

Americans." Hypertension is specifically high in African Americans, and it can cause peripheral artery disease and strokes in African Americans. Despite having several pharmacotherapies and indications readily available for the population of African Americans, disease management is inadequate among African Americans leading to more significant mortality. Thus, several strategies need to be implemented for African Americans to help them combat CVD.

Saban et al. (2021) suggested the impact of stressors relevant to the lives of African Americana, including racial, financial, occupational, general stress, and psychological distress on CVD. The study used quantitative design and surveys to examine the relationship between multiple psychosocial stressors and CVD risk indicators. Saban et al. (2021) established the relationship between racial stress, psychological distress, and CVD. Furthermore, the authors found that experiences with racism and depression were significantly associated with indicators of CVD risk. The construct of CVD was broadly conceptualized in CVD risk indicators focusing on racial stress and psychological distress that might affect health. The study's strength was the ability to capture how structural racism influences health. However, the study was weak due to an unbalanced sample size and the lack of evidence of the systemic and structural impact of racism variables existing as confounding variables.

In 2015, the AHA published Life's Simple 7, which detailed seven risk factors contributing to cardiovascular disease. These seven factors included cigarette smoking, diabetes, high cholesterol, hypertension, obesity, physical inactivity, and poor diet (Folsom et al., 2015). Life's Simple 7 is a Likert-stythle scale that gives a score of 0-2 for

each of the seven factors, with a score of 0 being poor, a score of 1 being intermediate, and a score of 2 is for ideal (Folsom et al., 2015). Achieving Life's Simple 7 in middle age led to decreased heart failure and greater preservation of cardiac output (Folsom et al., 2015). More recently, ideal adherence to Life's Simple 7 was shown to be associated with a lower risk of developing coronary heart disease in all populations examined by the study, including African Americans (Hasbani et al., 2022).

Family History of Cardiovascular Disease

Chacko et al. (2020) suggested that a family history of CVD is an independent risk factor for premature CHD. Chacko et al. (2020) sought to examine the strength of the relationship between a family history of CVD and premature CHD among Indigenous people. In a matched case-control study in Kerala, India., the authors found that a family history of CVD is affiliated with premature CHD risk increases; therefore, individuals with a family history of CVD should be targeted for CVD risk reduction interventions (Chacko et al.,2020). The study's strength was the author's ability to establish internal and external generalizability of the findings and minimize bias due to confounding variables (Chacko et al.,2020). The limitation of the study was the probability of recall and survival bias due to only selecting surviving cases. Although family history is a nonmodifiable risk factor, the construct of reducing the total CVD risk among individuals with a family history of CVD is health education and exposure to other known modifiable risk factors that should be included in their lifestyles (Chacko et al.,2020).

Using a qualitative design, Bolin et al. (2021) examined the life history of young adults who attended biofeedback training and disclosed a family history of CVD. The

authors concluded that all participants had a family history of CVD, with some participants already experiencing CVD issues leading to stress and anxiety because of their family history (Bolin et al., 2021). The study also found that millennials and Z generations who want to establish health care in their own way are approaching it differently, showing a shift from a traditional medical model (Bolin et al., 2021). In addition, the study provides vital data on millennials' experiences when using biofeedback therapy. These results can help support the implementation of effective educational interventions that are complementary to the new shift from the traditional medical model.

Moonesinghe et al. (2019) utilized the National Health and Nutrition Examination Survey to assess the relationship between family history of premature heart disease for the US population with cardiovascular disease to age group, sex, race, education, income-to-poverty ratio, and BMI using logistic regression and multivariable adjustment (Moonesinghe et al., 2019). The results indicated that the likelihood of CVD in individuals with a family history of premature heart disease was more than double the prevalence of CVD among individuals without a family history. In addition, individuals with a family history of premature heart disease have less favorable heart health. The study is limited due to cross-sectional surveys being unable to show causal effect and the possibility of misreporting medical history. However, the results provide data that could prompt the effectiveness of family history as a tool for preventing CVD. Family healthcare history can be a vital component in reducing the overall risk of CVD by putting more emphasis on modifiable risk factors.

The Effects of Income on Cardiovascular Disease Risk

The demographics of the United States are changing rapidly, with a substantial percentage of the millennial generation being minorities. The extent to which African Americans perceive CVD as a significant risk to their health is attributed to hierarchal social norms, privileges, power, and resources established, dating back to the transatlantic slave trade. The racial wealth gap and occurrences such as the Great Recession have affected socioeconomic indicators associated with race, employment, wages, poverty, and housing. African American millennials' health is frequently a reflection of these indicators. Behavioral traits established through a means of survival contribute to the prevalence of adverse health behaviors. The extent of pervasive cardiovascular disparities among African Americans can be identified as a significant disease burden.

Fosse et al. (2018) suggested that as one moves down the socioeconomic scale, their health worsens, indicating a relationship between health and social circumstance. Fosee et al. (2018) sought to study the implementation of new practices within public health work and the social inequalities of disadvantaged groups. In a mixed-methods approach that included surveys, the authors found that new comprehensive public health policies were implemented to reduce social inequalities. Reducing social inequalities and leveling the social gradient was broadly conceptualized, implying a view on public health policies aiming at an equal distribution of positive factors that influence health. The study's strength was the author's ability to bring awareness and knowledge of the content of the Public Health Act in 2012 (Fosee et al., 2018). However, rates in which it has been committed to the principles of the act to continue a process of improvement has yet to be

identified (Fosee et al., 2018). Further limitations of the study are that public health implementation differs locally and nationally (Fosee et al., 2018). Therefore, what works to commit to the act's principles in one area may not be the same in another area.

George et al. (2021) mentioned a continual history of discrimination against African Americans, which is more likely to affect lower socioeconomic statuses. Azap et al. (2021) studied the relationship between socioeconomic factors such as education, income, employment, and health insurance status) with an ideal cardiovascular health (ICH) score. The multinomial logistic regression model results concluded that socioeconomic status, income, and other demographic factors are associated with higher attainment of ICH. Therefore, the results suggest that it is important to implement programs, such as community-engaged interventions, to improve cardiovascular health in African Americans due to the high prevalence of CVD.

Poverty established across economic indicators contributes to a greater prevalence of adverse health risks and behaviors. This greater prevalence of harmful health risks and behaviors can be identified through a constant downward trend in health. Income level is regularly linked specifically with CVD risks. Studies suggest that low- and middle-income countries have an estimate of about 80% of CVD as a universal burden (World Health Organization, n.d.).

Moreover, the four markers that exhibit a relationship between CVD include education, income, employment status, and environmental factors (Schulaz et al., 2018). In addition, Gerber et al. mentioned that a $10,000 increase in the average income level within a neighborhood decreased the CVD mortality risk by 10%. It is noteworthy to

mention that diet plays a role in increased CVD prevalence. Lower-income neighborhoods have fewer food resources and grocery stores, limiting healthy food choices such as fruits and vegetables. Moreover, the high cost of healthy food also contributes to a lack of healthy options. Furthermore, there are racial disparities in food accessibility where there is a more significant population of African Americans, such as more restaurants and less healthy supermarkets.

The Effects of Residence on Cardiovascular Disease Risk

One's residence is a decisive factor in health. Sims et al. (2020) reviewed and summarized research that has examined the associations of housing status with cardiovascular health and overall health. The authors sought to compile research that has assessed the correlation of housing status with CVD health and overall health (Sims et al., 2020). Statistics report that health is affected by stability, quality and safety, affordability, and neighborhood environment (Sims et al., 2020). The research concluded that housing is a significant social determinant of CVD health and wellness and should be examined in assessing prevention intentions to curtail and eradicate racial and socioeconomic inequalities (Sims et al., 2020). Research linking one's residence to CVD health is relatively strong, with vulnerable and underserved populations at an increased risk for living in areas with substandard built environment features linked to CVD. Racial and socioeconomic inequalities place individuals at risk for displeasing and hazardous housing conditions. Without confronting structural barriers and a lack of policies that contribute to access to affordable housing, one's place of residence will continue to contribute to cardiovascular health or increased CVD risk.

In a linked study, Gabb et al. (2017) confirmed a relationship between knowledge, understanding of CVD risk, and geography. Geography has been fundamental to advancing knowledge and perception of CVD and its risk factors, as well as the development of competent interventions for practical strategies (Gabb et al., 2017). By addressing regional variation of knowledge of CVD and its risk, there is potential for widespread general health benefits (Gabb et al., 2017). Furthermore, Gabb et al. (2017) determined that the solution to reducing variations of knowledge of CVD in geographic locations doesn't solely rely on traditional clinical risk factors but public health policies and addressing inequalities as well. This data assists in backing the implementation of effective educational interventions and guiding policy development aimed at reducing exposure to CVD risk factors.

White et al. (2021) examined several participants and their CVD risk behaviors, such as social habits, caretaking responsibilities, and recreational activities. The results concluded that healthy choices are determined by their philosophy, peer pressure, or the residence community. The study also found that African Americans who lived in rural areas had a higher risk of CVD. In addition, geographical locations that had denser behavioral interventions that aid in healthy choices tend to influence physical and social behavior. White et al. (2021) mentioned that African Americans in rural areas may have influential individuals in their churches and workplaces that may serve as an intervention to improve CVD risk behaviors. Their data also supports the significance of geographical location and areas where the community could be utilized as a multilevel intervention catalyst.

Summary and Conclusions

Adverse health behaviors have contributed to a more significant disease burden in African American millennials, with CVD as a primary driver. Even an increase in education and income for African Americans has not helped with the downward health trend amongst millennials, threatening future prosperity. Utilizing SEM offers multiple possibilities for a new appeal to CVD health outcomes at various levels in African American millennials. The gap was addressed using a quantitative approach to explore the construct of CVD. This information provides context regarding the health risk of CVD, perhaps helping to guide program development aimed at reducing exposure to modifiable risk factors.

Chapter 3 discussed the research design and rationale. It also detailed the sampling and recruitment plans for the study. It concluded with a discussion of the data analysis plan.

Chapter 3: Research Method

Introduction

This quantitative correlational study explored the knowledge of risk factors for CVD among African American millennials and the relationship of this knowledge to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD. These variables relate to the five levels of the SEM. Strategies to promote adequate awareness of CVD and its risk factors may help African American millennials modify behaviors to reduce the risk of developing CVD (Negese et al., 2020). In this chapter, I discuss the research design, study rationale, methodology, sampling, recruitment procedures, instrumentation, and operationalization of constructs. The chapter ends with a discussion on data analysis threats to validity and ethical procedures.

Research Design and Rationale

This study examined the relationship between knowledge of CVD and income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD among a convenience sample of African American millennials using a quantitative research design. The research study utilized multiple linear regression to identify relationships between CVD knowledge and independent variables of African American millennials. Multiple linear regression helped identify the relationship between the five independent variables and knowledge of CVD risk factors. The five independent variables were

income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD.

Constraints consistent with the study's research design were the location of the recruitment of participants, the participants' willingness to participate in the study, and the truthfulness of the participants' responses. The integrity and honesty of participants' responses can impact the validity and reliability of the research, while the location in which the participants are recruited can induce bias. However, the examination of the relationship between knowledge of CVD and income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD among a convenience sample of African American millennials using a quantitative research design is complementary to the advancement of knowledge for relevant health education and promotion strategies to gather tools to combat CVD in African American millennials. This is due to quantitative studies being effective tools to examine the complex and dynamic contexts of health education and promotion in their forms, sites, and variations.

On the other hand, correlational research can detect predominant connections between variables and predict occurrences from present statistics and knowledge (Seeram, 2019). The vast differences established through African American cultural norms cause healthcare professionals to identify health education and promotion opportunities to deliver person-centered care. Incorporating person-centered care could decrease the disproportionate rate of African American millennials at risk for CVD. This study's contribution to social change may be data-driven recommendations for relevant

health education and promotion strategies to combat CVD in African American millennials.

Methodology

Population

The target population was African American millennials born between 1981 and 1996 who lived in Louisiana. The study location was Louisiana, where the population is 4,624,047 and 32.8% are African American (U.S. Census, 2021).

Sampling and Sampling Procedures

The primary sampling method was purposive. Volunteers meeting the criteria were recruited from accessible settings in the study population. This study used purposive sampling because the population samples used for research are chosen to reflect a specific characteristic such as African American, born between 1981 and 1996, as well as residing in Louisiana. Participants were recruited through personal connections. Other recruitment methods included coordinated short- and medium-term social media outreach using hashtags, tagging, and sharing information to raise awareness. Following these active engagement tactics, potential participants were directed to complete a questionnaire through a link or QR code provided on the recruitment flyer.

Power Analysis: Calculation of Sample Size

The G*Power calculator version 3.1.9.2 was used to estimate the required sample size for this study. The following is the power analysis utilized to determine the sample size needed to test R-square. When inputting the project effect size of .15, the alpha level

of 0.05, the conventional desired power of 0.80, and a multiple regression model

involving five predictors, G*Power calculated the required sample size as 92.

Procedure for Recruitment, Participation, and Data Collection

Participants were recruited through personal connections and social media such as

Facebook and directed to complete the HDKQ through an online link. For this study, a

questionnaire administered via SurveyMonkey was used to house and collect the data.

SSL encryption was used to protect study participants and mask IP addresses to enhance

anonymity. There was no follow-up with respondents to the questionnaire. Prior to

starting the questionnaire, the participants were informed about the questionnaire being

utilized for a doctoral dissertation and were prompted to proceed to provide informed

consent (Appendix B). The questionnaire took approximately 5 minutes to complete. The

questionnaire (Appendix E) consisted of two parts. Section 1 collected data on the

demographics of the respondent. Section 2 contained data on the participant's knowledge

and beliefs about heart disease. The questions in Section 2 were taken from the HDKQ.

Permission from developers to use the HDKQ was granted prior to utilizing the

instrument (Appendix A). The score on the HDKQ measures the knowledge base of CVD

and covers a wide array of medical knowledge, such as diet and risk factors. Participant

scores are calculated as the number of correct answers and range from 0–30. The closer

the score is to 30, the higher one's knowledge of CVD. The data collected were imported

to SPSS. Once imported into the statistical software package, the data were cleaned and

prepared for analysis. All data will be stored on an external hard drive in a locked safe for

5 years. The dependent variable for this study was the HDKQ score. The HDKQ was

used as a validated metric to obtain relevant data on African American millennials'

knowledge and beliefs about heart disease. The HDKQ consists of Bergman and

colleagues' developed and validated questions at the National Institutes of Health in

Canada (Bergman et al., 2011). The HDKQ is in the public domain, and no permission is

needed for its use in research. The objective of the HDKQ is to identify knowledge gaps

and understand the differences between one's perceived and actual knowledge (Bergman

et al., 2011). The advanced knowledge of CVD covers various concepts measured by the

HDKQ (Lim et al., 2016). Based on the number of correct responses to the questionnaire,

a continuous score ranging from 0–30 was calculated for each participant. The five

independent variables of the study were education, income, family history of CVD,

geographic residence, and whether or not a doctor or health provider had talked to a

patient about risk factors for CVD. Each of these variables links back to one of the SEM

levels. Education was measured by the question "What is your highest level of

education?" Response options for education were less than high school, high school

diploma, and bachelor's degree/graduate level. Income was measured by the question

"What is your annual household income level?" The response options for income were

less than $25,000, $25,000–50,000, $50,000–100,000, $100,000–200,000, and more than

$200,000. The geographic residence was measured by the question "Where is your

residence located?" The response options for geographic residence were urban, rural, and

suburban. Family history of CVD was measured by the question "Does cardiovascular

disease run in your family?" The response options for a family history of CVD were yes

or no. Finally, to assess whether or not a doctor or other health care provider had talked

to the respondent about CVD risk factors, they were asked, "Has a doctor or other health care provider ever talked to you about risk factors for cardiovascular disease?" The response options for this question were yes or no.

Data Analysis Plan

The participant data was exported from SurveyMonkey into SPSS for analysis. This study examined the relationship of knowledge of CVD risk factors to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD. Data collection was maximized in case of missing data.

The following research questions guided the study:

RQ1: Is there a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{01}: There is not a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A1}: There is a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ2: Is there a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{02}:   There is not a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A2}:   There is a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ3:   Is there a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{03}:   There is not a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A3}:   There is a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ4:   Is there a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{04}:   There is not a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A4}: There is a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ5: Is there a significant relationship between whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{05}: There is not a significant relationship between having a doctor or other health care provider talk to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A5}: There is a significant relationship between having a doctor or other health care provider talk to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ6: Is there a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{06}:   There is not a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A6}:   There is a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Descriptive statistics were used to describe the characteristics of the study participants. Multiple linear regression was used to assess the relationship between the dependent variable (knowledge of CVD risk factors) and independent variables and identify which independent variable best related to the dependent variable. Multiple linear regression was appropriate as the outcome variable was continuous. A fundamental assumption based on the nature of quantitative research is that participants are honest. This includes the assumption that participants are honest about inclusion criteria and demographic information. I followed a bracketing procedure in an effort to assess assumptions.

Multiple linear regression was appropriate due to its ability to identify how strong the relationship is between the independent and dependent variables. However, due to the questionnaire including both nominal and ordinal categorical variables that had more than two response options, dummy variables had to be created. The coding for the dummy variables was 0 and 1, where 1 equaled the presence of the property and 0 equaled the absence of the property. The dummy variables posed as a substitute that could turn variables on and off in the equation.

Threats to Validity

Internal validity refers to the extent to which a study establishes a trustworthy cause-and-effect relationship in the targeted population (Patino et al., 2018). By maintaining internal validity, the study was void of alternate interpretations for results. Possible internal validity threats to this study were historical events, confounding variables, and instrumentation. Historical events often influence how study participants feel and act, whereas confounding can lead to changes in an outcome variable due to an outside variable not being measured. The instrumentation being used was a questionnaire. The questionnaire used to measure knowledge has been validated through item analysis and confirmatory factory analysis (CFA) via a psychometric evaluation (Lim et al., 2016). It is formally possible that the combination of the questionnaires impacted the validity and reliability of the measurements. However, researchers do not anticipate this to be the case since each questionnaire has been independently validated. Though I did not anticipate historical events, confounding, and instrumentation to impact the findings,

researchers will closely monitor aspects of the research design that enhanced the

probability of rejecting the alternative hypotheses to reduce the risk of internal validity.

External validity refers to the extent to which the study results can be generalized

to a larger group than the group under evaluation. Possible external validity threats

specific to this study included access to the questionnaire and selection bias. In this study,

the targeted population was millennials in Louisiana; the location of the study being

delimited to Louisiana could have affected external validity. However, because the

prevalence of CVD is so widespread, I anticipated that the target population would be

indicative of the general population. To address this external validity threat, the

questionnaire was online so that it was not isolated to a specific location as well as

ensuring that the population being studied was clearly defined.

Ethical Procedure

The questionnaire (Appendix E) and consent form was online. The consent form

preceded the survey. Once participants clicked the link to the online survey, they first

read the consent form. The consent form described the study and purpose, the time

required to complete the questionnaire, the voluntary nature of participation, and how the

data was reported. Furthermore, the consent form outlined procedures for the protection

of their data and anonymity. If the participant agrees, they clicked NEXT to access the

survey. I.P. addresses were masked, and SSL encryption was used to ensure anonymity.

Approval to gain access to participants was obtained through Walden's Institutional

Review Board (IRB) prior to conducting research. Ethical consideration for recruitment

and data collection includes recruitment methods respecting the privacy of participants,

the study being introduced in a manner that is understood to be voluntary and free of misleading emphasis to make the study more appealing.

Summary

This chapter describes the methods that were used to conduct the study. The chapter defines the dependent (knowledge of CVD risk factors) and independent variables (income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider has talked with you about risk factors for CVD). In addition, chapter 3 describes the sampling method, recruitment procedures, instrumentation, and operationalization of constructs, as well as the data analysis plan. The chapter concludes with a discussion of threats to validity and ethical procedures. Chapter 4 will discuss the results of the study.

Chapter 4: Results

Introduction

The purpose of this quantitative correlational study was to explore African American millennials' knowledge of risk factors for CVD and the relationship of this knowledge to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with a patient about risk factors for CVD. The research questions and hypotheses that guided this study were the following:

RQ1: Is there a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{01}: There is not a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A1}: There is a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ2: Is there a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{02}: There is not a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A2}: There is a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ3: Is there a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{03}: There is not a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A3}: There is a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ4: Is there a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{04}: There is not a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A4}:   There is a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ5:   Is there a significant relationship between whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{05}:   There is not a significant relationship between having a doctor or other health care provider talk to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A5}:   There is a significant relationship between having a doctor or other health care provider talk to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

RQ6:   Is there a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{06}: There is not a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A6}: There is a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Data Collection

Primary data were collected from participants who were African American, born between 1981 and 1996, and residing in Louisiana. External validity specific to this study included access to the questionnaire and selection bias. In this study, the location of the study being delimited to Louisiana could have affected external validity. However, because the prevalence of CVD is so widespread, I anticipated that the target population was indicative of the general population. To address this external validity threat, the questionnaire was given online so that it was not isolated to a specific location. Furthermore, I ensured that the population studied was clearly defined.

The questionnaire was open on SurveyMonkey for 2 months. Participants were directed to SurveyMonkey to complete a questionnaire through an online link posted on social media or a QR code provided on the recruitment flyer. Once participants clicked the link or scanned the QR code to the online questionnaire, they were prompted to read the consent form. The consent informed participants that they were invited to complete an anonymous survey by a Walden University student working toward a doctoral degree, the purpose of the study, the time required to complete the questionnaire, the voluntary nature of participation, and how the data would be reported. The consent form also outlined procedures for the protection of their data and anonymity. If the participant agreed, they were then prompted to click NEXT to access the questionnaire. No compensation was given for the completion of the questionnaire.

The questionnaire collected data on the demographics of the respondent as well as the participant's knowledge and beliefs about heart disease via the HDKQ. The score on the HDKQ measures the knowledge base of CVD and covers a wide array of medical knowledge, such as diet and risk factors for CVD. Participant scores are calculated as the total number of correct answers and range from 0–30. The lower the total score, the lower the knowledge of CVD. The higher the total score, the higher the knowledge of CVD.

A total of 168 participants responded to the questionnaire. However, after the data were exported from SurveyMonkey into Excel and then scrubbed, only 136 met the requirements to participate. Reasons why a participant was scrubbed included the following: They were not African American, they were not born between 1981 and 1996, they did not reside in Louisiana, or they left those questions blank. Once the data was

scrubbed, the data was then imported into SPSS. Once in SPSS, dummy variables were created. The coding for the dummy variables was 0 and 1, where 1 equaled the presence of the property and 0 equaled the absence of the property.

Results

Descriptive statistics were provided for income, education, family history of CVD, geographic residence, and whether or not a doctor or a healthcare provider had talked with the participant about risk factors for CVD. Statistical analysis was conducted using multiple logistic regression.

Table 1

Frequency and Percent of Participants' Level of Education

What is your highest level of education?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Bachelor's degree	51	37.5	37.5	37.5
	Graduate level	54	39.7	39.7	77.2
	High school diploma or GED	30	22.1	22.1	99.3
	Less than high school or GED	1	.7	.7	100.0
	Total	136	100.0	100.0	

Table 2

Frequency and Percent of Participants' Geographic Residence

Where is your residence located?

	Frequency	Percent	Valid percent	Cumulative percent

Valid	Rural	15	11.0	11.0	11.0
	Suburban	58	42.6	42.6	53.7
	Urban	63	46.3	46.3	100.0
	Total	136	100.0	100.0	

Table 3

Frequency and Percent of Doctor or Other Healthcare Provider Talking About Risk Factors for CVD

Has a doctor or other health care provider ever talked to you about risk factors for cardiovascular disease?

		Frequency	Percent	Valid percent	Cumulative percent
Valid		64	47.1	47.1	47.1
	No	35	25.7	25.7	72.8
	Yes	37	27.2	27.2	100.0
	Total	136	100.0	100.0	

Table 4

Frequency and Percent of Participants' Level of Annual Income

What is the level of your annual household income?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	$100,000–199,999	27	19.9	19.9	19.9
	$25,000–49,999	38	27.9	27.9	47.8
	$50,000–99,999	56	41.2	41.2	89.0
	Less than $24,999	6	4.4	4.4	93.4
	More than $200,000	9	6.6	6.6	100.0

Total	136	100.0	100.0	

Table 5

Frequency and Percent of Participants' Family History

Does cardiovascular disease run in your family?

		Frequency	Percent	Valid percent	Cumulative percent
Valid	No	85	62.5	62.5	62.5
	Yes	51	37.5	37.5	100.0
	Total	136	100.0	100.0	

The following research question guided the following analysis:

RQ1.   Is there a significant relationship between education and knowledge of

CVD risk factors in African American millennials (individuals born

between 1981 and 1996)?

H_{01}.   There is not a significant relationship between education and

knowledge of CVD risk factors in African American millennials

(individuals born between 1981 and 1996).

H_{A1}.   There is a significant relationship between education and

knowledge of CVD risk factors in African American millennials

(individuals born between 1981 and 1996).

Results of the logistic analysis for RQ1 are outlined in Table 6–8.

A multiple regression was run to determine if there was a significant relationship

between education and knowledge of CVD risk factors in African American millennials.

The dependent variable input was the HDKQ score, whereas the independent variable input was education. Due to education being categorical, dummy variables were created. The categories for education were less than high school or GED, high school or GED, bachelor's, and graduate level. Dummy variables created were less than high school or GED, bachelor's, and graduate level, leaving high school or GED as a reference.

Table 6

Results of the Logistic Regression Model for Education and Knowledge of CVD: Model Summary

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.355 [a]	.126	.106	3.232

[a] Predictors: (Constant), Whatisyourhighestlevelofeducation = Graduate Level,

Whatisyourhighestlevelofeducation = Less than High School or GED,

Whatisyourhighestlevelofeducation = Bachelor's degree

Table 7

Results of the Logistic Regression Model for Education and Knowledge of CVD: ANOVA

<div align="center">ANOVA [a]</div>

	Model	Sum of squares	df	Mean square	F	Sig.
1	Regression	199.136	3	66.379	6.355	< .001 [b]
	Residual	1378.798	132	10.445		
	Total	1577.934	135			

[a] Dependent variable: HDKQ score. [b] Predictors: (Constant),

Whatisyourhighestlevelofeducation = Graduate Level,

Whatisyourhighestlevelofeducation = Less than High School or GED,

Whatisyourhighestlevelofeducation = Bachelor's degree

Table 8

Results of the Logistic Regression Model for Education and Knowledge of CVD:

Coefficients

		Unstandardized coefficients		Standardized coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	18.967	.590		32.143	< .001
	Whatisyourhighestleve lofeducation = Less than High School or GED	.033	3.285	.001	.010	.992
	Whatisyourhighestleve lofeducation = Bachelor's degree	.916	.744	.130	1.231	.220
	Whatisyourhighestleve lofeducation = Graduate Level	2.941	.736	.422	3.996	<.001

[a] Dependent variable: HDKQ score.

The R was low at .355 and R Square was .126. R square indicates that 12.6% of the variation in knowledge score can be explained by one's education level. The ANOVA is statistically significant (<.001). The coefficient table indicates that there is no statistical significance (p = .992) in participants with less than a high school or GED (B = .033) HDKQ score compared to participants in high school diplomas or GED. There was also no statistical significance (p = .220) in participants with a bachelor's degree HDKQ score (B = .916). However, there is a statistical significance (p = .001) in participants with less than a high school or GED (B = 2.94) knowledge score compared to individuals in high

school or GED. This concludes that there was not a relationship in HDKQ score for the participants that had less than high school or GED and bachelor's degree in reference to individuals with a high school diplomas or GED. However, there is there a significant relationship between education and knowledge of CVD risk factors in participants that had graduate level degrees.

The following research question guided the following analysis:

RQ2. Is there a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{02}. There is not a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A2}. There is a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Results of Logistic Analysis for RQ2 are outlined in Table 9-11.

A multiple regression was run to determine if there was a significant relationship between annual income and knowledge of CVD risk factors in African American millennials. The dependent variable input was the HDKQ score whereas the independent variable input was annual income. Due to income being categorical, dummy variables were created. The categories for annual income were less than $24,999, $25,000-$49,999, $50,000-$99,999, $100,000-$199,999 and more than $200,000. Dummy variables created

for annual incomes of \$24,999, \$25,000-\$49,999, \$100,000-\$199,999 and more than

\$200,000 while annual income levels of \$50,000-\$99,999 was used as a reference.

Table 9

Results of the Logistic Regression Model for Income and Knowledge of CVD: Model

Summary

		Model summary		
Model	R	R square	Adjusted R square	Std. error of the estimate
1	.208 [a]	.043	.014	3.395

[a] Predictors: (Constant), Whatisthelevelofyourannualhouseholdincome = Less than

24,999, Whatisthelevelofyourannualhouseholdincome = More than 200,000,

Whatisthelevelofyourannualhouseholdincome = 100,000-199,999,

Whatisthelevelofyourannualhouseholdincome = 25,000-49,999

Table 10

Results of the Logistic Regression Model for Income and Knowledge of CVD: ANOVA

ANOVA [a]

Model	Sum of squares	*df*	Mean square	*F*	Sig.
1 Regression	68.340	4	17.085	1.483	.211[b]
Residual	1509.594	131	11.524		
Total	1577.934	135			

[a] Dependent variable: HDKQ score. [b] Predictors: (Constant),

Whatisthelevelofyourannualhouseholdincome = Less than 24,999,

Whatisthelevelofyourannualhouseholdincome = More than 200,000,

Whatisthelevelofyourannualhouseholdincome = 100,000-199,999,

Whatisthelevelofyourannualhouseholdincome = 25,000-49,999.

Table 11

Results of the Logistic Regression Model for Income and Knowledge of CVD:

Coefficients

		Coefficients [a]				
		Unstandardized coefficients		Standardized coefficients		
Model		B	Std. error	Beta	T	Sig.
1	(Constant)	19.875	.454		43.813	< .001
	Whatisthelevelofyourannualhouseholdincome = 100,000-199,999	1.532	.795	.179	1.927	.056
	Whatisthelevelofyourannualhouseholdincome = 25,000-49,999	1.072	.713	.141	1.503	.135
	Whatisthelevelofyourannualhouseholdincome = More than 200,000	.681	1.219	.050	.558	.578
	Whatisthelevelofyourannualhouseholdincome = Less than 24,999	-1.042	1.458	-.063	-.714	.476

[a] Dependent variable: HDKQ score.

The R was low at .208 and R Square .043. R square indicates that 4.3% of the variation in knowledge score can be explained the participants annual income. The ANOVA model states there is no statistical significance (.211). The coefficient table indicates that there was no statistical significance in individuals with annual incomes of less than $24,999 (B = -1.042, P=.476), annual incomes of $25,000-$49,999 (B=1.072, P=.135) and annual incomes of more than $200,000. (B=.681, P= .578) HDKQ score. However, there was statistical significance (p = .056) in participants with an income of

$100,000-$199,999 (B = 1.532) HDKQ score. This concludes that there was not a significant relationship between income and knowledge of CVD risk factors for participants with annual incomes of $24,999, $25,000-$49,999, $100,000-$199,999 and more than $200,000 though there was a significant relationship in participants with annual incomes of $100,000-$199,999 in reference to an annual income of $50,000-$99,999.

The following research question guided the following analysis:

RQ3.　Is there a significant relationship between family history of CVD significantly and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{03}.　There is not a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A3}.　There is a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Results of Logistic Analysis for RQ3 are outlined in Table 12-14.

A multiple regression was run to determine if there was a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials. The dependent variable input was the HDKQ score whereas the independent variable input was whether the participants have a history of CVD in their family. Due to the family history of CVD being categorical, dummy variables were created. The

categories for family history of CVD in were yes and no. a dummy variable created was

for the answer yes.

Table 12

Results of the Logistic Regression Model for Family History of CVD and Knowledge of

CVD: Model Summary

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.021 [a]	.000	-.007	3.431

[a] Predictors: (Constant), DoesCardiovasculardiseaseruninyourfamily = Yes.

Table 13

Results of the Logistic Regression Model for Family History of CVD and Knowledge of

CVD: ANOVA

ANOVA [a]

	Model	Sum of squares	df	Mean square	F	Sig.
1	Regression	.671	1	.671	.057	.812 [b]
	Residual	1577.263	134	11.771		
	Total	1577.934	135			

[a] Dependent variable: HDKQ score. [b] Predictors: (Constant),

DoesCardiovasculardiseaseruninyourfamily = Yes.

Table 14

Results of the Logistic Regression Model for Family History of CVD and Knowledge of

CVD: Coefficients

			Coefficients [a]			
		Unstandardized coefficients		Standardized coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	20.424	.372		54.883	< .001
	DoesCardiovasculardiseaseruninyourfamily = Yes	.145	.608	.021	.239	.812

[a] Dependent variable: HDKQ score.

The R was low at .021 and R Square .000. R square indicates that 0% of the variation in knowledge score can be explained by whether the participants had a history of CVD in their family. The ANOVA model states there is no statistical significance (p= .812). The coefficient table indicates that there is no statistical significance (B=.145 P=.812) in individuals with a history of CVD in their family and their HDKQ knowledge score. This concludes that there was not a significant relationship between family history of CVD and knowledge of CVD risk factors in participants that had a history of CVD in their family in reference to participants that did not have a history of CVD in their family. The following research question guided the following analysis:

RQ4. Is there a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{04}. There is not a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A4}. There is a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Results of Logistic Analysis for RQ4 are outlined in Tables 15–17.

A multiple regression was run to determine if there was a significant relationship between geographic residence and knowledge of CVD risk factors in African American millennials. The dependent variable input was the HDKQ score whereas the independent

variable input was geographic residence. Due to geographic residence being categorical,

dummy variables were created. The categories for geographic residence were rural,

suburban and urban. The dummy variables created were for suburban and urban

communities while rural communities were used as a reference.

Table 15

Results of the Logistic Regression Model for Graphic Residence and Knowledge of CVD:

Model Summary

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.084 [a]	.007	-.008	3.432

[a] Predictors: (Constant), Whereisyourresidencelocated = Urban,

Whereisyourresidencelocated = Suburban.

Table 16

Results of the Logistic Regression Model for Graphic Residence and Knowledge of CVD:

ANOVA

ANOVA [a]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	11.158	2	5.579	.474	.624 [b]
	Residual	1566.776	133	11.780		
	Total	1577.934	135			

[a] Dependent variable: HDKQ score. [b] Predictors: (Constant),

Whereisyourresidencelocated = Urban, Whereisyourresidencelocated = Suburban.

Table 17

Results of the Logistic Regression Model for Graphic Residence and Knowledge of CVD:

Coefficients

		Coefficients [a]				
		Unstandardized coefficients		Standardized coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	19.933	.886		22.493	< .001
	Whereisyourresidencelocated = Suburban	.377	.994	.055	.379	.705
	Whereisyourresidencelocated = Urban	.829	.986	.121	.840	.402

[a] Dependent variable: HDKQ score.

The R was low at .084 and R Square .007. R square indicates that 0% of the variation in knowledge score can be explained by geographic residence. The ANOVA model states there is no statistical significance (p= .624). The coefficient table indicates that there is no statistical significance in participants that reside in urban communities (B = .829, P=.402) and for participants that reside in suburban communities (B=.377, P= .705) HDKQ score. This concludes that there is not a significant relationship between geographic residence and knowledge of CVD risk factors in participants that reside in urban and suburban communities in reference to participants that reside in rural areas. The following research questions guided the following analysis:

RQ5. Is there a significant relationship between whether or not a doctor or

health provider has talked to African American millennials about risk

factors for CVD and knowledge of CVD risk factors in African American

millennials (individuals born between 1981 and 1996)?

H_{05}.   There is not a significant relationship between having a doctor or

other health care provider talk to a patient about risk factors for

CVD and knowledge of CVD risk factors in African American

millennials (individuals born between 1981 and 1996).

H_{A5}.   There is a significant relationship between having a doctor or other

health care provider talk to a patient about risk factors for CVD

and knowledge of CVD risk factors in African American

millennials (individuals born between 1981 and 1996).

Results of Logistic Analysis for RQ5 are outlined in Table 18-20.

A multiple regression was run to determine if there was a significant relationship

between whether a doctor or other health care provider has discussed risk factors for

CVD and knowledge of CVD risk factors in African American millennials. The

dependent variable input was the HDKQ score whereas the independent variable input

was whether a doctor or other health care provider has discussed risk factors for CVD

with the participants. Due to the answer to whether a doctor or other health care provider

has discussed risk factors for CVD being categorical, a dummy variable was created. The

categories for this response were yes or no. A dummy variable was created for the answer

no while the answer yes was used as a reference.

Table 18

Results of the Logistic Regression Model for Whether or Not a Doctor or Health Provider

Talked About Risk Factors for CVD and Knowledge of CVD: Model Summary

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.038 [a]	.001	-.006	3.429

[a] Predictors: (Constant),

Hasadoctororotherhealthcareproviderevertalkedtoyouaboutriskfacto = No.

Table 19

Results of the Logistic Regression Model for Whether or Not a Doctor or Health Provider

Talked About Risk Factors for CVD and Knowledge of CVD: ANOVA

ANOVA [a]

	Model	Sum of squares	df	Mean square	F	Sig.
1	Regression	2.298	1	2.298	.195	.659 [b]
	Residual	1575.636	134	11.758		
	Total	1577.934	135			

[a] Dependent variable: HDKQ score. [b] Predictors: (Constant),

Hasadoctororotherhealthcareproviderevertalkedtoyouaboutriskfacto = No.

Table 20

Results of the Logistic Regression Model for Whether or Not a Doctor or Health Provider

Talked About Risk Factors for CVD and Knowledge of CVD: Coefficients

Coefficients [a]

	Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.554	.341		60.241	< .001
	Hasadoctororotherheal thcareproviderevertalk edtoyouaboutriskfacto = No	-.297	.673	-.038	-.442	.659

[a] Dependent variable: HDKQ score.

The R was low at .038 and R Square .001. R square indicates that 0% of the variation in knowledge score can be explained by to whether a doctor or other health care provider has discussed risk factors for CVD. The ANOVA model states there is no statistical significance (p= .659). The coefficient table indicates that there is no statistical significance in participants that have not discussed risk factors for CVD with a doctor or other health care provider (B = -.297, P=.659) HDKQ score. This concludes that there was not a significant difference in HDKQ score for participants that have not discussed risk factors for CVD with a doctor or other health care provider in reference to have discussed risk factors for CVD with a doctor or other health care provider.

The following research question guided the following analysis:

RQ6. Is there a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider has talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

H_{06}. There is not a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider has talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

H_{A6}. There is a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider has talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996).

Results of Logistic Analysis for RQ6 are outlined in Table 21-23.

A multiple regression was run to determine if there was a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talking to you about risk factors for CVD and knowledge of CVD risk factors in African American millennials. The dependent variable input was the HDKQ score whereas the independent variables are education, income, family history, geographic residence, and whether or not a doctor or health provider talking to you about risk factors for CVD. Due to education, income, family history, geographic residence, and whether or not a doctor or health provider talking to you about risk factors for CVD being categorical, dummy variables were created.

Table 21

Results of the Logistic Regression Model for Education, Income, Family History,

Geographic Residence, Whether or Not a Doctor or Health Provider Talked About Risk

Factors for CVD and Knowledge of CVD: Model Summary

		Model summary		
Model	*R*	*R* square	Adjusted *R* square	Std. error of the estimate
1	.445 [a]	.198	.127	3.194

Table 22

Results of the Logistic Regression Model for Education, Income, Family History,

Geographic Residence, Whether or Not a Doctor or Health Provider Talked About Risk

Factors for CVD and Knowledge of CVD: ANOVA

			ANOVA [a]			
	Model	Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	312.976	11	28.452	2.789	.003 [b]
	Residual	1264.958	124	10.201		
	Total	1577.934	135			

Table 23

Results of the Logistic Regression Model for Education, Income, Family History,

Geographic Residence, Whether or Not a Doctor or Health Provider Talked About Risk

Factors for CVD and Knowledge of CVD: Coefficients

Coefficients [a]

Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	18.021	1.107		16.273	< .001
	Whatisyourhighestlevelofeducation=Bachelor's degree	.878	.748	.125	1.174	.243
	Whatisyourhighestlevelofeducation=Graduate Level	3.294	.768	.473	4.288	< .001
	Whatisyourhighestlevelofeducation=Less than High School or GED	-1.581	3.318	-.040	-.476	.635
	Whatisthelevelofyourannualhouseholdincome=100,000-199,999	1.746	.761	.205	2.296	.023
	Whatisthelevelofyourannualhouseholdincome=25,000-49,999	1.642	.700	.216	2.347	.021
	Whatisthelevelofyourannualhouseholdincome=Less than 24,999	-.416	1.421	-.025	-.293	.770
	Whatisthelevelofyourannualhouseholdincome=More than 200,000	.069	1.174	.005	.059	.953
	Whereisyourresidencelocated=Suburban	-.433	.959	-.063	-.451	.653
	Whereisyourresidencelocated=Urban	.382	.956	.056	.399	.691
	DoesCardiovasculardiseaseruninyourfamily=Yes	-.242	.602	-.034	-.402	.688
	Hasadoctororotherhealthcareproviderevertalkedtoyouaboutriskfacto=No	.536	.673	.069	.796	.427

[a] Dependent variable: HDKQ score.

The R was .445 and R Square .198. R square indicates that 19.8% of the variation

in the HDKQ scores can be explained by the participants education, income, family

history, geographic residence, and whether or not a doctor or health provider talking to

you about risk factors for CVD. The ANOVA model states there is a statistical

significance (p= .003). The coefficient table indicates that there is no statistical

significance in participants with less than a high school or GED (B = -1.581, P= .635),

participants with bachelor degrees (B= .878, P=.243), participants with annual incomes

less than 24,999 (B = -.416, P=.770), annual incomes of more than $200,000 (B=.069, P=

.935), for participants that reside in urban communities (B = .382, P=.691), for

participants that reside in suburban communities (B=-.433, P= .653), participants with a

history of CVD in their family (-.242, p= .688), in participants that have not discussed

risk factors for CVD with a doctor or other health care provider (B = -.297, P=.659), and

in participants that have not discussed risk factors for CVD with a doctor or other health

care provider (B = .536, P=.427). However, there was a statistical significance (B= 1.642

p = .021) in participants with an income of $25,000-$49,999, participants with an annual

income of $100,000-$199,999 (B = 1.746, P=.023), and participants with a graduate level

degree (B=3.294, P=.001).

This statistical analysis concludes that there was not a significant relationship in

HDKQ score for participants with less than a high school or GED, participants with

bachelor's degrees, participants with annual incomes of less than 24,999, participants

with annual incomes of less than 24,999, and participants with an annual income of more

than $200,000. There was also not a significant relationship in HDKQ score for

participants with for participants that reside in urban communities, for participants that live in suburban communities, for participants with a history of CVD in their family, in participants that have not discussed risk factors for CVD with a doctor or other health care provider, and in participants that have not discussed risk factors for CVD with a doctor or other health care provider. However, there was a statistically significant relationship in participants with an income of $25,000-$49,999, an annual income of $100,000-$199,999, and a graduate-level degree. Therefore, I reject the null hypothesis that there is no relationship between income level ($25,000–$49,999 and $100,000–$199,999) and knowledge of CVD risk factors. Furthermore, I reject the null hypothesis that there is no relationship between having a graduate degree and knowledge of CVD risk factors among African American millennials.

Summary

This chapter presented the analysis of the results of my investigation regarding the extent of the relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talking to you about risk factors for CVD and knowledge of CVD risk factors in African American millennials. The results revealed that there was not an relationship to participants with less than a high school or GED, participants with bachelor degrees, participants with annual incomes of less than 24,999, participants with annual incomes of less than 24,999, for participants with an annual income of more than $200,000, for participants that reside in urban communities, for participants that reside in suburban communities, for participants with a history of CVD in their family, in participants that have not discussed risk factors for

CVD with a doctor or other health care provider, and in participants that have not discussed risk factors for CVD with a doctor or other health care provider and their knowledge of risk factors of CVD. However, the results revealed that there was a relationship between participants with an income of $25,000-$49,999, participants with an annual income of $100,000-$199,999 and participants with a graduate level degree. Chapter 5 provides a discussion of the interpretation of findings based on the peer-reviewed literature, significance of findings, limitations of the research study, recommendations, and conclusions.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

CVD is an umbrella term that includes various conditions affecting the heart, such as atherosclerosis, blood vessel disease, arrhythmia, heart rhythm disease, and heart valve disease (Mayo Clinic, 2022). According to the AHA, 70% of major CVD events in 2021 resulting in death or hospitalization could have been prevented by a mild to moderate increase in cardiovascular health (Tsao, 2022). Often, younger African Americans live with or die of many conditions typically not found in Caucasians until later in life due to demographics and socioeconomic status health differences (CDC, 2017). Faster than previous generations, African American millennials show alarming generational health decline (Tricas-Vidal et al., 2022). In addition, millennials' ethnic predisposition and modern lifestyle significantly increase their vulnerability to CVD risk compared to their older counterparts, partly due to a lack of monitoring (Das et al., 2020). Due to African American millennials' ethnic predisposition and modern lifestyle, early intervention is necessary to prevent the threat of increased prevalence of CVD.

The purpose of this cross-sectional, quantitative study was to test if there was a significant difference in African American millennials' knowledge of risk factors for CVD and the relationship of this knowledge to income, education, family history of CVD, geographic residence, and whether or not a doctor or healthcare provider had talked with them about risk factors for CVD. This chapter presents the interpretation of multiple regression analyses guided by six research questions. The constructs of the SEM were utilized to assess associations between the many factors contributing to

cardiovascular knowledge determinants in African American millennials. This chapter also presents the study findings, limitations, recommendations, implications for social change, and the conclusion.

<div align="center">**Interpretation of the Findings**</div>

Research Question 1

RQ1 was the following: Is there a significant relationship between education and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

A multiple regression analysis for RQ1 was utilized to determine if there was a significant relationship between education and knowledge of CVD risk factors in African American millennials. The study revealed no statistically significant relationship between HDKQ scores for participants with less than a high school degree or GED ($p = .220$) and a bachelor's degree ($p = .992$). However, there was a significant relationship between education and knowledge of CVD risk factors in participants with graduate-level degrees ($p = <.001$). Therefore, I reject the null hypothesis that there is not a significant relationship between education and knowledge of CVD risk factors in African American millennials.

When utilizing SEM to assess the associations between education and knowledge of CVD in African American millennials, education falls at the individual level of the model. Assari et al. (2020) suggested that though education reduces the risk of CVD among Caucasians, CVD risk is disproportionately higher in African Americans with high educational attainment. In addition, Khan et al.'s (2023) findings indicated that

Caucasians with less than a college degree had a lower burden of CVD risk factors than other races. Furthermore, Khan et al.'s findings suggested that educational attainment, social determinants, and social adversity contribute to adverse CVD outcomes experienced by the African American population. The current study's findings that education at a graduate level was associated with higher knowledge of CVD support prior research on knowledge of CVD risk factors related to the level of educational attainment.

Bashatah et al. (2023) found that the association between sociodemographic factors and overall participants' knowledge of CVD risk factors and preventative measures was significantly associated with CVD knowledge levels. In addition, Krupp et al. (2020) found that low CVD risk factor knowledge was significantly associated with low educational attainment. Low CVD risk factor knowledge associated with adverse lifestyles could be due to resources needed to lead fulfilling lives, thrive personally, and contribute to communities, often affiliated with relationships, skills, and education. Furthermore, access to quality education from early childhood into high school, college, and even graduate school can provide opportunities for individuals to shift their socioeconomic status, reducing the likelihood of adverse health outcomes. Kelli et al.'s (2019) Mendelian randomization study established that higher educational attainment is associated with a decreased CVD risk. Because knowledge is a prerequisite to the lifestyle changes required for reducing CVD, prevention efforts have focused on improving CVD risk factor knowledge (Krupp et al., 2020).

Research Question 2

RQ2 was as follows: Is there a significant relationship between income and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

Results of the multiple regression analysis for RQ2 revealed that there was no statistical significance in individuals with annual incomes of less than \$24,999 ($p = .476$), annual incomes of \$25,000–\$49,999 ($p = .135$), and annual incomes of more than \$200,000 ($p= .578$) HDKQ scores. However, there was statistical significance ($p = .056$) in participants with an income of \$100,000–\$199,999 HDKQ score. As such, I reject the null hypothesis that there is not a significant relationship between income and knowledge of CVD risk factors in African American millennials.

Income falls in the individual level of the SEM. Income is a driving force behind the striking health disparities among African Americans. African Americans with lower income experience lower knowledge of CVD risk. This is so because people are more likely to embrace health education and healthier lifestyles when they have a higher socioeconomic status with more access to health care and medical knowledge (Liu et al., 2020). This statement can be supported by research done by He et al. (2023). In this study, He et al. analyzed the association between clinical risk factors and social risk factors affiliated with the African American community with cardiovascular mortality. The results from this study indicated that 54% of African American adults had a higher cardiovascular disease mortality rate compared to Caucasian adults (He et al., 2023). However, when the study adjusted for age and sex for clinical and lifestyle risk factors,

the CVD mortality rate dropped to 34% and 31%. Furthermore, the racial difference in cardiovascular mortality completely dissipated after adjusting for social risk factors (He et al., 2023). The dissipation of racial difference in cardiovascular mortality after adjusting for social risk factor indicates that persistent social adversity faced by African Americans contributes to increased CVD risk. These findings strengthen the argument that cardiovascular knowledge is a critical factor because current prevention approaches for CVD are primarily based on the overall cardiovascular risk of individuals rather than the extent to which a single risk change (Lui et al., 2020).

Research Question 3

RQ3 was as follows: Is there a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

The multiple regression analysis results for RQ3 revealed no statistical significance ($p = .812$) in participants with a history of CVD in their family and their HDKQ knowledge score. Therefore, I fail to reject the null hypothesis that there is not a significant relationship between family history of CVD and knowledge of CVD risk factors in African American millennials.

The CDC (2023) has stated that genetic factors may lead to CVD. However, families that share everyday environments, eating habits, socioeconomic indicators, and other factors are also likely to have an increased risk of CVD (CDC, 2023). When heredity is combined with unhealthy lifestyle choices and a lack of health education, the risk for CVD is enhanced. The construct of reducing the total CVD risk among

individuals with a nonmodifiable risk factor or a family history of CVD is health

education and exposure to other known modifiable risk factors that should be included in

their lifestyles (Chacko et al.,2020). The metamorphosis of knowledge into healthy

behavior is a continual process (Lui et al., 2020). Putting more emphasis on enhancing

knowledge of modifiable risk factors can be vital in reducing the overall risk of CVD for

current families and generations to come.

Research Question 4

RQ4 was as follows: Is there a significant relationship between geographic

residence and knowledge of CVD risk factors in African American millennials

(individuals born between 1981 and 1996)?

Results of the multiple regression analysis for RQ4 revealed no statistical

significance in participants residing in urban communities ($p = .402$) and for participants

residing in suburban communities ($p = .705$) HDKQ in reference to participants residing

in rural areas. There was also no statistical significance in participants residing in urban

communities ($p = .471$) and rural communities ($p = .705$) HDKQ scores in reference to

participants residing in a suburban area. Therefore, I fail to reject the null hypothesis that

there is not a significant relationship between geographic residence and knowledge of

CVD risk factors in African American millennials.

From the SEM perspective, the participant's geographical residence falls in the

community level of the model. Though geographical residence was placed at the

community level, it is affected by the interaction between governmental policies,

stakeholders, organizations, and individuals that influence the safety, availability, and

accessibility of affordable residence. Using SEM will help explore variables that impact CVD in African American millennials at one level and how that problem may transfer to other levels.

For instance, Negesa et al. (2020) found that residence is associated with knowledge of CVD risk factors, which supports the stance that social, cultural, and economic factors are fundamental principles of knowledge and health behavior change. Despite reports of narrowing the neighborhood poverty gap, historical redlining laws are continuing to thrust African Americans into underserved and unsafe neighborhoods, increasing the probability of not obtaining adequate knowledge of CVD risk. Javed et al. (2022) exclaimed that the effects of historical discriminatory residential segregation policies, such as the National Housing Act of 1934, have continued to haunt African American society, discouraging ownership. Instead, African American millennials have been condemned to socioeconomically disadvantaged neighborhoods where knowledge of CVD risks and prevention is low. Living in socioeconomically disadvantaged neighborhoods leads to determinants that are likely to contribute to a lack of access to knowledge of CVD risk and other socioeconomic factors that decrease the risk for CVD (Javed et al., 2022). CVD health is relatively strong, with vulnerable and underserved populations at an increased risk for living in areas with substandard built environment features linked to a lack of knowledge of CVD risk.

Research Question 5

RQ5 was as follows: Is there a significant relationship between whether or not a doctor or health provider has talked to African American millennials about risk factors for

CVD and knowledge of CVD risk factors in African American millennials (individuals

born between 1981 and 1996)?

The multiple regression analysis results for RQ5 revealed no statistical

significance in participants who had not discussed risk factors for CVD with a doctor or

other health care provider ($p = .587$) and their HDKQ score in reference to participants

having discussed risk factors. There was also no statistical significance in participants

who had discussed risk factors for CVD with a doctor or other health care provider ($p =$

.659) and their HDKQ score in reference to participants having not discussed risk factors.

As such, I fail to reject the null hypothesis that there is not a significant relationship

between having a doctor or other health care provider talk to a patient about risk factors

for CVD and knowledge of CVD risk factors in African American millennials.

Middle-aged or older adults are more likely to be assessed for CVD or stroke to

track risk factors related to CVD (Brunner et al., 2019). Tricas-Vidal et al. (2022) claimed

that African American millennials show alarming generational health decline, faster than

previous generations, partly due to a lack of monitoring and health education. Therefore,

millennials are prime targets for intervention strategies to prevent and reduce CVD

disease risk by increasing knowledge about CVD. However, statistics regarding CVD and

current studies dedicated to African American millennials highlight persistent difficulties

regarding gaps in healthcare coverage and racial discrimination (Brunner et al., 2019; Das

et al., 2020; Nayak et al., 2020). Also, clarification of whether the participants have

sought healthcare is vital due to the mistrust of the African American community rooted

in past experiences of discrimination, mistreatment, and lack of access, causing African

Americans not to seek medical advice. With a discriminative healthcare system, lack of access to healthcare coverage, and a lack health education and promotion, such as knowledge of CVD risk, African American millennials health will continue to be compromised.

Research Question 6

RQ6 was as follows: Is there a significant relationship between education, income, family history, geographic residence, and whether or not a doctor or health provider talked to African American millennials about risk factors for CVD and knowledge of CVD risk factors in African American millennials (individuals born between 1981 and 1996)?

Results of the multiple regression analysis for RQ6 revealed that there is no statistical significance in participants with less than a high school diploma or GED ($p = .635$), participants with bachelor's degrees ($p = .243$), participants with annual incomes of less than \$24,999 ($p = .770$), participants with annual incomes of more than \$200,000 ($p = .935$), participants who reside in urban communities ($p = .691$), participants who reside in suburban communities ($p = .653$), participants with a history of CVD in their family ($p = .688$), and participants who have not discussed risk factors for CVD with a doctor or other health care provider ($p = .659$). However, there was a statistical significance ($p = .021$) in participants with an income of \$25,000–\$49,999, participants with an annual income of \$100,000–\$199,999 ($p = .023$), and participants with a graduate-level degree ($p = .001$). Therefore, I reject the null hypothesis that there is no relationship between income level (\$25,000–\$49,999 and \$100,000–\$199,999) and knowledge of CVD risk

factors. Furthermore, I reject the null hypothesis that there is no relationship between having a graduate degree and knowledge of CVD risk factors among African American millennials.

SEM could be helpful with potential prevention strategies due to its ability to identify solutions that are acted on at each level simultaneously to solve issues (Kilanowski, 2017). It may be used to analyze the complex interplay of education, income, family history, geographic residence, and whether a doctor or health provider talking to a patient about risk factors for CVD and knowledge of CVD risk factors in African American millennials facilitates understanding the various determinants that put individuals at risk for CVD.

Limitations of the Study

There were several limitations of the study. These limitations include the research design, the exclusion of individuals of other races or age groups, reliance on self-reporting, the delimitation of the study to Louisiana, the integrity and honesty of participants, and the accessibility of the questionnaire. The study's cross-sectional research design carries limitations because it was only possible to establish a causal relationship between variables with longitudinal data. A study using an experimental design would have helped determine the causal relations among the variables. Second, relying on the integrity and honesty of participants' responses impacts the validity and reliability of research. However, because the participants were informed that their answers would be kept confidential, they were more likely to answer truthfully instead of with what they might have thought was socially desirable. Third, replicating this study

with other more prominent and representative community samples would increase the

validity and generalizability of the findings. This study does not represent all African

American millennials or those outside Louisiana. African American millennials in

different states may have other socioeconomic indicators contributing to the knowledge

of CVD. Fourth, the questionnaire was only available online. The participants were

recruited through flyers and social media. However, the only place to take the

questionnaire was online. Participants without access to the internet may have different

CVD knowledge than those who participated in the study.

Recommendations

There are two recommendations for this study. First, further studies should be

completed to explore the association between sociodemographic factors and CVD in

African American millennials. This study can guide context-specific interventions aimed

at mitigating CVDs by improving levels of knowledge and awareness of the conditions

and risk factors among African American millennials. Understanding the knowledge of

CVD and sociodemographic factors that increase one's risk entails determining how

millennials acquire accurate health knowledge and if this knowledge becomes stagnant or

influential. Furthermore, understanding the risk factors that might be driving the adverse

levels of knowledge and awareness of the conditions and risk factors among African

American millennials would provide the opportunity to reduce inequalities with

interventions.

Second, more studies need to be done to explore the association between

socioecological risk factors and knowledge of CVD amongst African Americans of all

ages. Socioecological risk factors are risk factors that can be defined as risk factors found in multiple levels of influence on risk associated with health in various contexts (Scarneo et al., 2019). Increased CVD knowledge among African American millennials may be facilitated by actions at different levels across multiple domains. Doing so could assist in developing culturally appropriate programs that reduce the risk of CVD in that African American community. Culturally appropriate and salient programs for the target audience must be developed due to regional differences in beliefs and knowledge that may exist (Das et al., 2020). Furthermore, the successful development and implementation of a health promotion program depends upon identifying the scope and breadth of baseline knowledge among the targeted group members (Negesa et al., 2020). However, when considering that CVD risk prevention is multifaceted, a successful implementation can only happen by confronting structural barriers and a lack of policies that contribute to access will continue to contribute to cardiovascular confronting structural risk.

Implications

The findings of this study have vital health education and promotion implications for positive social change at the individual, relationship, community, and societal/policy levels. Analyzing the complex interplay of how the dependent variables impact CVD knowledge assists in comprehending how the range of factors at one level influences factors at another level. Furthermore, the clarification and comprehension of these factors suggest that to prevent CVD, it is critical to simultaneously implement prevention strategies across multiple levels due to the likelihood of sustaining prevention efforts over time. Prevention strategies at the individual level include promoting altering attitudes,

beliefs, and lifestyle behaviors that prevent CVD. Such strategies could include

interventions centered around nutritional education, CVD health education, and healthy

behavior programs. Prevention strategies at the relationship level would focus on

addressing determinants that increase the risk of CVD risk in communities. Prevention

strategies at the community level should be culturally relevant prevention programs that

promote healthy societal norms and healthy relationships with the healthcare systems.

Prevention strategies at the societal and policy levels include efforts to strengthen

financial security, promotion of societal norms that prevent CVD, the enhancement of

education, the availability of career advancement, and the implementation of policies that

affect the structural determinants of health. There are national initiatives to collect data

and support partnerships with the federal government to address the disproportionate rate

of CVD in African Americans (CDC, 2017). However, it is vital to understand and

implement strategic plans centered on variables such as age, environmental factors, and

socioeconomic status and their possible relationships to CVD in African American

millennials. In addition, it is essential to understand the factors contributing to CVD

disease progression in African Africans so that clinicians, social workers, and

governmental agencies can create new and appropriate treatments and disease prevention

programs.

The implication for social change is the awareness of the extent to which

sociodemographics affect knowledge of CVD at all levels of SEM. The knowledge

gained from my study could assist in enhancing compliance with health behavior and

assist policymakers, public health providers, and other governmental agencies in

promoting data-driven recommendations. This study's contribution to social change is data-driven proposals for suitable health education and promotion plans of action to combat CVD in African American millennials. These implications suggest that future studies and impending practice strategies must strive to identify the complex levels of SEM and how they impact public health. Structured intervention at all levels contributes to reducing CVD amongst African Americans. Therefore, it is imperative to combine any legislation attempt with a comprehensive behavioral approach to diminish inequalities, which appear to be the most significant factors in CVD risk in African Americans. Further research identifying the other related factors and the interplay between them will be vital to reducing CVD diagnosis and mortality associated with CVD. Moreover, research dedicated to a differing population will be critical to solidify the prognostication of these results outside of the investigated frame of reference.

Conclusion

CVD is the leading cause of death in the United States, with an interesting trend indicating that the frequency and severity of CVD in the United States appear to cycle throughout the years. Compared to their Caucasian counterparts, African Americans have a three times higher risk of developing CVD and twice the risk of CVD-related mortality (Das et al., 2020). Early intervention is necessary to prevent the threat of increased prevalence of CVD in African American millennials due to their ethnic predisposition and modern lifestyle, significantly increasing their vulnerabilities to CVD risk. However, the lack of monitoring of African American millennials compared to people of older ages puts African American millennials at a higher risk and lack of knowledge of CVD.

Adverse health behaviors have contributed to a more significant disease burden in African American millennials, with CVD as a primary driver. Even an increase in education and income for African Americans has not helped with the downward health trend amongst millennials, threatening future prosperity. The strategies needed to promote knowledge of the CVD risk of African American millennials require input from a broad set of stakeholders. It is essential to integrate any lawmaking pursuit with a comprehensive approach encompassing the complex interactions between individuals, relationships, community, policy, and societal factors to diminish inequalities, which appear to be the most significant factors in the lack of knowledge of CVD risk in African American millennials. Analyzing the complex interplay of variables that impact CVD knowledge assists in comprehending how factors at one level influence factors at another level. The likelihood of sustaining knowledge of CVD risk over time is predicated on implementing health education and promotion strategies across multiple levels.

References

Ardoin, T. W., Perry, E., Morgan, C., Hymowitz, J., & Mercante, D. (2023). The Design

   and Impact of a Clinic-Based Community Program on Food Insecurity, Healthy

    Eating Behaviors, and

   Mood. *Nutrients*, *15*(20). https://doi.org/10.3390/nu15204316

American Heart Association. (2021). *Heart disease & stroke statistical update fact*

   sheet: Black race & cardiovascular diseases. https://professional.heart.org/-

   /media/PHD-Files-/Science-News/2/2021-Heart-and-Stroke-

   StatUpdate/2021_Stat_Update_factsheet_Black_Race_and_CVD.pdf

Aminde, L. N., Takah, N., Ngwasiri, C., Noubiap, J. J., Tindong, M., Dzudie, A., &

   Veerman, J. L. (2017). Population awareness of cardiovascular disease and its risk

   factors in Buea, Cameroon. *BMC Public Health*, *17*(1), 1–10.

   https://doi.org/10.1186/s12889-017-4477-3

Assari, S., Cobb, S., Saqib, M., & Bazargan, M. (2020). Diminished returns of

   educational attainment on heart disease among Black Americans. *The Open*

   Cardiovascular Medicine Journal, *14*, 5–12.

   https://doi.org/10.2174/1874192402014010005

Avanceña, A. L. V., DeLuca, E. K., Iott, B., Mauri, A., Miller, N., Eisenberg, D., &

   Hutton, D. W. (2021). Income and income inequality are a matter of life and

   death. What can policymakers do about it? *American Journal of Public Health*,

   111(8), 1404–1408. https://doi.org/10.2105/AJPH.2021.306301

Bashatah, A., Syed, W., & Al-Rawi, M. B. A. (2023). Knowledge of cardiovascular disease risk factors and its primary prevention practices among the Saudi public— A questionnaire-based cross-sectional study. *International Journal of General Medicine*, *16*, 4745–4756. https://doi.org/10.2147/ijgm.s433472

Bolin, L. P., Horne, C. E., & Wei, H. (2021). A qualitative descriptive study: Young adults' experiences with biofeedback. *Journal of Holistic Nursing*, *39*(2), 144–153. https://doi.org/10.1177/0898010120950892

Brunner, F. J., Waldeyer, C., Ojeda, F., Salomaa, V., Kee, F., Sans, S., Thorand, B., Giampaoli, S., Brambilla, P., Tunstall-Pedoe, H., Moitry, M., Iacoviello, L., Veronesi, G., Grassi, G., Mathiesen, E. B., Söderberg, S., Linnenberg, A., Brenner, H., Amouyel, P., … Koenig, W. (2019). Application of non-HDL cholesterol for population-based cardiovascular risk stratification: Results from the Multinational Cardiovascular Risk Consortium. *The Lancet*, *394*(10215), 2173–2183. https://doi.org/10.1016/S0140-6736(19)32519-X

Carter, A. R., Gill, D., Davies, N. M., Taylor, A. E., Tillmann, T., Vaucher, J., Wootton, R. E., Munafò, M. R., Hemani, G., Malik, R., Seshadri, S., Woo, D., Burgess, S., Smith, G. D., Holmes, M. V., Tzoulaki, I., Howe, L. D., & Dehghan, A. (2019). Understanding the consequences of education inequality on cardiovascular disease: Mendelian randomization study. *British Medical Journal*, *2019*, Article 365. https://doi.org/10.1136/bmj.l1855

Centers for Disease Control and Prevention. (2017). *African American health: Creating equal opportunities for health.* https://www.cdc.gov/vitalsigns/aahealth/index.html

Centers for Disease Control and Prevention. (2023). *Heart disease: Know your risk for heart disease.* https://www.cdc.gov/heartdisease/risk_factors.htm

Chacko, M., Sarma, P. S., Harikrishnan, S., Zachariah, G., & Jeemon, P. (2020). Family history of cardiovascular disease and risk of premature coronary heart disease: A matched case-control. *Wellcome Open Research*, *5*, Article 70. https://doi.org/10.12688/wellcomeopenres.15829.2

Das, S., Pati, M., Saren, R., & Das, M. (2020). Millennial are more vulnerable to cardiovascular disease and diabetes than their parents: A population based longitudinal study from India. *American Heart Journal*, *229*, Article 173. https://doi.org/10.1016/j.ahj.2020.10.039

Der Ananian, C., Winham, D. M., Thompson, S. V., & Tisue, M. E. (2018). Perceptions of heart-healthy behaviors among African American adults: A mixed methods study. *International Journal of Environmental Research and Public Health*, *15*(11), Article 2433. https://doi.org/10.3390/ijerph15112433

Dumitrescu, C., & Iacob, C. I. (2021). Predicting healthy eating: Conscientiousness versus the Health Belief Model. *Romanian Journal of Applied Psychology*, *23*(1), 18–24. https://doi.org/10.24913/rjap.23.1.03

Ford, E. S., Ajani, U. A., Croft, J. B., Critchley, J. A., Labarthe, D. R., Kottke, T. E., Giles, W. H., & Capewell, S. (2007). Explaining the decrease in U.S. deaths from

coronary disease, 1980–2000. *New England Journal of Medicine*, *356*(23), 2388–2398. https://doi.org/10.1056/NEJMsa053935

Gabb, G., & Arnolda, L. (2017). Geographic location as a modifiable cardiac risk factor. *Canadian Medical Association Journal*, *189*(13), E482–E483. https://doi.org/10.1503/cmaj.170116

Galeshi, R., Sharman, J., & Cai, J. (2018). Influence of ethnicity, gender, and immigration status on millennials' behavior related to seeking health information: Results from a national survey. *Equality, Diversity and Inclusion: An International Journal*, *37*(6), 621–631. https://doi.org/10.1108/EDI-05-2017-0102

Gobel, M. S., & Carvacho, H. (2023). The dynamic socio-ecological model of economic Inequality and psychological tendencies: A cycle of mutual constitution. *Social and Personality Psychology Compass, e12875.* https://doi.org/10.1111/spc3.12875

Grauman, A., Veldwijk, J., James, S., Hansson, M., Byberg, L. (2021). Good general health and lack of family history influence the underestimation of cardiovascular risk: a cross-sectional study, European Journal of Cardiovascular Nursing, 20 (7), 676–683. https://doi.org/10.1093/eurjcn/zvab019

Gunderson, J., Kim-Mozeleski, J. E., Pike Moore, S. N., Trapl, E. S., Perzynski, A. T., Tsoh, J. Y., & Gunzler, D. D. (2021). *Food Insecurity Trajectories in the US During the First Year of the COVID-19 Pandemic*. *Preventing Chronic Disease*, 20, 220212. DOI: 10.5888/pcd20.220212

He, J., Bundy, J. D., Geng, S., Tian, L., He, H., Li, X., Ferdinand, K. C., Anderson, A.

H., Dorans, K. S., Vasan, R. S., Mills, K. T., & Chen, J. (2023). Social,

Behavioral, and Metabolic Risk Factors and Racial Disparities in Cardiovascular

Disease Mortality in U.S. Adults : An Observational Study. *Annals of Internal*

Medicine, *176*(9), 1200–1208. https://doi.org/10.7326/M23-0507

Javed, Z., Haisum Maqsood, M., Yahya, T., Amin, Z., Acquah, I., Valero-Elizondo, J., ...

& Nasir, K. (2022). Race, racism, and cardiovascular health: Applying a social

determinant of health framework to racial/ethnic disparities in cardiovascular

disease. *Circulation: Cardiovascular Quality and Outcomes, 15*(1), e007917.

Kelli, H. M., Mehta, A., Tahhan, A. S., Liu, C., Kim, J. H., Dong, T. A, Dhindsa, D. S.,

Ghazzal, B., Choudhary, M. K., Sandesara, P. B., Hayek, S. S., Topel, M. L,

Alkhoder, Martini, M.A., Sidoti, A., Ko, Y., Lewis, T.T.,Vaccarino, V., Sperling,

L. S & Quyyumi, A.A. (2019). Low Educational Attainment is a Predictor of

Adverse Outcomes in Patients with Coronary Artery Disease. Journal of the

American Heart Association: Cardiovascular and Cerebrovascular Disease, 8(17).

https://doi.org/10.1161/JAHA.119.013165

Khan, N., Javed, Z., Acquah, I., Hagan, K., Khan, M., Valero-Elizondo, J., Chang, R.,

Javed, U., Taha, M.B, Blaha, M.J., Virani, S.S., Sharma, G., Blankstein, R., Gulati,

M., Mossialos, E., Hyder, A.A., Achirica, M.C., & Nasir K. (2023). Low

educational attainment is associated with higher all-cause and cardiovascular

mortality in the United States adult population. *BMC Public Health*, *23*(1), 1–12.

https://doi.org/10.1186/s12889-023-15621-y

Krupp, K., Wilcox, M. L., Srinivas, A., Srinivas, V., Madhivanan, P., & Bastida,

E. (2020). Cardiovascular Risk Factor Knowledge and Behaviors Among Low-Income Urban Women in Mysore, India. *The Journal of Cardiovascular Nursing*, *35*(6), 588. https://doi.org/10.1097/JCN.0000000000000657

Kilanowski, J. (2017). Breadth of the Socio-Ecological Model. *Journal of Agromedicine*, https://doi.org/10.1080/1059924X.2017.1358971

Liu, L. (2011). Changes in Cardiovascular Hospitalization and Comorbidity of Heart Failure in the United States: Findings from the National Hospital Discharge Surveys 1980–2006. *International Journal of Cardiology*, *149,* (1), 39-45. https://doi.org/10.1016/j.ijcard.2009.11.037

Melchior, C., & Oliveira, M. (2022). Health-related fake news on social media platforms: A systematic literature review. *new media & society*, *24*(6), 1500-1522. https://doi.org/10.1177/14614448211038762

Millstein, S. G., & Halpern–Felsher, B. L. (2002). Judgments about risk and perceived invulnerability in adolescents and young adults. *Journal of research on adolescence*, 12(4), 399-422.

Moonesinghe, R., Yang, Q., Zhang, Z. & Khoury, M. (2019). Prevalence and Cardiovascular Health Impact of Family History of Premature Heart Disease in the United States: Analysis of the National Health and Nutrition Examination Survey, 2007–2014. *Journal of the American Heart Association: Cardiovascular and Cerebrovascular Disease*, *8*(14). https://doi.org/10.1161/JAHA.119.012364

Moslimani, M., Tamir, C., Budiman, A., Noe-Bustamante, L., & Mora, L. (2024, January 18). Facts About the U.S. Black Population. *Pew Research Center.*

https://www.pewresearch.org/social-trends/fact-sheet/facts-about-the-us-black-population/

Nagata, J. M. (2020). Supporting young adults to rise to the challenge of COVID-19. *Journal of Adolescent Health*, *67*(2), 297-298. https://doi.org/10.1016/j.jadohealth.2020.04.020

Nayak, A., Hicks, A. J., & Morris, A. A. (2020). Understanding the Complexity of Heart Failure Risk and Treatment in Black Patients. *Circulation: Heart Failure*, *13*(8), e007264. https://doi.org/10.1161/CIRCHEARTFAILURE.120.007264

Negesa, L.B., Magarey, J., Rasmussen, P., and Hendriks, J.M.L. Patients' knowledge on cardiovascular risk factors and associated lifestyle behavior in Ethiopia in 2018: A cross-sectional study (2020). *PLOS One, 15(*6), e0234198. https://doi.org/10.1371/journal.pone.0234198

Pahn, J., & Yang, Y. (2021). Factors Associated with Cardiovascular Disease Prevention Behavior Among Office Workers Based on an Ecological Model. *SAGE Open*. https://doi.org/10.1177/21582440211004163

Patton-López, M. (2022). Communities in action: Pathways to health equity. *Journal of Nutrition Education & Behavior*, *54*(1), 94–95. https://doi.org/10.1016/j.jneb.2021.09.012

Price-Haywood, E. G. (2023). Call to Action for Improving Community Health While Reducing Health Disparities. *The Ochsner Journal*, *23*(2), 104-105. https://doi.org/10.31486/toj.23.0040

Roger, V. L., Go, A. S., Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D., ... & Turner,

M. B. (2012). Executive summary: heart disease and stroke statistics—2012 update: a report from the American Heart Association. Circulation, 125(1), 188-197.

Rosengren, A., Smyth, A., Rangarajan, S., Ramasundarahettige, C., Bangdiwala, S. I., AlHabib, K. F., Avezum, A., Bengtsson Boström, K., Chifamba, J., Gulec, S., Gupta, R., Igumbor, E. U., Iqbal, R., Ismail, N., Joseph, P., Kaur, M., Khatib, R., Kruger, I. M., Lamelas, P., … Yusuf, S. (2019). Socio-economic status and risk of cardiovascular disease in 20 low-income, middle-income, and high-income countries: the Prospective Urban Rural Epidemiologic (PURE) study. *The Lancet Global Health*, *7*(6), e748–e760. https://doi.org/10.1016/S2214-109X(19)30045-2

Rutter, H., Cavill, N., Bauman, A., and Bull. F. (2019). Systems approach to global and national physical health plans. Bull World Health Organ., 97(2), 162-165.

Scarneo, S. E., Kerr, Z. Y., Kroshus, E., Register-Mihalik, J. K., Hosokawa, Y., Stearns, R. L., DiStefano, L. J., & Casa, D. J. (2019). The Socio-ecological Framework: A Multifaceted Approach to Preventing Sport-Related Deaths in High School Sports. *Journal of Athletic Training, 54(4), 356-360.* https://doi.org/10.4085/1062-6050-173-18

Scheier, M. F., & Carver, C. S. (2018). Dispositional optimism and physical health: A long look back, a quick look forward. *American Psychologist, 73(*9), 1082–1094. https://doi.org/10.1037/amp0000384

Schultz, W. M., Kelli, H. M., Lisko, J. C., Varghese, T., Shen, J., Sandesara, P.,

Quyyumi, A. A., Taylor, H. A., Gulati, M., Harold, J. G., Mieres, J. H.,

Ferdinand, K. C., Mensah, G. A., & Sperling, L. S. (2018). Socio-economic Status

and Cardiovascular Outcomes: Challenges and Interventions. *Circulation*,

137(20), 2166–2178. https://doi.org/10.1161/CIRCULATIONAHA.117.029652

Sims, M., Kershaw, K. N., Breathett, K., Jackson, E. A., Lewis, L. M., Mujahid, M. S., &

Suglia, S. F. (2020). Importance of Housing and Cardiovascular Health and Well-

Being: A Scientific Statement from the American Heart Association. *Circulation:

Cardiovascular Quality and Outcomes*, *13*(8), e000089.

https://doi.org/10.1161/HCQ.0000000000000089

Stevenson, B. (2024). *The Transatlantic Slave Trade*. Retrieved from

https://eji.org/report/transatlantic-slave-trade/

Tricas-Vidal, H., Lucha-Lopez, M.O., Hidalgo-Garcia, C., Vidal-Peracho, M.C., Monti-

Ballano, S., and Tricas-Moreno, J.M. (2022). Health habits and wearable activity

tracker devices: Analytical cross-sectional study. *Sensors, 22*(8), 2960.

https://doi.org/10.3390/s22082960

Tsao, C. W., Aday, A. W., Almarzooq, Z. I., Alonso, A., Beaton, A. Z., Bittencourt,M.

S., ... & American Heart Association Council on Epidemiology and Prevention

Statistics Committee and Stroke Statistics Subcommittee. (2022). Heart disease

and stroke statistics—2022 update: a report from the American Heart Association.

Circulation, 145(8), e153-e639.

Theofanidis, D., & Fountouki, A. (2018). Limitations and Delimitations in the Research

Process. *Perioperative Nursing*, 7(3), 155–162.

http://doi.org/10.5281/zenodo.2552022

The United Health Foundation (2022, December). *"America's Health Rankings": 2022 annual report.* https://www.americashealthrankings.org/learn/reports/2022-annual-reportrvices/

Uchino, B. N., Cronan, S., Scott, E., Landvatter, J., & Papadakis, M. (2020). Social support and stress, depression, and cardiovascular disease. In P. D. Chantler & K. T. Larkin (Eds.), *Cardiovascular implications of stress and depression* (pp. 211–223). Academic Press. https://doi.org/10.1016/B978-0-12-815015-3.09995-5

U.S. Department of Health and Human Services. (2021). *U.S. Department of Health and Human Services Office of Minority Health: Heart Disease and African Americans*. https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=19

Wang, Y., McKee, M., Torbica, A., & Stuckler, D. (2019). Systematic literature review on the spread of health-related misinformation on social media. *Social Science & Medicine*, *240*, 112552. https://doi.org/10.1016/j.socscimed.2019.112552

World Health Organization. (n.d.). Cardiovascular diseases (CVDs)[1]. Retrieved February 28, 2024, from

https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

Appendix A: Instrument Email Consent

Thanks for your interest in our scale. Sounds like you are doing a very important study.

The scale is considered part of the public domain so you are welcome to use it without our permission. The scoring is pretty straightforward – you can compute a total of accurate responses or break down by category. All the relevant info should be in the paper. There are no particular instructions for administration.

Hello, Ta Leithela,

It is wonderful to hear from you. Thank you for sharing your very important research area. The HDKQ is available in the public domain and no permissions are needed. We only ask (as you also note) that you cite the publication where you got the measure. I don't have any other supplemental material than what is in the article.

Bergman HE, Reeve BB, Moser RP, Scholl S, Klein WM. Development of a comprehensive heart disease knowledge questionnaire. American journal of health education. 2011 Mar 1;42(2):74-87.

I wish you all the best.

Appendix B: Recruitment Flyer

Appendix C: Initial Demographic Screening Questionnaire

Initial Demographic Screening Questionnaire:

What gender were you identified as at birth? Male/ Female

Were you born between 1996 and 1981? Yes or No

Are you African American? Yes or No

What is your highest level of education? Less than High School/ High School Diploma or

GED/ Bachelor's degree/Graduate Level

What is your employment status? Full-time/Part-time/Contact-Temporary/Unable to

Work/Unemployed

What is the level of your annual household income? Less than 24,999/25,000-

49,999/50,000-99,999/100,000-199,999/ More than 200,000

Do you rent, own or lease your place of residence? Rent/Own/Lease

Where is your residence located? Urban/ Rural/Suburban

What is your marital status? Single/Married/ Divorce/Widowed

 How likely is it that you would seek medical treatment? Not Likely/ Likely

Does Cardiovascular disease run in your family? Yes/No

Would you consider yourself disabled? Yes or No

Has a doctor or other health care provider ever talked to you about risk factors for

cardiovascular disease? Yes or No

Appendix D: Heart Disease Knowledge Questionnaire

Heart Disease Knowledge Questionnaire Instructions:

On the following page, you will be asked to respond to a number of True/False questions

addressing your beliefs and knowledge about various aspects of heart disease.

Please answer "T" for True and "F" for False.

HD1 Polyunsaturated fats are healthier for the heart than unsaturated fats. T or F

HD2 Women are less likely to get heart disease after menopause than before. T or F

HD3 Having had chicken pox increases the risk of getting heart disease. T or F

HD4 Eating a lot of red meat increases heart disease risk. T or F

HD5 Most people can tell whether or not they have high blood pressure. T or F

HD6 Trans-fats are healthier for the heart than most other kinds of fats. T or F

HD7 The most important cause of heart attacks is stress. T or F

HD8 Walking and gardening are considered types of exercise that can lower heart disease

risk. T or F

HD9 Most of the cholesterol in an egg is in the white part of the egg. T or F

HD10 Smokers are more likely to die of lung cancer than heart disease. T or F

HD11 Taking an aspirin each day decreases the risk of getting heart disease. T or F

HD12 Dietary fiber lowers blood cholesterol. T or F

HD13 Heart disease is the leading cause of death in the United States. T or F

HD14 The healthiest exercise for the heart involves rapid breathing for a sustained period

of time. T or F

HD15 Turning pale or gray is a symptom of having a heart attack. T or F

HD16 A healthy person's pulse should return to normal within 15 minutes after exercise. T or F

HD17 Sudden trouble seeing in one eye is a common symptom of having a heart attack. minutes after exercise. T or F

HD18 Cardiopulmonary resuscitation (CPR) helps to clear clogged blood vessels. T or F

HD19 HDL refers to "good" cholesterol, and LDL refers to "bad" cholesterol. T or F

HD20 Atrial defibrillation is a procedure where hardened arteries are opened to increase blood flow. T or F

HD21 Feeling weak, lightheaded, or faint is a common symptom of having a heart attack. T or F

HD22 Taller people are more at risk for getting heart disease. T or F

HD23 "High" blood pressure is defined as 110/80 (systolic/diastolic) or higher. T or F

HD24 Most women are more likely to die from breast cancer than heart disease. T or F

HD25 Margarine with liquid safflower oil is healthier than margarine with hydrogenated soy oil. T or F

HD26 People who have diabetes are at higher risk of getting heart disease. T or F

HD27 Men and women experience many of the same symptoms of a heart attack. T or F

HD28 Eating a high fiber diet increases the risk of getting heart disease. T or F

HD29 Heart disease is better defined as a short-term illness than a chronic, long-term illness. T or F

HD30 Many vegetables are high in cholesterol. T or F

Note: Items HD4 and HD28 overlap with both dietary and risk factor domains. However, we kept them in the risk factor domain because they refer to a particular dietary risk factor of heart disease, as opposed to general dietary aspects pertaining to overall heart health, which are in the dietary domain.

Appendix E: Combined Questionnaires

Combined Questionnaires

What gender were you identified as at birth? Male/ Female

Were you born between 1996 and 1981? Yes or No

Are you African American? Yes or No

What is your highest level of education? Less than High School/ High School Diploma/

Bachelor's degree/Graduate Level

What is your employment status? Full-time/Part-time/Contact-Temporary/Unable to

Work/Unemployed

What is the level of your annual household income? Less than 24,999/25,000-

49,999/50,000-99,999/100,000-199,999/ More than 200,000

Do you rent, own or lease your place of residence? Rent/Own/Lease

Where is your residence located? Urban/ Rural/Suburban

What is your marital status? Single/Married/ Divorce/Widowed

How likely is it that you would seek medical treatment? Not Likely/Likely

Does Cardiovascular disease run in your family? Yes/No

Would you consider yourself disabled? Yes or No

Has a doctor or other health care provider ever talked to you about risk factors for

cardiovascular disease? Yes or No

Please answer True or False.

HD1 Polyunsaturated fats are healthier for the heart than unsaturated fats. T or F

HD2 Women are less likely to get heart disease after menopause than before. T or F

HD3 Having had chicken pox increases the risk of getting heart disease. T or F

HD4 Eating a lot of red meat increases heart disease risk. T or F

HD5 Most people can tell whether or not they have high blood pressure. T or F

HD6 Trans-fats are healthier for the heart than most other kinds of fats. T or F

HD7 The most important cause of heart attacks is stress. T or F

HD8 Walking and gardening are considered types of exercise that can lower heart disease risk. T or F

HD9 Most of the cholesterol in an egg is in the white part of the egg. T or F

HD10 Smokers are more likely to die of lung cancer than heart disease. T or F

HD11 Taking an aspirin each day decreases the risk of getting heart disease. T or F

HD12 Dietary fiber lowers blood cholesterol. T or F

HD13 Heart disease is the leading cause of death in the United States. T or F

HD14 The healthiest exercise for the heart involves rapid breathing for a sustained period of time. T or F

HD15 Turning pale or gray is a symptom of having a heart attack. T or F

HD16 A healthy person's pulse should return to normal within 15 minutes after exercise. T or F

HD17 Sudden trouble seeing in one eye is a common symptom of having a heart attack. minutes after exercise. T or F

HD18 Cardiopulmonary resuscitation (CPR) helps to clear clogged blood vessels. T or F

HD19 HDL refers to "good" cholesterol, and LDL refers to "bad" cholesterol. T or F

HD20 Atrial defibrillation is a procedure where hardened arteries are opened to increase blood flow. T or F

HD21 Feeling weak, lightheaded, or faint is a common symptom of having a heart attack. T or F

HD22 Taller people are more at risk for getting heart disease. T or F

HD23 "High" blood pressure is defined as 110/80 (systolic/diastolic) or higher. T or F

HD24 Most women are more likely to die from breast cancer than heart disease. T or F

HD25 Margarine with liquid safflower oil is healthier than margarine with hydrogenated soy oil. T or F

HD26 People who have diabetes are at higher risk of getting heart disease. T or F

HD27 Men and women experience many of the same symptoms of a heart attack. T or F

HD28 Eating a high fiber diet increases the risk of getting heart disease. T or F

HD29 Heart disease is better defined as a short-term illness than a chronic, long-term illness. T or F

HD30 Many vegetables are high in cholesterol. T or F