Health Behavior Research

Volume 7 | Number 3 Article 2

June 2024

Examining the Influence of Heart Disease Risk Factor Knowledge and Social Support in African American Women

Brittny Bratcher-Rasmus
Texas Southern University, brbratcher@gmail.com

Marilyn Massey-Stokes
Texas Woman's University, mmasseystokes@twu.edu

Mandy Golman
Texas Woman's University, mgolman@twu.edu

See next page for additional authors

Recommended Citation

Bratcher-Rasmus, Brittny; Massey-Stokes, Marilyn; Golman, Mandy; Amuta, Ann O.; Fisher, Dwalah; and Johnson, Keisha (2024) "Examining the Influence of Heart Disease Risk Factor Knowledge and Social Support in African American Women," *Health Behavior Research*: Vol. 7: No. 3. https://doi.org/10.4148/2572-1836.1230

Examining the Influence of Heart Disease Risk Factor Knowledge and Social Support in African American Women

Abstract

Heart disease disproportionately impacts African American women and disparities can stem from risk factors related to limited risk factor knowledge and socioeconomic resources. Social support mitigates heart disease risk in this population. The study aimed to examine how perceived social support impacts heart disease risk factor knowledge among African American women and whether demographic characteristics moderate a relationship between perceived social support and heart disease knowledge. This was a quantitative study with purposeful, snowball sampling representative of African American women aged 30-55 in Texas (n = 121) who completed an online survey on heart disease knowledge and perceived social support. Approximately half the participants displayed heart disease knowledge deficiencies. Multiple regression analysis revealed that when demographic variables were controlled, age (standardized β= .28, p = .002) and income (standardized β= .19, p = .037) were the only predictor variables indicating that social support impacts heart disease knowledge, with nonsignificant differences in the regression model (standardized β = -.023, p = .80). Hierarchical multiple regression revealed that age (F change = 1.056, R square change = .008, and p = .306), education (F (3, 115) = .583, p = .627), family history (F (2, 116) = 1.51, p = .225), and income (F change = 1.006, R2 change = .008, and p = .318) as individual predictors yielded nonsignificant differences in the overall predictive model, indicating demographic variables did not moderate a relationship between social support and heart disease knowledge. Social support is critical to decision-making and lifestyle modifications, which can protect against chronic diseases such as heart disease in African American women. Further understanding of the connection between perceived social support and heart disease knowledge through public health education programs can be instrumental in reducing heart disease disparities among African American women.

Keywords

Heart Disease, Social Support, African American Women, Disparities

Acknowledgements/Disclaimers/Disclosures

The authors declare no potential conflicts of interest.

Authors

Brittny Bratcher-Rasmus, Marilyn Massey-Stokes, Mandy Golman, Ann O. Amuta, Dwalah Fisher, and Keisha Johnson

Examining the Influence of Heart Disease Risk Factor Knowledge and Social Support in African American Women

Brittny Bratcher-Rasmus, PhD, CHES
Marilyn Massey-Stokes, EdD, CHES, CHWC, FASHA
Mandy Golman, PhD, MCHES
Ann Amuta, PhD, MPH, CPH
Dwalah Fisher, EdD
Keisha Johnson, MPH

Abstract

Multiple factors contribute to heart disease and African Americans are more burdened with heart disease and heart disease-related deaths than any other ethnic group in the United States. African American women have more negative health outcomes related to heart disease, obesity, hypertension, and stress compared to any other race or ethnicity. The aim of this study was to investigate the influence of perceived social support on self-reported knowledge of heart disease risk factors among African American women aged 30-55, and to explore whether demographic variables moderate the association between social support and knowledge among African American women. We surveyed 121 African American women meeting inclusion criteria using a demographics questionnaire, the Heart Disease Knowledge Questionnaire, and the Multidimensional Scale of Perceived Social Support. Social support was not a statistically significant predictor of knowledge of heart disease risk factors. Age and income were the only predictors when considering all other study variables. Moreover, education, family history of heart disease, and income did not moderate the relationship between social support and knowledge. Our results may influence heart health campaigns and culturally relevant messaging that will enable knowledge increase and health information discussions through social networks.

Keywords: heart disease; risk factors; social support; African Americans; women's health

* Corresponding author may be reached at Brittny.Bratcher@TSU.edu

Introduction

Heart disease is the number one cause of death in the United States (U.S.) and globally (Centers for Disease Control and Prevention [CDC], 2020b; World Health Organization [WHO], 2021). Although the U.S. heart disease death rate has declined approximately 38% since 2013, the burden and risk factors are expected to grow continuously by 2030 (American Heart Association [AHA], 2016). In 2020, coronary heart disease contributed to nearly 383,000 deaths in the U.S. (Tsao et al., 2023). Multiple factors contribute to heart disease, including obesity, diabetes, genetics, smoking, high blood pressure, poor diet, and physical inactivity (CDC, 2020a). At least half of the U.S. population has at least one risk factor for heart disease (National Center for Health Statistics, 2018; Texas Department of State Health Services [TX DSHS], 2018).

African Americans are disproportionately burdened with heart disease and heart disease-related deaths at higher rates than any other ethnic group in the U.S. (CDC, 2020a). Disproportionate rates of heart disease are seen in African Americans in the U.S. due to

more frequent occurrence of lower socioeconomic status, obesity, high cholesterol, poor diet, hypertension (high blood pressure), stress, and diabetes (Graham, 2015). In 2017, 58% of the African American population resided in the southern U.S. with Texas having the largest population of African American residents (U.S. Department of Health and Human Services Office of Minority Health [OHM], 2019). In Texas, racial disparities in heart disease exist, with African Americans having the highest rates of (TX DSHS, 2018).

Heart Disease in African American Women

African American women account for approximately 52% of the African American population and have the highest health disparities among both minority and majority populations. Heart disease disparities between African American women and women representing other ethnicities are linked to limited resources, such as less education, lower socioeconomic status, and lack of access to healthy foods (Kris-Etherton et al., 2020), which can lead to premature development of heart disease risk factors (Graham, 2015). In addition, Belgrave and Abrams (2016) conclude that African American women have more negative health outcomes related to heart disease, obesity, hypertension, and stress compared to any other race or ethnicity. According to the American Heart Association (AHA) (2023), approximately 50% of African American women over 20 years old have hypertension, a precursor for heart disease-related complications. In addition, between 2017 and 2020 59% of African American women had some form of cardiovascular or heart disease (Tsao et al., 2023). Premature onset of risk factors such as obesity, hypertension, and type 2 diabetes directly contribute to heart disease development and heart disease-related deaths in African American women. Health-compromising behaviors, sedentary lifestyles, and chronic stress also contribute to the burden of heart disease risk factors in African American women (Carnethon et al., 2017). Despite numerous resources and programs available to increase general heart health knowledge and reduce heart disease, the prevalence of cardiovascular disease in African American women over age 20 years remains unprecedentedly high (AHA, 2021). This trend persists across various demographics, including age, socioeconomic status, and geographic locations in African American women (Belgrave & Abrams, 2016).

Importance of Social Support and Heart Disease Research in African American Women

Social support is an individual's perception and experiences of available help or support from others (Berkman et al., 2000; Liang et al., 2011). Social support serves as a protective factor against premature death, even for African American women with chronic diseases such as cardiovascular disease, cancer, and diabetes (Holt-Lunstad et al., 2010). In addition, close relationships that include support and supportive behaviors yield a positive influence on health behaviors (McKenzie et al., 2017). Social support is critical in reducing health disparities among African American women (Belgrave & Abrams, 2016). Without social or positive social relationships, African American women often have no outlet to help them improve self-efficacy and motivate them to create sustainable health behavior change. Belgrave and Abrams (2016) also suggest that social support provides resources and influences on medication adherence, physical activity, weight management, cancer survivorship, and a host of other related health issues impacting African American

women. Social support can positively impact health-related quality of life outcomes in individuals with congestive heart failure (Bennett et al., 2001). In addition, Uchino (2006) found that social support enhanced immune function, supported healthy behaviors, promoted exercise, and improved overall nutrition among adults with chronic illnesses.

Conversely, African American women in underserved populations report reduced perceived and received social support (Belgrave & Abrams, 2016). For example, a study conducted by Baruth et al. (2014) revealed that many low-income African American women received negative family pressure to eat unhealthfully or avoid losing weight. Participants also cited that family members pressured them to eat more when practicing portion control and criticized them for allocating time for physical activity. Reports of low or reduced social support showed associations with poorer mental and physical health outcomes in the African American population (Wallace et al., 2019). For example, studies examining the relationship between social support and health-related quality of life among diverse groups of women have shown a positive relationship between decreased social support and physical and mental health (Salihu et al., 2017). Another study assessing social support and physical and mental health concluded that low-income women might not seek the social support needed to be healthy and thrive without family support (Salihu et al., 2017).

Based on the review of literature, there is a higher prevalence of heart disease-related risk factors in African American women in the U.S. and in Texas. Consequently, there is an increased rate of diagnosed heart disease and heart disease mortality in African American women. This indicates a further need for additional studies to explore why risk factors, diagnosis, and mortality rates are above national averages and continue to rise in African American women. There is an also a need to examine the role of perceived social support in reducing heart disease risk factors in African American women. Social support studies address depression, anxiety, PTSD, and chronic diseases in all adults; however, the focus is not solely on African American women. Also, most studies examining whether perceived social support impacts heart disease risk factors in African American women focus primarily on physical activity. In addition, most studies focused on African American women feature how social support can predict successful outcomes in health promotion programs. However, to our knowledge, no studies have examined how heart disease knowledge and perceived social support impact heart disease risk factors among African American women outside of health promotion programs.

Methods

The aim of this quantitative study was twofold: (1) to investigate the influence of perceived social support on self-reported knowledge of heart disease risk factors among African American women aged 30-55 residing in Texas, and (2) to explore whether demographic variables (age, education level, family history of heart disease, and income) moderate the association between social support and knowledge among African American women aged 30-55 residing in Texas.

Instrumentation

The 52-item self-report survey instruments used in this study included a demographics questionnaire, the Heart Disease Knowledge Questionnaire (HDKQ) (Bergman et al., 2011), and the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988). We

created a demographic questionnaire consisting of 10 items to use for this study. The demographic questionnaire included questions regarding race, age, education level, income ranges, zip code, marital status, and family history of heart disease.

The assessment of heart disease knowledge to create relevant and effective prevention measures has been subject to extensive research (Bergman et al., 2011). However, to address a gap in the literature regarding individuals' perceived heart disease knowledge versus their actual knowledge about heart disease, we developed and validated the HDKQ as a comprehensive tool to explore the gap in perceived versus actual heart disease knowledge (Bergman et al., 2011). The HDKQ assesses heart disease knowledge in five domains: dietary knowledge, epidemiology, medical information, risk factors, and symptoms; however, in this study, the instrument assessed overall knowledge versus measuring the domains independently. The 30-item questionnaire yielded an acceptable internal reliability of .73 in examining heart disease knowledge (Bergman et al., 2011). However, although the five-factor analysis domains yielded strong results, the alpha levels were still relatively low, denoting that the instrument is unreliable in measuring group differences or changes over time (Bergman et al., 2011).

The MSPSS was designed to evaluate perceptions of support from three dimensions: family, friends, and significant others (Zimet et al., 1988). Evidence shows that African American women respond well to social support related to creating positive health behaviors and improving overall health outcomes (Belgrave & Abrams, 2016). The validated instrument is a 12-item, seven-point scale Likert scale survey ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). In this study, the total scores were calculated using the MSPSS scale using the sum across all 12 items, then divided by 12 to access overall perceived social support. Although brief, the 12-item, seven-point Likert scale survey is psychometrically sound in assessing social support among adults. According to Zimet et al. (1988), the MSPSS has been administered to demographically diverse groups, including pregnant women, undergraduate students, psychiatric patients, and pediatric hospital residents. In the population of pregnant women tested, the reliability of the MSPSS was measured in the stability of responses over time. Researchers report that the MSPPS's Cronbach alpha score has remained consistent among 13 different study groups, ranging from .77 to .92 on the scale (Zimet, 1998).

Prior to addressing the research questions, reliability was assessed using Cronbach's alpha (0.846) to examine the inter-item consistency of the developed instrument, MSPSS. Responses for subscale items ranged from 1 (*very strongly disagree*) to 7 (*very strongly agree*) and were entered into SPSS. Next, the total sum of scores was calculated on the MSPSS scale, using the sum across all 12-items, then divided by 12. Next, percentages of correct answers were calculated in HDKQ to reflect the knowledge level of the 30-item, true-false instrument. The answer "I don't know" was considered as "false." The research questions were tested with multiple linear regression and hierarchal linear regression analyses, which are advanced correlational statistical tests.

Pilot-testing

We pilot-tested with a group of 15 African American women representing different ages and socioeconomic statuses within the study parameters before complete survey dissemination. The pilot-testing was Web-based, ensuring the quality of the survey protocol, procedures, and online usability (Creswell & Creswell, 2018). Additionally,

the pilot-testing allowed us to conduct preliminary data analysis procedures (Creswell & Creswell, 2018). We used non-parametric analyses, such as Spearman's rho correlation and the Mann-Whitney U tests, to examine the bivariate relationships between every predictor variable and the outcome (Field, 2013).

Participants

We employed purposeful sampling measures for data collection in this study. Luciani et al. (2019) regard purposeful sampling as obtaining an individual, group, or culture's perceptions or experiences relating to a specific subject. We also note that purposeful sampling can be reflective of a single data source, which for this study, was African American women aged 30-55 who reside in Texas (Luciani et al., 2019). We recruited participants through the social media platforms Facebook and Instagram. Regarding the survey (MSPSS + HDKQ + demographic questionnaire), using specified online recruitment techniques, 159 participants began the survey, with 137 participants completing it. Of the 137 completed surveys, 16 participants were excluded based on the age parameters of the study, leaving 121 participants who met the inclusion criteria.

Data Analysis

We analyzed our data using IBM's Statistical Package for the Social Sciences (SPSS) version 25. We tested the research questions with multiple linear regression and hierarchal linear regression analyses, which are advanced correlational statistical tests. Therefore, the research design also can be viewed as correlational, describing the relationship between independent and dependent variables in each research question (Jackson, 2011). The subscale items from both instruments were then used to determine the relationship between social support and knowledge about heart disease while controlling for key demographic variables (age, education, family history, and income). Then, we examined demographic variables to determine the moderation between social support and heart disease risk factor knowledge. Finally, we used the data to determine whether to reject or fail to reject the null hypotheses. Bivariate relationships between demographics and social support and knowledge were examined first to determine if any of the demographics should

Table 1

Multiple Regression Predicting Heart Disease Risk Factor Knowledge

Predictors	Unstandardized B	Std. Error	Standardized Beta	*t*	*p*
(Constant)	24.500	12.964		1.890	.061
AGE	0.560	0.178	0.279	3.150	.002
Education	0.799	1.491	0.050	0.536	.593
Income	2.541	1.207	0.192	2.106	.037
Family History	-3.457	2.869	-0.107	-1.205	.231
Social Support	-0.273	1.068	-0.023	-0.256	.799

Note.

*$p < .05$, N = 121 (dependent variable: Knowledge)

be controlled for in the regression model. The MSPSS measured the independent variable of perceived social support. The HDKQ measured the dependent variable of knowledge about heart disease risk factors. The covariates in the study were certain demographic variables. Once the scores were calculated for perceived social support and knowledge about heart disease, both variables were measured on an interval scale. Then, the multiple linear regression was used to determine the relationship between social support and knowledge about heart disease while controlling for key demographic variables (age, education, income, family history). The independent variable, perceived social support, was measured by the MSPSS. Next, the HDKQ measured the dependent variable of knowledge about heart disease risk factors. Hierarchical multiple linear regression was performed in the first step, including the main effect. Then, the interaction term was added (each demographic variable x social support) to the second step in the regression model to examine which demographic variable moderates social support's relationship with the knowledge of heart disease.

Table 2

Hierarchical Regression of Perceived Social Support and Age Predicting Heart Disease Risk Factor Knowledge

Predictors	B	Std. Error	Beta	*t*	*p*	Adjusted R^2	Significant *F* change
Step 1							
(Constant)	32.939	9.665		3.408	.001	.077	.004
Age	0.608	0.177	0.304	3.432	.001		
Social Support	-0.095	1.069	-0.008	-0.088	.930		
Step 2							
(Constant)	67.405	34.904		1.931	.056	.077	.306
Age	-0.231	0.835	-0.115	-0.276	.783		
Social Support	-5.868	5.719	-0.486	-1.026	.307		
Age-Moderator*	0.141	0.137	0.636	1.028	.306		

Note.
$p < .05$, $N = 121$; *Age as the moderating variable.

Results

All study participants identified as African American women, with 120 participants born in the U.S. and one in South Africa. Study participants represented five of the 13 Texas regions: Region 3 - Metroplex 18%; Region 5 - Southeast Texas 4%; Region 6 - Gulf Coast 75%; Region 7 - Capital 3%; Region 8 - Central 1%. Participant ages represented the following five categories: 30-35 (40.5%); 36-40 (14.9%); 41-45 (17.4%); 46-50 (16.5%); 51-55 (10.7%). Most participants were married or cohabitating (65%), with the remainder being single (46%) or divorced (8.3%). A substantial number of participants had obtained a graduate degree (66.4%) or a college degree (26.5%), with the remainder having some college education (4.1%), or high school education, GED, or lower (0.8%). Annual income categories of participants included < $25,000 (2.5%), $26,000- $35,999 (1.7%), $36,000-$45,999 (5.8%), $46,000-$55,999 (14.9%), $56,000-$65,999 (19%), and > $66,000 (56.2%). Additionally, 52% of participants recorded having a family history of heart disease.

Table 3

Hierarchical Regression of Social Support and Education Predicting Heart Disease Risk Factor Knowledge

Predictors	B	Std. Error	Beta	*t*	*p*	Adjusted R^2	Significant *F* change
Step 1							
(Constant)	52.767	8.546		6.175	.000	-.009	.635
Social Support	-.353	1.414	.123	-.310	.757		
Education	1.410	1.129	-0.46	.944	.347		
Step 2							
(Constant)	75.411	25.479		2.884	.005	-.011	.361
Social Support	-4.368	6.031	-0.382	-1.093	.337		
Education	-4.026	4.337	-0.274	-0.689	.512		
Education-Moderator*	.954	1.041	0.594	1.073	.361		

Note.
$p < .05$, $N = 121$; *Education as the moderating variable.

Social Support and Heart Disease Risk Factor Knowledge

We used multiple linear regression to investigate whether demographic variables and social support (as measured by the MSPSS) predicted knowledge of heart disease (as measured by the HDKQ). Study variables (age, education, family history, income) explained a considerable proportion of the variance in the knowledge of heart disease, adjusted R^2 = .114, $F(5, 113)$ = 4.033, p = .002. Age was a significant predictor of knowledge of heart disease (standardized β = .28, p = .002). Income significantly predicted knowledge of heart disease (standardized β = .19, p = .037). The above results indicate that older age and higher annual income were significantly associated with better knowledge of heart disease. Social support (as measured by the MSPSS) did not predict knowledge of heart disease when controlling demographic variables. In summary, social support did not emerge as a statistically significant predictor of knowledge of heart disease risk factors

Table 4

Hierarchical Regression of Social Support and Family History Predicting Heart Disease Risk Factor Knowledge

Predictors	B	Std. Error	Beta	*t*	*p*	Adjusted R^2	Significant *F* change
Step 1							
(Constant)	64.749	7.763		8.341	.000	.009	.225
Social Support	-0.053	1.109	-0.004	-0.048	.962		
Family History	-5.141	2.969	-0.159	-1.731	.086		
Step 2							
(Constant)	44.158	20.135		2.193	.030	.011	.270
Social Support	3.478	3.374	0.288	1.031	.305		
Family History	9.438	13.487	0.292	0.700	.485		
Family History-Moderator*	-2.489	2.247	-0.560	-1.108	.270		

Note.
$p < .05$, N = 121; *Family History as the moderating variable.

(standardized β = -.023, p = .80). Age and income were the only predictors while considering all other study variables (Table 1).

Social Support and Age/Heart Disease Risk Factor Knowledge

We conducted a two-stage hierarchical multiple regression analysis with knowledge of heart disease as the dependent variable. Age and social support were entered at Stage 1. Age as a moderator was entered at Stage 2. Results revealed that at Stage 1, age and social support significantly contributed to the regression model, $F(2, 116) = 5.899$, p = .004, and accounted for 9% of the variation in knowledge of heart disease. Age was a statistically significant predictor of knowledge of heart disease, controlling for social support – standardized β = .30, $t(118) = 3.43$, p = .00 (Table 2). Introducing the age moderator explained an additional 1% of the variation in knowledge of heart disease, $F(3, 115) = 4.287$, p = .007. The model was not significantly changed (F change = 1.056, R^2 change = .008, and p = .306), so age did not moderate the relationship between social support and knowledge (Table 2).

Social Support and Education/Heart Disease Risk Factor Knowledge

We conducted a two-stage hierarchical multiple regression analysis with knowledge of heart disease as the dependent variable. Education and social support were entered at Stage 1. Education as a moderator was entered at Stage 2. Results revealed that at Stage 1, education and social support did not significantly contribute to the regression model, $F(2, 116) = .456$, p = .635, and accounted for 1% of the variation in knowledge of heart disease. Education and social support were not statistically significant predictors of knowledge of heart disease. Introducing the education moderator explained an additional 1% variation in heart disease knowledge, $F(3, 115) = .583$, p = .627. The model was not significantly changed (F change = .840, R^2 change = .007, and p = .361), so education did not moderate the relationship between social support and knowledge (Table 3).

Social Support and Family History/Heart Disease Risk Factor Knowledge

We conducted a two-stage hierarchical multiple regression analysis with knowledge of heart disease as the dependent variable. Family history and social support were entered at Stage 1. Family history as a moderator was entered at Stage 2. Results revealed that at Stage 1, family history and social support did not significantly contribute to the regression model, $F(2, 116) = 1.51$, p = .225, and accounted for 3% of the variation in knowledge of heart disease. Family history and social support were not statistically significant predictors of knowledge of heart disease (Table 4). Introducing the family history moderator explained an additional 1% variation in heart disease knowledge, $F(3, 116) = 1.418$, p = .241. The model was not significantly changed (F change = 1.228, R^2 change = .010, and p = .270), so family history did not moderate the relationship between social support and knowledge.

Social Support and Income/Heart Disease Risk Factor Knowledge

We conducted a two-stage hierarchical multiple regression analysis with knowledge of heart disease as the dependent variable. Income and social support were entered at Stage 1. Income as a moderator was entered at Stage 2. Results revealed that at Stage 1, income and social support did not significantly contribute to the regression model, $F(2, 116) = 3.440$, p = .035, and

Table 5

Hierarchical Regression of Social Support and Income Predicting Heart Disease Risk Factor Knowledge

Predictors	B	Std. Error	Beta	*t*	*p*	Adjusted R^2	Significant *F* change
Step 1							
(Constant)	42.627	8.725		4.885	.000	.040	.035
Social Support	-0.332	1.092	-0.027	-0.304	.762		
Income	3.139	1.199	0.237	2.619*	.010		
Step 2							
(Constant)	70.815	29.430		2.406	.018	.040	.318
Social Support	-5.112	4.890	-0.423	-1.045	.298		
Income	-2.359	5.612	-0.178	-0.420	.675		
Income-Moderator*	0.929	0.927	0.597	1.003	.318		

Note.
$p < .05$, $N = 121$; *Income as the moderating variable.

accounted for 5% of the variation in knowledge of heart disease. Social support was not a statistically significant predictor of knowledge of heart disease. However, income significantly predicted knowledge of heart disease when controlling for social support, standardized $\beta = .24$, $t(118) = 2.62$, $p = .01$. Introducing the income moderator explained an additional 1% of the variation in knowledge of heart disease, $F(3, 115) = 2.629$, $p = .05$ (Table 5). The model was not significantly changed (F change = 1.006, R^2 change = .008, and $p = .318$), so income did not moderate the relationship between social support and knowledge.

This study revealed gaps in heart disease risk factor knowledge in participants, with only 56% of the knowledge questions answered correctly. Nearly 35% of participants were unaware that heart attack symptoms in women differed from men, and 18% were unsure if there were any differences. These findings are similar to ones from a study conducted by Sholanke (2015) revealing that African American women were still unaware of heart attack signs and symptoms after heart attack occurrence. Moreover, 53% of participants did not know cardiovascular exercise promoted overall heart health (Sholanke, 2015). Furthermore, the study reveals the need for health promotion programs to increase overall heart health knowledge in African American women and increase

awareness of the benefits of regular physical activity.

Discussion

Our findings did not reveal a statistically significant relationship between perceived social support and heart disease risk factor knowledge, rejecting the null hypothesis. However, controlling the covariates (age, education, family history, and income) revealed that older age and higher income resulted in increased heart disease risk factor knowledge. These findings align with studies conducted by Assari (2017) and Carnethon et al. (2017), which showed that socioeconomic status impacts African American women's overall awareness of heart disease. Additionally, findings align with a study conducted by Jones et al. (2007)that found that older African American women with higher socioeconomic status were more knowledgeable about heart disease and associated risk factors compared to those with lower socioeconomic status (Reeder, 2012).

Social support has a critical role in decision-making and lifestyle modifications that can protect against chronic diseases such as heart disease and other chronic conditions (Holt-Lunstad et al., 2010; Jackson et al., 2007). Quality and quantity of social support both significantly influence women (Antonucci & Jackson, 1987; Harvey & Alexander, 2012), and when individuals receive high levels of low-quality social support, the protective health factors of social support are significantly reduced (Benca-Bachman et al., 2020). There is also the concern that a perceived lack of social support has long-term, negative influence on African American women's health, particularly heart health. Larger social networks among women, as proposed by Hernandez et al. (2016), might lead to increased seeking of social support during times of need. Higher levels of social support also correlate with reduced adverse and cardiovascular health outcomes (Dennis et al., 2008). Hernandez et al. (2016) also noted that social support serves as a buffer to reduce long-term health effects, particularly chronic diseases in African American women. In addition, McKenzie et al. (2017) conveyed that close relationships, such as social support, positively influence health behaviors related to heart disease and heart disease risk factors in African American women.

To our knowledge, this is the first quantitative study to examine whether individual demographic variables moderate the relationship between social support and heart disease risk factor knowledge in African American women. We employed a hierarchical multiple regression analysis to determine whether demographic variables moderated the relationship between social support and heart disease knowledge. Results revealed that the demographic variables (age, education, family history, and income) do not moderate the relationship between social support and heart disease based on the study sample. As a result of this finding, the null hypothesis was not rejected. In contrast, other studies have demonstrated that demographic variables can impact social support and heart disease risk factor knowledge in African American women. Research supports the importance of demographic variables analyzed in this study (age, education, family history, and income) as heart disease disparities are found broadly among African American women in various age groups, socioeconomic status, education levels, and demographic locations (Belgrave & Abrams, 2016; BWHI, 2018; Carnethon, 2017; Chinn et al. 2021; Davis et al., 2014). In African American women across the life spectrum, social inequities such as lower incomes, discrimination, lack of education, and lack of social support are more inclined to lead to health inequities (e.g., inadequate access to

health care and reduced quality of care) that contribute to heart disease risk factors (Belgrave & Abrams, 2016; Chinn et al., 2021).

Limitations

Our study's main limitation stems from its focus on African American women aged 30-55 who reside in Texas, potentially limiting generalizability in African American women who do not meet specific eligibility criteria. Similarly, the study sample did not include all African American women between 30 and 55 from all 12 regions in the state of Texas. Five regions were represented in the sample, with the majority (77%) of participants residing in the Gulf Coast region (Region 6). The other regions (3, 5, 7, and 8) represented in the sample are highly populated with African American women; therefore, results may not translate to other Texas regions with fewer African American women residents. A further limitation of the study is that the data collection period was relatively short – approximately two weeks. Extending the data collection period to an entire month may have yielded a larger sample size and allowed for more robust data analysis and sample generalizability. Including other recruitment outlets in addition to our affiliated institution's email distribution list also may have increased reach to a more diverse sample of participants in other regions of Texas.

Additionally, 95% of the study participants had a bachelor's degree or higher, significantly higher than the 30.7% of the Texas attainment rates (U.S. Census Bureau, 2021b). Therefore, African American women with lower education levels may have different levels of perceived social support and heart disease knowledge. For example, a heart disease knowledge intervention conducted by Brown et al. (2018) revealed that African American women with higher education levels scored the highest on pre- and post-knowledge questionnaires. In contrast, a study conducted by Asarri et al. (2020) suggested that higher education levels had less of a protective factor in reducing heart disease development in African Americans and Hispanics than in non-Hispanics and Whites.

Implications for Health Behavior Research

Our results can have valuable implications in furthering health education practice to increase heart disease risk factor education in African American women to reduce heart health disparities. Although our study did not reveal a statistically significant relationship between social support and heart disease risk factor knowledge, social support has been observed as a critical component for creating sustainable behavior change in African American women (Belgrave & Abrams, 2016; Ebong & Breathett, 2020; Uchino, 2018; Villablanca et al., 2016). The inclusion of social support and a tailored approach to African American women's heart health in both community and clinical settings can help increase risk factor knowledge and promote self-efficacy to engage in healthy behaviors to reduce heart disease risks. In addition, there are opportunities to use the data to guide future social support interventions to improve heart health and knowledge in African American women. Furthermore, this study may influence heart health campaigns and culturally relevant messaging targeting African American women, which will allow the population to increase knowledge and discuss health information through social networks.

Ethics Approval

The institutional review board of Texas Woman's University reviewed and approved the protocol for this study.

Conflict of Interest

The authors declare no potential conflicts of interest.

Discussion Questions

Considering the study's findings, what implications does it hold for health education practices, interventions, and health campaigns targeting African American women's heart health?

How can healthcare professionals and communities leverage social support to improve heart disease risk factor knowledge and promote healthier behaviors among African American women?

References

American Heart Association. (2016). *Heart disease, stroke, and research statistics at-a glance.* http://www.heart.org/idc/groups/ahamahpublic/@wcm/@sop/@smd/documents/downloadable/ucm_480086.pdf

American Heart Association. (2023). *Heart disease in African-American women.* https://www.goredforwomen.org/en/about-heart-disease-in-women/facts/heart-disease-in-african-american-women

Antonucci, T. C., & Jackson, J. S. (1987). Social support, interpersonal efficacy, and health. In: L. L. Carstensen, & B. A. Edelstein, (Eds.). *Handbook of clinical gerontology* (pp. 291-311). Pergamon Press.

Assari, S. (2017). Social determinants of depression: The intersections of race, gender, and socioeconomic status. *Brain Sciences*, *7*(12), 156. https://doi.org/10.3390/brainsci7120156

Baruth, M., Sharpe, P. A., Parra-Medina, D., & Wilcox, S. (2014). Perceived barriers to exercise and healthy eating among women from disadvantaged neighborhoods: Results from a focus groups assessment. *Women & Health, 54*(4), 336-353. https://doi.org/10.1080/03630242.2014.896443

Belgrave, F. Z., & Abrams, J. A. (2016). Reducing disparities and achieving equity in African American women's health. *American Psychologist, 71*(8*)*, 723-733. https://doi.org/10.1037/amp0000081

Benca-Bachman, C. E., Najera, D. D., Whitfield, K. E., Taylor, J. L., Thorpe, R. J., Jr, & Palmer, R. (2020). Quality and quantity of social support show differential associations with stress and depression in African Americans. *American Journal of Geriatric Psychiatry, 28*(6), 597-605. https://doi.org/10.1016/j.jagp.2020.02.004

Bennett, S. J., Perkins, S. M., Lane, K. A., Deer, M., Brater, D. C., & Murray, M. D. (2001). Social support and health-related quality of life in chronic heart failure patients. *Quality of Life Research, 10*(8), 671-682. https://doi.org/10.1023/a:1013815825500

Bergman, H. E., Reeve, B. B., Moser, R. P., Scholl, S., & Klein, W. M. P. (2011). Development of a comprehensive heart disease knowledge questionnaire. *American Journal of Health Education, 42*(2), 74-87. https://doi.org/10.1080/19325037.2011.10599175

Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine, 51*(6), 843-857. https://doi.org/10.1016/s0277-9536(00)00065-4

Black Women's Health Imperative. (2018, February 19). *Heart disease homework: A guide to getting your family history.* https://www.bwhi.org/2018/02/19/heart-disease-homework-guide-getting-family-history/

Brown, C. W., Alexander, D. S., Cummins, K., Price, A. A., & Anderson-Booker, M. (2017). STEPS to a healthier heart: Improving coronary heart disease (CHD) knowledge among African American women. *American Journal of Health Education, 49*(2), 57-65. https://doi.org/10.1080/19325037.2017.1414640

Carnethon, M. R., Pu, J., Howard, G., Albert, M. A., Anderson, C., Bertoni, A. G., Mujahid, M. S., Palaniappan, L., Taylor, H. A., Jr., Willis, M., & Yancy, C. W. (2017). Cardiovascular health in African Americans: A scientific statement from the American Heart Association. *Circulation, 136*(21), e393-e423. https://doi.org/10.1161/CIR.0000000000000534

Centers for Disease Control and Prevention. (2020a). *Defining adult overweight and obesity.* https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_09-508.pdf

Centers for Disease Control and Prevention. (2020b). *Facts about hypertension.* https://www.cdc.gov/bloodpressure/facts.htm

Chinn, J. J., Martin, I. K., & Redmond, N. (2021). Health equity among Black women in the United States. *Journal of Women's Health, 30*(2), 212-219. https://doi.org/10.1089/jwh.2020.8868

Davis, S. K., Gebreab, S., Quarells, R., & Gibbons, G. H. (2014). Social determinants of cardiovascular health among black and white women residing in Stroke Belt and Buckle regions of the South. *Ethnicity & Disease, 24*(2), 133-143.

Dennis, J. P., Markey, M. A., Johnston, K. A., Vander Wal, J. S., & Artinian, N. T. (2008). The role of stress and social support in predicting depression among a hypertensive African American sample. *Heart & Lung: Journal of Critical Care, 37*(2), 105-112. https://doi.org/10.1016/j.hrtlng.2007.03.003

Ebong, I., & Breathett, K. (2020). The cardiovascular disease epidemic in African American women: Recognizing and tackling a persistent problem. *Journal of Women's Health 29*(7), 891-893. https://doi.org/10.1089/jwh.2019.8125

Graham, G. (2015). Disparities in cardiovascular disease risk in the United States. *Current Cardiology Reviews, 11*(3), 238-245. https://doi.org/10.2174/1573403x11666141122220003

Harvey, I. S., & Alexander, K. (2012). Perceived social support and preventive health behavioral outcomes among older women. *Journal of Cross-Cultural Gerontology, 27*(3), 275-290. https://doi.org/10.1007/s10823-012-9172-3

Hernandez, R., Ruggiero, L., Prohaska, T. R., Chavez, N., Boughton, S. W., Peacock, N., Zhao, W., & Nouwen, A. (2016). A cross-sectional study of depressive symptoms and diabetes self-care in African Americans and Hispanics/Latinos with diabetes: The role of self-efficacy. *The Diabetes Educator, 42*(4), 452-461. https://doi.org/10.1177/0145721716654008

Holt-Lunstad, J., Smith, T., & Layton, J. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine, 7*(7), Article e1000316. https://doi.org/10.1371/journal.pmed.1000316

Jackson, E. S., Tucker, C. M., & Herman, K. C. (2007). Health value, perceived social support, and health self-efficacy as factors in a health-promoting lifestyle. *Journal of American College Health, 56*(1), 69-74. https://doi.org/10.3200/jach.56.1.69-74

Jones, D. E., Weaver, M. T., & Friedmann, E. (2007). Promoting heart health in women: A workplace intervention to improve knowledge and perceptions of susceptibility to heart disease. *AAOHN Journal, 56*(7), 271-276. https://doi.org/10.1177/216507990705500703

Kris-Etherton, P. M., Petersen, K. S., Velarde, G., Barnard, N. D., Miller, M., Ros, E., O'Keefe, J. H., Williams, K., Van Horn, L., Na, M., Shay, C., Douglass, P., Katz, D. L., & Freeman, A. M. (2020). Barriers, opportunities, and challenges in addressing disparities in diet-related cardiovascular disease in the United States. *Journal of the American Heart Association, 9*(7), Article e014433. https://doi.org/10.1161/JAHA.119.014433

Liang, T. P., Ho, Y. T., Li, Y. W., & Turban, E. (2011). What drives social commerce: The role of social support and relationship quality. *International Journal of Electronic Commerce, 16*(2), 69-90. https://doi.org/10.2753/jec1086-4415160204

Luciani, M., Campbell, K., Tschirhart, H., Ausili, D., & Jack, S. (2019). How to design a qualitative health research study. Part 1: Design and purposeful sampling considerations. *Professioni Infermieristiche, 72*(2), 152-161.

McKenzie, J. F., Neiger, B., & Thackery, R. (2017). *Planning, implementing, and evaluating health promotion programs* (7th ed.). Pearson.

National Center for Health Statistics. (2018). *Summary health statistics: National Health Interview Survey, 2018.* U.S. Department of Health and Human Services. https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2018_SHS_Table_A-1.pdf

Reeder, R.L. (2012). *Working class African American women and heart disease: How communication and community impact prevention knowledge and behaviors.* https://uncw.edu/csurf/explorations/documents/reederranata.pdf

Salihu, H. M., Adegoke, K., Turner, D., Al Agili, D., & Lo Berry, E. (2017). Social support and health-related quality of life among low-income women: Findings from community-based participatory research. *Southern Medical Journal, 110*(4), 270–277. https://doi.org/10.14423/smj.0000000000000635

Sholanke, F. (2015). *Perceived factors contributing to coronary heart disease in African American women* (Publication No. 3684424) [Doctoral dissertation, Walden University]. Walden Dissertations and Doctoral Studies Collection. https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1284&context=dissertations

Texas Department of State Health Services. (2018). *Public health strategies for addressing heart disease and stroke in Texas, 2019–2023.* https://www.dshs.texas.gov/heart/pdf/Texas-Public-Health-Strategies_CVDS-2019-2023-Final.pdf

Tsao, C. W., Aday, A. W., Almarzooq, Z. I., Anderson, C. A., Arora, P., Avery, C. L., Baker-Smith, C. M., Beaton, A. Z., Boehme, A. K., Buxton, A. E., Commodore-Mensah, Y., Elkind, M. S., Evenson, K. R., Eze-Nliam, C., Fugar, S., Generoso, G., Heard, D. G., Hiremath, S., & Ho, J. E. (2023). *Heart disease and stroke statistics—2023 update: A report from the American Heart Association. Circulation, 147*(8). https://doi.org/10.1161/cir.0000000000001123

U.S. Census Bureau. (2021b). *QuickFacts: United States.* https://www.census.gov/quickfacts/fact/table/US/HSD410216#viewtop

U.S. Department of Health and Human Services Office of Minority Health. (2019). *Profile: Black/African Americans.* https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=61

Uchino, B. N., Trettevik, R., Kent de Grey, R. G., Cronan, S., Hogan, J., & Baucom, B. R. (2018). Social support, social integration, and inflammatory cytokines: A meta-analysis. *Health Psychology, 37*(5), 462-471. https://doi.org/10.1037/hea0000594

Villablanca, A. C., Warford, C., & Wheeler, K. (2016). Inflammation and cardiometabolic risk in African American women is reduced by a pilot community-based educational intervention. *Journal of Women's Health, 25*(2), 188-199.

Wallace, D. D., Pack, A., Uhrig Castonguay, B., Stewart, J. L., Schalkoff, C., Cherkur, S., Schein, M., Go, M., Devadas, J., Fisher, E. B., & Golin, C. E. (2019). Validity of social support scales utilized among HIV-infected and HIV-affected populations: A systematic review. *AIDS and Behavior, 23*(8), 2155-2175. https://doi.org/10.1007/s10461-018-2294-z

World Health Organization. (2020). *Obesity and overweight.* https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight

World Population Review. (2022.) *How big is Texas?* https://worldpopulationreview.com/states/texas/how-big

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). *Multidimensional Scale of Perceived Social Support* [Data set]. PsycTESTS. https://doi.org/10.1037/t02380-000