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Black Hearts Matter: A Comparative Study of Sociodemographic, Clinical, and Psychosocial Characteristics in Black and White Persons With Heart Failure

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Black Hearts Matter: A Comparative Study of Sociodemographic, Clinical, and Psychosocial Characteristics in Black and White Persons With Heart Failure

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

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ABSTRACT

Heart failure (HF) is a chronic, progressive, debilitating illness that disproportionately affects Black individuals, often leading to poor quality of life (QOL). Various sociodemographic, clinical, and psychological characteristics are related to QOL in patients with HF. Because most studies do not include representative Black samples or report findings from racial subgroup analyses, these relationships and any existing racial differences are not well understood. The purpose of this descriptive, comparative study was to explore the relationships among sociodemographic, clinical, and psychological characteristics and QOL in patients with HF and to determine if there were racial differences between Black and White individuals. Mean participant age was 56.29 (*SD* = 12.42). SPSS 27.0 was the program used to conduct secondary data analysis. Among the sociodemographic characteristics, racial differences were apparent in age, gender, and marital status. Racial differences in ejection fraction, New York Heart Association Classification, comorbidities, and functional status emerged as clinical characteristics. Race was not significantly associated with QOL. Physical functioning and anxiety were significant predictors of QOL in the initial analysis. However, in the full model, older age and greater depression remained significant, suggesting they were the strongest predictors of QOL. Patients with HF should undergo regular screening for depression and anxiety. Future researchers should explore sociodemographic, clinical, and psychological characteristics in larger samples; consider the timing and measurement approaches for depression, anxiety, and QOL; and further explore racial differences.

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DEDICATION

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION AND STATEMENT OF PROBLEM

Chronic Illness Challenges, Chronic Illness With Blacks, Disparities, Depression and Anxiety, Sociodemographic and Clinical Characteristics, and Quality of Life

Chronic illnesses are prevalent (Boersma et al., 2020; NCCDPHP, 2021a; Raghupathi & Raghupathi, 2018) and costly (Buttorff et al., 2017; Martin et al., 2021; NCCDPHP, 2021b), lead to functional status impairment and disability (van Campen & Cardol, 2009), and require patients to make many life adjustments to effectively manage and cope with the associated physiological and psychosocial changes (Bury, 1991; Charmaz, 1995; Chin et al., 2000; Loeb, 2006; Schulman-Green et al., 2016; Sharpe & Curran, 2006; Sidell, 1997). Many individuals live with multiple chronic illnesses (Boersma et al., 2020; Denton & Spencer, 2010; Vogeli et al., 2007), contributing to even more pronounced physical limitations, psychosocial challenges, and disability (Iezzoni, 2010). Black individuals are disproportionately affected by chronic illnesses (Calvin et al., 2003; Ezeokpo & Ugwueze, 2022; Kanchi et al., 2018; Piccolo et al., 2013; Quinones et al., 2019; Smalls et al., 2020; Smedley et al., 2002) with higher morbidity, comorbidity (Marrie et al., 2008; McGee et al., 1996), disability (Thorpe et al., 2016; Whitson et al., 2011), and mortality rates (Howard et al., 2016; Smalls et al., 2020; Smedley et al., 2002) than Whites.

Living with chronic illness is challenging for patients because of the physical symptoms and psychosocial issues (Ingram & South, 2020; Schulman-Green et al., 2016), the complex treatment plan requirements, and the functional status limitations they often experience (Charmaz, 1995; Schulman-Green et al., 2016; Sidell, 1997). Among the psychosocial challenges faced by chronically ill patients are independently occurring depression and anxiety (Brown et al., 2010; Di Benedetto et al., 2014; Eisner et al., 2010; Fattouh et al., 2019; Li et al., 2008;

Thomas et al., 2003), and cooccurring depression and anxiety, with more pronounced adverse effects (DeJean et al., 2013; Liew, 2012; von Leupoldt et al., 2011; Yohannes et al., 2010).

Various sociodemographic and clinical characteristics influence depression and anxiety in chronically ill patients (Ani et al., 2009; Bell et al., 2005;El-Gabalawy et al., 2011; Rutledge et al., 2006; Thomas et al., 2003). Among these sociodemographic and clinical characteristics is race, which is a key variable that might influence depression and anxiety in chronically ill Blacks; however, its potential influence is not well understood (Assari, 2014; Assari et al., 2015; Hill-Joseph, 2019; Johnson-Lawrence et al., 2013; Li et al., 2008; Mouzon, 2017). Some investigators have found that Blacks with chronic illnesses have more depression (Assari, 2014; Assari et al., 2015; Mouzon, 2017), whereas others suggest that Blacks might have less depression than Whites (Ani et al., 2009; Hollingshaus & Utz, 2013) or found no racial differences in depression (Ghods et al., 2008) and anxiety (Ellis et al., 2015). However, it is generally known that Blacks do not receive the same rates of screening, diagnosis, and treatment for depression as White individuals (Barnes & Bates, 2017; Lagomasino et al., 2011; Stockdale et al., 2008). Depression underdiagnosis in Blacks might be due to its presentation differing from that of White individuals (Bailey et al., 2019). Black individuals experience more fluctuations in depressive symptoms, which suggests that the measurement timing might confound screening attempts and study findings in this racial minority group (Hill-Joseph, 2019).

Anxiety is also associated with chronic illnesses in Black people (Assari, 2016; Watkins et al., 2015). Although some researchers have found Black individuals are less likely to experience anxiety than Whites, anxiety in Blacks is associated with greater negative effects, including more significant functional impairment (Himle et al., 2009). Yet, it remains unclear whether Black individuals living with chronic illnesses experience anxiety at similar rates as their White counterparts or whether race influences rates of anxiety in chronically ill Blacks.

Depression and anxiety in chronically ill patients, particularly when undiagnosed and untreated, contribute to decreased life satisfaction, poor health-related quality of life (HRQOL) (Balcells et al., 2010; Brown et al., 2010; Chuquilín-Arista et al., 2021; Lebel et al., 2020; Liu et al., 2020; Sadlonova et al., 2021; Strine et al., 2008; von Leupoldt et al., 2011), and negative clinical outcomes (Assari, 2014; McLaughlin et al., 2005; Ryu et al., 2016; Sidell, 1997; Whittemore & Dixon, 2008), including greater morbidity, healthcare utilization (Ani et al., 2009), and mortality (McLaughlin et al., 2005; Sadlonova et al., 2021). Chronically ill Blacks have the worst functional status and quality of life (QOL; Jackson-Triche et al., 2000). More effort is necessary to reduce and eliminate persistent racial disparities among Black, chronically ill patients (Smedley et al., 2002). Research focused on understanding potential racial differences could provide a better understanding of whether depression and anxiety contribute to the persistent disparities.

Heart Failure Overview and Statistics

Heart failure (HF) is one of the most prevalent, costly, and debilitating chronic illnesses (AHA, 2017; Centers for Disease Control and Prevention, 2020) that contributes to morbidity, healthcare utilization, and mortality (Sullivan et al., 2002; Virani, Alonso, Aparicio, et al., 2020; Virani, Alonso, Benjamin, et al., 2021). HF is challenging for patients because of its chronicity, multibody system involvement, progressive nature, association with disability, and negative impact on psychosocial wellness (Riegel et al., 2009; Wong et al., 2011). HF affects 6.2 million American adults 20 years and older, with approximately 960,000 new diagnoses annually. As of 2017, HF accounted for about 80,480 deaths yearly (Virani, Alonso, Aparicio, et al., 2020;

Virani, Alonso, Benjamin, et al., 2021). Patients with HF have significant healthcare utilization resulting from frequent exacerbations that require medical intervention (Urbich et al., 2020). Annually, patients with HF have 1,932,000 primary care visits, 414,000 emergency department visits, and 809,000 HF-related hospital readmissions (Virani et al., 2020). HF is the leading cause of rehospitalization for patients ages 65 and older, accounting for 24% of all-cause 30-day rehospitalizations (Desai & Stevenson, 2012; Heidenreich et al., 2011). HF management places a significant burden on the U.S. healthcare system, with annual costs of approximately $30.7 billion (Desai & Stevenson, 2012; Sullivan et al., 2002; Virani et al., 2020). Projections show that by 2030, HF-related costs will increase to $160 billion, with reflects a 46% increase; Heidenreich et al., 2013; Tsao et al., 2022).

Heart Failure and Racial Disparities Among Blacks

Similar to other chronic illnesses, HF disproportionately affects Black individuals (Benjamin et al., 2017; Go et al., 2013; Roger et al., 2012; Tsao et al., 2022; Virani, Alonso, Aparicio, et al., 2020; Virani, Alonso, Benjamin, et al., 2021), and several disparities exist among Black individuals with HF. Black people have the highest risk of developing HF (Virani et al., 2020), are a majority of the HF patient population (Heidenreich et al., 2011), tend to be younger (Vaccarino et al., 2002), and have a higher incidence before age 50 (Benjamin et al., 2017; Bibbins-Domingo et al., 2009; Go et al., 2013). Blacks are also more likely to have comorbidities and greater mortality than their White counterparts (Evangelista, Dracup, & Doering, 2002; Mensah et al., 2005; Mentz et al., 2013; Roger et al., 2012; Vaccarino et al., 2002). Other disparities include: Blacks are more likely to delay seeking HF-related treatment (Cuyjet & Akinboboye, 2014; Virani et al., 2020), to receive emergency department care and require readmissions (Alhurani et al., 2015; Cuyjet & Akinboboye, 2014; Evangelista, Dracup, &

Doering, 2002), have the highest rates of HF-related hospitalizations (Virani et al., 2020), have greater functional decline following hospitalization (Vaccarino et al., 2002), and have higher mortality rates than Whites (Mensah et al., 2005; Mentz et al., 2013; Roger et al., 2012; Virani et al., 2020). According to projections, HF will substantially negatively impact Blacks more than Whites over the next several years. Interventions to decrease racial disparities are needed (Van Nuys et al., 2018).

Because depression and anxiety are common in patients with HF (Easton et al., 2016; Ishak et al., 2020; Johansson et al., 2006; Joynt et al., 2004; Konstam et al., 2005; MacMahon & Lip, 2002; Norra et al., 2008; Rustad et al., 2013; Rutledge et al., 2006b; Sokoreli et al., 2016; Yohannes et al., 2010), undiagnosed depression and anxiety might be a contributing factor to the disparate clinical outcomes observed among Blacks, such as higher rates of mortality and rehospitalization (Virani, Alonso, Aparicio, et al., 2020; Virani, Alonso, Benjamin, et al., 2021). Similar to the effects of depression and anxiety on QOL in other chronic illness populations (Lim et al., 2011), depression and anxiety negatively impact QOL in patients with HF (Ahmed et al., 2006; Bekelman et al., 2007; Garin et al., 2009; Rumsfeld et al., 2003; Rustad et al., 2013; Samartzis et al., 2013; Trivedi et al., 2009). Improving depression and anxiety might improve QOL in Black patients with HF (Blumenthal, 2012); however, the influence of depression and anxiety on Black individuals with HF is not well understood because Blacks are underrepresented in the published literature and race has not been investigated for its potential influence on QOL.

To date, research on the prevalence and influence of depression and anxiety in Black patients with HF and contributing factors, such as sociodemographic and clinical characteristics, and outcomes related to depression and anxiety, such as QOL, are rarely stratified by race.

Among the limited studies conducted with Black individuals with HF, findings vary. Factors that might contribute to disparate outcomes among Black individuals with HF, such as depression and anxiety, require further exploration to determine whether racial differences exist.

Summary, Research Focus, and Research Implications

Despite advancements in understanding psychological and psychosocial functioning in patients with HF, research focused on depression, anxiety, and their comorbid existence remains limited, and any differences that might exist between Blacks and Whites are not well understood (Dickson et al., 2013; Evangelista, Ter-Galstanyan, et al., 2009). Even when systematic reviews and meta-analyses are conducted using studies of patients with HF, it is difficult to compare and draw conclusions from findings related to depression and anxiety because included studies are heterogenous and consider different covariates (Celano et al., 2018; Sokoreli et al., 2016).

Although Black individuals comprise the majority racial group within the HF patient population (Virani, Alonso, Aparicio, et al., 2020; Virani, Alonso, Benjamin, et al., 2021), they are underrepresented in most studies of depression and anxiety (Gaffey et al., 2022). Generally, investigators did not consider race as an important construct in their study design and only reported racial groups descriptively, indicating there were no baseline differences; grouped all minorities in their analysis; did not include representative Black samples; and did not conduct racial subgroup analyses, even when recruiting representative samples of Black patients. For this reason, the body of research focused on the factors that influence depression and anxiety in Blacks is even more limited and lacks a cultural lens (Dickson et al., 2013). It is unknown whether existing findings can be generalized to Blacks (Bean et al., 2009). Yet, how race influences health, chronic illness, and healthcare should be a variable of interest when conducting research (Bhopal et al., 2021; Culley, 2006). This knowledge gap could contribute to the persistent negative and disparate clinical outcomes among Black patients with HF. A better understanding of depression and anxiety in Black individuals with HF, the sociodemographic and clinical factors that could influence any relationships, and how depression and anxiety might impact QOL differently in Blacks compared to Whites is needed.

Additional research is needed to explore the incidence and impact of comorbid depression and anxiety in Black patients with HF compared to their White counterparts. Understanding the relationships among and influences on sociodemographic and clinical variables on depression and anxiety in Black individuals with HF is essential to inform evidence that guides patient care. Such evidence could ultimately improve morbidity, mortality, care quality, reduces rehospitalizations and care costs (Dickson et al., 2013) and enhance overall clinical outcomes (MacMahon & Lip, 2002) for all patients with HF, but especially for those who self-identify as Black and who continue to experience disparate clinical outcomes (Evangelista, Ter-Galstanyan, et al., 2009).

The literature suggests that sociodemographic characteristics and clinical characteristics influence depression and anxiety in patients with HF and that depression and anxiety negatively influence QOL in patients with HF. Researchers have not stratified their findings by race or examined race as a sociodemographic variable of potential influence. As a result, there is a poor understanding of the potential impact of race on depression and anxiety in patients with HF. Also unclear is whether racial differences are sociodemographic and clinical characteristics and the impact of depression and anxiety on QOL. There is also relatively no literature focused on anxiety in Black individuals with HF or comorbid depression and anxiety in Black individuals with HF. Additional research is needed to better understand any racial differences between Black and White people, which might help decrease disparities and improve clinical outcomes among

Black individuals with HF. The purpose of this descriptive, comparative study was to explore the relationships among sociodemographic, clinical, and psychological characteristics and QOL in patients with HF and to determine if there were racial differences between Blacks and Whites. The research question was: *What are the differences between Blacks and Whites with HF with respect to sociodemographic and clinical characteristics and quality of life?* The specific aims were to (a) to describe the differences and examine the relationships between sociodemographic, clinical, and psychological characteristics and QOL in Black and White persons with HF; and (b) examine the influence of sociodemographic, clinical, and psychological characteristics on QOL in Black and White persons with HF.

Findings from this study will provide foundational new knowledge to help better understand how psychosocial factors might impact Black individuals with HF and inform interventions to improve HF care and decrease disparate clinical outcomes for Black patients with HF. This study aligns with the National Institute for Nursing Research's (NINR; 2016) future strategic direction related to examining social determinants of health and their impact on health outcomes and QOL, health equity (reducing and eliminating systemic and structural inequities among disadvantaged groups), and tertiary prevention approaches for reducing disease severity, symptoms, and progression, with an emphasis on eliminating health disparities (NINR, 2022).

Organization of the Dissertation

Chapter 2 will include a discussion of the conceptual framework that guided the study design. There will be a review of the existing literature regarding depression and anxiety within the context of chronic illness, specifically HF; sociodemographic and clinical influencers of depression and anxiety; and the impact of depression and anxiety on QOL in patients with HF.

Chapter 3 presents the methodology used to conduct the study, and Chapter 4 includes the findings. Chapter 5 is a discussion of the findings, study weaknesses/limitations, and future directions to further advance this body of knowledge.

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CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter includes two sections. The first is the theoretical framework and conceptual model that guided this study. Next, there will be a review of what is known regarding the relationships among sociodemographic, clinical, and psychological characteristics and quality of life (QOL) in Black and White patients with heart failure (HF).

Conceptual Model

The guiding conceptual model comprised the heart failure racial disparities reduction framework, a new framework I proposed based on a synthesis of the HF literature; the National Institute on Minority Health and Health Disparities (NIMHD) research framework; and Doll's (2018) epidemiological framework. These sources collectively informed the relevance of this exploratory comparative study, highlighted the importance of investigating the differences between Black and White individuals with HF, and contributed to the scholarly work of reducing disparities among Black individuals with HF.

The literature shows differences between Black and White individuals with HF (Afzal et al., 1999; Cuyjet & Akinboboye, 2014; Dickson et al., 2015; Durstenfeld et al., 2016; Glynn et al., 2019; Goyal et al., 2022; Mwansa et al., 2021; Nayak et al., 2020; Sharma et al., 2014; Smith et al., 2005; Su et al., 2019; Vaccarino et al., 2002), suggesting that race influences various phenomena in patients with HF. Because race-based health disparities persist and HF affects Black people more negatively (Tsao et al., 2022; Virani et al., 2020, 2021; Ziaeian et al., 2017), studies designed with a disparities lens to examine racial differences between Black and White patients with HF are needed (Akwo et al., 2018; Echouffo-Tcheugui et al., 2022; Gordon et al., 2010; Lewsey & Breathett, 2021; Mentz et al., 2015; Nayak et al., 2020; Rathore et al., 2003; Sharma et al., 2014; Spahillari et al., 2017; Yancy, 2001).

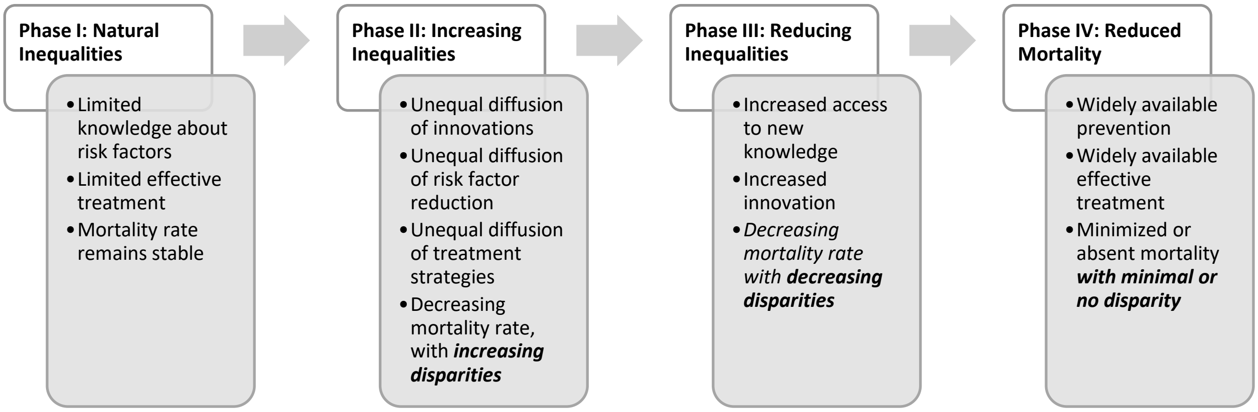
The NIMHD provides a lens from which to conduct health disparities research. This framework suggests that individual patient domains affect health outcomes (NIMHD Minority Health and Health Disparities, 2017). This study aligned because it was an exploration of the relationships among individual patient factors, such as sociodemographic, clinical, and psychological characteristics, and their influence on QOL. The primary focus was comparing the observed relationships between Black and White patients with HF.

The third component of the heart failure racial disparities reduction framework (see Figure 3) is an epidemiological approach to investigating Black-White disparities in gynecologic cancer (Doll, 2018). Using Doll's (2018) framework in this study enabled comparing relationships observed in Black versus White patients with HF and helped interpret inequalities. Although inequity and inequality are different concepts, in U.S. society, systemic inequity contributes to specific health-related inequalities, which then play a role in perpetuating persistent racial disparities among patients with HF. Doll's framework was appropriate in this study to illuminate inequalities in this patient population that might contribute to disparities. It includes elements of three other frameworks for studying racial inequity—eco-social theory of disease distribution, fundamental cause theory, and public health critical race praxis—indicating four disease phases (see Figure 1):

1. Phase I: Natural Inequalities
2. Phase II: Increasing Inequalities
3. Phase III: Reducing Inequalities
4. Phase IV: Reduced Mortality

Figure 1

Doll's Theoretical Framework



Note. From "Investigating Black-White Disparities in Gynecologic Oncology: Theories, Conceptual Models, and Applications," by K. M. Doll, 2018, *Gynecologic Oncology*, *149*(1), pp. 78-83 (https://doi.org/10.1016/j.ygyno.2017.10.002). Copyright 2018 by Elsevier.

Each phase represents a stage on a continuum of evolution to reduce racial disparities. According to the heart failure racial disparities reduction framework (see Figure 2), racial disparities persist, increase, improve, or resolve based on inequalities. Addressing these inequalities involves designing targeted, efficacious interventions to generate knowledge and decrease racial disparities.

During Phase I: Natural Inequalities, there is limited knowledge about risk factors and few treatments available to reduce disparities within a patient population . As a result, the mortality rate remains stable (Doll, 2018). Characterizing Phase II: Increasing Inequalities are unequal diffusion of innovations, reduction of risk factors, and treatment strategies within the patient population. During this phase, mortality due to the illness decreases. However, there are increasing disparities because of the inequality of effective interventions across all subpopulations of individuals affected. Phase III: Reducing Inequalities involves increased access to new knowledge and innovation applied to the patient population, including those with disparate outcomes, decreasing mortality rates, and disparities. Finally, Phase IV, Reduced Mortality, is characterized by widely available prevention strategies and treatment applied equitably, contributing to minimized or absent mortality rates and little to no remaining disparities.

Doll’s (2018) theory indicates that health disparities can persist in a specific racial group despite increasing innovation and resources to decrease the illness’s overall burden and effects. There is a need for research to address the racial differences that might contribute to persistent inequalities and health disparities. Targeted studies could inform tailored interventions to reduce disparities and promote more equitable patient outcomes.

Conceptual Model for the Current Study

This study incorporated the four phases of the heart failure racial disparities reduction framework (see Figure 2) into Doll’s (2018) original framework (see Figure 3). However, rather than disparities in gynecological cancer, the four phases of inequality applied to inequalities, specifically, racial disparities in HF related to depression and anxiety in Black and White patients. Although Doll investigated Black–White disparities in gynecologic oncology patient populations, the framework is applicable to disparities research focused on potential differences between Black and White patients with HF. This study and future studies to identify racial differences could contribute to a growing body of knowledge on disparities in HF research.

Racial disparities persist within the HF patient population. Black individuals have worse outcomes than White persons (Tsao et al., 2022; Virani et al., 2020, 2021; Ziaeian et al., 2017), which is consistent with Phase II: Increasing Inequalities. Despite resources and innovations directed at primary and secondary HF prevention, there has been no reduction in disparities among Blacks patients. Black patients with HF are understudied

The Heart Failure Racial Disparities Reduction Framework. The heart failure racial disparities reduction framework (see Figure 2) is an application of Doll's (2018) epidemiological framework with application to the HF patient population (see Figure 3). Consistent with Doll, Phase I includes the inequalities in HF influenced by sociodemographic characteristics (race, age, gender, marital status, education, and employment status), clinical characteristics (disease severity, comorbidities, and functional status), and psychological characteristics (depression and anxiety), characteristics that collectively influence QOL. The framework suggests that these characteristics are inherently different in Black and White patients with HF. In addition, the characteristics influence depression and anxiety in ways that perpetuate disparities among Blacks, including underdiagnosis and undertreatment (Dickson et al., 2013; Evangelista et al., 2009). The current study did not address Phase I on the continuum because morbidity and mortality rates among patients with HF are no longer stable. Instead, there is stability and continued growth in the morbidity, mortality, and disparity between Black and White patients with HF (Tsao et al., 2022; Virani et al., 2020, 2021).

The heart failure racial disparities reduction framework was appropriate for this study to explore phenomena in Black individuals' and determine whether racial differences exist by examining the potential influences of sociodemographic and clinical characteristics on psychological characteristics and their collective influence on QOL. This study focused on the interval between Phase II (Increasing Inequalities) and Phase III (Reducing Inequalities; see Figure 3). The persistent health disparities observed among Black individuals with HF align with the unequal diffusion of innovations, reduction of risk factors, and treatment strategies (Doll, 2018), perpetuated by the underrepresentation of Black patients in HF research (Sharma et al., 2014). Medical professionals have attempted to address racial disparities in patients with HF, albeit with limited success. There have been investments and scientific advances to better treat HF, improve clinical outcomes, and decrease morbidity and mortality within the general HF patient population (Braunwald, 2013; Lewsey & Breathett, 2021). However, these knowledge increases and innovative treatment approaches have received unequal application among Black individuals (Azam & Colvin, 2021; Heiat et al., 2002; Khayyat et al., 2021; Lekavich & Barksdale, 2016; Sullivan et al., 2018). Thus, the increases and advancements have not significantly contributed to improving clinical outcomes or decreasing health disparities among Black individuals with HF.

Researchers have investigated depression and anxiety in patients with HF, albeit with Black participants underrepresented in their samples (Sharma et al., 2014). Most investigators have only reported race descriptively, grouped all races and minorities, and inconsistently tested for racial differences. Rather than considering race as a significant predictor or contributor to the persistent disparities observed in Black individuals with HF, scholars have rarely unexplored race as a variable of potential influence. Depression and anxiety remain underdiagnosed and undertreated in Black individuals with HF (Dickson et al., 2013; Evangelista et al., 2009). Clinical outcome disparities among Black patients persist, including greater morbidity, greater health care utilization, more pronounced disability, and higher mortality (Tsao et al., 2022; Virani et al., 2020, 2021).

By underrepresenting Black patients in studies of depression and anxiety in patients with HF and not stratifying findings by race or comparing them to explore potential racial differences, researchers have contributed to persistent disparities among Black patients with HF. The knowledge generated cannot be generalized to Blacks. Scientific innovation has improved clinical outcomes for the overall HF patient population (Braunwald, 2013; Lewsey & Breathett, 2021), yet Black individuals have not benefited as much from improvements (Tsao et al., 2022; Virani et al., 2020, 2021). Addressing this pattern of disparity requires a better understanding of depression and anxiety in Black patients and the sociodemographic and clinical characteristics that influence these psychological characteristics. Insight into the associations between and among sociodemographic, clinical, and psychological characteristics and QOL and whether racial differences exist is also warranted. The heart failure racial disparities reduction framework (see Figure 3) shows race as a central construct in HF health disparities research. The goal of applying this framework was to identify and account for any observed racial differences and ultimately decrease racial disparities by better understanding any differences between Black and White patients with HF so scholars and practitioners can address them.

The HF racial disparities reduction framework (see Figure 3) was appropriate due to the limited research on depression and anxiety in Black individuals with HF. The minimal literature on this subpopulation is insufficient to determine whether there are racial differences in the rates of depression and anxiety in Black and White individuals. The limited published literature provides insufficient insight into the sociodemographic and clinical characteristics that influence depression and anxiety (psychological characteristics) or how these factors might collectively influence QOL. Because most researchers have not included representative Black samples or conducted racial subgroup analyses when there are representative samples, more research is needed. Knowledge regarding racial differences is limited (Dickson et al., 2013; Evangelista et al., 2009), the findings are not generalizable to Black individuals (Bean et al., 2009), and disparate clinical outcomes, including mortality, persist (Tsao et al., 2022; Virani et al., 2020, 2021). Because race influences health, illness, and health care (Bhopal et al., 2021; Culley, 2006), it is a necessary variable in investigating disparities. Black individuals might perceive depression and anxiety differently than people from other races (Dickson et al., 2013). A cultural lens is necessary to investigate depression and anxiety within this subgroup of the HF patient population (Dickson et al., 2013; Nayak et al., 2020). In the era of persistent race-based disparities among Black individuals with HF, a better understanding of the prevalence of depression and anxiety in this patient population is needed to reduce disparities, illness burden, and mortality; improve care quality; decrease costs; and improve QOL (Celano et al., 2018; Cully et al., 2009; Dekker et al., 2014; Konstam et al., 2005; MacMahon & Lip, 2002; Rutledge et al., 2006; Yohannes et al., 2010).

Similar to its influence on health, race specifically influences HF, as patients of diverse racial groups do not experience HF the same as White patients (Dickson et al., 2013; Jaarsma et al., 2021; Riegel et al., 2008, 2009). Overall, Black individuals have a greater mortality risk than Whites, influenced by sociodemographic factors, including age, gender, and socioeconomic status (Beydoun et al., 2016). Black individuals with HF have higher mortality rates (Tsao et al., 2022; Virani et al., 2020, 2021), and although depression and anxiety are common in patients with HF, little research on depression and anxiety in patients with HF addresses potential racial differences. Researchers who consider sociodemographic characteristics and racial differences to understand patients' experiences without bias are more likely to better understand racially influenced phenomena (Doll, 2018; Nayak et al., 2020; Sharma et al., 2014).

Doll (2018) proposed stratifying research by race using univariate and multivariate modeling to consider the socioeconomic and sociocultural influences on the outcome of interest. Further, Doll encouraged exploring race as a variable to assess unique features within data sets and to test mechanisms of known disparities, which this study aimed to accomplish. Although most research on patients with HF does not have findings stratified by race, scholars who choose to explore race as a variable of potential influence have identified racial disparities (Doshi et al., 2020; Minhas et al., 2022). Thus, stratification by race among patients with HF could help identify critical racial disparities to address. The current state of HF and accompanying disparities aligned with Phase II of the theoretical framework (see Figure 3). Research is needed to progress to Phase III, characterized by a reduction in inequalities secondary to new knowledge that informs the development of new interventions.

Figure 2

The Heart Failure Racial Disparities Reduction Framework

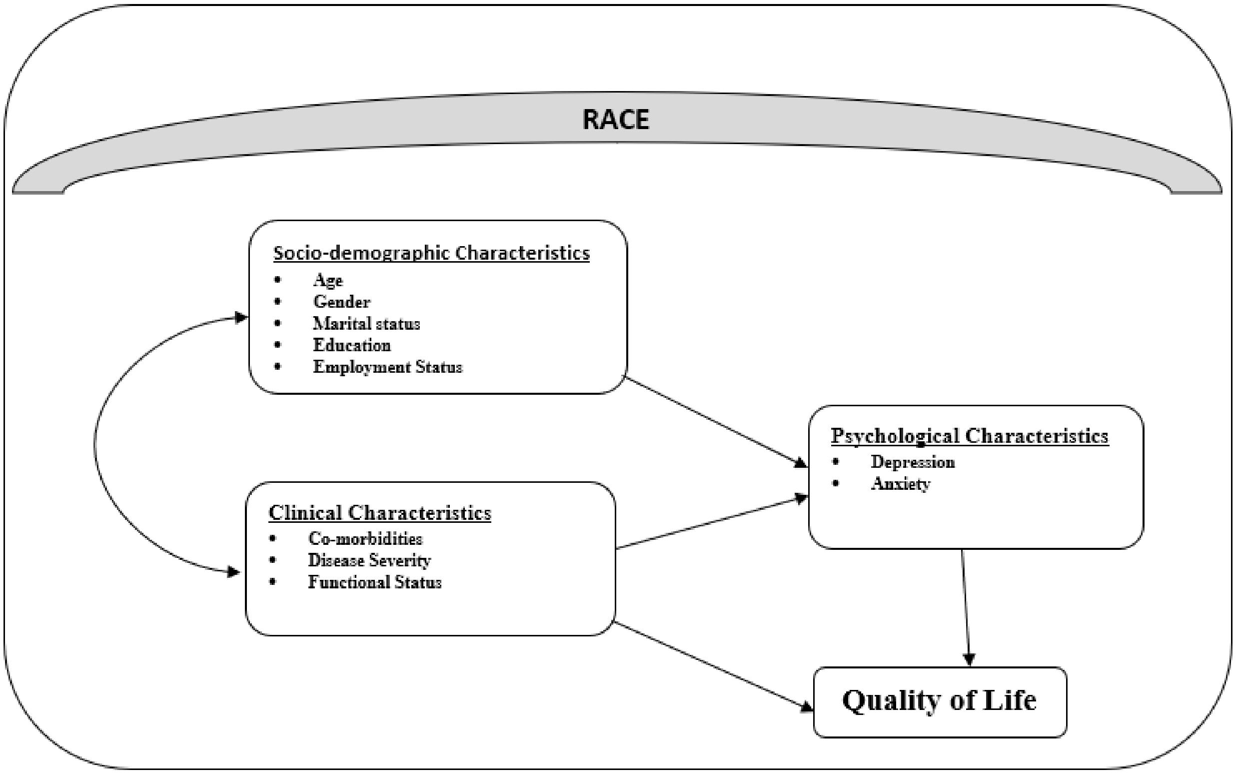
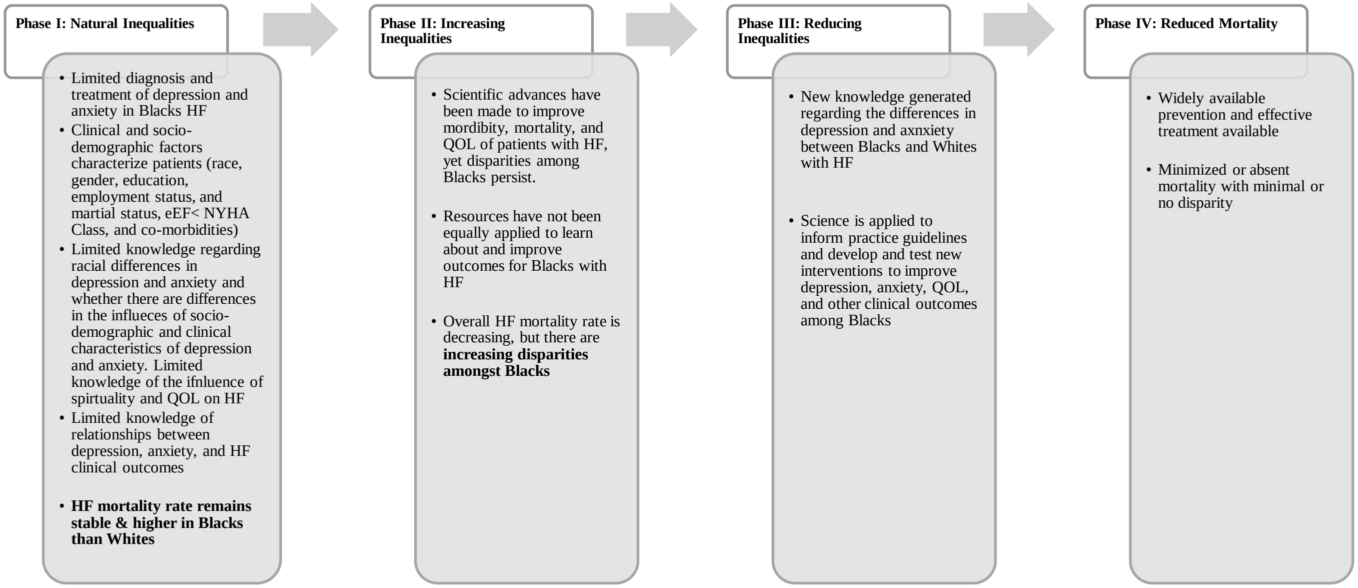


Figure 3

Application of Doll's Theoretical Framework to Disparities in HF



Phase I: Natural Inequalities

- Limited diagnosis and treatment of depression and anxiety in Blacks HF
- Clinical and socio-demographic factors characterize patients (race, gender, education, employment status, and martial status, eEF< NYHA Class, and co-morbidities)
- Limited knowledge regarding racial differences in depression and anxiety and whether there are differences in the influeces of socio-demographic and clinical characteristics of depression and anxiety. Limited knowledge of the ifnluence of spirtuality and QOL on HF
- Limited knowledge of relationships between depression, anxiety, and HF clinical outcomes
- **HF mortality rate remains stable & higher in Blacks than Whites**

Phase II: Increasing Inequalities

- Scientific advances have been made to improve mordibity, mortality, and QOL of patients with HF, yet disparities among Blacks persist.
- Resources have not been equally applied to learn about and improve outcomes for Blacks with HF
- Overall HF mortality rate is decreasing, but there are **increasing disparities amongst Blacks**

Phase III: Reducing Inequalities

- New knowledge generated regarding the differences in depression and axnxiety between Blacks and Whites with HF
- Science is applied to inform practice guidelines and develop and test new interventions to improve depression, anxiety, QOL, and other clinical outcomes among Blacks

Phase IV: Reduced Mortality

- Widely available prevention and effective treatment available
- Minimized or absent mortality with minimal or no disparity

This and subsequent studies generate new knowledge to foster progression to Phase III: Reducing Inequalities. The current study was an exploration and comparison of the sociodemographic (race, age, gender, marital status, education, and employment status), clinical (disease severity, comorbidities, and functional status), and psychological (depression and anxiety) characteristics; how they influence each other; and how they might influence QOL in Black individuals with HF differently from White individuals (see Figure 3). Comparing these sociodemographic, clinical, and psychological characteristics was a means to identify racial differences between Black and White patients with HF that might contribute to the increasing inequalities phase (Phase II) among Black patients with HF (see Figure 3). The current study entailed testing whether differences exist, measuring the magnitude of any differences, and measuring the influence of depression and anxiety in Black individuals with HF. Findings from this study could inform interventions that address and ultimately decrease racial disparities in clinical outcomes among Black individuals with HF. This research generated foundational new knowledge to inform the diagnosis, care, and treatment of depression and anxiety in Black individuals with HF.

Phase III of the adapted version of Doll's (2018) heart failure racial disparities reduction framework suggests that developing increased knowledge and innovative approaches could improve the diagnosis and treatment of depression and anxiety in patients with HF (see Figure 3), with better QOL and overall HF clinical outcomes. Additional contributions were novel treatment strategies, culturally competent care, and culturally responsive interventions that account for racial differences. Success in Phase III will lead to Phase IV: Reduced Mortality, which occurs when prevention and treatment are widely available to all patients with HF, with racial disparities significantly reduced or eliminated (see Figure 3).

Leveraging Doll's adapted framework (see Figure 3) to inform the heart failure racial disparities reduction framework (see Figure 2) might help to advance knowledge regarding disparities within the HF patient population and advance health equity. HF patients, their care, and the healthcare providers caring for them are not isolated components. The greater context of society, which includes race as a societal construct, could influence phenomena in the HF patient population and thus merited research consideration (Doll, 2018).

Literature Review

This literature review is an exploration of what is known about the influence of sociodemographic and clinical characteristics on psychological characteristics when comparing Black and White persons with HF. The published research regarding the influence of sociodemographic, clinical, and psychological characteristics on QOL receives discussion, with a focus on comparing potential differences between Black and White individuals with HF.

Sociodemographic and Clinical Characteristics

Sociodemographic characteristics, including age (Cleland et al., 2007; Li et al., 2008), gender (Boersma et al., 2020; Cleland et al., 2007; Kalsoom, 2020; Liew, 2012), marital status (Pindikura et al., 2019; Wang et al., 2021; A.-Z. Zhang et al., 2016), education (Liew, 2012; Pindikura et al., 2019; Wang et al., 2021), and employment status (Almawi et al., 2014; Balcells et al., 2010), influence depression and anxiety in patients with chronic illnesses. Likewise, clinical characteristics, such as disease severity (Di Marco et al., 2006; Kim et al., 2014), comorbidities (Ahn et al., 2017; Bell et al., 2005; Lim et al., 2011), and functional status (Gerogianni et al., 2014; McCann & Boore, 2000; Pumar et al., 2014) also influence depression and anxiety in chronically ill individuals. Investigators have found associations between having depression and anxiety and having one or multiple physical chronic illnesses (Assari, 2016;

Balcells et al., 2010; Johnson-Lawrence et al., 2013; Katon et al., 2007; Liew, 2012; Read et al., 2017; Watkins et al., 2015). In addition, some Black individuals are more likely than persons of other races to have multiple chronic illnesses (Johnson-Lawrence et al., 2013; Warner et al., 2019). Blacks could be at the greatest risk for depression and anxiety. Depression and anxiety in chronically ill persons negatively influence functional status (Lim et al., 2011), often already diminished in patients with HF.

Sociodemographic Characteristics. Based on existing research, sociodemographic (race, gender, marital status, education, and employment status) and clinical (disease severity, comorbidities, and functional status) characteristics might also influence psychological characteristics (depression and anxiety) in patients with HF (Ahmed et al., 2006; Chung, Moser, et al., 2009; Dekker, Lennie, et al., 2014; Freedland, Rich, et al., 2003; Gottlieb et al., 2004; Jiang et al., 2001; Johansson et al., 2006ab; Vaccarino, Kasl, et al., 2001; Rohyans & Pressler, 2009; Rutledge et al., 2006; Sharma et al., 2009; Trivedi et al., 2009). These characteristics could affect depression and anxiety in Black individuals in diverse ways compared to White individuals with HF, which further investigation might indicate.

Because sociodemographic factors play a role in depression and anxiety, there is a strong likelihood of racial, ethnic, and sociocultural factors having diverse impacts on the experiences of Black patients with HF and depression and anxiety (Dickson, McCarthy, et al., 2013ab; Riegel et al., 2011). However, race has not been a variable of potential influence in most studies of depression and anxiety in patients with HF. Investigators studying depression and, to a lesser extent, anxiety in patients with HF have controlled for several sociodemographic characteristics, including age (Dekker et al., 2014; Freedland, Rich, Skala, et al., 2003), gender (Dekker et al., 2014; Gottlieb et al., 2004; Jackson & Emery, 2011), marital status (Luttik et al., 2006; Rohyans

& Pressler, 2009), education (Dekker et al., 2014; Gottlieb et al., 2004; Vaccarino et al., 2001), and employment status (Freedland, Rich, Skala, et al. , 2003), and clinical variables, including disease severity (ejection fraction [EF] and New York Heart Association Classification [NYHA Class]; Benatar et al., 2003; Gottlieb et al., 2004), and comorbidities (Freedland, Rich, Skala, et al., 2003; Jiang et al., 2001; Sharma et al., 2009). However, researchers investigating depression and anxiety in patients with HF have rarely stratified depression and anxiety by race. There are likely racial differences when comparing minority patients, specifically Black and White (Rutledge et al., 2006).

Race. Race is a biological and social construct that influences health (Corbie-Smith et al., 2008) and a fluid concept used to group people based on various criteria, including ancestral background, social identity, and visible physical characteristics (Institute, n.d.). Race is an important consideration when investigating health disparities (Hill et al., 2015). In the present study, the conceptualization of race was the racial group (Black or White) with which a participant self-identified. Race received discussion within the context of knowledge regarding the sociodemographic, clinical, and psychological characteristics and QOL explored in this study.

Age. Age is the length of time from the beginning of a person's existence to a specific point in time (Merriam-Webster, n.d.-a). Age influences health in diverse ways (Charles & Piazza, 2009; Schöllgen et al., 2016; World Health Organization, n.d.) and should be a consideration when investigating various aspects of disorders (Geifman et al., 2013; Schöllgen et al., 2016). In this study, the concept of age was a self-reported numeric value that reflects an adult participant's chronological age.

Age is an important consideration when studying HF because HF symptoms vary based on age (Sethares & Chin, 2021). Research findings suggest that age influences depression and anxiety in patients with HF, psychological characteristics that might vary based on patient age (Celik et al., 2016; Dekker et al., 2014; Dickson et al., 2013; Easton et al., 2016; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Rohyans & Pressler, 2009; Trivedi et al., 2009; Vaccarino et al., 2001). However, these age-related findings differ are unstratified by race. Few researchers have investigated whether age might influence depression and anxiety differently in Black individuals than White individuals with HF.

Some investigators have found that younger age is commonly associated with greater depression (Athilingam et al., 2017; Chung, Lennie, et al., 2009; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Koenig, 1998; Mentz et al., 2015; Rohyans & Pressler, 2009; Stamp et al., 2014; Xiong et al., 2015) and anxiety (Dekker et al., 2014) in the general population of patients with HF. For example, Chung et al. (2009) found that younger age was associated with more depression. However, the sample was predominantly White (86%), and the researchers did not conduct a racial subgroup analysis on the Black sample. In another study, Celik et al. (2016) suggested that older age was associated with more depression but did not report race. However, in an all-Black sample of patients with HF, older age (> 62) was also significantly associated with more depression (t = 2.147, p = 0.168; Dickson et al., 2013).

Black individuals with HF tend to be younger than patients of other racial groups (Tandon et al., 2020; Virani et al., 2020, 2021) and might be at greater risk for depression and anxiety. Age could influence depression and anxiety differently among Black individuals. However, racial differences related to its influence are not well understood. In one of the few studies assessing relationships between age and anxiety, Dekker et al. (2014) found that younger age was associated with more anxiety. However, the researchers did not stratify their findings by race and grouped all minorities, which prevented isolating the findings related to Black individuals with HF. Because researchers have not sufficiently studied the intersection of age and race as influencers on depression and anxiety in the HF patient population, the potential relationship and whether there are Black-White racial differences in the influence of age on depression and anxiety in patients with HF is unclear. Further research on this topic is needed to account for covariates (Sokoreli et al., 2016). This study was a test for age-related racial differences in depression and anxiety among patients with HF.

Gender. Gender is a social construct determined by biological factors and societal norms, roles, and values. It is a social and cultural determinant of health that influences health-related outcomes in various ways (ORWH, n.d.). Exploring relationships between gender and illness could help identify within-group and between-group differences (Phillips, 2005). In addition, including gender in research informs prevention strategies and interventions for both men and women (ORWH, n.d.; Phillips, 2005; World Health Organization, n.d.). In this study, gender was characterized by the group (male or female) with which participants self-identified.

Although gender influences symptoms in chronically ill individuals (O’Neill & Morrow, 2001), women are underrepresented in HF research (Reza et al., 2022). However, HF symptoms, including depression (Heo et al., 2019) and various phenomena in patients with HF vary by gender (Hopper et al., 2016). Gender might also influence depression and anxiety in Black and White individuals with HF, yet these potential relationships have not received sufficient study. Some researchers have found that women are more depressed than men (Ahmed et al., 2006; Gottlieb et al., 2004; Jiang et al., 2001; Vaccarino et al., 2001; Xiong et al., 2015). In contrast, others identified no statistically significant differences in depression based on gender (Celik et al., 2016; Rohyans & Pressler, 2009; Sharma et al., 2009).

Ahmed et al. (2006) found that women in their prematched sample (*N* = 2,040) were more likely to be depressed than men ($p < 0.0001$), yet they did not stratify the findings by race. In another study, investigators found that women (64%) were more significantly depressed than men (44%), and Black women were more depressed than White women (Gottlieb et al., 2004), yet Black men were less depressed than White men. These varied findings suggest there might be racial differences in depression and anxiety based on gender, although more research is needed to determine potential relationships.

Although depression and anxiety are highly correlated (Celano et al., 2018; Herr et al., 2015), investigators have found differing relationships between anxiety and gender. For example, in a study conducted in Turkey, Celik et al. (2016) found that women were more anxious than men ($p < 0.05$). They observed no statistically significant relationship when comparing depression rates in males and females ($p > 0.05$). Race was not a variable reported in the study.

Because most researchers did not address the intersection of race and gender, it is unknown whether there are racial differences in the influence of gender on depression and anxiety in patients with HF. Some investigators (Dekker et al., 2014; Freedland et al., 2003; Gottlieb et al., 2004; Griffin et al., 2007; Jackson et al., 2011; Jiang, 2011; Rohyans & Pressler, 2009; Sharma et al., 2009; Vaccarino et al., 2001) have considered the influence of gender on depression and anxiety in patients with HF, but few have explored evidence suggesting there might be gender-related differences in depression and anxiety between Black and White patients with HF. As a result, the research is limited, and findings differ across studies. Although some investigators who have tested for gender differences have found that women with HF are more depressed than men, women are not well represented in the existing research (Reza et al., 2022). It is unclear whether depression and anxiety prevalence differ in men and women or whether other racial subgroup differences exist. An exploration of the impact of gender on depression and anxiety and its intersection with race is needed to enhance understanding. This study was a means to test for the potential influence of gender on depression and anxiety and differences in this influence based on race.

Marital Status. Marital status is defined as the state of being married or unmarried according to the civil laws or customs of a country and can include subcategories, such as separated, single, divorced, or widowed (Merriam-Webster n.d.-b; OECD, n.d.). In this study, marital status was an individual's self-identified membership in one of the categories delineating currently, previously, or never married. Examining marital status as a variable that could influence depression and anxiety aligns with the premises that marital status can influence mental health (Waldron et al., 1997), and married individuals have better health and well-being (Grundström et al., 2021) and lower mortality (Drefahl, 2012; Manzoli et al., 2007). Married persons with chronic illnesses experience less depression (Lam & Perales, 2017; Wang et al., 2021) than unmarried individuals, and there have been observable differences by race (Williams et al., 1992). Married individuals with cardiovascular illnesses have better clinical outcomes, including fewer adverse events and lower mortality rates than unmarried persons (Dhindsa et al., 2020; Manfredini et al., 2017; Potluri et al., 2019; Schultz et al., 2017).

Limited research regarding the influence of marital status on depression in patients with HF has shown varied results. Marriage can serve as a protective factor in patients with HF (Chung, Lennie, et al., 2009; Rohrbaugh et al., 2006), perhaps by providing companionship and decreasing the social isolation that patients with HF often experience (Dickson, McCarthy, &

Katz, 2013). Living alone is linked to depression in patients with HF (Johansson et al., 2006). Conversely, a live-in partner can provide social support that buffers some of the adverse effects of depression in patients with HF (Lee et al., 2017). Some investigators found that married patients have more depression (Celik et al., 2016). In a study conducted in Greece with a hospitalized sample of 190 patients, Polikandrioti et al. (2019) found that unmarried (single, divorced, and widowed) participants were significantly more likely to have major depression (35.6% vs. 19.2%, $p = 0.046$). However, they did not report race. In comparison, Rohyans and Pressler (2009) found no statistically significant differences in depression between married and unmarried patients ($t = 1.41$, $p = 0.16$) in a sample of patients with HF ($N = 150$; 31% Black). Their findings were not stratified by race, so the presence of racial differences is unclear. Although Chung et al. (2009) found no significant differences in depression among married and nonmarried patients with HF (10.9 vs. 12.2, $p = 0.39$), the sample was predominantly White (86%). The researchers reported no stratified findings and no data regarding the racial composition of the non-White sample.

Despite minimal research on the relationship between marital status and anxiety, the limited evidence suggests that marital status and anxiety are not associated (Celik et al., 2016). Although Celik et al. (2016) found a 33% anxiety prevalence in their sample, they observed no relationships between marital status and anxiety ($p = 0.98$) and did not report race. Despite infrequent explorations of the relationship between marital status and depression, investigators frequently examine relationships between marital status and clinical outcomes (i.e., rehospitalization and mortality). Chung et al. (2009) conducted a longitudinal study of a sample of patients with HF ($N = 166$) recruited from outpatient clinics at an academic medical center. The results showed that even when depressed, married patients with HF have lower morbidity and mortality rates than unmarried patients ($p = 0.012$), suggesting the potentially protective influence of having a marital partner. However, the researchers did not measure anxiety or report race among the sociodemographic variables.

In a study of patients with HF conducted in the Netherlands, investigators found that being married positively influenced clinical outcomes, such as rehospitalization rates, mortality, and QOL (Luttik et al., 2006). These relationships might be related to less depression and anxiety due to marital status and unmarried patients' lack of social support from a spouse. However, Luttik et al. (2006) did not report race, and more evidence is needed to support these potential relationships. Similarly, a recent meta-analysis of 10 studies to explore the influence of marital status on HF outcomes showed that unmarried status is associated with negative clinical outcomes, including increased risk of mortality (pooled OR = 1.52, 95% CI [1.30–1.78], $p < .001$), increased risk of rehospitalization (pooled OR = 1.80, 95% CI [1.18–2.74], $p = .007$), and increased risk of combined endpoint of mortality and rehospitalization (pooled OR = 1.72, 95% CI = 1.36–2.17, $p < .001$; Kewcharoen et al., 2021). These negative clinical outcomes could be related to undiagnosed depression and anxiety among unmarried patients with HF. Marital status might influence outcomes in patients with HF, but more evidence is needed to support this potential relationship.

Although some researchers found evidence suggesting that marital status might influence clinical outcomes in patients with HF, other researchers concluded that marital status did not influence clinical outcomes in patients with HF. In a study of 357 patients with HF, Watkins et al. (2013) found no association between marital status and negative clinical outcomes (HR = 0.71; 95% CI [0.35–1.49]). There were missing data, and although the sample included 183

Black patients, findings were not stratified by race, preventing comparisons between Black and White patients.

Marital status might influence depression and anxiety in patients with HF, and racial differences could exist. Still, there is very little specific evidence to support this potential relationship, and existing findings have not been stratified by race. Further investigation is needed to understand these potential relationships and determine if there are racial differences in the influence of marital status on depression and anxiety in patients with HF. This study included an assessment of the potential influence of marital status on depression and anxiety, with results stratified by race to better understand any potential relationships and if there are racial differences between Black and White individuals.

Education. Educational attainment level is “the highest level of schooling completed” or “the status of learning that has been achieved by a student” (American Psychological Association, 2022) attained by meeting a set of standards for acquired knowledge that individuals must master before completing an educational level. In this study, educational attainment level was characterized as education and referred to the highest level of education completed by each participant. Relationships between education and health are well-established (Ross & Wu, 1995), with greater educational attainment contributing to more positive health outcomes (Brunello et al., 2016; Ross & Mirowsky, 1999). Higher educational status is associated with greater health literacy (Andrus & Roth, 2002; Kickbusch, 2001), leading to better health outcomes (Berkman et al., 2011; Ferguson & Pawlak, 2011). Researchers have established relationships between higher levels of education and less depression and anxiety (Bjelland et al., 2008), with other studies showing that more-educated patients with cardiovascular illnesses have less depression and anxiety (Gorini et al., 2020).

Among patients with HF, depression and anxiety might differ based on education. However, few investigators have explored the relationships between education, depression, and anxiety (Celik et al., 2016; Gottlieb et al., 2004; Vaccarino et al., 2002), and there are few, if any, studies exploring the influence of education on depression and anxiety at the intersection of race. In a study with a majority-White patient sample (86% of $N = 166$), Chung, Lennie, et al. (2009) found that patients with HF who were less educated had more depression (44.5% vs. 63.6%, $p = 0.032$). Because the researchers did not report the races of the remaining 14% of the sample, whether there were racial differences in this observed relationship is unknown. Similarly, in a study with 231 participants in Greece, Aggelopoulou et al. (2017) found that lower educational status was associated with high levels of depression and anxiety. The researchers did not report race.

In the United States, Dekker et al. (2014) found an association between fewer years of education and more depression (10.8 vs. 13.5, $p < 0.001$) and more anxiety (33% vs. 17%, $p < 0.001$) in patients with HF. The sample included Black individuals, but the researchers grouped all minorities ($n = 206$); as a result, findings related to Blacks cannot be determined. Vaccarino et al. (2001) reported similar findings, indicating that less education was significantly associated with more depression ($p = 0.004$) in patients with HF. However, the limitations included a small sample size ($N = 79$), only 20% Black participants, missing data, and findings not stratified by race. In another study conducted in the United States, Gottlieb et al. (2004) found no differences in depression based on educational status ($p = 0.232$) in a sample of 155 patients with HF (57% Blacks, $n = 89$), yet without stratifying the results by race.

In a study conducted in Turkey, Celik et al. (2016) reported that lower educational status was associated with more severe depression ($p = 0.02$). There was no association between anxiety and education ($p = 0.28$). As with other studies, the researchers did not report race. Likewise, in a study in the Netherlands with a sample of 268 patients with HF, greater depression was associated with higher educational status ($\beta = 1.41$, SE = 0.48, $p = < 0.005$. However, anxiety was unmeasured and race unreported.

Few researchers have explored the relationship between education and anxiety in patients with HF. Dekker et al. (2014) found higher levels of anxiety among participants in their American sample ($N = 556$) who were less educated (less than a high school diploma; 33% vs. 17%, $p < 0.001$). Although the researchers included approximately 200 minorities in the sample, they did not isolate race among the minority group or stratify the findings by race. Yet, this finding on the overall sample is consistent with other studies that showed associations between lower levels of education and greater anxiety (Bjelland et al., 2008; Thurston et al., 2006).

Although education is not a variable frequently studied in relation to depression and anxiety in patients with HF, these potential relationships require exploration because low health literacy is related to lower educational status in patients with HF (Cajita et al., 2016; Peterson et al., 2011) and health literacy is often lower among Black individuals (Chaudhry et al., 2011; Morrow et al., 2006; Westlake et al., 2013). Additionally, lower health literacy is related to poor adherence to the prescribed HF regimen (Cajita et al., 2016; Deek et al., 2020) and negative clinical outcomes (Fabbri et al., 2020; Peterson et al., 2011) and might be associated with greater depression and anxiety. Poor adherence often leads to increased symptom burden and other adverse clinical outcomes, indirectly increasing depression and anxiety in patients with HF (De Jong et al., 2011; Easton et al., 2016; Rechenberg et al., 2020). Low health literacy might be indirectly related to educational status, but this potential relationship requires further exploration with a focus on testing for potential racial differences between Black and White individuals.

Education has implications for socioeconomic status (SES) and is an important variable in health disparities research (Shavers, 2007; Winkleby et al., 1992). Due to the limited explorations of relationships between education, depression, and anxiety, there is very little known about the presence of racial differences in the influence of education on depression and anxiety in Black and White individuals with HF. Because this study focused on potential racial differences between Black and White individuals with HF, education was a variable of interest to determine its association with depression and anxiety in patients with HF and whether there were racial differences between Black and White individuals.

Employment Status. Employment status is a person's situation in relation to the labor force. This status includes those who are engaged in work for pay or profit (employed), those who are jobless but available to work and have actively sought work within the past 4 weeks (unemployed), those out of the labor force (retired), and those who are eligible for the labor force but are neither employed nor unemployed (HealthyPeople.gov, n.d.). In this study, employment status was characterized as paid or volunteer work completed by the participant. Employment status is an important variable to consider when investigating health disparities, chronic illnesses, and health outcomes (Jones & Crews, 2013; Landsbergis et al., 2018) in Black individuals because employment has implications for SES (Stronks et al., 1997). In addition, financially distressed Black individuals are at risk for depression (Assari, 2019), highlighting the need to investigate the relationship between depression, anxiety, and employment status.

Although employment status is a critical sociodemographic variable to study within the HF patient population, it receives little consideration for its potential relationship to depression and anxiety in this patient population. However, because many patients with HF are disabled and unable to work, and unemployment can influence depression and anxiety (Ohlsson et al., 2021), there could be an unexplored relationship. In a study of inpatients with HF, Freedland et al. (2003) found that unemployment due to disability was significantly related to depression (n = 289, p = .0002, and n = 259, p = .0001), respectively, when assessed using two different measures of depression. However, the investigators did not stratify the findings by race. Ohlsson et al. (2021) identified a relationship between unemployment and increased mortality (adjusted HR = 1.76; 1.47, 2.11) among patients with HF, and adjusting for age and gender did not significantly change this estimate. However, the researchers conducted their study in Sweden and did not report race.

Unemployed and disabled patients with HF have greater mortality and worse clinical outcomes (García-Olmos et al., 2019; Ohlsson et al., 2021; Rørth et al., 2018). When considering disparities in depression and anxiety among Black and White individuals with HF, employment status merits investigation because economic burden contributes to the development and progression of depression in patients with HF (Havranek et al., 2004) and might contribute to negative clinical outcomes. Compared to White individuals, Black persons traditionally have lower SES (including income; Anderson & Armstead, 1995; Averbuch et al., 2021) and significantly more disabilities (Van Nuys et al., 2018). These racial differences might contribute to greater depression and anxiety in Black patients. However, there is insufficient evidence to support a relationship between employment status, depression, and anxiety in Blacks and whether differences are apparent when comparing Black and White patients.

Patients with HF need income from employment to meet their financial obligations, including the costly requirements of HF care and treatment. However, most are unemployed and receive disability benefits, as HF’s chronic and debilitating nature limits their ability to maintain employment (Seo et al., 2021). Because disability benefits are often lower than patients’ previous earnings, their financial needs might exceed available resources. Patients with HF who are less comfortable with their financial position are more likely to be depressed (Chung et al., 2009). For example, Cirelli et al. (2018) reported a relationship between home ownership and depression in a sample of patients with HF (*N* = 309), suggesting that patients with HF who have financial concerns might be at risk for depression. However, although the sample included 60 Black participants, the findings were not stratified by race.

In addition, multiple HF symptoms experienced by patients often significantly limit activities of daily living (ADLs), and many patients with HF have pronounced functional status limitations (Blinderman et al., 2008; Falk et al., 2008; Herr, Salyer, Flattery, et al., 2015; Herr, Salyer, Lyon, et al., 2014; Moser et al., 2014), which might limit their participation in physically demanding occupations they held prior to their HF diagnosis (Dickson et al., 2008). Patients must also engage in complex HF management that takes enough time to be considered work (Granger et al., 2009), which limits their capacity for employment. Individuals living with HF experience exacerbations that result in worsened symptoms, the need for healthcare provider intervention and hospitalization, and a restricted physical inability to work productively. This cyclical pattern of exacerbations and rehospitalizations make it challenging for patients with HF to maintain employment (Dickson et al., 2008).

Black individuals are diagnosed with HF at younger ages than their White counterparts (Virani et al., 2020, 2021). Younger patients might be at greater risk for depression because their illness prevents them from functioning in their expected roles, including employment (Johansson et al., 2006). The age and clinical outcome disparities among Black individuals with HF suggest that employment status could be an important variable to consider in this subpopulation of patients with HF. Specifically, these younger Black individuals might have financial obligations unmet by disability benefits, contributing to depression and anxiety. Financial strain can contribute to nonadherence with the prescribed treatment regimen (Tansey, 2010), leading to increased rehospitalizations, poor QOL, and a cyclical pattern of depression and anxiety. Conversely, employment can negatively impact patients' ability to effectively manage HF and engage in the prescribed regimen. However, employment can be a mood enhancer for some patients with HF (Dickson et al., 2008). Thus, employment status needs further exploration.

Despite the extremely limited study of employment status, especially in Black individuals with HF, employment is an essential measurement when considering racial disparities among chronically ill individuals (Beatty & Joffe, 2006; Vassilev et al., 2014; von Houtum et al., 2015; Walker, 2010; Wilson, 2001) and thereby, those with HF. Although investigations of relationships between depression, anxiety, and employment status are scarce, there could be relationships because of the economic burden of unemployment. Further study is needed to measure the influence of employment status on depression and anxiety in Black individuals with HF and compare this outcome to White individuals to determine whether there are racial differences. This study was an investigation of the potential relationships between employment status, depression, and anxiety and differences between Black and White individuals with HF.

Clinical Characteristics

Investigators have found associations between clinical characteristics, including disease severity (Dekker et al., 2014; Evangelista et al., 2009; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Jiang et al., 2001; McCarthy et al., 2015; Mentz et al., 2015; Rohyans & Pressler, 2009; Sharma et al., 2009), comorbidities (Freedland et al., 2003; Sharma et al., 2009), and functional status (Dekker et al., 2014; Herr, Salyer, Flattery, et al., 2015; Shen et al., 2010) with depression and anxiety. However, the findings differ and are not stratified by race. Clinical characteristics might influence anxiety, but these potential relationships in patients with HF is minimal and race-based findings are seldom, if ever, explored. Furthermore, instead of examinations for their potential influence on depression and anxiety, clinical variables are most often only reported descriptively in research studies.

Disease Severity. In patients with HF, disease severity refers to the accepted clinical criteria that denote the magnitude of symptoms and how HF limits physical activity and usual functioning (American Heart Association, 2017). In this study, disease severity conceptualization was with two variables: the left ventricular EF and NYHA Class. Left ventricular EF is the quantity of blood pumped out by the heart's left ventricle with each heartbeat. Expressed as a percentage, EF has a normal range of 50% to70%. The categories of EF are preserved (diastolic HF; < 40%) and reduced (systolic HF; < 35%). The heart muscle contracts normally with a preserved EF, but the ventricles do not relax as they should when refilling with blood. A reduced EF is evident when the heart does not contract effectively, thus pumping out less oxygen-rich blood to the body (Katz, 2013). In this study, EF was characterized as a percentage and was one of two values used to measure disease severity.

Relationships between depression, anxiety, and disease severity receive infrequent investigation; however, racial differences might exist when comparing Black and White individuals with HF. The NYHA Class provides a simple means of measuring the extent of HF, classifying patients into one of four categories based on their limitations during physical activity regarding normal breathing and varying degrees of shortness of breath and angina pain. NYHA Class includes four categories based on intensity, from Class I (mild) to Class IV (most severe). Patients in Class I have no activity limitations and no symptoms with ordinary activity. Patients with HF classified as NYHA Class II have slight limitations and slight to moderate symptoms with normal activity. Patients categorized as Class III have marked activity limitations and symptoms with less-than-normal activity. Finally, Class IV patients might have symptoms at rest and be unable to carry out physical activity without discomfort (American Hospital Association, 2017; Fleg et al., 2000). In this study, NYHA Class was conceptualized as a second measure of disease severity because it might have influenced depression, anxiety, and QOL differently in Black and White individuals with HF.

Ejection Fraction. Although this is a relationship not well explored by race, disease severity, as measured by the EF, is associated with depression in patients with HF (Adelborg et al., 2016). Freedland et al. (2003) found that depression was more prevalent among participants with lower EF in their sample (*N* = 682), which included 278 Black individuals (41%), but findings were not stratified by race. In a study of 172 patients with HF, Steca et al. (2013) reported an inverse relationship between disease severity and depression, suggesting that lower EF (worse disease severity) was associated with greater depression ($p < 0.001$). However, they conducted the study in Italy and did not report race. Adelborg et al. (2016) conducted another large study of patients with HF (*N* = 204,523) sampled from the Danish medical registries. The results showed that a history of depression was associated with all-cause mortality in patients with HF who had an EF ≤ 35% (MRR = 1.14, 95% CI [1.12–1.17]), which represented an approximately 20% higher mortality rate than patients without a history of depression.

If more investigators explored racial differences in outcomes based on EF, perhaps there would be more knowledge regarding the influence of EF on depression and anxiety by race. However, there is little knowledge because only a few scholars have explored relationships between EF, depression, and anxiety. Depression and anxiety might be associated with greater disease severity, as measured by the EF, and there could be differences between Black and White individuals. More evidence is needed to support potential relationships, especially related to anxiety. This study was an exploration of relationships between disease severity as measured by the EF, depression, and anxiety, comparing findings in Black and White patients with HF.

NYHA Class. Relationships between NYHA Class and depression and anxiety have received minimal study in patients with HF. Although some researchers have found associations between disease severity (NYHA Class) and greater depression (Bean et al., 2009; Chung et al., 2009; De Jong et al., 2011; de Leon et al., 2009; Dekker et al., 2014; Dickson, McCarthy, & Katz, 2013; Freedland, Rich, et al., 2003; Gottlieb et al., 2004; Rohyans & Pressler, 2009; Sharma et al., 2009; Trivedi et al., 2009), few considered race. In a study of 268 patients with HF in the Netherlands, Brouwers et al. (2014) found that depression was significantly associated with NYHA Class ($\beta = 2.43$, SE = 0.75, $p = 0.001$) at baseline (2.44, SE = 0.74, $p = 0.001$) and the 12-month follow-up ($\beta = 2.37$, SE = 0.85, $p = 0.005$; OR = 4.54, $p = 0.02$), even after adjusting for sociodemographic factors (OR = 4.85, $p = 0.02$). These results suggest a strong correlation between NYHA Class as a measure of disease severity and depression. Brouwers et al.'s study had limitations, as they did not examine anxiety or report race. In research conducted in Turkey, Celik et al. (2016) found no relationship between anxiety and disease severity as measured by the NYHA Class ($p = 0.31$), although a relationship emerged between depression and the NYHA Class ($p \leq 0.001$). Race was not reported. In a U.S. study, Chung, Moser, et al. (2009) identified an association between depression and higher NYHA Class (greater disease severity). Patients with depression had worse functional status (NYHA Class III–IV 83.3% vs. 50.5%, $p < 0.001$). However, White patients accounted for the majority of this sample (86%) and no findings were reported by race.

Dekker, Lennie, et al. (2014) found that patients with more severe HF (higher NYHA Class III or IV) were significantly more likely to be depressed (75% vs. 43%, $p < 0.001$) and anxious (64% vs. 41%, $p < 0.001$). Although the sample included 200 participants reported as a group of “minorities” who were “mostly Black,” the findings were not stratified by race and cannot be generalized to Black patients. In a mixed methods study of an all-Black sample of patients with HF ($N = 30$), Dickson et al. (2013) found an association between NYHA Class III and greater levels of depression ($t = - 2.477$, $p = 0.02$). Wierenga et al. (2017) reported findings related to clinical outcomes based on race. A secondary data analysis showed that NYHA Class (III and IV; 1.24, 95% CI [0.4–3.81], $p = 0.711$) and depressive symptoms ($\beta = 1.02$, 95% CI [1.02, 1.18], $p = 0.018$) were statistically significant predictors of shorter event-free survival in White but not Black individuals. The overall sample ($N = 863$) came from a multisite HF registry, and the Black sample was small ($n = 91$; 10.5%). This relationship might be related to the association between disease severity as measured by the NYHA Class, but more evidence is needed to support this potential relationship.

Among the limited research focused on relationships between anxiety and disease severity (NYHA Class), two studies found higher rates of anxiety based on NYHA Class (Dekker, Lennie, et al., 2014; Freedland et al., 2003). In a meta-analysis, Easton et al. (2016) found that lower NYHA Class was associated with increased anxiety. Few studies have explored the influence of disease severity on depression and anxiety, and the literature review showed only one that specifically tested for racial differences between Black and White individuals. Even fewer researchers have used both the NYHA Class and EF as measures of disease severity. With the employment of two measures, this study had an innovative approach to investigating the influence of disease severity on depression and anxiety. The potential influence of disease severity on depression and anxiety in Black and White patients with HF was also assessed to identify potential racial differences.

Comorbidities. Comorbidities are illnesses, diseases, or disorders simultaneously present in an individual (American Psychological Association, APA, 2022). In this study, comorbidities were conditions that co-occur with HF (Formiga et al., 2018), as determined by calculating a weighted taxonomy of co-occurring conditions and their prognostic implications (Charlson et al., 1987). Comorbidities are common in patients with HF (Dickson, Buck, & Riegel, 2011; Lang & Mancini, 2007; Wiley et al., 2018; Wong et al., 2011). They are associated with depression (Patel et al., 2018) and anxiety (Dekker et al., 2014) in patients with HF, and Black individuals with HF have more comorbidities than White individuals (Sharma et al., 2014). Measuring the influence of comorbidities on psychological characteristics and QOL is important because comorbidities can result in patients experiencing overlapping symptoms, which can influence study findings (de Groot et al., 2003). Among the common comorbidities observed in patients with HF are depression and anxiety (Celano et al., 2018; Dekker, Lennie, et al., 2014; Konstam et al., 2005; Lang & Mancini, 2007; Sokoreli et al., 2016; Yohannes et al., 2010). There might be racial differences in the number and influence of comorbidities on psychological, sociodemographic, and other clinical characteristics and QOL.

Ahmed et al. (2006) found that greater depression was associated with comorbidities (hypothyroidism, dementia, hypertension, coronary artery disease, diabetes, cardiac dysrhythmias, and acute renal failure) in a sample of 2,040 patients with HF. Although they included 240 Black patients, the researchers did not stratify their findings by race. Assari, Dejman, and Neighbors (2015) found comorbidities associated with depression in White patients with HF, but this association did not emerge in Blacks. From a predominantly Black sample, Sharma et al. (2009) concluded that comorbidities were associated with more depression in White patients with HF, but this association was not apparent in Blacks (*n* = 116, 86%). However, Freedland et al. (2016) found that depression rates were not affected by comorbidities, including diabetes or renal disease.

Relationships between comorbidities and anxiety are rarely explored. There is very minimal research on the general HF patient population, and none focused on differences between Black and White individuals with HF. Relationships between race, comorbidities, depression, and anxiety in patients with HF have not received sufficient exploration. Despite the limited data, the presence of multiple chronic illnesses might negatively influence Black individuals differently than White individuals. Black individuals with HF might have more comorbidities, such as hypertension, coronary artery disease, and diabetes, than their White counterparts (O’Connor et al., 2019; Parashar et al., 2009). There might be other racial differences related to comorbidities influencing levels of depression and anxiety. Although multiple chronic illnesses could adversely affect depression and anxiety in Black individuals differently than in White individuals, the potential relationships are unclear. Researchers have not presented a good understanding of whether there are racial differences in the influence of comorbidities on depression and anxiety. This study was a means to test for racial differences in the influence of comorbidities on depression and anxiety in Black and White individuals with HF.

Functional Status. Most patients with HF experience decreased functioning and activity limitations, which some investigators and providers might perceive as causing them to underestimate their functional abilities (Gottlieb et al., 2004). Patients whose functional status is not significantly and immediately affected by disease progression and intensified symptoms later experience functional status declines (Wong et al., 2011). These individuals’ struggles with changes in their lives, roles, functions, and independence contribute to depression and anxiety (Herr et al., 2015; Shen et al., 2010). For example, in an all-Black sample of patients with HF (***N*** = 30), Dickson, McCarthy, and Katz (2013) identified a significant association between depression levels and lower physical functioning status (***r*** = -0.418, ***p*** = 0.02). After controlling for other factors, Vaccarino, Kasl, et al. (2001) noted that functional decline at 6 months was higher among patients with more significant depression. Little is known regarding whether functional status declines or depression is the precursor for the other observation.

However, findings related to depression, anxiety, and functional status are limited overall. In addition, there is not a good understanding of whether differences in the relationships between functional status, depression, and anxiety exist between Black and White individuals. Limited studies have suggested relationships between depression, anxiety, and functional status with racial differences between Black and White individuals. For example, investigators have found that patients who are unable to perform ADLs were more depressed, and younger Blacks were more likely to have worse functional status (de Leon et al., 2009; Freedland et al., 2003). However, there were methodological issues, including the sampling of Black participants. Specifically, de Leon et al. (2009) and Freedland et al. (2003) excluded patients from the studies who were more likely to be Black, which could have confounded the results.

Clarke et al. (2000) found that patients with HF who were depressed and anxious and of a non-White race were more likely to experience severe limitations in ADL functioning after 1 year. However, the findings were not statistically significantly different when controlling for disease severity and comorbidities. A limitation was that Clarke et al. included all minority participants together rather than stratifying findings by race, thus preventing generalizing the findings to Black individuals.

Two other studies among patients with HF found that younger patients had worse general functioning than elder patients (de Leon et al., 2009; Gottlieb et al., 2004), suggesting that depression and anxiety might be even more debilitating for younger patients with HF and could have grave impacts on their functional status. There is a decreasing average HF patient age and an increase in the likelihood that Black individuals with HF are younger (Sharma et al., 2014; Tandon et al., 2019). Because Black individuals with HF are more likely to be younger than White individuals, depression and anxiety could be even more debilitating for younger patients, specifically younger Blacks with HF. As a result, functional status limitations could contribute to more depression and anxiety in Black individuals because of discrepancies between their realized functional status and their functional status expectations based on chronological age. These functional status limitations might contribute to depression and anxiety, and relationships could differ between Black and White individuals (Dickson, McCarthy, & Katz, 2013). However, there is insufficient evidence to support this potential relationship.

Depression and anxiety can result in decreased participation in the HF treatment plan, leading to worse health status and ultimately contributing to diminished functioning among patients with HF (Dickson, McCarthy, et al., 2013; Dickson, McCarthy, & Katz, 2013). Lack of patient participation in the treatment plan results in a cyclical pattern contributing to negative clinical outcomes (Sevilla-Cazes et al., 2018). Although studies regarding functional status, depression, and anxiety are limited—and those considering race even rarer—available evidence suggests that these potential relationships warrant further exploration.

Findings regarding relationships between functional status and depression and anxiety in patients with HF are difficult to compare because researchers have used various measures of functional status. Among the measures used are the NYHA Class (Bean et al., 2009; De Jong et al., 2011; de Leon et al., 2009; Dekker, Lennie, et al., 2014; Dickson, McCarthy, & Katz, 2013; Freedland et al., 2003; Gottlieb et al., 2004; Rohyans & Pressler, 2009; Sharma et al., 2009; Trivedi et al., 2009) and the Duke Activity Status Index (Dekker, Lennie, et al., 2014; Dickson, McCarthy, & Katz, 2013). However, the NYHA Class is not optimal as a sole measure of disease severity because it is a clinician's assessment of a patient's functional status at a specific time point. Because HF involves frequent fluctuations in severity and patient condition a documented NYHA Class is accurate at the time of assessment and might not remain accurate indefinitely. Additionally, disease severity should include patients' subjective perception that is not captured by and might differ from a healthcare professional's assessment of their condition (Caraballo et al., 2019; Raphael et al., 2007; Severo et al., 2011).

Still, the research shows an association between depression and lower functional status as measured by the NYHA Class (Dekker et al., 2014; Dickson, McCarthy, & Katz, 2013). The present study assessed NYHA Class and EF as measures of disease severity and measured their relationships with depression, anxiety, and QOL. Functional status was also assessed using a valid and reliable measure and its relationship to depression, anxiety, and QOL was investigated.

Functional status is an important variable to measure because declines are common in patients with HF (Salyer, 2015). Declines might directly or indirectly relate to depression and anxiety, influencing patients' energy levels and engagement in managing HF. Thus, improving functional status might reduce depression (X. Zhang et al., 2020). However, most existing studies did not report or compare findings by race. Obtaining a better understanding of the potential relationships and whether there are differences between Black and White patients with HF is needed.

Limited evidence suggests there might be relationships between sociodemographic, clinical, and psychological characteristics in the general HF patient population. However, not enough is known about these potential relationships and the influence of clinical characteristics (disease severity, comorbidities, and functional status) on Black individuals. The presence of differences between Black and White individuals remains unclear due to minimal research comparing racial groups. There is a need for further investigation regarding the potential influences of these clinical characteristics on depression and anxiety and whether any racial differences exist. This study was an exploration of whether there are differences in the influence of sociodemographic characteristics (age, gender, marital status, education, employment status), clinical characteristics (disease severity, comorbidities, and functional status) on psychological characteristics (depression and anxiety) and QOL and a comparison of the potential influences by race in Black and White individuals with HF.

Psychological Characteristics

Chronically ill patients frequently experience depression and anxiety (Assari, Dejman, & Neighbors, 2016; DeJean et al., 2013; Yohannes et al., 2010), symptoms commonly observed in patients with HF. Depression and anxiety can occur independently (Cully et al., 2009; Konstam et al., 2005; Sokoreli et al., 2016; Tsabedze et al., 2021) or together (Celano et al., 2018; Dekker, Lennie, et al., 2014; Yohannes et al., 2010). Although both conditions negatively impact patients with HF, the relationship between depression and anxiety and their comorbidity is not well understood. Little is known about the potential difference in relationships between Black and White patients with HF.

Depression. Depression and depressive symptoms are common in patients with HF (Celano et al., 2018; Ishak et al., 2020; Joynt et al., 2004; Konstam et al., 2005; MacMahon &

Lip, 2002; Rutledge et al., 2006). Although depressive symptoms present similarly to depression, they are less severe and do not meet the diagnostic criteria for depression; however, both conditions negatively impact patients with HF (Alhurani et al., 2015; Celano et al., 2018; Konstam et al., 2005; Nair et al., 2012; Rustad et al., 2013). In this study, “depression” represented both clinical depression and depressive symptoms (see Ahmed et al., 2006).

According to the American Psychological Association (2020), depression, also referred to as major depressive disorder, is a common, serious illness that lasts 2 or more weeks and negatively affects thoughts, feelings, and actions. Depression results in emotional and physical symptoms of varied intensity, including sadness, despondence, hopelessness, helplessness, apathy, loss of interest or pleasure in activities once enjoyable, changes in appetite (weight gain or loss unrelated to dieting), anergia, fatigue, increase in purposeless physical activity (or slowed movements or speech), feeling worthless or guilty, difficulty thinking, concentrating, and making decisions, insomnia, sleeping too much, and suicidal thoughts (American Psychiatric Association, 2020). Depression and depressive symptoms are positively correlated with anxiety (Dickson et al., 2013;).

Depression contributes to adverse clinical outcomes (Freedland, Hesseler, et al., 2016; Sokoreli et al., 2016) yet remains understudied in all patients with HF (Ahmed et al., 2006; Bhatt et al., 2016; Holzapfel et al., 2008). Although Black individuals have the worst clinical outcomes of any racial subpopulation with HF (Benjamin et al., 2017; Go et al., 2013; Roger et al., 2012; Tsao et al., 2022; Virani et al., 2020, 2021), they are underrepresented in depression-related HF research (Evangelista et al., 2009).

Much like the differences observed when comparing Black and White patients in other chronically ill populations (Ani et al., 2009; Assari, Burgard, & Zivin, 2015; Assari, Dejman, &

Neighbors, 2014; Ellis et al., 2015; Ghods et al., 2008; Hill-Joseph, 2019; Hollingshaus & Utz, 2013; Johnson-Lawrence et al., 2013; Li et al., 2008; Mouzon, 2017), differences in depression could become apparent with the exploration of racial differences. However, studies comparing depression rates in Black and White individuals with HF are limited (Evangelista et al., 2009), and findings vary. Some researchers found Black individuals more depressed than White individuals (Dekker, Lennie, et al., 2014; Evangelista et al., 2009). Other studies showed less depression in Black people compared to White (Ahmed et al., 2006; Koenig, 1998; Stamp et al., 2014; Vaccarino, Kasl, et al., 2001; Wierenga et al., 2017) or no statistically significant racial differences in depression between Black and White individuals with HF (Freedland et al., 2003; Gottlieb et al., 2004; Griffin et al., 2007; Piamjariyakul et al., 2013; Rohyans & Pressler, 2009; Xiong et al., 2015).

The limited studies showing Black individuals had more depression than Whites (Dekker et al., 2014; Evangelista, Ter-Galstanyan, Moughrabi, & Moser, 2009) had small Black samples or other methodological issues. More research is needed to better understand whether there are differences in depression in Black and White individuals with HF. For example, in a secondary analysis of an outpatient sample of patients with HF, Dekker et al. (2014) reported that minorities, mostly classified as Black ($N = 200$; 36%), were more depressed than Whites. However, grouping all minorities might have confounded race-related findings.

From a sample of 241 patients with HF (7% Black; $n = 18$) recruited from an outpatient HF clinic, Evangelista et al. (2009) found that Black race was a significant predictor of depression ($\beta = -0.153$, $p = 0.020$). Although there was a trend when comparing depression in Black and White individuals with HF, these relationships were not statistically significant ($p = 0.063$). A post hoc analysis indicated that Blacks were more likely to be depressed than

Hispanics ($F = 3.544$, $p = 0.026$), suggesting that race might influence depression rates in the HF patient population. However, the Black sample in this study was small (7%), and the researchers attributed the lower depression scores observed to their outpatient study setting. Six months or less had elapsed since the participants in their sample had last been hospitalized, which could have resulted in lower rates of depression. This finding is consistent with other studies who have found that hospitalized patients with HF are at risk for higher levels of depression (Albert et al., 2009; Freedland et al., 2003; Polikandrioti, 2019) compared to community-dwelling patients.

Multiple studies have found that Black individuals have less depression than Whites (Ahmed et al., 2006; Koenig, 1998; Stamp et al., 2014; Vaccarino, Kasl, et al., 2001; Wierenga et al., 2017). In a study of 391 inpatients at an academic medical center, Vaccarino, Kasl, et al. (2001) found that Black individuals ($n = 79$) were significantly less depressed than other races (mean = 6.81 ± 2.33, $p = 0.02$). Ahmed et al. (2006) conducted a retrospective study of 2,720 participants (8.8% Black; $n = 240$) from all 50 states and the District of Columbia using the National Hospital Discharge Survey 2001–2003 data sets. The findings showed that among depressed patients in the randomized postmatched sample ($n = 680$), only 8.7% ($n = 59$) of Black individuals were depressed, as determined by ICD-9-CM coding. However, patients in the prematched sample who were depressed were less likely to be classified as Black ($p = 0.002$). Although Black race was not a significant predictor of depression in the overall post matched sample ($p = 0.876$), the depression prevalence among Black individuals accounted for 24.6% of the Black randomized, postmatched sample ($n = 240$; Ahmed et al., 2006).

Although Ahmed et al. (2006) provided insight into depression rates among Black individuals in large samples from various geographic locales, the measurement of depression could have confounded results. The findings might have varied if they used a screening tool with demonstrated validity and reliability in measuring depression or different statistical analytic approaches. Using ICD-9-CM coding as a measure of depression limits the findings to depression officially diagnosed and documented by a health care provider. This limitation is problematic because depression is underdiagnosed and undertreated in the HF patient population (Ahmed et al., 2006; Bean et al., 2009; Celano et al., 2018; Dekker, Lennie, et al., 2014) and especially in Black individuals with HF (Bean et al., 2009; Dickson, McCarthy, & Katz, 2013; Evangelista et al., 2009). Relying on ICD-9/10 coding to identify depression likely results in the under identification of patients who are depressed. Additionally, depressive symptoms, although debilitating to patients (Dekker, Lennie, 2014; Dekker, Peden, et al., 2009; Havranek et al., 2004; Lesman-Leegte et al., 2009; Rumsfeld et al., 2003; Vaccarino, Kasl, et al., 2001), are not recognized as a diagnosis that can be captured based on ICD-9/10-CM coding.

Some studies have found no racial differences in depression among Black and White individuals with HF (Freedland et al., 2003; Gottlieb et al., 2004; Griffin et al., 2007; Piamjariyakul et al., 2013; Rohyans & Pressler, 2009; Xiong et al., 2015). For example, in a secondary analysis of data from the SADHART-CHF RCT (randomized controlled trial) that included 155 patients with HF recruited from an outpatient academic HF practice (39% Black; $n = 60$), Xiong et al. (2015) found no baseline racial differences in depression ($\chi^2 = 9.40$, $p = 0.15$). However, 48 Black patients in the sample (80%) were categorized as mildly ($n = 17$), moderately ($n = 24$), or severely ($n = 7$) depressed. In another study of 155 patients with HF (57% Black; $n = 89$), Gottlieb et al. (2004) found that 48% of the overall sample was depressed, and 53.3% of those depressed were Black ($n = 40$). However, the researchers identified no statistically significant differences in depression rates when comparing Black patients ($n = 89$) and White patients ($n = 65$; $p = 0.344$).

Among participants recruited from primary care and HF clinics (*N* = 150), Rohyans and Pressler (2009) found that 28% of the overall sample was depressed. However, there were no statistically significant differences in depression in Black individuals (31%; *n* = 47) compared to White individuals (67%; *n* = 101; *t* = 1.06, *p* = 0.29). Finally, in a secondary analysis of data from a randomized controlled trial conducted in a sample of patients with HF, investigators found that there were no baseline differences in depression in Blacks (*n* = 77) when compared to Whites (*n* = 93). However, after a nurse-led group discussion intervention, Black individuals had a statistically and clinically significant reduction in depression of 4.19 points compared to White individuals (*F* = 3.99, *p* = 0.047; Piamjariyakul et al., 2018). These findings suggest that Black individuals with HF who experience depression might benefit from tailored interventions. However, there should be more research regarding potential racial differences in the rates and nature of depression and relationships to anxiety, sociodemographic and clinical characteristics, and QOL in Black and White individuals before determining effective interventions.

Although depression among Black individuals with HF is underdiagnosed and undertreated (Dickson, McCarthy, & Katz, 2013; Lewis, 2011; Mentz et al., 2015), it is often more debilitating when compared to White patients (Mentz et al., 2015). For example, some researchers have found that Black patients with depression were more likely to have worse clinical outcomes, greater mortality, and greater risk for rehospitalization (Mentz et al., 2015). Depression is an undertreated condition in patients with HF, especially in Black patients (Sharma et al., 2009), and Black individuals are less likely to have an antidepressant prescription (Lewis et al., 2011). Although some depressed patients with HF receive antidepressant prescriptions, they remain depressed (Chung et al., 2013; Freedland, Hesseler, et al., 2016; Jiang et al., 2001) either because the prescribed treatment is ineffective, or because these patients are not following the prescribed treatment regimen. Sharma et al. (2009) studied a predominantly Black sample of patients with HF (86%; *N* = 116) recruited from three emergency departments in New York City. The researchers found a depression prevalence of 45% and concluded that depression in Black individuals is frequently untreated yet more debilitating than in White individuals. Dickson, McCarthy, and Katz (2013) conducted a mixed methods study with an all-Black sample of patients with HF (*N* = 30) recruited from a HF clinic and inpatient units at an urban medical center. The findings showed that 40% of the sample was depressed, but none were prescribed antidepressants.

Freedland et al. (2016) conducted a prospective cohort study at an urban academic medical center with a sample of 662 inpatients with HF (40% Black). They found that 39.6% (*n* = 42) of participants with minor depression and 42% (*n* = 55) with major depression were Black. Although these investigators found high rates of depression among Black individuals in their sample, major depression did not significantly influence survival in Black individuals with HF ($p = 0.14$), despite its observable influence in White individuals ($p < 0.0001$). Conversely, minor depression significantly influenced survival in Black individuals with HF ($p = 0.0003$) but did not have the same effect on White individuals ($p = 0.95$). These findings suggest that there might be racial differences and that lower levels of depression can have more pronounced effects on Black individuals with HF. Accordingly, depressive symptoms that do not meet the diagnostic criteria for clinical depression could be especially debilitating to Black individuals with HF and contribute to negative clinical outcomes and even persistent disparities. However, these relationships require further exploration to better understand racial differences in the influences on depression in Blacks compared to Whites and in whether the severity of depression influences Black patients differently than Whites.

Because Freedland et al. (2016) used the DSM-IV/DSM-5 criteria to measure depression, the observed depression rates excluded depressive symptoms and might have been underestimated. Although depressive symptoms result in adverse clinical outcomes for patients with HF (Celano et al., 2018; Freedland et al., 2011), the DSM-IV/DSM-5 is a source to diagnose major depression and not screen for depressive symptoms, leading to an underestimation of depression. Based on these findings, it seems as though depression in Black patients remains underdiagnosed and undertreated, yet it is debilitating to them and results in negative clinical outcomes. This trend might be among the reasons that disparities have persisted among Blacks with HF.

In addition to individual studies, investigators have conducted systematic reviews and meta-analyses on depression incidence among HF patients (Celano et al., 2018; Ishak et al., 2020; Johansson et al., 2006; Joynt et al., 2004; Konstam et al., 2005; MacMahon & Lip, 2002; Rutledge et al., 2006; Sokoreli et al., 2016), yet none reported findings based on race. Perhaps these investigators did not consider race an important construct to include in their analyses, or the sample sizes were too small to analyze (Rutledge et al., 2006). In addition, because few researchers have tested for racial differences across several studies or large enough samples, the literature lacks a reliable summary of potential racial differences in depression between Black and White individuals. This study yielded new knowledge through an investigation of potential differences in depression and anxiety in Black and White individuals with HF to determine whether there are racial differences.

Anxiety. Anxiety disorders include feelings of stress, nervousness, anxiousness, excessive fear, and anticipation of a future concern and incorporate muscle tension and avoidance behavior that impacts functioning (American Psychiatric Association, 2017). Anxiety symptoms are similar to anxiety disorders but do not meet the diagnostic criteria for the diagnosis; however, both the symptoms and the disorders negatively affect patients with HF (Konstam et al., 2005; Lenze et al., 2000; Rechenberg et al., 2020). For this dissertation, “anxiety” referred to both anxiety that meets the diagnostic criteria and anxious symptoms that do not meet the criteria for generalized anxiety disorder yet are clinically significant and negatively impact patients with HF (see Pelle et al., 2008).

Although anxiety is common in patients with HF, it is significantly understudied among this patient population (Celano et al., 2018; Dekker et al., 2014; Konstam et al., 2005; MacMahon & Lip, 2002; Sokoreli et al., 2016). Few researchers have considered anxiety in Black individuals with HF or whether there are racial differences between Blacks and Whites (Evangelista et al., 2009). The findings from these limited studies have been inconsistent, showing that Black individuals had more anxiety or less anxiety or no statistically significant differences in anxiety between Black and White individuals with HF.

A few researchers have found that Blacks are more likely to be anxious (Dekker, Lennie, et al., 2014; Evangelista et al., 2009) compared to Whites. Dekker, Lennie, et al. (2014) recruited an outpatient sample (N = 556; 36% minorities) from three Southeastern and Midwestern academic medical centers and clinics. These investigators reported a 23% (n = 130) anxiety prevalence in their overall sample, which was 36% minority (n = 200) and mostly Black. The results showed a significantly higher proportion of anxious patients who were minorities (43% vs. 29%, $p < 0.001$). However, because the researchers categorized all minorities together, they did not indicate the specific races of participants and did not isolate Black participants in the analysis. Combining all minorities might have confounded results. Accordingly, readers cannot determine the specific potential relationship between anxiety and Black individuals with HF and any potential racial differences compared to Whites.

Examining a sample of 241 patients with HF (60.7% White, 22.8% Hispanic, and 7% Black) recruited from an outpatient clinic, Evangelista et al. (2009) found that 40% of the overall sample was anxious. In a post hoc analysis, the investigators concluded that Black individuals (*n* = 18) were more likely to be anxious than Whites (*f* = 3.107, *p* = 0.048). A limitation of the study was the small Black sample.

Other evidence suggests that Black individuals with HF might have less anxiety than White individuals with HF. Bean et al. (2009) conducted a cross-sectional study with a sample of 97 patients with HF (48 Black [49.5%], 46 White [47.4%], and three Hispanic [3.1%]) recruited from the inpatient setting at a large, urban medical center and cardiac clinic. The results showed that only 8.2% (*n* = 8) of the sample was anxious. Bean et al. also found that 6.2% (*n* = 3) of Black participants and 10.2% (*n* = 5) of Whites were anxious, suggesting that Black individuals might have less anxiety than Whites. However, the overall study sample was small, yielding small racial groups for analysis. The researchers identified the need for more research focused on the Black population to determine whether existing knowledge is generalizable to Black individuals. In Cully et al.’s (2009) study of 158 patients with HF, the observed anxiety prevalence was 25.3%. However, White race was used as the referent group, resulting in only two racial categories and all non-White patients (37%; *n* = 27) categorized together.

Finally, some studies found no statistically significant differences in anxiety when comparing Black and White patients with HF. Evangelista et al. (2009) recruited a sample of 241 patients with HF (7% Black; *n* = 18) from an outpatient HF clinic. Although there was a trend when comparing anxiety in Black and White individuals with HF, these relationships were not statistically significant (*f* = 3.107, *p* = 0.290). However, because the Black sample was small, it is unclear if this finding can be generalized to the HF patient population.

De Jong et al. (2011) found that 54% of their sample (*N* = 147) recruited from Midwestern outpatient academic medical centers and clinics had more than double the anxiety levels of healthy adults. Anxiety independently predicted event-free survival after adjusting for age, gender, NYHA Class, EF, ACE inhibitor use, and beta blocker use. Further, patients with greater anxiety levels were more likely to visit the emergency department, be hospitalized, and die. However, the Black patients accounted for 11% of the sample (*n* = 16), and no racial subgroup analysis occurred to assess for racial differences. In summary, research related to racial differences between Black and White patients with HF does not provide enough insight into these phenomena. Anxiety levels in patients with HF could contribute to adverse clinical outcomes and disparities. There is a need to better understand anxiety in Black patients with HF and whether there are racial differences. The proposed study will be an assessment of these relationships.

Comorbid Depression and Anxiety. Limited research suggests that depression and anxiety frequently co-occur (Dekker et al., 2014; Evangelista et al., 2009; Salyer et al., 2019). However, their comorbid occurrence and its influencing factors are unknown. Findings specific to Black individuals with HF are minimal, yet they could be significant contributors to the disparate clinical outcomes in this sub-patient population (Benjamin et al., 2017; Go et al., 2013; Roger et al., 2012; Virani et al., 2020, 2021). Dekker, Lennie, et al. (2014) found that depression and anxiety highly correlated in their sample of 556 patients with HF recruited from academic medical centers and clinics in the U.S. Southeast and Midwest, and that depression was a predictor of anxiety. The results showed that 32% of the sample had both depression and anxiety, 58% (*n* = 179) of the patients who were anxious (*n* = 309) had comorbid depression, and 91% of the patients who were depressed (*n* = 179) were anxious. Minorities comprised 36% (*n* = 200) of the sample, and Dekker et al. concluded that minorities were more likely to have comorbid depression and anxiety.

Because the researchers reported the findings for all minorities together, data specific to Black individuals with HF cannot be isolated. As a result, there is little known about comorbid depression and anxiety in patients with HF. Even less is known specifically about Black patients or whether racial differences in comorbid depression and anxiety exist when comparing Black and White patients. The impact of comorbid depression and anxiety in Black individuals with HF is unclear due to the lack of exploration of the phenomenon. Black individuals with HF might mirror the general HF patient population in that co-occurring depression and anxiety are common, underdiagnosed, and undertreated yet negatively impact clinical outcomes (Celano et al., 2018; Cully et al., 2009a, 2009b; Dekker, Lennie, et al., 2014; Evangelista, et al., 2009; MacMahon & Lip, 2002; Yohannes et al., 2010). A better understanding of comorbid depression and anxiety in patients with HF, the sociodemographic and clinical characteristics that might influence the phenomenon, and whether relationships differ by White race and Black race is needed. Studying the influence of race on anxiety in Black patients with HF is essential to determine the comorbid prevalence in this subpopulation and identify whether racial differences exist.

Depression and anxiety might be more difficult to diagnose in Black individuals with HF than in White individuals because of ethnic/sociocultural differences; reported rates might be inaccurate (Dickson, McCarthy, et al., 2013; Dickson, McCarthy, & Katz, 2013). Providers cannot rely on Black individuals to self-report depression and anxiety or request screening or treatment because they are less likely to use mental health services than White individuals (Alegría et al., 2008; Cook et al., 2014; Das et al., 2006; Ojeda & McGuire, 2006). Black patients have stated that they seldom reported or admitted their feelings of depression and anxiety to health care providers (Dickson, McCarthy, & Katz, 2013; Gottlieb et al., 2004; Sharma et al., 2009). This lack of disclosure could be because Blacks might perceive depression and anxiety differently than other races. They might not use the term "depression" but consider themselves overwhelmed with sadness or lacking energy (Dickson, McCarthy, & Katz, 2013). Further, some Black individuals with HF might hold negative attitudes about depression and anxiety based on stigma. Withholding these subjective symptoms could signify a cultural difference that contributes to underdiagnosis and undertreatment among Black individuals with HF (Das et al., 2006).

Depression and anxiety could vary by race (Dickson, McCarthy, et al., 2013), but limited knowledge regarding this phenomenon exists. Yet, differences in clinical outcomes between Black and White individuals with HF suggest the need to explore possible racial differences. Several methodological issues, including measurement and sampling, might influence or confound existing findings related to depression and anxiety in Black and White individuals with HF. To better understand whether racial differences in depression and anxiety are present among Black and White individuals with HF, more research is needed that considers race as an important construct with the potential to influence outcome variables (Doll, 2018). This study was among the few investigations of Black/White racial differences in depression and anxiety among patients with HF.

Quality of Life. QOL is a subjective, multidimensional concept encompassing various aspects of well-being and incorporating individual preferences, experiences, and perspectives

(Cella, 1994; Felce & Perry, 1995; Heo et al., 2009). In this study, QOL was characterized as life satisfaction (Ferrans & Powers, 1985) and defined as individuals’ sense of well-being based on their satisfaction or dissatisfaction with the aspects of life they deem most important (Ferrans, 1990). QOL in this context is holistic, including various domains, the subjective evaluation of each domain, and the unique level of importance assigned to each domain by the individual (Ferrans & Powers, 1985). The domains contribute to four major dimensions of QOL: health and functioning, psychological/spiritual, social and economic, and family (Ferrans, 1990; Ferrans & Powers, 1985).

Depression and anxiety in chronically ill patients, particularly when undiagnosed and untreated, contribute to decreased life satisfaction, reduced QOL (Lim et al., 2011), including poor health-related quality of life (Balcells et al., 2010; Brown et al., 2010; Chuquilín-Arista et al., 2021; Lim et al., 2011; Liu et al., 2020; Sadlonova et al., 2021; Strine et al., 2008; von Leupoldt et al., 2011) and negative clinical outcomes (Assari, 2014; McLaughlin et al., 2005; Ryu et al., 2016; Sidell, 1997; Whittemore & Dixon, 2008), including greater morbidity, health care utilization (Ani et al., 2009), and mortality (McLaughlin et al., 2005; Sadlonova et al., 2021). Chronically ill Black individuals have worse QOL than their White counterparts (Jackson-Triche et al., 2000).

The chronicity of HF and the nature, intensity, and duration of symptoms, such as the physical and psychosocial symptoms experienced by patients with HF (Alemoush et al., 2021; Bekelman et al., 2007; Hwang et al., 2014; Rechenberg et al., 2020; Salyer et al., 2019), can negatively impact QOL (Bekelman et al., 2007; Cella, 1994; Salyer et al., 2019). Limited evidence suggests that QOL in Black individuals can differ from that observed within the general HF patient population (Warnecke et al., 1996). Although these differences are not well understood, depression (AbuRuz, 2018; Aggelopoulou et al., 2017; Bekelman et al., 2007; Chung, Moser, Lennie, & Rayens, 2009; Chung, Moser, Lennie, & Frazier, 2013; Cully et al., 2010; Gottlieb et al., 2004; Mentz et al., 2015; Salyer et al., 2019b; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009) and anxiety (AbuRuz, 2018; Aggelopoulou et al., 2017; Chung, Moser, Lennie, & Rayens, 2009; Polikandrioti et al., 2019; Salyer et al., 2019) can negatively impact QOL in patients with HF and might impact Black individuals differently than Whites.

In a study of 695 patients with HF of whom 227 were Black (33%), de Leon et al. (2009) found that greater depression was associated with lower QOL (-0.082, SE = 0.0005, $p < 0.001$) and that Black individuals had better QOL than White individuals (-0.550, SE = 0.148, $p < 0.05$). However, the Black patients in de Leon et al.'s sample reported worse QOL based on their self-perceptions, which differed from the scores derived from the measurement. These findings suggested a possible relationship between depression and QOL and that published findings related to QOL might vary based on conceptualization and measurement. Sampling errors could have influenced the findings, as the researchers excluded 209 patients due to missing data. The excluded patients were more likely to be Black and have lower QOL scores.

Bekelman et al. (2007) found a 32% rate of depression in their sample ($N = 60$), with Black individuals significantly more likely to have worse QOL than White participants ($p = .04$). However, the overall sample size was small, there were only seven (11.7%) Black participants, and the researchers did not stratify depression rates by race. In another study of patients with HF ($N = 97$; 49.5% Black) recruited from both inpatient and outpatient settings at a large medical center, Bean et al. (2009) found that participants with more depression and anxiety reported lower QOL. The researchers observed no statistically significant racial differences ($p > .05$). The researchers might not have found racial differences because of the small sample size ($N = 97$)

and varied sample characteristics, including mean age and disease severity. Bean et al. recommended more research to stratify these phenomena by race.

Despite knowledge that depression (Eisele et al., 2021; Garin et al., 2009; Rustad et al., 2013; Samartzis et al., 2013) and anxiety (Eisele et al., 2021) negatively impact QOL in patients with HF, more research is needed. There is insufficient evidence regarding racial differences between Black individuals compared to White individuals, especially regarding the potential influence of anxiety. Perhaps the lack is due to varying research methods, including sampling and measurement approaches. In this study, depression, anxiety, and QOL were stratified by race in a larger sample to determine whether there are racial differences. Using a valid and reliable research instrument designed to measure QOL in patients with cardiovascular illnesses was a means to improve measurement accuracy. Studies focused on the influence of anxiety on QOL are lacking, and most researchers have not measured both depression and anxiety, despite the conditions' high correlation necessitating joint study in patients with HF (Celano et al., 2018; Chung, Moser, Lennie, & Rayens, 2009; Dekker, Lennie, et al., 2014; Herr et al., 2013; Konstam et al., 2005; Lenze et al., 2000; MacMahon & Lip, 2002). Measuring depression and anxiety simultaneously in this study will add to the existing body of knowledge.

Sociodemographic Characteristics and Quality of Life. Findings regarding the influence of sociodemographic characteristics (race, age, gender, marital status, education, and employment status) on QOL vary. Younger age (Carson et al., 2009; Liu et al., 2021; Reddy et al., 2020) and female gender (Carson et al., 2009; Chana et al., 2019) have been associated with better QOL in some patients with HF. Although most findings have not been stratified by race, in an all-Black study of patients with HF (*N* = 1,050), Carson et al. (2009) found associations between worse QOL and younger age and overall QOL with all-cause mortality. de Leon et al.

(2009) noted that Black participants had lower QOL-physical functioning. Similarly, older age was correlated with poor QOL in a sample of patients from Greece (*N* = 231), but race was not reported (Aggelopoulou et al., 2017). Riegel et al. (2012) found relationships between age, gender, and QOL. They reported that older patients had better QOL, and women had worse QOL than men. However, a third group of investigators noted that age, gender, and marital status did not significantly influence QOL in patients with HF (Luttik et al., 2006). Marital status emerged as a significant predictor of QOL for Tarekegn et al. (2021; *p* = 0.022). However, the researchers conducted the study in Ethiopia and did not report race, perhaps because the sample was racially homogeneous.

Some investigators have found better QOL associated with higher educational levels (Liu et al., 2021), and patients with HF with lower educational status have lower QOL (Barbareschi et al., 2011; Lee et al., 2005). However, these studies occurred in Taiwan, Greece, the Netherlands, and Hong Kong, and race was not reported. AbuRuz (2018) concluded that employed patients with HF had better QOL. The study took place in Jordan, perhaps in a racially heterogenous sample, and race was not reported. Although there is not much research published to establish the relationship between employment status and QOL, investigators have found that unemployment and poor economic situation are associated with worse QOL (Aggelopoulou et al., 2017). In comparison, economic independence and higher levels of education are associated with greater earning potential, contribute to better financial stability and independence, and are thereby associated with better QOL (Liu et al., 2021). Because low SES is associated with lower QOL (Luttik et al., 2006), education and employment status might influence QOL independently, and there could be differences when comparing Black and White patients with HF. It appears some sociodemographic characteristics might influence QOL. Still, more research is needed, with an emphasis on identifying whether there are racial differences between Black and White patients with HF.

Clinical Characteristics and Quality of Life. Some investigators have found relationships between clinical characteristics (disease severity, comorbidities, and functional status) and QOL. Multiple studies have shown an association between higher disease severity and lower QOL (AbuRuz, 2018; Carson et al., 2009; Freedland et al., 2021). AbuRuz (2018) found higher EF associated with better QOL, whereas Coelho et al. (2005) found no clear association between EF and QOL. Similarly, a higher NYHA Class was associated with lower QOL in several studies (Coelho et al., 2005; Freedland et al., 2021; Lee et al., 2005). Comorbidities negatively influence QOL in patients with HF (Carson et al., 2009; Freedland et al., 2021; Heo et al., 2012; Reddy et al., 2020), and lower comorbidity burden was associated with better QOL ($r = .365$, $p < .001$; Heo et al., 2012). Carson et al. (2009) found that some comorbidities (chronic obstructive pulmonary disease and systolic hypotension) were associated with lower QOL in an all-Black sample of patients with HF ($N = 1{,}050$) derived via stratified sampling from a randomized controlled trial. De Leon et al. (2009) noted that patients with higher symptom burden and lower functional capacity had worse QOL. In a secondary analysis of 408 patients with HF, Reddy et al. (2020) found that comorbidities were associated with worse QOL. However, the researchers did not report race.

Functional status influences various aspects of QOL in patients with HF. Wu et al. (2016) found that functional status was associated with QOL, and patients with better functional status had better QOL ($p < 0.001$). However, most of the sample was White (79%), all minorities were grouped, and no findings were stratified by Black race. Conversely, some researchers found a weak association between functional impairment and QOL (Carels, 2004). De Leon et al. (2009)

found that younger age and Black race were associated with worse QOL-physical functioning, but older age was associated with higher overall QOL scores. This relationship suggests that although patients in the study had lower function, they had greater satisfaction. Despite these findings, Black individuals with HF might experience greater functional impairment (Vaccarino, Gahbauer, et al., 2002) and are at risk for lower QOL. This association merits exploration to determine whether racial differences exist.

Summary/Conclusion

Limited research suggests there could be racial differences in the rates of depression and anxiety among Black individuals with HF (Dickson et al., 2013), which is consistent with findings in other chronically ill patient populations. Depression and anxiety in Black individuals with HF are grossly understudied, underdiagnosed, and undertreated, even more than in the general HF patient population. In addition, comorbid depression and anxiety remain largely unstudied, especially in Black individuals. Despite some progress in better understanding psychosocial and psychological functioning in patients with HF, few researchers have focused on anxiety and comorbid depression and anxiety. There has been little progress made in testing whether racial differences are present and whether the existing knowledge can be generalized to Blacks.

Most researchers of depression and anxiety in patients with HF have not included representative Black samples or conducted racial subgroup analyses, even when recruiting adequate Black samples (Bean et al., 2009). As a result, little is known regarding potential differences in the sociodemographic and clinical influences of depression and anxiety on Black individuals with HF, how they might influence QOL, and whether there are racial differences between Black and White patients. Applying and generalizing the limited research to Blacks is presumptuous because the existing knowledge focuses on depression and anxiety across the entire population of patients with HF without adequately addressing race and potential racial differences. Black patients with HF who experience depression and anxiety might have unique needs and experiences compared to their White counterparts. Providing better care for this sub-patient population requires a better understanding of the rates of depression and anxiety and their comorbid occurrence in Black individuals with HF, the sociodemographic and clinical characteristics associated with depression and anxiety, and how these characteristics influence QOL in Black and White patients with HF.

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CHAPTER 3: METHODOLOGY

Introduction

The purpose of this descriptive, comparative study was to explore the relationships between sociodemographic characteristics (race, age, gender, marital status, education, and employment status), clinical characteristics (disease severity, comorbidities, and functional status), psychological characteristics (depression and anxiety), and quality of life (QOL) in patients with heart failure (HF) and to determine if there are racial differences between Blacks and Whites. The research question was: What are the differences between Blacks and Whites with HF with respect to sociodemographic and clinical characteristics and quality of life? The specific aims were to (a) describe the differences and examine the relationships between sociodemographic, clinical, and psychological characteristics, and QOL in Blacks and Whites persons with HF and (b) examine the influence of sociodemographic, clinical, and psychological characteristics on QOL in Black and White persons with HF.

Like several prior studies, Herr et al. (2015; the parent study) did not aim to identify differences in depression and anxiety by race in patients with HF. Hence, a secondary analysis of previously collected data was employed. Exploring whether there are racial differences in depression and anxiety based on these variables in a geographically homogeneous sample will add to the limited research that suggests that there might be racial differences and that other sociodemographic, clinical, and psychological characteristics might also influence these relationships. Findings from this study could serve as foundational research for future studies that explore racial differences in depression and anxiety in Black patients with HF. Ultimately, learning more about racial differences, if they exist, could help to decrease clinical outcome disparities among Blacks. Following is a discussion of the research approach and the rationale for its choice, followed by the sample, setting, data collection procedures, variables and instruments used for measurement, and a description of the statistical analysis plan.

Rationale for Conducting a Secondary Data Analysis

Given that all data and perspectives are usually not explored in primary research studies, investigators considering secondary data analysis apply theoretical knowledge and conceptual skills to design studies with new research questions that are supportable by existing knowledge and gaps in knowledge (Johnston, 2017). Analyzing existing data helps researchers reduce costs, improve feasibility, and inflict less participant burden (Dunn et al., 2015). Secondary data analysis also allows researchers to answer important questions that generate new knowledge while posing less risk to vulnerable, hard-to-reach, and over-researched groups such as Blacks and patients with cardiovascular diseases (Dunn et al., 2015; O’Connor, 2020).

Setting, Sample, Data Collection, and Human Subjects Protection

The present study was a secondary analysis of the data from Herr et al.’s (2015) cross-sectional study. The parent study occurred within a heart failure/transplant program at Virginia Commonwealth University Medical Center in Richmond, Virginia, to identify symptom clusters and evaluate relationships between identified clusters and functional status (Herr et al., 2015). A subsequent study of the parent study investigated HF symptom clusters and their influence on QOL (Salyer et al., 2019). While conducting the parent study, Herr et al. recruited a convenience sample (N = 117) during a scheduled follow-up clinic visit. Potential participants entered a private examination room, where advanced practice nurses and cardiologists screened them for inclusion using the established participant eligibility criteria: (a) confirmed diagnosis of HF, (b) age 18 or older, (c) NYHA Class II to IV, and (d) receiving standard treatment for HF (beta blocker, diuretics, or ACE inhibitor therapy). Exclusion criteria were: (a) diagnosis of dementia,

(b) the presence of a ventricular assist device, or (c) the presence of a total artificial heart. After confirming participant eligibility, a research assistant explained the study to potential participants and gave each eligible patient a study packet that included a cover letter, consent form, and study questionnaires. After obtaining informed consent, study staff reviewed the questionnaire packet with each participant and answered questions. Participants then spent about 30 minutes completing the self-report questionnaires, which they returned to the staff (Herr et al., 2015).

The medical records provided participants' ages. Five the 151 eligible patients declined to participate. Of the questionnaires provided to 146 eligible participants, 29 were incomplete. Only complete questionnaires were included in the analysis, leaving a sample of 117 participants' data in the parent study (Herr et al., 2015). To address the aims of the current study, the sample for this secondary analysis (N = 114) includes the completed data of patients who racially self-identified as Black (n = 59) or White (n = 55). Patients who self-identified as American Indian or Alaska Native (n = 3) were excluded from this analysis.

Virginia Commonwealth University's Institutional Review Board (IRB) provided approval prior to conducting the parent study (Herr et al., 2015; Salyer et al., 2019). The primary investigators deidentified the data set used for this secondary study. The secondary study proceeded after obtaining Virginia Commonwealth University IRB approval.

Study Variables and Measures

Sociodemographic Characteristics

Sociodemographic data were self-reported by participants and collected using a researcher-developed questionnaire. The sociodemographic characteristics examined in this study were race, age, gender, marital status, education, and employment status. In this study, race was a categorical variable with two levels (Black/White), age was a continuous variable, gender was a categorical variable with two levels (male/female), and marital status was a categorical variable with three levels (never married, previously married, and currently married). Education was a categorical variable with three levels (did not complete high school, high school graduate, and college graduate), and employment status was a categorical variable with eight levels (unemployed, employed part-time, employed full time, homemaker, receiving disability, retired, student, and volunteer).

Clinical Characteristics

Clinical characteristics came from each participant’s medical record. The three clinical characteristics investigated in this study were disease severity, comorbidities, and functional status. Left ventricular EF and NYHA Class were the measures of HF disease severity used, with the EF serving as the primary measure of disease severity with a predictive value. EF is a continuous variable expressed as a percentage, which ranges from 0–100%. A normal EF ranges from 50–70%, and an EF of less than 40% is consistent with a diagnosis of HF (American Heart Association, 2017b). The NYHA Class was the second measure of HF disease severity, used descriptively. NYHA Class includes four classes (Levels I–IV) that coincide with patients’ symptom severity and related activity limitations. Class I has with no physical activity limitations, and Class II involves slight physical activity limitations. Patients classified at Level II are comfortable at rest, but ordinary activity results in symptoms such as fatigue, palpitations, and dyspnea. Class III involves marked physical activity limitations. Although patients in this group are comfortable at rest, limited activity causes the same as Class II. Class IV involves severe limitations, with patients experiencing HF symptoms at rest (American Hospital Association, 2017a). In this study, NYHA Class was a categorical variable with three levels (II–IV). There were no NYHA Class I patients included.

The Charlson Comorbidity Index (Charlson et al., 1987) was the measurement used to summarize co-occurring conditions. The method provides a weighted taxonomy of comorbid disorders and accompanying prognostic consequences to estimate the risk of death based on an individual’s number and type of comorbidities. The Charlson Comorbidity Index received extensive use in research conducted on Black individuals with chronic illnesses (Braithwaite et al., 2009; Hill-Briggs et al., 2002; Rattanasompattikul et al., 2011; Schoenthaler et al., 2009) and among the HF patient population (Dickson et al., 2011; Formiga et al., 2018; Shuvy et al., 2020; Siabani et al., 2016; Tamaki et al., 2018).

Measuring functional status, characterized as physical functioning, entailed using a battery of items from the physical functioning subscale of the Medical Outcomes Survey (MOS) 36-Item Short Form (SF-36). The SF-36 questionnaire was an adaptation of the longer instruments used to collect data in the MOS, which was an observational study of variations on physician practice styles and patient outcomes in different healthcare delivery systems. In its original form, MOS was appropriate for respondents 14 years of age or older and is either self-administered or administered by a trained interviewer.

In this study, the conceptualization of functional status was as functional limitations. The physical functioning items (*n* = 10) assess the degree to which an individual’s health status limits the ability to perform basic physical activities of daily living (ADLs), such as bathing, dressing, lifting, or carrying groceries. Respondents choose from three responses (1 = *limited a lot*, 2 = *limited a little,* and 3 = *not limited at all*), with a score for the physical functioning subscale subsequently generated by recoding and then averaging the 10 SF-36 items that comprise the physical functioning subscale. The physical functioning subscale is a valid and reliable measure of physical functioning, with a Cronbach’s alpha of 0.93 (Hays et al., 1995).

The SF-36, including the physical functioning subscale, has received extensive use to measure functioning in chronically ill patients (Bjorner et al., 2013; Del Core et al., 2018; Fukuhara et al., 2006; Padilla et al., 2008; Yarlas et al., 2011), Black individuals with chronic illnesses (Hill-Briggs et al., 2002; Kusek et al., 2002; Montague & Perchonok, 2012; Porter et al., 2014), patients with cardiovascular illnesses (Aydemir et al., 2005; Konerman et al., 2011; Stefanick et al., 2016), including those with HF (Edelmann et al., 2011; Supino et al., 2009), and Black individuals with HF (de Leon et al., 2009; Gottlieb et al., 2004; Jayadevappa et al., 2007).

Psychological Characteristics

The Hospital Anxiety and Depression Scale (HADS) was the instrument used to measure depression and anxiety. The HADS is a well-established measure to screen for clinically significant depression and anxiety that takes 2 to 5 minutes to complete. The 14-item questionnaire with two subscales, depression and anxiety. The depression and anxiety subscales include seven items each and with ratings on a 4-point Likert scale from 0 (*absence/occasionally/very seldom*) to 3 (*occurs most of the time/very definitely/as much as I ever did*), with total possible scores for each subscale ranging from 0–21. Higher total scores for either subscale indicate greater severity of depression and/or anxiety with a total score of 0–7 considered normal, a total score of 8–10 indicating borderline (mild to moderate) depression or anxiety, and a total score of 11 or greater on either subscale suggesting abnormal levels of depression or anxiety (Snaith, 2003; Zigmond & Snaith, 1983).

The HADS is a valid and reliable measure of depression and anxiety with a Cronbach's alpha of 0.81 (Stafford et al., 2007). The tool is useful to measure depression and anxiety in patients with chronic illnesses (Bener et al., 2011; Loosman et al., 2010; Marinus et al., 2002), chronically ill Blacks (Nelson et al., 2010; Snigdha Alur-Gupta et al., 2021; Weiss et al., 2011) and patients with cardiovascular illnesses (Matsuda et al., 2016; Roberts et al., 2001), including those with HF (Cameron et al., 2008; Cubbon Gale et al., 2011; Gaston-Johansson et al., 2013; Roberts et al., 2001; Yuen et al., 2011), and Black individuals with HF (Bakitas et al., 2020).

Quality of Life

In this study, the Quality of Life Index Cardiac Version-IV (QLI) overall score was the instrument used to measure QOL and the scores from each subscale to assess four unique domains of QOL. The QLI incorporates a common set of items across the general population as well as illness-specific versions with specific items developed for various disorders, including the version used in this study developed for use in patients with cardiovascular illnesses. The QLI is a self-administered two-part questionnaire, written at the fourth-grade reading level, takes approximately 10 minutes to administer and includes four subscales: (a) Health and Functioning, (b) Social and Economic, (c) Psychological and Spiritual, and (d) Family. The Health and Functioning subscale consists of 15 items that elicit respondents' subjective views of physical health status, ability to function in various activities and social roles, stress, concerns, worries, the ability to travel and participate in leisurely activities, and the potential for a happy old age/retirement. The Social and Economic subscale (seven items) is aligned with socioeconomic factors, including social support, friendships, neighborhood composition, education, employment status, one's standard of living, financial independence and includes concerns related to inflation, and economic stress. The seven items in the Psychological and Spiritual subscale are related to cognitive, emotional, and spiritual responses to various aspects of life, including peace of mind, faith in God, goal achievement, personal appearance, self-image, happiness, and general life satisfaction. Finally, the Family subscale includes five items related to family, including satisfaction with a significant other, children, emotional support from family, and overall family health and happiness (Ferrans & Powers, 1985, 1992).

The QLI questionnaire includes two sections (Satisfaction and Importance) with 35 items per section (total of 70 responses required). The first section (Satisfaction) uses a 6-point Likert scale (1 = *very dissatisfied*, 2 = *moderately dissatisfied*, 3 = *slightly dissatisfied*, 4 = *slightly satisfied*, 5 = *moderately satisfied*, and 6 = *very satisfied*) and measures the respondents' satisfaction with various aspects of life. The second section (Importance) is a measure of the importance of the aspects of life assessed using a 6-point Likert scale (1 = *very unimportant*, 2 = *moderately unimportant*, 3 = *slightly unimportant*, 4 = *slightly important*, 5 = *moderately important*, and 6 = *very important*). Five scores are calculated from this questionnaire, one for each of the four QOL domains (subscales) and an overall QOL score combining each subscale.

The Importance items in the second QLI section are means to weigh the respondents' satisfaction of various aspects of life, resulting in scores reflecting respondents' satisfaction with the aspects of life they value most. Items rated as more important to a respondent have a greater impact on the QOL score than those deemed less important. Only the Satisfaction aspect of the QLI was reported in this study because it was the only aspect of the QLI measured in the parent study.

The QLI is a reliable and valid measure of QOL. Confirming its content validity occurred via a development process that included an extensive literature review of QOL, firsthand patient reports regarding the quality of their lives, and the Content Validity Index. Assessing construct validity entailed using the contrasted groups approach and factor analysis, resulting in the four factors underlying the QLI explaining 91% of the total variance. Supporting convergent validity were strong correlations between the QLI and Campbell et al.'s (1976) measure of life satisfaction. The QLI has shown internal consistency with a Cronbach's alpha ranging from 0.73 to 0.99 across 48 studies (Ferrans, 1990; Ferrans & Powers, 1985; Ferrans and Powers Quality of Life IndexFerrans and Powers Quality of Life Index, n.d.). Temporal reliability was assessed for the overall scale, and test-retest reliability was supported by correlations between 0.79 to 0.87 measured at 2-week and 1-month intervals (Dougherty et al., 1998; Ferrans & Powers, 1985) and of 0.78 at 3- to 4-week intervals (Rustoen et al., 1999). Each of the four subscales also showed temporal reliability by test-retest correlations at 2-week intervals: health and functioning (r = .72), social and economic (r =.68), psychological/spiritual (r = .76), and family (r = .69; Dougherty et al., 1998). Cronbach's alphas for the four subscales ranging from 0.63 to 0.96 have appeared in 24 studies. Finally, the QLI indicated sensitivity to change in 27 intervention studies (Ferrans, 1990; Ferrans & Powers, 1985; Ferrans and Powers Quality of Life Index, n.d.).

The QLI has received extensive use to measure QOL in chronic illness populations (Carroll et al., 1999; Delgado, 2007; DeSouza & Subrahmanya Nairy, 2003), chronically ill Black individuals (Greene, 2005; Johnson et al., 1998; Welch & Austin, 1999), and patients with cardiovascular illnesses (Flemme et al., 2001; Ghasemi et al., 2014; Grady et al., 1999), including those with HF (Koukouvou et al., 2004; Scott, 2000; Scott et al., 2004) and Black individuals with HF (de Leon et al., 2009).

Statistical Analysis

Data analysis entailed using SPSS 27 (IBM Corp., 2020). Calculating a score for each variable/instrument for each participant preceded descriptive statistics used to summarize the baseline sociodemographic characteristics, clinical characteristics, psychological characteristics, and QOL of the Black and the White samples. The Shapiro–Wilk test was the test used to assess for normality of the data (Ghasemi & Zahediasl, 2012). The level of significance was 0.05, and the analysis required a minimum of 50 participants per group to have 80% power to detect differences between Blacks and Whites (Cohen, 1992; Serdar et al., 2021).

Aim 1

To describe the differences and examine the relationships between sociodemographic (age, gender, marital status, education, and employment status), clinical (disease severity, comorbidities, and functional status), and psychological (depression and anxiety) characteristics and QOL between Blacks and Whites with HF—Depending on the distribution of the data, a mean or median score was calculated for each sociodemographic, clinical, and psychological characteristic and QOL dichotomized by race (Black/White) and compared. Then, *t* tests (for continuous variables) and chi-square tests (for categorical variables) for independent samples were the statistics used to assess the mean or median for each measure.

To examine the relationships between or among sociodemographic (age, gender, marital status, education, and employment status), clinical (disease severity, comorbidities, and functional status), and psychological (depression and anxiety) characteristics, and QOL in Blacks and Whites with HF—To examine the relationships between or among these variables, Pearson’s correlation (for normally distributed data) or Spearman’s correlation (for data that do not meet parametric test assumptions) were used to determine significant relationships.

Aim 2

To examine the influence of sociodemographic (race, age, and gender), clinical (disease severity, comorbidities, and functional status), and psychological (depression and anxiety) characteristics on QOL in Blacks and Whites with HF—To examine the influence of the independent variables (psychological, sociodemographic, and clinical characteristics) that influence the dependent variable (QOL) in Blacks and Whites with HF, the scores of psychological (depression and anxiety), and certain sociodemographic (age, race, and gender), clinical (disease severity, comorbidities, and functional status) characteristics were added to a regression model and a stepwise model-building approach used to determine the most significant predictors of QOL in Blacks for comparison with White patients with HF while trimming the model based on nonsignificant variables.

Limitations and Delimitations

With this study conducted in an outpatient clinical setting of one academic medical center and a small sample size, the findings might not be generalizable to the general HF patient population. Second, the variables examined were limited to those available in the dataset, although other variables might have been appropriate to investigate in a prospective study. Third, the parent study included patients who did not self-identify as Black or White race; however, they were excluded from this study, which aimed to compare characteristics of only Black and White racial groups. A fourth potential limitation was that researchers in the parent study included only participants with NYHA Class II to IV, thus excluding those with a NYHA Class of I, which could have influenced findings. Thus, comparisons to patients with NYHA Class I was not possible.

Another limitation was that the Satisfaction aspect of the QLI was the only subscale collected and reported in the parent study, and the Importance aspect was not available for analysis. The availability of this Importance data might have influenced findings because QOL is culturally influenced and Black individuals might weigh various aspects of their QOL differently than Whites (Blake & Darling, 2000; Matthews et al., 2012). Finally, the parent study occurred from 2011 to 2012 (Herr et al., 2015). Findings might vary from data collected today due to the elapsed time and changes in HF patient care and treatment that might influence racial disparities among patients with HF. Despite these limitations, few researchers have investigated depression and anxiety in patients with HF and assessed for racial differences. This study provided foundational research contributing to the existing body of knowledge and informing future research directions regarding potential differences between Blacks and Whites with HF.

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CHAPTER 4: RESULTS

Introduction

This study addressed the differences and relationships between and the influence of sociodemographic, clinical, psychological characteristics, and the quality of life (QOL) on Black and White persons with heart failure (HF). This chapter presents the statistical and data analysis. The chapter also presents the univariate, bivariate, and multivariate analysis findings.

Data Analysis

Approach and Phases of Data Analysis

SPSS Version 27.0 (IBM Corp., 2020) was the software used to analyze the data in three phases. The first phase was descriptive analysis. All study variables were presented with descriptive statistics of means, standard deviations, minimum/maximum values for continuous variables (interval/ratio level), and frequencies and percentages for categorical variables (nominal/ratio level). The second phase was bivariate analysis, in which bivariate tests produced inferential statistics for the explanatory variables related to the dependent QOL variable at a statistically significant level ($p <.05$). Pearson's r zero-correlation indicated if the continuous explanatory variables significantly correlated to the continuous dependent variables. Independent-samples t tests were the means of measuring the differences between the continuous variables for Blacks and Whites. Finally, one-way ANOVA indicated if categorical explanatory variables with three or more categories significantly impacted QOL. The third phase, multivariate analysis, included the explanatory variables that correlated to the dependent variable at a statistically significant level ($p <.05$). Race was a design variable; therefore, it remained in each step of the regression model-building.

Data Preparation and Management

The original dataset included 114 participants (59 Black and 55 White). One participant did not self-identify a race and was excluded from the analysis. Due to a small amount of missing data, there was a plan to treat the missing data based on the missingness amount and patterns (Aguinis et al., 2013). The mean scale score was imputed for other missing data cases in the scales. The final data set did not include seven participants who did not provide sufficient data for the Quality of Life Index (QLI), QOL, and SF-36 functional status variables (at least 80% of items completed). Thus, the analysis did not include 5.4% (*n* = 8) participants due to missing data. The final sample included 104 patients with HF (51 Blacks and 53 Whites).

Creation of New Variables

The employment status variables in the parent study had eight categories. Due to small cell size by race, the employment status variable was collapsed into four categories: employed full-time, not employed full-time, receiving disability benefits, and retired. Initially, the marital status variable had three categories: never married, previously married, and currently married. However, this variable was collapsed into two categories, not currently married and currently married, to address associations with and the influence of married compared to unmarried status.

Data Distribution

The data distribution underwent examination to ensure each variable aligned with the parametric test assumptions of normality, linearity, homoskedasticity, multicollinearity, and outlier undue influence. The results showed an approximately normal score distribution due to skewness and kurtosis lower than three times the respective standard error (SE) of each value. Other than those indicated below, all data aligned with the parametric test assumptions and presented no issues. The Charlson Comorbidity Index had one outlier score (high = 11). The

HADS-D had one high outlier score of 12. The QLI had one outlier score (low = 48). The QOL Social/Economic Subscale had one outlier (low = 17). The Family Subscale had five outliers (low = 4, 4, 8, 9, 9).

Reliability

All the normed scales in this study showed sufficient internal consistency and reliability (Cronbach's alpha = ≥ .70; Bujang et al., 2018), including the QOL total scores (Cronbach's alpha =.96), physical functioning scores (Cronbach's alpha= .90), anxiety scores (Cronbach's alpha = .85), and depression scores (Cronbach's alpha = .83). The final multivariate analysis included the physical functioning scores to show the functional status construct. Cronbach's alpha also underwent examination for the QLI subscales and showed adequate internal consistency and reliability: Health/Functioning Subscale (Cronbach's alpha = .90), Social and Economic Subscale (Cronbach's alpha = .88), Psychological/Spiritual Subscale (Cronbach's alpha = .92), and Family Subscale (Cronbach's alpha = .75).

Statistical Power Analysis

Regarding statistical power, the G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007) indicated that a multiple linear regression model with seven explanatory variables, a medium effect size (Cohen's f = .15) between the explanatory and dependent variables, statistical power of t .80, and an alpha of .05 required a sample of 103 participants. Thus, the sample of 104 participants provided sufficient statistical power for analysis.

Descriptive Analysis

This section presents the sociodemographic, clinical, and psychological characteristics and QOL variables. The section also presents the characteristics of the overall sample and the characteristics by race. This section addresses the mean comparisons by race and the bivariate and multivariate analysis results. The results showed an approximately normal score distribution due to skewness and kurtosis lower than approximately three times the respective standard error of each value.

Sociodemographic Characteristics

Table 4 presents a descriptive analysis of the categorical study variables. Table 5 presents the descriptive analysis of the continuous study variables. Table 4 includes the comparisons of the means of categorical variables by race. The overall mean participant age was 56.29 (*SD* = 12.42, min/max = 21.00–84.00). The sample had almost even division by race, with 51% (*n* = 53) White and 49.0% (*n* = 51) Black participants. The Black participants' ages ranged from 21 to 78, whereas the White participants' ages ranged from 40 to 84. There was a statistically significant difference between the Black and White participants' mean ages, $t(88.90)= 3.79$, $p = <0.001$). Men accounted for two-thirds of the overall sample (*n* = 69; 66.3%), with 42 White and 27 Black men. The female sample consisted of 11 White and 24 Black women. Race significantly related to gender, $x^2 = 8.05$, $p <.01$, as there was a higher percentage of Black (*n* = 24, 47.1%) than White women (*n* = 11, 20.8%; see Table 7). Over half the sample was married (*n*=59, 56.7%). Race significantly associated with marital status, ($x^2 = 5.52$, $p <.05$), as more Whites were married (*n* = 36, 67.9%) than Blacks (*n* = 23, 45.1%; see Table 7).

Race significantly related to education level, $x^2 = 10.89$, $p <.01$, as more Black participants completed high school (*n* = 34, 66.7%) than White participants (*n* = 19, 35.8%). However, more White participants completed college (*n* = 25, 47.5%) than Black participants (*n* = 10, 19.6%). Regarding employment status, almost half the sample received disability (*n* = 43, 41.3%). Race did not significantly correlate with employment, $x^2 = 3.16$, $p = .37$.

Clinical Characteristics

The clinical characteristics examined by race included disease severity, comorbidity, and functional status; however, none showed statistical significance (see Table 6). The ejection fraction (EF) and New York Heart Association Classification (NYHA Class) were the means of measuring disease severity. The sample's mean EF (n = 103) was 24% (SD = 9%, min/max = 10–40%). The mean difference in EF by race lacked statistical significance (t = 1.21, p = .23). The sample included 41 participants in NYHA Class II (21 Blacks and 20 Whites), 49 in NYHA Class III (25 Blacks and 24 Whites), and 14 in NYHA Class III (five Blacks and nine Whites). There were no statistically significant differences in mean NYHA Class (t = .79, p = .43) for comorbidities (t = -0.02, p = .99) or functional status by race (t = -0.33, p =.74).

Psychological Characteristics

The psychological characteristics of depression and anxiety were the variables measured with two subscales of the Hospital Anxiety and Depression Scale (HADS). Depression and anxiety highly correlated (r = 0.651, p = <0.001) in this sample. There were no statistically significant differences by race in the mean depression (t = .25, p = 80) or anxiety scores (t = -1.15, p =.25; Table 6).

When assessing the relationships between sociodemographic and psychological characteristics, the results showed higher depression levels (r= -.211, p = .03) and anxiety (r = -.262, p = .007) significantly correlated with lower education. Depression did not correlate with the remaining sociodemographic characteristics (see Table 8). Higher anxiety levels significantly correlated with age, as the younger participants reported more anxiety (r = -.308, p = .001).

Some clinical characteristics significantly correlated: NYHA Class and EF (*r* = -.26, *p* = .007), total comorbidity and functional status (*r* = .34, *p* = <.001), and NYHA Class and functional status (*r* = .30, *p* = .002). When assessing the relationships between clinical and psychological characteristics, higher NYHA Class (greater disease severity) correlated with higher levels of depression (*r* = .251, *p* = .01), suggesting that participants with more severe illnesses experienced more depression. Higher depression also significantly associated with lower functional status (*r* = .582, *p* = <0.001). However, depression did not significantly correlate with EF (*r* = .008, *p* = 0.934) or comorbidities (*r* = .14, *p* = .078). Anxiety significantly correlated with NYHA Class (*r* = .262, *p* = .007), suggesting that those with severe illnesses feel more anxious. Anxiety also significantly correlated with lower functional status (*r* = .421, *p* = <0.001) but not EF (*r* =- .068, *p*= .493) and comorbidities (*r* = .102, *p* = .305).

Quality of Life

There were no racial differences in overall QOL scores (see Table 5), even when assessing the four subscale scores for differences by race (see Table 6). The Health and Functioning Subscale score significantly correlated to age (*r* = -.22, *p* = .03), as the older participants had lower levels of health and functioning. Health and functioning did not significantly associate with the remaining sociodemographic characteristics of race (*r* = .12, *p* = .22); gender (*r* = .07, *p* = .48), marital status (*r* = .48, *p* = .63), educational status (*r* = .10, *p* = .33), and employment status (*r* = -.12, *p* = .22). The Health and Functioning Subscale did not correlate to the clinical characteristics of NYHA Class (*r* = .14, *p* = .16), EF (*r* = -.10, *p* = .33); comorbidities (*r* = -.10, *p* = .31), and functional status (*r* = .03, *p* = .73). The subscale also did not correlate with the psychological characteristics of depression (*r* = .02, *p* = .88) or anxiety (*r* = .07, *p* = .49).

The Social and Economic Subscale did not significantly correlate with the sociodemographic characteristics of race (*r* = -0.2, *p* = .84), age (*r* = -.07, *p* = .49), gender (*r* = .09, *p* .= 37), marital status (*r* =.05, *p* =.63), education level (*r*=.01, *p*=.91); and employment status (*r*=-.02, *p*= *.84*). Additionally, the subscale did not correlate with the clinical characteristics of NYHA Class (*r* = .24, *p* = .81), EF (*r* = -.03, *p* = .75), comorbidities (*r* = -.16, *p* = .12), or functional status (*r* = .10, *p* = .32) or the psychological characteristics of depression (*r* = .02, *p* = .82) or anxiety (*r* = -.16, *p* = .12).

The Psychological/Spiritual Subscale did not significantly relate to the sociodemographic characteristics of race (*r* = .83, *p* = .40), age (*r* = -.11, *p* = .27), gender (*r* = .02, *p* = .82), marital status (*r* = .10, *p* = .31), educational status (*r* = .10, *p* = .33), and employment status (*r* = -.07, *p* = .46). The subscale did not correlate with the clinical characteristics of NYHA Class (*r* = .07, *p* = .46), EF (*r* = -.06, *p* = .52), comorbidities (*r* = -.06, *p* = .52), or functional status (*r* = -.05, *p* =.63). Additionally, the subscale did not correlate with the psychological characteristics of depression (*r* = .01, *p* = .95) or anxiety (*r* = .05, *p* = .60).

The Family Subscale did not significantly correlate with the sociodemographic characteristics of race (*r* = -.03, *p* = .75), age (*r* = -.06, *p* = .53), gender (*r* = -.05, *p* = .60), marital status (*r* = .10, *p* = .31), educational status (*r* = .00, *p* = .33), and employment status (*r* = -.07, *p* = .46). The subscale did not correlate with the clinical characteristics of NYHA Class (*r* = -.07, *p* = .49), EF (*r* = -.02, *p* = .83), comorbidities (*r* = -.18, *p* = .06), or functional status (*r* = .-.07, *p* = .47). Additionally, the subscale did not correlate with the psychological characteristics of depression (*r* = -.07, *p* = .46) or anxiety (*r* = -.12, *p* = .21).

Table 1

Descriptive Analysis of Categorical Study Variables

Variable	*n*	%
Gender		
Male	69	66.3
Female	35	33.7
Race		
White	53	51.0
Black	51	49.0
Education level		
Less than high school	16	15.4
Completed high school	30	28.8
Started college	23	22.1
Completed college	21	20.2
Education level (collapsed for analysis)		
Less than high school	16	15.4
High school	53	51.0
Completed college	35	33.7
Marital status		
Never married	20	19.2
Previously married	25	24.0
Currently married	59	56.7
Employment status		
Unemployed (but looking for work)	6	5.8
Employed part time	2	1.9
Employed full time	17	16.3
Homemaker	1	1.0
Receiving disability	43	41.3
Retired	32	30.8
Student	1	1.0
Volunteer	2	1.9
Employment status (collapsed for analysis)		
Employed full time	17	16.3
Not employed full time	12	11.5
Receiving disability	43	41.3
Retired	32	30.8

Note. *N* = 104

Table 2

Descriptive Analysis of Continuous Study Variables

Variable	*M* (*SD*)	Minimum/maximum
Age	56.29 (12.30)	21.00–84.00
QOL (Total)	150.57 (33.34)	48.00–209.00
QOL-Health/Functioning	51.90 (16.37)	14.00–83.00
QOL-Social/Economic	43.15 (9.32)	17.00–64.00
QOL-Psych/Spiritual	35.76 (10.27)	10.00–48.00
QOL-Family	19.66 (4.38)	4.00–24.00
Physical Functioning	30.58 (25.39)	0.00–95.00
Ejection Fraction*	24% (9%)	10–40%
NYHA Class	2.74 (.68)	2.00–4.00
Comorbidity	3.15 (1.87)	0.00–8.00
Anxiety (HADS-A)	8.17 (4.66)	0.00–19.00
Depression (HADS-D)	7.54 (4.34)	0.00–19.00

Note. *N* = 104. **N* = 103

Table 3

Independent Samples t-Test Analysis Examining Racial Differences in Sociodemographic and Clinical Characteristics and Quality of Life

Variable	n	*M* (*SD*)	*t* (*df*)	*p*
Age			3.82 (102)	<.001*
White	53	60.54 (9.37)		
Black	51	51.88 (13.47)		
QOL Total Scores			.13 (102)	.90
White	53	150.88 (28.73)		
Black	51	150.06 (37.84)		
QOL-Health/Functioning			-.57 (102)	.57
White	53	51.00 (14.84)		
Black	51	53.75 (15.50)		
QOL-Social/Economic			1.37 (102)	.17
White	53	44.38 (7.70)		
Black	51	41.88 (10.68)		

Variable	n	*M* (*SD*)	*t* (*df*)	*p*
QOL-Psych/Spiritual			-.48 (102)	.63
White	53	35.28 (9.23)		
Black	51	36.25 (11.33)		
QOL-Family			1.32 (102)	.19
White	53	20.22 (3.84)		
Black	51	19.08 (4.85)		
Physical Functioning			-.43 (102)	.67
White	53	29.53 (24.71)		
Black	51	31.68 (26.27)		
Ejection Fraction			1.21 (101)	.23
White	53	25% (9%)		
Black	51	23% (8%)		
NYHA Class			.79 (102)	.43
White	53	2.79 (.72)		
Black	51	2.69 (.65)		
Comorbidity			.131 (203)	.89
White	53	3.21 (2.24)		
Black	51	3.16 (1.67)		
Anxiety (HADS-A)			-1.15 (102)	.25
White	53	7.66 (4.72)		
Black	51	8.71 (4.58)		
Depression (HADS-D)			-.25 (102)	.80
White	53	7.43 (4.20)		
Black	51	7.64 (4.52)		

*p < .05, **p < .01.

Table 4 presents the chi-square analyses of categorical sociodemographic characteristics by race.

Table 4

Chi-Square Analysis of Sociodemographic Characteristics by Race

Gender

	Male *n* (%)	Female *n* (%)	X^2 (*df*)	*p*
Race			8.05 (1)	.005*
White	42 (79.2)	11 (20.8)		
Black	27 (52.9)	24 (47.1)		

Marital status

	Previously or never married *n* (%)	Currently married *n* (%)	*v*	*p*
Race			5.52 (1)	.02*
White	17 (32.1)	36 (67.9)		
Black	28 (54.9)	23 (45.1)		

Education level

	< High school *n* (%)	High school *n* (%)	Completed college *n* (%)	X^2 (*df*)	*p*
Race				10.89 (2)	.004*
White	9 (17.0)	19 (35.8)	25 (47.2)		
Black	7 (13.7)	34 (66.7)	10 (19.6)		

Employment status

	Employed full time *n* (%)	Not employed full time *n* (%)	Disability *n* (%)	Retired *n* (%)	X^2 (*df*)	*p*
Race					3.16 (3)	.37
White	10 (18.9)	4 (7.5)	20 (37.7)	19 (35.8)		
Black	7 (13.7)	8 (15.7)	23 (45.1)	13 (25.5)		

Note. *N* = 104. **N* = 103

Analysis for Aim 3

Table 5 presents Pearson's correlation of the relationship between QOL and the continuous explanatory study variables (sociodemographic, clinical, and psychological characteristics).

Sociodemographic Characteristics

The two-tailed correlation analysis showed that older participants had better QOL than younger participants, $r(102) = .26$, $p <.01$. The QOL varied significantly by marital status, $t(73.07) =-2.24$, $p <.05$, with the participants identifying as currently married ($M = 4.45$, $SD = .77$) having better QOL than those unmarried (previously/never married category; $M = 4.01$, $SD = 1.14$). QOL did not significantly correlate with race, $t(102) = .01$, $p = .99$; gender, $t(84.85) = -.12$, $p = .90$; education, $F(2, 101) = .13$, $p = .88$; or employment, $F(3, 100) = 2.50$, $p = .06$.

Clinical Characteristics

Worse physical functioning, $r(102) = -.44$, $p <.01$, and lower disease severity measured by the NYHA Class, $r(102) = -.32$, $p <.01$, were significantly associated with QOL. However, QOL did not significantly correlate with EF, $r(102) = .04$, $p = .71$, or comorbidity, $r(102) = -.13$, $p = .19$.

Psychological Characteristics

Better QOL significantly correlated with lower anxiety, $r(102) = -.59$, $p <.01$, and lower depression, $r(102) = -.73$, $p <.01$, scores.

Table 5

Pearson's r Correlation Analysis Examining the Relationship Between Sociodemographic Characteristics and Psychological Characteristics

	1	2	3	4	5	6	7	8
1. Race	–	-.353**	.278**	-.230*	-.180	-.040	.113	.025
2. Age		–	-.117	.347**	.896	.410**	-.308*	-.131
3. Gender			–	-.035	-.132	-.045	.123	.057
4. Marital status				–	.179	.150	-.127	-.179
5. Education					–	-.186	-.262**	-.211*
6. Employment status						–	-.044	
7. Anxiety (HADS-A)							–	.651**
8. Depression (HADS-D)							–	

*p <.05, **p <.01.
Note. N = 104.

Table 6

Pearson's r Correlation Analysis Examining the Relationship Between Sociodemographic Characteristics and Psychological Characteristics

	1	2	3	4	5	6	7	8
1. QOL	–	.268**	-.425**	.036	-.299**	-.128	-.586**	-.696**
2. Age		–	-.069	.202*	-.092	.208*	-.308**	-.131
3. Physical Functioning			–	.015	.297**	.342**	.421**	.582**
4. Ejection Function				–	-.264**	.166	-.068	.008
5. NYHA Class					–	.161	.262**	.251*
6. Comorbidity						–	.102	.174
7. Anxiety (HADS-A)							–	.651**
8. Depression (HADS-D)							–	

*p <.05, **p <.01.
Note. N = 104.

Table 7 presents the independent-samples *t* test and one-way ANOVA of the relationship between QOL total scores with the categorical explanatory study variables (sociodemographic, clinical, and psychological characteristics).

Table 7

Independent Samples t-Test and One-Way ANOVA Analysis Examining the Differences Between QOL and Categorical Sociodemographic and Clinical Characteristics

Variable	*n*	*M* (*SD*)	*t* (*df*)	*p*
Gender			-.12 (84.85)	.90
Male	69	4.25 (1.04)		
Female	35	4.28 (.81)		
Race			.01 (102)	.99
White	53	4.26 (.87)		
Black	51	4.26 (1.06)		
Education level			.13 (2, 101)	.88
Less than high school	16	4.15 (.87)		
High school	53	4.29 (1.00)		
Completed college	35	4.27 (.97)		
Marital status			-2.24 (73.07)	.03*
Previously/never married	45	4.01 (1.14)		
Currently married	59	4.45 (.77)		
Employment status			2.50 (3, 100)	.06
Employed full-time	17	4.60 (.80)		
Not employed full-time	12	4.08 (.97)		
Receiving disability	43	4.01 (1.00)		
Retired	32	4.49 (.93)		

$^*p$ <.05.

Multivariate Analysis

Except for race, the variables that significantly correlated with QOL in the bivariate analysis were entered into the hierarchical multiple linear regression model for QOL. This study focused on racial differences; therefore, race was the design variable entered and retained in the regression model, although it did not significantly correlate with QOL in the bivariate analysis. Forward and backward elimination approaches occurred for significant QOL predictors (see Table 11). Race was not a significant QOL predictor when assessed independently of other variables (B = -.01, SE = .19, β = -.01, *p* = .95). The forward elimination approach showed the statistical significance of the full model, which included race, age, marital status, physical functioning, NYHA Class, anxiety, and depression, in Step 3, $F(98) = 21.32$, $p < .001$, and that depression accounted for 62% of the variance in QOL ($R^2 = .62$, Adjusted $R^2 = .59$). Regarding individual predictors, the sociodemographic characteristic of age and the psychological characteristic of depression significantly correlated with QOL in the full model. Younger age ($B = -.01$, $SE = .01$, $\beta = -.17$, $p = .03$) and greater depression (B = -.14, SE = .02, $\beta = -.62$, $p < .001$) significantly associated with lower QOL. Physical functioning and anxiety were significant predictors of QOL in Step 2. However, the independent variables (race, marital status, physical functioning, NYHA Class, and anxiety) did not significantly correlate with QOL in Step 3.

Table 8

Hierarchical Multiple Linear Regression Examining Quality of Life (Forward Elimination)

Variable	B (*SE*)	β	*p*
Step 1			
Race	-.01 (.19)	-.01	.95
Step 2			
Race	.14 (.17)	.07	.39
Age	.01 (.01)	.13	.13
Marital status	-.06 (.16)	-.03	.70
Physical functioning (SF-36)	-.01 (.00)	.19	.04*
NYHA Class	-.20 (.12)	-.14	.10
Anxiety (HADS-A)	-.71 (.14)	-.47	<.001**
Step 3			
Race	.13 (.01)	.06	.36
Age	.01 (.01)	.17	.03*
Marital status	.18 (.14)	.09	.21
Physical functioning (SF-36)	-.00 (.00)	-.03	.72
NYHA Class	-.17 (.10)	-.11	.10
Anxiety (HADS-A)	-.23 (.14)	-.15	.10
Depression (HADS-D)	-.14 (.02)	-.62	<.001**

Step 1: *F*(103) = .004, *p* = .95, R^2 = -.00, adjusted R^2 = -.01.
Step 2: *F*(98) = 12.52, *p* <.001, R^2 = .45, adjusted R^2 = .41.
Step 3: *F*(98) = 21.32, *p* <.001, R^2 = .6, adjusted R^2 = .59.
**p* <.05, ***p* <.01.
Note. *N* = 104.

A backward elimination approach showed the model's strength. Older age and greater depression remained significant QOL predictors in both the full (older age, B = -.01, SE=.01, β=-.17, *p* .= 03, and greater depression, B = -.14, SE = .02, β = -.62, *p* <.001) and trimmed (older age, B = .02, SE = .01, β = .21, *p* = .00, and greater depression, B = -.16, SE = .02, β = -.70, *p* <.001), models (see Table 12).

Table 9

Hierarchical Multiple Linear Regression (Backward Elimination) Examining Quality of Life

Variable	B (*SE*)	β	*p*
Step 1			
Race	.13 (.14)	.06	.36
Age	.01 (.01)	.17	.03*
Marital status	-.13 (.13)	-.07	.33
Physical functioning (SF-36)	-.00 (.00)	-.03	.72
NYHA Class	-.17 (.10)	-.11	.10
Anxiety (HADS-A)	-.23 (.14)	-.15	.10
Depression (HADS-D)	-.14 (.02)	-.62	<.001**
Step 2			
Race	.13 (.14)	.06	.37
Age	.01 (.00)	.17	.02*
Marital status	-.13 (.13)	-.07	.30
NYHA Class	-.16 (.09)	-.11	.11
Anxiety (HADS-A)	-.22 (.14)	-.15	.10
Depression (HADS-D)	-.13 (.02)	-.61	<.001**
Step 3			
Race	.15 (.14)	.08	.27
Age	.01 (.01)	.17	.03*
NYHA Class	-.17 (.09)	-.12	.08
Anxiety (HADS-A)	-.21 (.14)	-.14	.12
Depression (HADS-D)	-.13 (.02)	-.58	<.001**
Step 4			
Race	.17 (.14)	.09	.23
Age	.02 (.01)	.21	.00*
Depression (HADS-D)	-.16 (.02)	-.70	<.001**

Step 1: $F(98) = 21.32$, $p < .001$, $R^2 = .62$, adjusted $R^2 = .59$.
Step 2: $F(98) = 12.52$, $p < .001$, $R^2 = .62$, adjusted $R^2 = .60$.
Step 3: $F(101) = 28.13$, $p < .001$, $R^2 = .59$, adjusted $R^2 = .57$.
Step 4: $F(101) = 43.15$, $p < .001$, $R^2 = .57$, adjusted $R^2 = .56$.
**p* <.05, ***p* <.01.
Note. *N* = 104.

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CHAPTER 5: DISCUSSION

Introduction

The purpose of this descriptive, comparative study was to examine the relationships between sociodemographic, clinical, and psychological characteristics and quality of life (QOL) in patients with heart failure (HF) to determine racial differences between Blacks and Whites. The research question was, What are the differences between Blacks and Whites with heart failure with respect to sociodemographic and clinical characteristics and quality of life? The study focused on the differences, relationships, and influences of sociodemographic, clinical, and psychological characteristics on QOL in Blacks and Whites with HF. The HF racial disparities reduction framework (see Figures 2 and 3) guided the study to address racial disparities in the HF population. A research framework for racial disparities in gynecological cancer was appropriate to address potential racial differences to contribute to the design and testing of innovative approaches and interventions for effectiveness and efficacy (Doll, 2018). With a foundation of the HF racial disparities reduction framework (see Figures 2 and 3), the study provided a better understanding of the relationships between sociodemographic, clinical, and psychological characteristics and their influence on QOL and the racial differences contributing to persistent disparities among Blacks with HF.

This chapter presents the discussion and contextualization of the study’s results. First addressed are the results related to the study’s goals and limitations. Second, the chapter presents the study’s conclusions and practice implications. Third, there are recommendations for future research on Black persons with HF and racial disparities.

Discussion

This section presents the results based on the study's goals, the differences by race, and the relationships between the sociodemographic, clinical, and psychological characteristics. There are discussions of the sociodemographic, clinical, and psychological characteristics that correlated with and impacted QOL.

Aim 1: Racial Differences and Associations Between Sociodemographic, Clinical, and Psychological Characteristics

The results showed differences by race for the following sociodemographic characteristics: age, gender, and marital status. Education level and employment status did not significantly differ by race. Among the clinical characteristics, only ejection fraction (EF) differed by race, with Blacks having lower (worse) EF than Whites. This finding could have resulted from several factors, including time since diagnosis. Disease severity, as measured with the New York Heart Association Classification (NYHA Class), comorbidities, and functional status did not differ based on race. The psychological characteristics of depression and anxiety were significantly correlated, a finding consistent with prevalent clinical presentations and studies (Celano et al., 2018; Dekker et al., 2014; Evangelista, Ter-Galstanyan, Moughrabi, Moser, et al., 2009). However, the results indicated no differences in depression or anxiety between the Black and White participants.

Sociodemographic Characteristics. ***Race.*** Neither depression nor anxiety significantly correlated with race in this sample. This finding aligned with prior researchers who found no significant racial differences in depression between Black and White individuals with HF (Freedland et al., 2003a; Gottlieb et al., 2004; Griffin et al., 2007; Piamjariyakul et al., 2013; Rohyans & Pressler, 2009; Xiong et al., 2015). However, other scholars have identified racial differences and concluded that Black individuals with HF had less depression than Whites (Ahmed et al., 2006; Koenig, 1998; Stamp et al., 2014; Vaccarino et al., 2001; Wierenga et al., 2017) or more depression than Whites (Dekker et al., 2014; Evangelista, Ter-Galstanyan, Moughrabi, & Moser, 2009; Freedland, Carney, et al., 2021). Sampling or measurement approaches could have contributed to these differences across studies.

Age. The Black participants in this sample were younger than the White participants. This finding aligned with HF epidemiology in Blacks, as Blacks with HF tend to be younger, on average, than Whites (Benjamin et al., 2017; Bibbins-Domingo et al., 2009; Go et al., 2013; Tandon et al., 2020; Vaccarino et al., 2002; Virani et al., 2020, 2021). This finding also aligned with other studies that found differences in age by race among Black and White patients with HF (Afzal et al., 1999; Glynn et al., 2019; Koenig, 1998; Lewis et al., 2011; Piamjariyakul et al., 2018; Stamp et al., 2014; Thomas et al., 2011; Wierenga et al., 2017; Ziaeian et al., 2017). Thus, younger Blacks remain disproportionately affected by HF (Tsao et al., 2022; Virani et al., 2020, 2021).

In this study, age did not correlate with depression. This finding differed from prior studies showing younger patients with HF had more depression (Athilingam et al., 2017; Chung et al., 2009; Freedland et al., 2003a; Gottlieb et al., 2004; Koenig, 1998; Mentz et al., 2015; Rohyans & Pressler, 2009; Stamp et al., 2014; Xiong et al., 2015). Conversely, Dickson et al. (2013) found that older patients with HF had more depression. Unlike other research, this study did not include participants in NYHA Class I, who often have less severe disease symptoms and more recent HF diagnoses.

Blacks are more likely to be diagnosed with HF at a younger age (Tsao et al., 2022; Virani et al., 2020, 2021), and younger age correlates with more depression with HF (Athilingam et al., 2017; Chung et al., 2009; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Koenig, 1998; Mentz et al., 2015; Rohyans & Pressler, 2009; Stamp et al., 2014; Xiong et al., 2015) and anxiety (Dekker et al., 2014). If this study's sample had included younger, more recently diagnosed participants in NYHA Class I, the results might have aligned with prior research showing increased depression and anxiety.

Age correlated with anxiety in this study, as the younger participants reported higher anxiety. This finding contributed to the limited research on anxiety in patients with HF. Little research has focused on anxiety in patients with HF, but Dekker et al. (2014) also found that anxiety correlated with younger age. A better understanding of the relationship between anxiety and HF could provide insight into younger patients with HF, of which Blacks comprise the majority (Tsao et al., 2022; Virani et al., 2020, 2021).

Gender. The sample included almost equal numbers of Black men and women (*n* = 27 and *n* = 24, respectively). However, White women were an underrepresented population in this sample (*n* = 11, with *n* = 42 White men), a finding that aligned with prior studies showing an underrepresentation of women in HF research (Bozkurt & Khalaf, 2017; De Bellis et al., 2019; DeFilippis et al., 2022; Habal et al., 2019; Heiat et al., 2002; Hsich & Pina, 2009; Reza et al., 2022). Although this study had a small White female sample, there was an adequate Black female sample. Gender and its intersection with race remain important, as prior studies have found gender differences (Dekker et al., 2014; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Vaccarino et al., 2001; Xiong et al., 2015) in depression (Ahmed et al., 2006), anxiety (Dekker et al., 2014); QOL (Jackson & Emery, 2011), and race. For example, Black men are at the greatest risk of hospital readmissions (Chen et al., 2013), and Black women report more depression than Whites (Gottlieb et al., 2004).

Marital Status. The Black participants in this sample were less likely to be married. This was consistent with Wierenga et al.’s (2017) findings that Blacks were less likely to be married. Although this study did not include living arrangements, the finding suggests that Black individuals might have less access to social and financial support due to the absence of live-in marital partners. Patients with HF who are not married might need additional support to avoid poor clinical outcomes (Chung et al., 2009).

Education. In this study, more Blacks completed high school, and more Whites completed college. This finding aligned with prior research indicating that Black individuals with HF are less educated than their White counterparts (Lewis et al., 2011; Piamjariyakul et al., 2018). Also, education level correlates with health literacy in patients with HF (Cajita et al., 2016; Peterson et al., 2011). Blacks generally have less health literacy than Whites (Chaudhry et al., 2011; Morrow et al., 2006; Murray et al., 2009; Westlake et al., 2013). Less-educated Black patients with HF might have lower health literacy and struggle to understand HF’s complex pathophysiology, severity, and self-management requirements (Cajita et al., 2016; Deek et al., 2020; Dennison et al., 2011; Rockwell & Riegel, 2001; Zou et al., 2017). In Allen et al.'s (2008) study, Black patients with HF in one sample without a college education overestimated their life expectancy, which suggests an incomplete understanding of their prognosis despite verbalizing their understanding of healthcare professionals’ education.

Education also has implications for SES and health outcomes. SES correlates with depression in patients with HF (Hertzog et al., 2010; Koenig, 1998; Retrum et al., 2012; Vaccarino et al., 2001). Individuals with less education often earn less income (Eng & Feeny, 2007). Although there is no consistent relationship between higher education and increased income in Black individuals compared to Whites (Assari et al., 2018), there could be a relationship between financial distress and depression in Blacks (Assari, 2019). Lower SES also negatively impacts access to health care, including among patients with chronic illnesses (Canedo et al., 2017; Georgopoulou et al., 2011; Sewell & Velayos, 2013). Thus, SES can impact QOL (Bielderman et al., 2015; Keyvanara et al., 2015; Tuzun et al., 2015), including for patients with HF (Verma et al., 2016). Patients with HF and less education could have fewer financial resources to adequately self-manage their health by adhering to dietary restrictions and medication regimens (Dickens et al., 2019; Macabasco-O'Connell et al., 2008).

Employment Status. This study found no racial differences in employment status. This finding was unsurprising, as many patients with HF lack employment due to HF's physiological and psychosocial impacts (Bennett & Sauvé, 2003; Ohlsson et al., 2021; Phillips et al., 2005; Pressler, 2008; Rørth, Fosbøl, et al., 2018; Rørth, Wong, et al., 2016). This study's findings aligned with research indicating that Blacks with HF are likelier to be younger (Benjamin et al., 2017; Go et al., 2013; Lewis et al., 2011; Piamjariyakul et al., 2018; Roger et al., 2012; Stamp et al., 2014; Tsao et al., 2022; Virani et al., 2020, 2021; Wierenga et al., 2017). Most patients with HF are ineligible for retirement benefits, instead relying on disability benefits to meet their financial needs (Seo et al., 2021). However, disability benefits do not often cover living costs and might not enable living above the poverty level, resulting in increased financial strain and depression (Chung et al., 2009; Cirelli et al. (2018).

Clinical Characteristics. ***Ejection Fraction*****.** Both measures of disease severity (NYHA Class and EF) correlated in this study's sample. The Black participants had lower EF than White participants, a finding that contributed to the literature because prior scholars had not stratified findings related to EF by race. The Black participants with HF were significantly younger than Whites in this sample, which aligned with the general HF patient population (Tandon et al., 2020; Virani et al., 2020, 2021). However, the Black participants had lower EF, potentially indicating greater disease severity at a younger age. Greater disease severity could correlate with a greater risk of depression and anxiety and worse QOL (AbuRuz, 2018; Aggelopoulou et al., 2017; Carson et al., 2009; de Leon et al., 2009; Freedland, Rich, et al., 2021; Lee et al., 2005). Therefore, addressing this pattern of worse heart functioning in Blacks is critical to improving racial disparities.

NYHA Class, Comorbidities, and Functional Status. This study showed no statistically significant differences in mean NYHA Class, co-morbidities, and functional status by race. Testing associations between these clinical variables for racial differences contributed to the research on racial differences between Black and White persons with HF. The results indicate the need for further research on the associations between these variables and the factors contributing to negative outcomes among Blacks with HF.

Psychological Characteristics. ***Depression, Anxiety, and Comorbid Depression and Anxiety*****.** Finding no differences by race in depression aligned with prior studies on racial differences in depression (Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Griffin et al., 2007; Piamjariyakul et al., 2013; Rohyans & Pressler, 2009; Xiong et al., 2015). However, other research has found differences in depression (Ahmed et al., 2006; Bean et al., 2009; Evangelista, Ter-Galstanyan, Moughrabi, Moser, et al., 2009; Gottlieb et al., 2004) and anxiety by race. A potential contributor to this study’s findings was using the Hospital Anxiety and Depression Scale (HADS) to measure depression and anxiety. The HADS could have had measurement issues resulting in false positives and negatives (Y. Wu, Levis, Sun, He, et al., 2021; Y. Wu, Levis, Sun, Krishnan, et al., 2020). However, other scholars used the Minnesota Living with HF Questionnaire (Gottlieb et al., 2004), the Center for Epidemiologic Studies (Piamjariyakul, Thompson, et al., 2018) Patient Health Questionnaire (Rohyans & Pressler, 2009), and the Diagnostic Interview Schedule (Freedland, Rich, Skala, et al., 2003) and found no significant differences in depression among Black and White participants.

The Black race did not correlate with anxiety in this sample. This finding contributed to the limited research on patients with HF and their anxiety and racial differences, which had little anxiety-related findings by race. Scholars have rarely studied anxiety among the overall HF patient population (Celano et al., 2018; Easton et al., 2016; Sokoreli et al., 2016), particularly Black individuals with HF. Although not reported by race, some research has suggested that patients with HF and anxiety have greater healthcare utilization and mortality (De Jong et al., 2011). Undiagnosed and untreated anxiety could contribute to disparate healthcare utilization and mortality rates among Blacks. Therefore, there is a need for further anxiety-focused research on potential racial differences.

Depression and anxiety were highly correlated in this sample, consistent with prior studies (Celano et al., 2018; Dekker et al., 2014; Evangelista, Ter-Galstanyan, et al., 2009; Freedland, Carney, et al., 2021). Evangelista, Ter-Galstanyan, et al. (2009) found that Blacks were likelier to have comorbid depression and anxiety than Whites. Comorbid depression and anxiety commonly occur in patients with HF, and their clinical presentation overlaps. Isolating each disorder's symptoms is challenging (Celano et al., 2018).

Relationships Between Psychological and Sociodemographic Characteristics.

Gender. Gender did not significantly correlate with depression or anxiety in this study's sample. The lack of a relationship between gender and depression aligned with studies that showed no significant differences in depression based on gender (Celik et al., 2016; Griffin et al., 2007; Rohyans & Pressler, 2009; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009). However, other scholars found that women with HF reported significantly more depression (Ahmed et al., 2006; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Jiang et al., 2001; Vaccarino et al., 2001; Xiong et al., 2015) and anxiety (Dekker et al., 2014) than men. However, this study's sample had a significant difference in participant gender, with men better represented, particularly among Whites. This sampling issue could have impacted the findings.

Marital Status. Depression and anxiety did not correlate in this sample, consistent with four studies that found no significant differences in depression among patients married or living alone and those living with family or friends (Dekker et al., 2014; Gottlieb et al., 2004; Rohyans & Pressler, 2009; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009). However, relationships between depression, anxiety, and marital status require further exploration because Chung et al. (2009) found that patients and their spouses felt depressed and anxious. There could be social support considerations and mental health implications for spouses of patients with HF.

Education Level. Lower education levels correlated with depression and anxiety in this sample. Although studies have had differing findings, a lower educational level is associated with greater depression (Celik et al., 2016; Chung et al., 2009; Vaccarino et al., 2001). Two other studies found correlations between higher levels of depression and anxiety (Aggelopoulou et al., 2017; Dekker et al., 2014). However, Brouwers et al. (2014) found that higher educational level correlated with greater depression in patients with HF. Thus, the research has had inconsistent findings. These three studies indicated above occurred in the United States, Turkey, and Greece. Cultural and societal norms and sampling, including of Blacks and other minorities in the United States compared to racially homogenous samples in other countries, could have impacted these studies' findings.

Employment Status. Employment status did not relate to depression or anxiety in this sample. Little research has focused on employment status and emotional well-being among patients with HF. However, Freedland, Rich, Skala, et al. (2003) found that unemployment due to disability significantly correlated with depression. Similarly, Ohlsson et al. (2021) identified a relationship between unemployment and increased mortality among patients with HF and adjusting for age and gender did not affect this finding.

Relationships Between Psychological and Sociodemographic Characteristics. The EF of this study's sample did not significantly differ by race. Interestingly, the results showed no significant differences by race in disease severity, as measured with EF and NYHA Class when comparing Blacks and Whites. This finding suggests that Black and White individuals with similar clinical status might have different outcomes, with Blacks tending to have negative or worse outcomes (Tsao et al., 2022; Virani et al., 2020, 2021). Hence, there is a need for further research on the factors contributing to different clinical outcomes.

Disease Severity: EF and NYHA Class. NYHA Class and EF were significantly related in this study's sample. This study's findings differed from Freedland, Rich, Skala, et al. (2003), who found depression more prevalent among individuals (*n* = 682) with lower EF within a sample that comprised 278 Blacks (41%). However, Freedland, Rich, Skala, et al. did not stratify the findings by race. This study did not find a significant association between depression and anxiety and EF. However, a higher NYHA Class was significantly associated with depression and anxiety. Thus, depression and anxiety significantly correlated with NYHA Class. This finding aligned with research that found associations with greater depression (Bean et al., 2009; Chung et al., 2009; De Jong et al., 2011; de Leon et al., 2009; Dekker et al., 2014; Dickson, McCarthy, & Katz, 2013; Freedland, Rich, Skala, et al., 2003; Gottlieb et al., 2004; Rohyans &

Pressler, 2009; Sharma et al., 2009; Trivedi et al., 2009) and NYHA Class. However, although EF and NYHA Class correlated, neither were significantly associated with depression and anxiety in this study.

Comorbidities. Neither depression nor anxiety was significantly associated with comorbidities in this study. This finding differed from prior studies that found comorbidities associated with depression (Patel et al., 2018) and anxiety (Dekker et al., 2014) in patients with HF. Lesman-Leegte et al. (2009) found an increased unadjusted odds ratio of 2.48 for depression in patients with HF without additional chronic conditions and 3.79 in those with additional chronic conditions. The risk for depression in patients with HF and participants with more chronic conditions was more than three times higher than in patients without chronic conditions (Lesman-Leegte et al., 2009). This finding aligned with Ahmed et al. (2006) and Sharma et al. (2009), who found no relationship between greater depression and comorbidities.

Functional Status. This study's results showed a correlation between lower functional status and depression and anxiety, aligning with prior studies on depression and, to a lesser extent, anxiety (Clarke et al., 2000; Dickson et al., 2013; Herr, Sayler, Flattery, et al., 2015; Shen et al., 2010; Vaccarino et al., 2001). Functional status limitations commonly occur among patients with HF, as HF symptoms frequently affect patients' ability to participate in activities of daily living (ADLs). Additionally, many patients with HF have fatigue and pronounced mobility challenges (Blinderman et al., 2008; Falk et al., 2008; Herr, Sayler, Lyon, et al., 2014; Herr, Sayler, Flattery, et al., 2015; Moser, Lee, et al., 2014). Patients unable to perform ADLs are likelier to be depressed and have worse functional status (de Leon et al., 2009; Freedland, Rich, Skala, et al., 2003). Improving functional status could be a way to reduce depression (X. Zhang et al., 2020).

Aim 2: Sociodemographic, Clinical, and Psychological Predictors of Quality of Life

This study showed that the sociodemographic characteristics of race, gender, education level, and employment status did not impact QOL. Of the clinical characteristics, EF and comorbidities did not impact QOL. Age, marital status, functional status, NYHA Class, and anxiety associated with QOL in the bivariate analysis were significant predictors of QOL in Steps 1 and 2 of the regression model building. However, depression was the most significant contributor to QOL.

Sociodemographic Characteristics and QOL. ***Race.*** An interesting finding was that race was not significantly associated with QOL in this sample, perhaps because the study did not include patients classified as NYHA Class I. Higher NYHA Class correlates with lower QOL (Coelho et al., 2005; Freedland, Rich, et al., 2021; Lee et al., 2005). However, most research has not focused on patients in NYHA Class I, likely because they are often asymptomatic. This omission could have resulted in limited interventions for this subpopulation, which might cause significant emotional distress. Relationships between race and QOL require further exploration, as does the influence of other sociodemographic, clinical, and psychological characteristics on patients with HF.

Age. In the bivariate analysis, age was significantly associated with QOL, as the older patients had better QOL. In the multivariate analysis, older age was a significant predictor of better QOL. Some studies found that younger patients have worse QOL. This study's results do not align with other research indicating worse QOL among older patients with HF (Luttik et al., 2006).

Gender. The bivariate analysis showed that gender was not significantly associated with QOL in this study's sample. This result aligned with other studies that found that QOL did not vary by gender. However, some studies found that women with HF had worse QOL than men, even after adjusting for age and comorbidities (Lesman-Leegte et al., 2009; Riedinger et al., 2001).

Marital Status. Marital status was significantly associated with QOL in this study's sample, which aligns with prior research indicating that married individuals have higher QOL (Luttik et al., 2006). Similarly, Chung, Lennie, et al. (2009) found that patients with spouses had longer event-free survival. Marriage could be a protective factor and means of social support for patients with HF (Chung, Lennie, et al., 2009; Rohrbaugh et al., 2006). Many patients with HF are homebound and experience social isolation. Therefore, a marital partner who assists with ADLs, shares in financial responsibilities, assists with HF self-care, and provides emotional support could positively influence QOL. Chung, Moser, et al. (2013) also found that depression was a predictor of social support, and that social support was a QOL predictor QOL. Therefore, there are relationships between social support, lower depression, and better QOL.

Education and Employment Status. Education level and employment status did not significantly associate with QOL in this sample. In contrast, prior studies found that participants with less education had lower QOL (Barbareschi et al., 2011; Lee et al., 2005; Liu et al., 2021) and that patients with HF with employment had better QOL (AbuRuz, 2018). However, these studies occurred in other countries, and sociocultural differences could have resulted in differing findings. Unemployment correlates with greater mortality in patients with HF (Rørth, Fosbøl, et al., 2018). There is a need for further research on the relationships between employment status and QOL.

Clinical Characteristics and QOL. ***Disease Severity.*** Another interesting finding was that although the Black participants had significantly worse disease severity than Whites as measured by the EF, they did not have significantly lower QOL than the White patients. This finding differed from the general HF patient population, as prior studies found an association between higher disease severity and lower QOL (AbuRuz, 2018; Carson et al., 2009; Freedland, Rich, et al., 2021). Additionally, like prior research, this study showed that a worse NYHA Class was associated with worse QOL (Coelho et al., 2005; Freedland, Rich, et al., 2021; Lee et al., 2005).

Comorbidities. In this study, comorbidities did not significantly associate with QOL. However, prior studies found that comorbidities negatively impacted QOL in patients with HF (Carson et al., 2009; de Leon et al., 2009; Lesman-Leegte et al., 2009; Reddy et al., 2020). Because Black individuals are likelier to have multiple chronic illnesses (Cuyjet & Akinboboye, 2014), they have the greatest risk for lower QOL. There is a need for further research on the relationships between comorbidities and QOL in patients with HF, as comorbidities with overlapping symptoms could impact a study's findings (de Groot et al., 2003). Managing multiple chronic illnesses is taxing and can negatively affect QOL. Future scholars could investigate comorbidity measures, as the long-standing Charlson Comorbidity Index (Charlson et al., 2022) might not be the best instrument for measuring phenomena with implications for clinical outcomes in large patient populations and reducing disparities among Blacks with HF.

***Functional Status*.** Functional status is an element of QOL (Ferrans et al., 2005) measured in the QLI-Health and Functioning Subscale (Ferrans, 1990; Ferrans & Powers, 1985, 1992; Ghasemi et al., 2014; Warnecke et al., 1996). Based on prior research, one of this study's assumptions was that there would be a relationship with QOL (Wu et al., 2016). However, functional status does not consistently correlate with QOL in patients with HF (Carels, 2004; de

Leon et al., 2009). Different findings could have resulted from functional status measurements across studies.

Psychological Characteristics and QOL. ***Depression.*** Depression was the most significant predictor of QOL in this sample, accounting for 60% of QOL variance. The multivariate analysis results aligned with prior studies that found that depression negatively impacted QOL in patients with HF (AbuRuz, 2018; Aggelopoulou et al., 2017; Bekelman, Havranek, et al., 2007; Chung, Lennie, et al., 2009; Chung, Moser, et al., 2013; Cully et al., 2010; Gottlieb et al., 2004; Mentz et al., 2015; Salyer et al., 2019; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009). Despite limited evidence that QOL in Black individuals differs from the general population of patients with HF (de Leon et al., 2009; Warnecke et al., 1996), this study did not find racial differences in the sample. Instead of using a valid and reliable instrument, de Leon et al. (2009) measured QOL based on patient perceptions but excluded Black patients (n = 209) due to missing data. Black patients were also likelier to have lower QOL scores. Therefore, sampling and measurement issues could have contributed to the observed racial differences in this sample. Other studies had differing findings. For example, despite finding that participants with more depression and anxiety reported lower QOL, Bean et al. (2009) identified no statistically significant racial differences ($p > .05$).

Racial disparities, racial QOL differences, and the influence of depression on QOL require further exploration. Baseline and worsening depression correlate with poor QOL and all-cause mortality (Mentz et al., 2015), and Black patients have persistently worse clinical outcomes. Depression can negatively impact a patient’s ability or willingness to engage in physical activity, regardless of ability (McCarthy et al., 2015). Thus, there is a need to discern whether patients have clinically significant depression (Bean et al., 2009; Blumenthal et al., 2012), as it can negatively impact patients with HF, especially those who are Black (Mentz et al., 2015).

This study did not find significant differences in depression, as Black and White participants had similarly high depression rates. However, behavior caused by depression could be more detrimental to Blacks with HF and contribute to disparate clinical outcomes. Black individuals with HF with depression might be less likely than individuals of other races to adhere to diet, exercise, and medication regimens and report symptoms. Rather than seeking care for symptoms such as shortness of breath, fatigue, and fluid retention, Black patients with HF and depression might choose passive self-care, such as resting in bed or waiting for symptoms to subside. Some patients have attributed a lack of self-care to depression, sadness, or a lack of energy (Bean et al., 2009; de Leon et al., 2009; Dickson et al., 2013; Gottlieb et al., 2004; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009). Coping with depression can cause behavioral or mental disengagement, sometimes resulting in poor self-management practices, such as ignoring symptoms and medical recommendations (Trivedi et al., 2009). Individuals with HF and depression might recognize their health status is changing and their HF-related symptoms are worsening but delay contacting health care providers and seeking care (Evangelista et al., 2002).

Anxiety. Anxiety was a significant QOL predictor in Step 2 of the regression model–building process, but its significance decreased in the full model (Step 3). Although insignificant in the final model, this finding aligned with prior research that anxiety negatively impacts QOL in patients with HF (AbuRuz, 2018; Aggelopoulou et al., 2017; Chung, Moser, et al., 2009; Polikandrioti et al., 2019; Salyer et al., 2019).

Multivariate Analysis. Several variables were significant QOL predictors when entered into the stepwise regression model. In the final model, depression was the only significant predictor of negative QOL and accounted for 60% of QOL variance. This study showed the negative impact of depression on the QOL of patients with HF. This finding aligned with prior studies indicating that depression negatively impacts QOL in patients with HF (Gottlieb et al., 2004).

Blacks are likelier to have severe, disabling, and untreated major depressive disorder (Williams et al., 2007). Additionally, Blacks with chronic illnesses have the highest depression rates, poorest health-related QOL, and worst functional status (Jackson-Triche et al., 2000). Black individuals are not screened, diagnosed, and treated at the same rates as Whites (Barnes & Bates, 2017), and depression and anxiety fluctuate over time (Hamatani et al., 2021; Hill-Joseph, 2019). Research might have had varied findings based on measurement timing. Contradictory evidence might have also resulted from cultural differences, cultural norms, and stigma in Blacks' perceptions of depression and anxiety and reluctance to identify with perceived negative mental health diagnoses (Das, Olfson, et al., 2006; Das, Roy, et al., 2019).

Among patients with HF, psychological distress can result in poor adherence to prescribed regimens (Eisele et al., 2020). In the presence of depression, patients with HF might struggle to engage in the self-care necessary to avoid hospital readmission and other adverse clinical outcomes (Lockhart et al., 2014). Some patients with HF prescribed antidepressant therapy remain depressed (Blumenthal et al., 2012; Chung, Moser, et al., 2013; Dekker et al., 2014). Depression was the most significant QOL predictor in patients with HF in this sample. Thus, depression in patients with HF requires attention and intervention by clinicians and researchers to prevent negative clinical outcomes.

Black patients have the highest rate of depression, the poorest health-related QOL, and the worst functional status (Jackson-Triche et al., 2000). Williams et al. (2007) found that Blacks were likelier to have severe, disabling, and untreated major depressive disorder. Providers can address depression’s significant influence on the QOL of patients with HF and disparities among Blacks (Tsao et al., 2022; Virani et al., 2020, 2021) by proactively screening Black patients with HF for depression. However, due to stigma (Das, Olfson, et al., 2006) and other cultural norms, some Blacks might not admit their feelings to healthcare providers (Dickson et al., 2013; Gottlieb et al., 2004; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009) or identify with or admit to feeling depressed. Instead, Black patients might use other terms for depression, such as sadness, overwhelm, low energy, or feeling-down energy (Dickson et al., 2013).

Limitations

This study has several methodological limitations. First, the secondary data analysis focused on extant data via study methods designed to address the study’s goals. Secondary data analysis is a way to improve feasibility. However, remaining limited to the methods used in a previous study with different goals did not enable the full exploration of all potential variables.

Second, the study included data collected in 2014. Older data could have differed from more recent data, which would have impacted this study’s findings. Third, the relatively small sample from one setting may not have represented the general population of Black and White patients with HF despite methodological rigor. The sample aligned with the criterion of 50 participants per group to find differences (Cohen, 1992; Serdar et al., 2021), and there was adequate power based on the G*Power analysis (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner 2007). The data had normal distribution; the instruments showed adequate reliability (Cronbach’s alphas ranging from .83 to .96), and addressing the missing data with well-established standards. However, despite using proven strategies for handling missing data, the missing data could have impacted the findings, as 10 cases were excluded from the already small sample (see Figure 4).

Fourth, the parent study included participants in NYHA Classes II–IV and omitted those in Class I. Therefore, the study lacked findings regarding the sociodemographic, clinical, and psychological characteristics and QOL of patients in NYHA Class I. Also, the parent study occurred with only the satisfaction aspect of the Quality of Life Index (QLI). The inability to assess the importance of various QOL aspects could have resulted in limited findings, particularly regarding race. Fifth, this study did not include data on whether patients took prescribed antidepressants and anxiolytics and how their medications affected their observed depression and anxiety scores. Patients with HF prescribed antidepressants and anxiolytics often remain depressed (Chung et al., 2013; Freedl et al., 2016; Jiang et al., 2001) and anxious.

Conclusion

Like prior research (AbuRuz, 2018; Aggelopoulou et al., 2017; Bekelman, Havranek, et al., 2007; Chung, Lennie, et al., 2009; Chung, Moser, et al., 2013; Cully et al., 2010; de Leon et al., 2009; Gottlieb et al., 2004; Mentz et al., 2015; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009), this study found that greater depression and younger age were the most significant predictors of worse QOL among patients with HF. Despite the small sample and limitations, the results showed the prevalence of and need to screen for and treat depression in patients with HF because of its negative effects on QOL and clinical outcomes (Freedl et al., 2016; Sokoreli et al., 2016). Depression remains understudied in patients with HF (Ahmed et al., 2006; Bhatt et al., 2016; Holzapfel et al., 2008).

This study’s findings also indicate the importance of considering how various sociodemographic, clinical, and psychosocial characteristics impact patients with HF. Although the results showed no racial differences in depression, anxiety, or QOL, racial disparities persist among Black patients with HF. For example, Black individuals have the highest healthcare utilization rates (Pahuja et al., 2022; Tsao et al., 2022). Therefore, there is a need for more studies with racial comparisons to gain insight into the drivers of disparate clinical outcomes.

HF's global economic burden of over $108 billion (Cook et al., 2013) and projected impact (Heidenreich, Fonarow, et al., 2022; Heidenreich, Trogdon, et al., 2011; Lesyuk et al., 2018; Moradi et al., 2021; Tsao et al., 2022; Urbich et al., 2020) indicate the need to research and design interventions for all patients with HF, especially those disparately affected, such as Blacks (Tsao et al., 2022; Virani et al., 2020, 2021). Future research could focus on physiological and psychosocial contributors to depression and QOL in patients with HF and the factors contributing to racial disparities and disparate clinical outcomes among Blacks with HF.

Recommendations and Future Research

Racial disparities persist among Black individuals with HF (Tsao et al., 2022; Virani et al., 2020, 2021). Success in Phase III of the HF Disparities Reduction Framework (see Figures 2 and 3) and improving QOL require increasing knowledge and developing innovative approaches to improve depression and anxiety diagnosis and treatment in patients with HF (Doll, 2018). Scholars and practitioners could design, develop, and deploy novel treatment strategies, culturally competent care, and culturally responsive interventions to address racial differences and disparate clinical outcomes among Black patients. Scholars could use several approaches and foci to advance the research.

First, future research could occur with different research designs and methodologies. Scholars could conduct quantitative studies with larger samples from multiple study sites, qualitative studies of patients' perceptions of depression and QOL, and mixed methods studies to triangulate rich data about multiple facets of depression, anxiety, or QOL in HF patients. Considering patients’ diverse experiences could provide a better understanding of their thoughts, feelings, perceptions, behaviors, beliefs, and values when developing culturally appropriate interventions to positively impact care (Riegel et al., 2016) and reduce healthcare disparities (Davidson et al., 2007; Watson, 1995).

HF is cyclical, and depression and anxiety intensity vary over time (Hamatani et al., 2021; Hill-Joseph, 2019; Mentz et al., 2015; Regan et al., 2019). Black individuals experience a more significant fluctuation in depressive symptoms (Hill-Joseph, 2019). Scholars could conduct longitudinal studies to assess depression and anxiety patterns and their influence on QOL at various points with repeated measures (Hill-Joseph, 2019; Konstam et al., 2005) and assessments for racial differences. Researchers could observe variations as patients move across the healthcare continuum and through various healthcare delivery settings, especially with stressors such as readmission to inpatient facilities or HF exacerbations requiring outpatient provider visits.

Researchers could conduct secondary analyses to identify means of interrupting racial disparities among patients with HF. To determine racial differences, investigators could conduct secondary data analyses using data sets that include sociodemographic, clinical, and psychological characteristics, QOL, and representative Black samples. Practitioners could use such findings in making depression and anxiety screening tools a standard of care in primary and acute care settings. Screening would help to identify patients who could benefit from proactive interventions to prevent depression and anxiety from negatively impacting QOL and contributing to other negative clinical outcomes.

Black individuals comprise the majority of the patients with HF (Benjamin, Blaha, et al., 2017; Benjamin, Munter, et al., 2019; Benjamin, Virani, et al., 2018; Go et al., 2013; Go et al., 2014; Mozaffarian et al., 2016; Mozaffarian et al., 2015; Roger et al., 2012; Tsao et al., 2022; Virani et al., 2020, 2021). Despite being disproportionately affected by HF (Tsao et al., 2022; Virani et al., 2020, 2021), Black persons are underrepresented in HF research (Evangelista, Ter-Galstanyan, Moughrabi, Moser, et al., 2009; Gaffey et al., 2022). Race remains largely unexamined as a variable of potential influence. Although Black participants are available, investigators might not recruit them. The scholars whose samples have included Black individuals with HF and had adequate power to detect racial differences have seldom stratified findings by race. Decreasing racial disparities among Blacks with HF requires further investigation into the associated drivers and contributors. Intentionally including Blacks and identifying racial differences could be a way to advance science in this area and inform the development of innovative interventions for racial disparities among Blacks with HF. Future scholars could include Black participants for more representative samples to compare phenomena among patients with HF by race and use race as a variable with predictive value.

Researchers conducting studies with representative Black samples could isolate race as a variable that could impact the outcomes under study. Rather than reporting race descriptively, scholars could assess race’s influence on and predictive value for various clinical outcomes. Grouping minorities in analyses prevents the opportunity to detect racial differences, minimizing and disregarding race’s potential influence on health outcomes. Race can impact health and health outcomes and is a social determinant of health (Bhopal et al., 2021; Culley, 2006). Researchers who consider sociodemographic factors and cultural differences in focused and unbiased inquiries into patients' experiences could better understand racially, ethnically, and culturally influenced phenomena.

Black individuals' long-standing mistrust of the healthcare system and health-related research could be barriers to conducting health disparities research (Corbie-Smith, Thomas, St. George, 2002; Corbie-Smith, Thomas, Williams, & Moody-Ayers, 1999; Oh et al., 2015; Scharff et al., 2010; Simmonds, 2008). Therefore, setting specific recruitment goals (Durant et al., 2007), understanding barriers to (Branson et al., 2007; Hughes et al., 2017; Luebbert & Perez, 2016; Pugh et al., 2022; Rollins et al., 2018) and reasons for nonparticipation (Nooruddin et al., 2020), building trust, and gaining cultural awareness and competence (Rucker-Whitaker et al., 2006; Trantham et al., 2015) are essential when researching health disparities among Blacks (Byrd et al., 2011; Scharff et al., 2010). Innovative approaches to foster trust and connection, such as community engagement and involvement, could enable Black individuals to understand how participating in research might improve the human condition of other Blacks with HF and Black communities (Byrd et al., 2011; Lang et al., 2013; Spruill, 2010).

Scholars could also provide incentives, train staff in culturally congruent recruitment strategies, and diversify research teams to obtain more Black participants' agreement and commitment to participate in HF research (Billingsley, 2014; Branson et al., 2007; Browne et al., 2010; Ford et al., 2013; Fuqua et al., 2005; Graham et al., 2018; Hayes & Sharma, 2021; Huang & Coker, 2010; Hughes et al., 2017; Isler & Corbie-Smith, 2012; Lang et al., 2013; Luebbert & Perez, 2016; Mody et al., 2008). Further, investigators should not assume that Blacks will not participate in research, as Millon Underwood et al. (2013) found that 88.7% of their all-Black sample (*n* = 212) reported that they would have taken part in studies had anyone asked them.

Using this study’s model (see Figure 3) to test the relationships between sociodemographic, clinical, and psychological characteristics, QOL, and racial differences could contribute to the HF racial disparities research. Adding new sociodemographic, clinical, and psychosocial variables to the model could provide a better understanding of the factors contributing to persistent racial disparities, which might address the psychosocial needs of younger patients with HF, who are disproportionately Black (Gottlieb et al., 2004; Tandon et al., 2020; Virani et al., 2020, 2021). There is a need for more research on the intersection of race and age and its influence on depression, anxiety, and QOL. There is also a need to focus on preventative efforts and targeted interventions for younger Blacks with different age-based needs.

Women with HF have physiological and psychosocial differences (De Bellis et al., 2019; Hopper et al., 2016; Lee & Riegel, 2018; Sethares & Chin, 2021). Therefore, scholars could compare race and gender intersections with representative samples of women from all races to generate knowledge and design tailored interventions. The relationships between marital status, depression, anxiety, and QOL require further exploration, with an emphasis on racial differences. Scholars could explore marital quality in the general HF patient population and stratify the data by race to determine whether there are racial differences.

Patients with higher education levels tend to have less depression and anxiety (Bjelland et al., 2008). Thus, there is a need to understand the relationships and racial differences among education, depression, and anxiety. Researchers should explore the relationships between employment status, depression, and QOL because patients with HF who are unemployed are likelier to have poor adherence to prescribed medication regimens (Dickson et al., 2008) and experience negative clinical outcomes related to loss of livelihood (Rørth, Fosbøl, et al., 2018).

Future studies could also address SES, an important focus of health disparities research (Shavers, 2007; Winkleby et al., 1992). Scholars could explore the relationships among education, employment status, income, depression, anxiety, and QOL in patients with HF. SES might be an important indicator of racial differences among Black and White individuals with HF. Although Black persons with HF might receive disability benefits, unemployment, underemployment, and limited financial resources could cause financial stress and strain and contribute to negative clinical outcomes (Clark et al., 2003; Dewan et al., 2019; Hung et al., 2021; Lindenauer et al., 2013; Tansey, 2010; Tromp et al., 2020).

Future studies with patients in NYHA Class I could have different findings regarding depression, anxiety, and QOL, as this study included only patients in NYHA Classes II–IV. Data across the HF severity spectrum could provide better insight into depression, anxiety, and QOL. Additionally, Black individuals receive HF diagnoses at younger ages than Whites (Tsao et al., 2022; Virani et al., 2020, 2021). Younger Black patients newly diagnosed with HF might fall into NYHA Class I. Although patients in NYHA Class I do not have severe symptoms, they are at risk for depression, anxiety, and poor QOL, especially during the adjustment phase after diagnosis. Poor self-care during NYHA Class I could contribute to disease progression and more rapid and severe illness phases. Focusing on this seemingly lower-risk subpopulation is necessary because its members might be despondent about their diagnosis and long-term prognosis.

Future scholars could investigate correlations between EF and NYHA Class and their influence when measuring disease severity. Scholars could also research the contributors to HF disease severity among Black individuals. Future studies could also indicate differences in phenomena based on disease severity, as measured by reduced versus preserved EF.

Relationships between disease severity, depression, anxiety, and QOL require further exploration focusing on the best approaches for measuring disease severity in patients with HF.

This study did not find a correlation between comorbidities and depression, anxiety, or QOL. However, other researchers found adverse outcomes associated with comorbidities, including lower QOL in patients with HF (Carson et al., 2009; Freedland, Rich, et al., 2021; Heo et al., 2012; Reddy et al., 2020). Future researchers could further assess these relationships and test for racial differences. Because Black individuals with HF might experience greater functional impairment (Vaccarino et al., 2002), there is a need for more research on the relationships between functional status and QOL to address racial differences. Future scholars could assess the medications prescribed to patients with HF, such as beta blockers, that might correlate with depression (Silver, 2010) and prescriptions for other chronic illnesses that might lead to adverse outcomes in patients with HF (Amabile & Spencer, 2004). Researchers could also assess medication adherence and its potential relationship with sociodemographic, clinical, and psychosocial characteristics, as medication adherence contributes to optimal outcomes in patients with HF. However, multiple factors often impact medication adherence (Andrews et al., 2017; Molloy et al., 2012).

Contemporary scholars quantifying disease severity, progression, and functional status in patients with HF tend to use the Kansas City Cardiomyopathy Questionnaire (KCCQ) rather than the NYHA Class (Greene et al., 2021) or EF. The KCCQ more comprehensively addresses patient-reported health outcomes, enables patient monitoring over time, and includes diverse patient characteristics (Spertus et al., 2020). Therefore, the KCCQ could be a better measure of the clinical and psychosocial characteristics of patients with HF, including disease severity.

Inflammation is a possible physiological contributor to depression in patients with HF due to an activated immune response (Brouwers et al., 2013; Ghosh et al., 2016; Petersen & Felker, 2006; Xiong et al., 2015). Other clinical variables, such as disease severity, functional status, poor appetite, and mortality, correlate with inflammatory biomarkers (von Haehling et al., 2009). Studying the relationships between inflammatory biomarkers (e.g., tumor necrosis factor; Interleukin 1, 6, and 18; and C-reactive protein and depression) could provide insight into depression in patients with HF, including those who are Black, who remain underrepresented in the literature. Further insight might provide information on improving QOL in patients with HF by addressing depression's physiological basis with interventions for preventing and treating depression related to inflammation.

Future researchers could also explore the relationships between inflammatory biomarkers and anxiety. Depression is a significant predictor of QOL, and depression and anxiety correlate (Celano et al., 2018; Dekker et al., 2014; Dickson et al., 2013), as was also found in this study. Examining the relationships between comorbid depression and anxiety and inflammatory biomarkers could address HF's physiological and psychosocial aspects and contribute to the biobehavioral research on the interplay of these chronic disorders.

Symptom science research has provided insight into the effects of symptoms and symptom clusters on patients with HF (Herr, Salyer, Flattery, et al., 2015; Herr, Salyer, Lyon, et al., 2013; Jurgens et al., 2009; Lee & Riegel, 2018; Moser et al., 2014; Park et al., 2019; Salyer et al., 2019; Sethares & Chin, 2021; Son & Won, 2018). However, most studies have lacked a cultural lens. There is a need for further study of symptoms and symptom clusters with race stratification because HF's often-intense symptoms can impact depression, anxiety, and QOL (Heo, Doering, et al., 2008; Heo, Lennie, et al., 2009; Heo, Moser, Lennie, et al., 2007). Using a disparities lens to examine how symptoms contribute to and occur with depression, anxiety, and poor QOL could provide insight into how to improve QOL. Thus, scholars could stratify findings by race to capture any racial differences. Exploring differences in symptom clusters based on other sociodemographic and clinical characteristics would also contribute to the literature.

Future researchers could address clinical characteristics by assessing equity in the treatment of Black patients with HF, as inequities in the medical management of HF among Black individuals (Cascino et al., 2022; Mitchell et al., 2011) could contribute to adverse clinical outcomes, including hospital readmission (Wispelwey et al., 2019). Identifying inequities might indicate how to tailor interventions to foster equity in HF care and treatment for all races (Mensah et al., 2019; Ornelas et al., 2021).

Further study on psychological characteristics could show how to decrease depression and anxiety and improve QOL in patients with HF. Emotional distress can negatively impact Black patients with HF and contribute to adverse clinical outcomes, including decompensation, rehospitalization, and mortality (Ghali et al., 1988; Mentz et al., 2015). Black patients might not be screened, diagnosed, and treated for depression at the same rates as Whites (Barnes & Bates, 2017; Lewis et al., 2011; Mentz et al., 2015; Williams et al., 2007), and even when treated, Black patients might remain depressed (Chung et al., 2013; Freedl et al., 2016; Jiang et al., 2001). Access to care challenges and health equity also require further investigation because the mental health care provided to Black individuals could be inadequate compared to Whites (Cook et al., 2014).

This study found no racial differences in depression and anxiety. There is a need to understand depression and anxiety in Black individuals with HF because they might perceive depression and anxiety differently than other races, despite similarly high levels of psychological distress. Due to cultural norms and stigma regarding negative emotions (Das, Olfson, et al., 2006; Das, Roy, et al., 2019), Black patientss might underreport depression and anxiety to healthcare providers (Dickson, McCarthy, & Katz, 2013; Gottlieb et al., 2004; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009). They might also communicate less directly regarding depression, considering themselves overwhelmed with sadness, low spirits, or a lack of energy (Dickson et al., 2013). Thus, Black individuals might choose a passive response, such as resting in bed or waiting for symptoms to subside (Bean et al., 2009; de Leon et al., 2009; Dickson et al., 2013; Gottlieb et al., 2004; Sharma, Zehtabchi, Rojas, & Birkhahn, 2009). The passive approach has a cyclical effect because depression worsens among patients unable to effectively perform HF self-care (Dickson et al., 2013; Freedland, Carney, & Rich, 2011). Black individuals with chronic illnesses have the highest rates of depression, the poorest health-related QOL, and the worst functional status (Jackson-Triche et al., 2000) when compared to other races. Blacks are likelier to rate their depression as severe, very severe, disabling, and causing significant interference with functioning (Williams et al., 2007), potentially resulting in disparate HF clinical outcomes, including poor self-care (Alegría et al., 2008). Thus, Black individuals with HF require more proactive, intentional screening for depression and anxiety.

Providers cannot rely on Black patients to self-report depression or depressive symptoms, request antidepressants, or participate in therapy because Blacks are less likely to access mental health services than Whites (Alegría et al., 2008; Cook et al., 2014; Das, Olfson, et al., 2006; Ojeda & McGuire, 2006). Despite screening attempts, miscommunication regarding depression and anxiety could also contribute to missed diagnoses. Providers’ attitudes and communication styles could impact Black patients’ willingness to disclose depression. Some physicians minimize emotional expression in Black compared to White patients, resulting in less antidepressant prescriptions (Sleath et al., 1998). Thus, there is a need for congruent provider communication regarding psychological distress, culturally appropriate screening, and a focus on understanding the patient’s perspective (Humphreys et al., 2008).

Future researchers should examine methods for standardizing depression and anxiety measurement and screening of patients with HF to ensure measure reliability and validity in diverse samples. There are various measures for depression and anxiety in patients with HF. However, measurement errors could produce false high or low results because not all anxiety measures are equivalent (Clover et al., 2020). Thus, providers could misclassify depression depending on measurement approaches (Y. Wu, Levis, Sun, Krishnan, et al., 2020). Scholars have debated the best cutoff score for properly identifying depression (Tesio et al., 2014) and criticized the well-established HADS as a measure of depression (Y. Wu, Levis, Sun, He, et al., 2021; Y. Wu, Levis, Sun, Krishnan, et al., 2020) and anxiety (Clover et al., 2020).

Contending that the HADS might not be the best depression and anxiety measure, some investigators have suggested alternative scoring approaches to avoid false negatives and positives for major depression (Y. Wu, Levis, Sun, He, et al., 2021). Sensitivity and specificity issues in detecting major depression have led scholars to question the HADS and other instruments as accurate measures of depression. The measures might overlook symptoms that do not align with major depression diagnostic criteria but negatively impact patients with HF (Alhurani et al., 2015; Celano et al., 2018; Konstam et al., 2005; Nair et al., 2012; Rustad et al., 2013). Despite criticism, the HADS-D has adequate specificity for indicating depression in patients (Cassiani-Miranda et al., 2022).

Researchers could measure depression and anxiety to investigate the best measures for affective symptoms in patients with HF. Further research could show extant measures’ cultural congruence and appropriateness for identifying depression and anxiety in Blacks with HF. Scholars could focus on understanding the effectiveness of the best depression and anxiety measures in the general population of patients with HF and Black patients with HF. Researchers might focus on using culturally appropriate measures with internal consistency and reliability for all-Black samples. Future researchers could also isolate anxiety from depression to avoid confounding the two (Celano et al., 2018).

Depression is the most significant predictor of poor QOL, and anxiety highly correlates with depression (Celano et al., 2018; Dekker et al., 2014). Researchers could assess etiology, prevention methods, and strategies to minimize the effects and effectiveness of traditional (i.e., antidepressants, anxiolytics, and psychotherapy) and nontraditional depression and anxiety treatments (i.e., relaxation, meditation, and guided imagery) in patients with HF (Celano et al., 2018). Future scholars could also assess the treatment of patients with HF with antidepressants, compliance with prescribed medication regimens, and the medications prescribed for physical conditions. Finally, further exploring comorbid depression and anxiety with larger samples could contribute to the limited research on comorbid depression and anxiety in the general patient population and Blacks with HF to test for racial differences.

Depression profoundly affects the QOL of patients with HF. Future researchers could investigate depression-contributing factors and mitigation efforts in patients with HF, especially Black patients. Due to emotional and psychological distress, individuals with chronic illnesses (Ahmedani et al., 2017; Erlangsen et al., 2015; Fässberg et al., 2016; Fiske et al., 2008; Kye & Park, 2016; Le Strat et al., 2015; Sampaio et al., 2019), such as cardiovascular diseases (Dunn et al., 2021; Petersen et al., 2020; Suarez et al., 2015) and HF (Celano & Huffman, 2018; Korkmaz et al., 2019; Liu et al., 2018; Lossnitzer et al., 2009; V. C.-C. Wu et al., 2018), are at risk for suicide ideation, suicide attempts, and death by suicide, especially when faced with untreated and unrelenting depression.

This study found that the Black patients were younger than the White participants, aligning with prior research (Tsao et al., 2022; Virani et al., 2020, 2021). Younger patients are at the greatest risk of depression (Choi et al., 2019; Fiske et al., 2008; Hirsch et al., 2009; Juurlink et al., 2004; V. C.-C. Wu et al., 2018). Additionally, there might be relationships between depression, QOL, and suicidality based on age. Black individuals with HF might have a higher risk of suicide because they often have more comorbidities, and comorbidities increase suicide risk (Juurlink et al., 2004) among patients with chronic illnesses (Sharma et al., 2014). Younger persons who receive disability pensions also have a higher mortality risk from suicide (Jonsson et al., 2013). There is a need for more research on the relationships between depression and suicidality in patients with HF to inform the development and testing of interventions to prevent, identify, and treat depression, avoid suicide risk, and lower suicide prevalence as HF prevalence increases, especially among younger Blacks.

This study did not indicate the importance of the overall QOL and four QOL domains in the QLI to patients or the racial differences in perceived importance. Future researchers should explore whether Black and White patients with HF consider various QOL domains (health and functioning, social and economic, psychological/spiritual, and family) equally important and stratify the findings by race. Assessing the importance of specific QOL aspects could indicate how to develop tailored interventions to improve QOL in Blacks with HF. Black patients with chronic illnesses may perceive the importance of QOL aspects differently from their White counterparts based on their perceptions. Future scholars could also assess the relationships between the four QOL domains and sociodemographic, clinical, and psychological characteristics to determine whether the relationships differ from assessing total QOL. In addition to examining the contributors to and detractors of QOL in patients with HF, scholars could investigate the psychosocial characteristics contributing to QOL and patients' abilities to adhere to treatment regimens, such as self-management, sexual health and functioning, social support, spirituality, health literacy, depression, anxiety, and QOL in caregivers of patients with HF.

Because of its complexity and chronic nature, HF requires patients to actively engage in effective self-care at home to yield positive clinical outcomes (Jaarsma et al., 2021; Riegel, Dickson, & Faulkner, 2016; Riegel, Moser, et al., 2009). Culture differs among various racial and ethnic groups and can impact HF self-care (Davidson et al., 2007; Dickson, McCarthy, Howe, et al., 2013; Dickson, McCarthy, & Katz, 2013; Jaarsma et al., 2021; Riegel et al., 2009). Cultural influences on self-care, including those related to depression and anxiety, could contribute to persistent racial disparities among Blacks with HF (Dickson, McCarthy, Howe, et al., 2013).

Self-management is an aspect of HF self-care. Effective HF self-management is complex, requiring active engagement and motivation to monitor and manage medications, symptoms, diet, and exercise (Granger, Sandelowski, Tahshjain, Swedberg, & Ekman, 2009; Riegel & Dickson, 2008; Riegel, Lee, & Dickson, 2011; Riegel, Moser, & Anker, et al., 2009). Patients who effectively engage in self-care have less than half the risk of all-cause mortality, hospitalization, or emergency room admission than those less engaged (Lee, Moser, Lennie, & Riegel, 2011). Minorities, individuals with lower SES, and those with lower health literacy are the most vulnerable and at the greatest risk for poor self-management and worse clinical outcomes (Barnason et al., 2012; Murray et al., 2009). Blacks fall into all three high-risk categories. Although patients might know about the prescribed HF self-management regimen, they could struggle to avoid exacerbation, clinical status declines, and hospitalization when they are depressed and anxious (Granger, Sandelowski, Tahshjain, Swedberg, & Ekman, 2009).

High healthcare utilization and increased mortality among patients with HF, especially Black patients, might correlate with undiagnosed and untreated depression and anxiety. Patients could struggle to implement the prescribed complex HF self-management regimens when depressed and anxious (DiMatteo et al., 2000; Mead et al., 2010; Riegel, Moser, et al., 2009). Scholars could research relationships between self-management, depression, anxiety, and QOL with a focus on racial differences to decrease healthcare costs, enhance QOL, decrease racial disparities, and improve other clinical outcomes. Future investigators could also consider examining relationships between depression, anxiety, and QOL and other aspects of HF self-care, including symptom perception and self-care maintenance.

Sexual health is an important QOL aspect addressed in the QLI. Sexual health and functioning affect health, well-being, and QOL among patients with chronic illnesses, including HF (Baert et al., 2019; Westlake et al., 1999). However, sexual functioning has received minimal focus in HF care, management, and research. Sexual dysfunction correlates with depression in the general population (Andrews et al., 2017; Atlantis & Sullivan, 2012; Fabre & Smith, 2012; Yazdanpanahi et al., 2018) and patients with chronic illnesses (Bąk et al., 2017; Basson et al., 2010; Cichocka et al., 2020; Corona et al., 2016; Esen et al., 2015; Heiden-Rootes et al., 2017; McCabe et al., 2016; Slack & Aziz, 2020; Yazici et al., 2009). Additionally, sexual dysfunction contributes to poor QOL in individuals with chronic illnesses (Collins et al., 2012; Fernandes et al., 2010; Schwarz et al., 2008; Senol, 2018; Tański et al., 2022; Tutoglu et al., 2014; Yazici et al., 2009). Some antidepressants contribute to sexual dysfunction (Baldwin, 2001; Baldwin &

Foong, 2013; Basson & Gilks, 2018; Heiden-Rootes et al., 2017; McCabe et al., 2016; Montejo et al., 2018; Slack & Aziz, 2020). Therefore, treating depression with antidepressants might significantly contribute to a cyclical pattern of worsening depression and sexual dysfunction.

HF's complex negative physiological and psychological effects cause many patients to experience sexual dysfunction (da Silva et al., 2022; Jaarsma, 2017; Schwarz et al., 2008; Sztajzel, 2015), which contributes to poor QOL (Baert et al., 2019; Freitas et al., 2006). Sexual health is important to patients with HF, and sexual dysfunction is concerning (Fischer & Bekelman, 2017; Schwarz et al., 2008). Sexual dysfunction in younger individuals and noncompliance to prescribed regimens for chronic illnesses indicate masked depression (Shetty et al., 2018). Black patients with HF are likelier to be younger than White patients (Tsao et al., 2022; Virani et al., 2020, 2021). Therefore, sexual dysfunction could have greater implications for Black persons with HF and could be a major contributor to depression, anxiety, and poor QOL.

Patients with HF want to discuss their sexual health (Baert et al., 2019; van Driel et al., 2014), but healthcare professionals struggle to integrate sexual health into chronic illness management (Fennell & Grant, 2019; Haesler et al., 2016; McGrath et al., 2021), including for those with HF (Hoekstra et al., 2012; Kolbe et al., 2016). Sexual health changes could contribute to depression and poor QOL in patients with HF. Healthcare professionals should provide opportunities for patients to discuss and learn about their sexual health while living with HF and its potential activity and physical limitations.

Future scholars could explore the relationships between sexual health, depression, anxiety, and QOL and assess them for racial differences. Investigators could also explore barriers and facilitators to effective communication and patient sexual education among healthcare professionals. Researchers could also test interventions related to improving the sexual health of patients with HF to decrease depression and improve QOL.

Patients lacking adequate social support are likelier to experience adverse physical and mental health, including poor coping abilities, depression, and inadequate self-care (Bean et al., 2009; de Leon et al., 2009; Dickson, McCarthy, & Katz, 2013; Evangelista, Ter-Galstanyan, S. Moughrabi, & Moser, 2009; Rohyans & Pressler, 2009; Trivedi et al., 2009). Social support is a way to prevent and reduce depression (Graven & Grant, 2013; Riegel, Moser, et al., 2009; Trivedi et al., 2009), as loneliness correlates with depression (Brouwers et al., 2014). The supporter’s relationship to the patient or living arrangements might not indicate support efficacy; however, human beings who act as confidants and discuss depression and other symptoms can increase patients’ ability to improve their coping mechanisms and self-care (Bean et al., 2009; de Leon et al., 2009; Dickson, McCarthy, & Katz, 2013; Evangelista, Ter-Galstanyan, Moughrabi, & Moser, 2009). A lack of social support also correlates with poor QOL. Social support might not modify the effects of HF’s physical limitations; however, it contributes to mitigating depression, improving QOL (de Leon et al., 2009) and patients’ ability to effectively cope with symptoms (Bean et al., 2009; Chung, Moser, Lennie, & Frazier, 2013; Chung, Moser, Lennie, & Rayens, 2009; de Leon et al., 2009; Dekker et al., 2014; Dickson, McCarthy, & Katz, 2013; Evangelista, Ter-Galstanyan, Moughrabi, & Moser, 2009; Rohyans & Pressler, 2009; Trivedi et al., 2009).

There might be racial, ethnic, and cultural differences in the relationships between depression, anxiety, QOL, and social support. Dickson, McCarthy, and Katz (2013) found that Black patients with HF rarely relied on healthcare providers for support, instead relying on family and friends of the same culture. Future researchers could explore the influence of social support on depression and anxiety and whether there are differences between Black and White patients with HF. Scholars could also explore how to use eHealth and mHealth interventions to improve social support for patients (Mohr et al., 2014), especially Blacks with HF. Around-the-clock, indefinite access to healthcare professionals or caregivers might not be feasible, but technology could enable social interactions among patients from various locales. Thus, technology could enable patients to engage with others who understand their condition and interact with healthcare providers. Black individuals could use technology to interact with people of the same race who could provide culturally driven social support (Dickson, McCarthy, & Katz, 2013) for decreased depression and anxiety (Cornelius et al., 2022).

Culturally responsive eHealth interventions (Latulippe et al., 2017), such as an online social networking platform, or mHealth modalities, such as text messaging and mobile applications, could be means of socially supporting Black patients with HF (Vorderstrasse et al., 2016), decreasing depression and anxiety, and improving QOL. However, Black patients remain underrepresented in eHealth and mHealth studies (James et al., 2017). Before designing, developing, and testing technological interventions, scholars could assess Black individuals' willingness, perceptions, preferences, and priorities for using technology for social support. Scholars could research the technological modalities patients are likelier to use and the sociodemographic (Riegel, Moser, et al., 2009), clinical, or psychosocial factors that could impact use and perceptions about technology (Guzman-Clark et al., 2013; Peeters et al., 2013). Understanding the perspectives of Black patients with HF about using technology to improve social support could indicate how to design and develop interventions (Peeters et al., 2013) to improve acceptability and adoption. Such interventions could be ways to decrease depression and anxiety, improve social support and QOL, and reduce disparities among Blacks with HF.

Caregivers of patients with HF often serve as support systems. However, there has been growing concern for the mental and emotional well-being of caregivers of patients with HF. More research should occur to determine the depression, anxiety, and QOL of caregivers of patients with HF. Living with a family member with HF is challenging and could negatively impact family and caregiver physical and psychosocial well-being (Bahrami et al., 2014; Dracup et al., 2004; Ghasemi et al., 2020; Lum et al., 2014; Whittingham et al., 2013). Patients with HF and their spousal caregivers might have similar depression and anxiety (43%–57%; Chung et al., 2009). The emotional well-being of patients with HF also impacts their caregivers' emotional well-being (Evangelista, Dracup, Doering, et al., 2002). Caregivers of patients with HF require support to adequately function in their caregiving roles (Cameron et al., 2016). However, scholars have not stratified these limited findings by race.

There are also differences in the effects of HF caregiving on caregivers based on age, race, employment status, financial position, family dynamics, social support, and other factors (Dracup et al., 2004; Grigorovich et al., 2017; Hu et al., 2016; Saunders, 2008; Usher & Cammarata, 2009). However, scholars have not stratified their findings by race, and there is little research on the experiences of Black caregivers of Black patients with HF. Future research could focus on the influence of depression, anxiety, and QOL on caregivers of patients with HF and address potential racial differences. Depression and anxiety might contribute to poor QOL, morbidity, and mortality among caregivers of patients with HF. These adverse impacts are especially problematic for Blacks, who already have high rates of chronic illness morbidity and mortality (Doshi et al., 2016; Ellis et al., 2020; Ward & Schiller, 2013). However, there are effective interventions for caregiver burden (Etemadifar et al., 2014). More research and interventions could indicate how to interrupt this pattern among Black caregivers of Black patients with HF.

Spirituality also impacts QOL (Abu et al., 2018; Beery et al., 2002; Borges et al., 2021; Burlacu et al., 2019; Counted et al., 2018; Koenig, 2004; Melo et al., 2015; Panzini et al., 2017; Sawatzky et al., 2005) and is one of the QOL domains assessed in the QLI (Ferrans, 1990; Ferrans & Powers, 1985). Patients with chronic illnesses (Delgado, 2007; Roger & Hatala, 2018), particularly Black patients (Becker & Newsom, 2005; Chin et al., 2000; Coats, 2015; Conner & Eller, 2004; Gibson & Hendricks, 2006; Holt et al., 2009; Siler et al., 2021; Warren-Findlow & Issel, 2010), rely on spirituality to cope and adjust (Coats et al., 2017) and decrease the negative effects of depression and anxiety (Chin et al., 2000; Loeb, 2006).

Spirituality can also positively impact depression (Bekelman, Dy, et al., 2007; Clark & Hunter, 2019; Mills et al., 2015; Westlake & Dracup, 2001) and anxiety (Bean et al., 2009; Clark & Hunter, 2019; Westlake et al., 2002) in patients with HF. However, few studies have addressed the relationships between spirituality and anxiety in patients with HF. Spiritual well-being has a significant role in illness perceptions and coping with sadness and loss. Additionally, spiritual well-being closely correlates with psychological well-being and responses to depression and anxiety. Spiritual well-being could be of greater importance to the psychological health of Black individuals with HF (Bean et al., 2009; Dickson et al., 2013), as Black persons often rely on their faith to protect against and mitigate depression (Bean et al., 2009; Dickson, McCarthy, Howe, et al., 2013).

Elhag et al. (2022) found relationships between spirituality and medication adherence in patients with cardiovascular disease, including HF. Thus, spirituality could support self-management activities and might correlate to less depression and anxiety and adequate QOL.

Scholars have measured and conceptualized spirituality in patients with HF in various ways (Beery et al., 2002; Clark & Hunter, 2019). Interventions in which spirituality is a means of improving depression, anxiety, and QOL could be effective (Naghi et al., 2012), especially among Black patients. Such interventions could be a way to decrease disparities and improve clinical outcomes among Black individuals. However, there is a need for more research to understand the relationships and their influence.

Lower health literacy contributes to negative clinical outcomes (Cajita et al., 2016; Fabbri et al., 2020; Liu et al., 2019; Moser et al., 2015; Peterson et al., 2011), including lower QOL (Macabasco-O'Connell et al., 2011) and greater mortality (Fabbri et al., 2020; Liu et al., 2019; McNaughton et al., 2015; Moser et al., 2015) in patients with HF. Scholars could explore lower health literacy and racial differences in psychosocial characteristics. Lower health literacy correlates with poor adherence to prescribed HF regimens (Cajita et al., 2016; Deek et al., 2020), greater depression and anxiety, and low QOL. Therefore, patients with HF could benefit from clinicians regularly assessing health literacy as often as vital signs (Evangelista, Rasmusson, et al., 2010; Weiss et al., 2005). Rather than focusing only on educational status, providers could improve depression, anxiety, and QOL in patients with HF by assessing and improving health literacy, especially in Black patients, who often have lower health literacy (Chaudhry et al., 2011; Morrow et al., 2006; Westlake et al., 2013). Future scholars could develop and test interventions, including those with technology, to improve health literacy in patients with HF (Bas-Sarmiento et al., 2022; Deek et al., 2020; Friel, 2016; Westlake et al., 2013). Other social determinants of health, including economic stability, neighborhood and physical environment, community and social context, and the healthcare system, have implications for the QOL of patients with HF (Javed et al., 2022). This study did not address these concepts at length, indicating the need for future research.

Alignment With National Institute for Nursing Research

This study's foci and related directions for future research aligned with much-needed HF health disparities research and the National Institute for Nursing Research's (NINR) Strategic Plan for the next 4 years. This body of work examines social determinants of health, such as SES; proposes a focus on population and community-level interventions to address critical health challenges among patients with HF, including those that would leverage technology; focuses on tertiary prevention strategies among patients with HF by reducing disease severity, symptoms, and progression by considering relationships between sociodemographic, clinical, and psychosocial characteristics, and has the potential to reduce and ultimately eliminate systemic and structural inequities among Black patients with HF (NINR, 2022).

Advancing Health Disparities in Heart Failure Research

Structural racism is a social determinant of health (Nardi et al., 2020). More research on racial disparities among Black and White persons with HF could indicate how to improve HF racial disparities and usher in Phase IV: Reduced Mortality of the HF racial disparities framework (see Figure 3). Phase IV focuses on the wide availability of prevention and treatment methods for all patients with HF, especially Black patients, to significantly reduce or eliminate racial disparities (Doll, 2018). Although structural (Churchwell et al., 2020) and cultural (Cogburn, 2019) racism, including implicit bias (Nayak et al., 2020), have contributed to racial inequities and health disparities among Blacks with HF, it is possible to overcome these negative outcomes (Sharma et al., 2014). Researchers who investigate phenomena, recruit sufficient Black samples, and make comparisons by race with analytic approaches have contributed to the limited knowledge (Wei et al., 2022) of racial disparities among Blacks with HF. The increased research is a charge for the scientific community and has implications for society regarding current and projected HF care costs, morbidity, and mortality (Benjamin, Blaha, et al., 2017; Benjamin, Muntner, et al., 2019; Benjamin, Virani, et al., 2018; Cook et al., 2013; Go et al., 2013; Heidenreich, Albert, et al., 2013; Heidenreich, Fonarow, et al., 2022; Lesyuk et al., 2018; Mensah & Dunbar, 2006; Mensah et al., 2005; Mensah et al., 2019; Tsao et al., 2022; Virani et al., 2020, 2021).

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APPENDICES

Table 10

Characteristics Under Study

Characteristics Under Study	Variables
Sociodemographic Characteristics	Race
	Age
	Gender
	Marital Status
	Education
	Employment Status
Clinical Characteristics	Disease Severity
	Comorbidities
	Functional Status
Psychological Characteristics	Depression
	Anxiety
Quality of Life	Quality of Life (QOL)
	Health Functioning QOL
	Social and Economic QOL
	Psychological/Spiritual QOL
	Family QOL

Table 11

Aims, Variables, and Measures

Aim	Variables	Instruments/measures
1. Describe the differences and examine the relationships between or among sociodemographic, clinical, and psychological characteristics and QOL between Blacks and Whites with HF.	Sociodemographic characteristics • Race* • Age* • Gender* • Marital status* • Education* • Employment status*	*Indicates a variable that is its own measure
	Clinical characteristics • Disease severity • Comorbidities • Functional status	*Disease severity* ▪ Ejection fraction ▪ New York Heart Association (NYHA) Classification *Comorbidities* ▪ Charlson Comorbidity Index *Functional status – MOS 36-Item Short Form (SF-36)* ▪ Functional limitations • Mobility limitations
2. Examine the influence of sociodemographic clinical and psychological characteristics on QOL in Blacks and Whites with HF.	Psychological characteristics • Depression • Anxiety	*Hospital Anxiety and Depression Scale (HADS)* ▪ Depression (HADS – Depression Subscale) ▪ Anxiety (HADS – Anxiety Subscale)
	Quality of life	*Quality of Life Index (QLI – Cardiac IV)* ▪ Health Functioning Subscale ▪ Social and Economic Subscale ▪ Psychological/Spiritual Subscale • Family Subscale

Table 12

Statistical Analysis Plan

Aim	Variables/measures	Statistical tests
1. Describe the differences in sociodemographic, clinical, and psychological characteristics and QOL between Blacks and Whites with HF.	Sociodemographic characteristics • Race • Age • Gender • Marital status • Education • Employment status	Mean/median *t* tests/ Chi-square tests
2. Examine the relationships between or among sociodemographic, clinical, and psychological characteristics and QOL in Blacks and Whites with HF.	Clinical characteristics • Ejection fraction • NYHA Class • Charlson Comorbidity Index • Functional status: MOS 36-Item Short Form (SF-36)	Pearson/Spearman correlation
3. Examine the influence of sociodemographic clinical and psychological characteristics on QOL in Blacks and Whites with HF.	Psychological characteristics • Hospital Anxiety & Depression Scale (HADS) Quality of life • Quality of Life Index (QLI)	Multiple regression model

Figure 4

Sampling Method