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## The Effect of Gender, Race, and Age on 30-Day Readmission Rates Among Heart Failure Patients in Mississippi

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# Walden University

College of Management and Human Potential

This is to certify that the doctoral study by

Patricia Mondy

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

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Walden University  
2025

Abstract

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Failure Patients in Mississippi

by

Patricia Mondy

MHA, Walden University, 2015

BS, Dillard University, 1982

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Healthcare Administration

Walden University

November 2025

## Abstract

A sizable number of U.S. heart failure patients are readmitted within 30 days of hospital discharge. There was a need to explore ways to reduce this number and improve the care of heart failure patients when they are discharged home. The purpose of this quantitative correlational study was to determine if there is a relationship between age, gender, and race of heart failure patients and 30-day readmissions in the U.S. state of Mississippi in 2019. The dependent variable was heart failure 30-day readmissions, and the independent variables were age, gender, and race. Wagner's chronic care model was the theoretical framework for this study and supported the purpose through a focus on quality care and improved patient outcomes. Data were obtained from the Healthcare Cost and Utilization Project State Inpatient Database for 2019. The results of the binary logistic regression analyses showed that both gender ( $\chi^2 (1) = 5.234, p = .022$ ) and age ( $\chi^2 (5) = 18.990, p = .002$ ) groups were significant predictors of the 30-day readmission of patients. However, race was not a significant predictor of 30-day readmission of patients. The results showed that individuals aged 50–59 are more likely to be readmitted within 30 days than other age groups, and men tend to have higher readmission rates than women. These findings underscore the value of a standardized chronic care model for disease management. By better understanding the effects of age, gender, and race on heart failure readmissions, health care administrators may take actions to avoid initial heart failure hospitalizations. The study's implications for positive social change include awareness of the diverse health care requirements among heart failure patients, enabling the development of enhanced strategies to address these needs and improve patient outcomes.

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## Dedication

To my beloved mother, Alther Lee Ratliff Mondy, who is no longer with us but remains a constant presence in my life and work. Thank you for instilling in me the value of education.

## Acknowledgments

First of all, I would like to thank God for sustaining me through all the barriers I experienced throughout my study. I will keep trusting you for my future.

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## Section 1: Foundation of the Study and Literature Review

U.S. hospital administrators have expressed concern regarding the rising incidence of hospital readmissions, as these events contribute to increased treatment costs, place additional strains on patients, and impact hospital resources. Research indicates that the prevalence of heart failure (HF) rose from 17% to 20% between 1993 and 2006, accompanied by an upward trend in 30-day readmission rates (Hoang-Kim et al., 2020). Existing research has addressed issues concerning readmissions and the associated costs for hospitals and patients. However, processes, quality of care, health status outcomes, and other patient experiences have yet to be examined within the context of gender, race, and age in Mississippi (Mendy et al., 2022). While some scholars have investigated gender, race, and age differences in HF (Arcopinto et al., 2022; Johnson & Waller, 2021; Pena et al., 2021), there is a notable absence of studies evaluating the combined impact of these attributes on readmission rates within a particular state.

### **Problem Statement**

Hospital readmissions are a priority issue for cost reduction and a frequent focus of hospital administrators due to Medicare regulations (Centers for Medicare & Medicaid [CMS], 2025; McKay et al., 2019). Unplanned readmissions for patients with multiple chronic conditions continues to be a common occurrence, with a high rate of Medicare patients being readmitted within 30 days after their initial discharge (Kang et al., 2025; Murray et al., 2021). HF is the most common cause of readmissions for Medicare patients, and this study focused on HF patients in Mississippi (Mendy et al., 2022). According to the Heart Failure Society of America (2025), in recent years HF affected

6,700,000 Americans at an annual cost of \$30,700,000,000, and these patients are often compromised further by additional diagnoses. DeAngelo et al. (2023) reported that more than 18% of HF patients are readmitted within 30 days of discharge and nearly 50% within 6 months. HF is a serious illness that warrants ongoing focus to reduce readmissions and strengthen quality outcomes while reducing costs (Heidenreich et al., 2022). HF is defined as a chronic, progressive condition in which the heart muscle is unable to pump enough blood to meet the body's needs for blood and oxygen (American Heart Association [AHA], 2025).

Furthermore, insufficient care coordination for seniors with HF may lead to the deterioration of their health and an increase in adverse outcomes (Heo et al., 2023; McKay et al., 2019). Older adults utilize health services frequently and often consult multiple physicians, which can result in uncoordinated management of medications and treatments. This lack of integration may elevate the risk of hospitalization among patients with HF (Ayenew et al., 2024; Rao et al., 2019).

Johnson and Waller (2021) found that as the number of chronic conditions, including HF, increased the risk for readmissions and higher costs increased. In Mississippi, the HF disease rate for males is 6.0% compared with the United States at 4.9%. The HF rate for females in Mississippi is 5.3% with the U.S. rate at 3.2% (Centers for Disease Control and Prevention, 2024). The leading cause of death in Mississippi is heart disease and the state ranks 47<sup>th</sup> in the nation for the years 2013-2019 (Mendy et al., 2022). In addition, HF and COPD have the highest readmission rates (23% -26%) compared to all other illnesses (CMS, 2025).

Delivery of services is complicated due to readmissions and health care leaders need to adapt to change and develop innovative services for HF and other chronic illnesses (Heidenreich et al., 2022; McKay et al., 2019; Patel et al., 2020). Numerous studies have investigated methods to reduce HF readmissions; however, there remains a lack of research specifically analyzing how different factors within a single state may influence health outcomes (Heidenreich et al., 2022; Mendy et al., 2022). This research examined the state of Mississippi, analyzing variations in 30-day HF readmissions by gender, age, and race. The findings aim to provide health care professionals with insights to enhance service delivery (AHA, 2025; Mendy et al., 2022).

### **Purpose of the Study**

The purpose of this quantitative study was to determine if a correlation exists between gender, age, race and 30-day HF readmissions Mississippi. The results of this study may have policy implications that could improve care coordination for this population by identifying programs that meet the needs of patients affected by HF. Improving quality and lowering the cost of health care are a central focus of health organizations (DeAngelo et al., 2025; McKay et al., 2019). This study may yield knowledge that administrators can use to identify patients at risk for hospitalization and readmission and establish programs aimed at reducing the rates of both. Furthermore, this study may promote improvements in care coordination and discharge planning.

The dependent variables for this study are HF 30-day readmissions in Mississippi. The independent variables are gender (male and female), race (Black and White) and age. The data for the analysis were obtained from the Healthcare Cost and Utilization Project

(HCUP) State Inpatient Database (SID) for 2019 for the state of Mississippi. The data was used to determine patient specific results for gender, age, and race which could be used for preventive care strategies that may lead to improvements in patient outcomes (Grudniewicz et al., 2023).

Awareness of issues and factors associated with HF readmissions for patients in Mississippi could improve care and decrease the number of readmissions (Arcopinto et al., 2022). This study addressed the research gap of gender, age, and race to determine if there is a relationship with HF readmissions. By studying the variables, these results could encourage the development of clinical interventions that are informed by - and associated with – various patient attributes (Benjamin et al., 2019). Knowledge of various dynamics related to readmissions could enhance protocols by encouraging health care workers and administrators to develop programs and policies concerning medication adherence, improvements in discharge planning, and improvements in patients' communication with their providers. Additionally, care teams could address treatment issues that may be associated with these attributes that have the potential to reduce future readmissions (Greene et al., 2020).

### **Research Questions and Hypotheses**

Following are the research questions (RQs) and hypotheses for the study.

RQ1: Is there a statistically significant difference in 30-day readmissions for gender (male/female) for patients with HF in Mississippi?

$H_{01}$ : There is not a statistically significant difference in 30-day readmissions for gender (male/female) for patients with HF in Mississippi.

$H_{11}$ : There is a statistically significant difference in 30-day readmissions for gender (male/female) for patients with HF in Mississippi.

RQ2: Is there a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi?

$H_{02}$ : There is not a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi.

$H_{12}$ : There is a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi.

RQ3: Is there a statistically significant difference in 30-day readmissions for race (Black/White) for patients with HF in Mississippi?

$H_{03}$ : There is not a statistically significant difference in 30-day readmissions for race (Black/White) for patients with HF in Mississippi.

$H_{13}$ : There is a statistically significant difference in 30-day readmissions for race (Black/White) for patients with HF in Mississippi.

### **Theoretical Framework**

The theoretical framework for this study was Wagner's chronic care model. Wagner (1998) developed this framework to enhance care delivery by promoting identification of the essential components in the health care system that would encourage disease management and prevention for high-risk patients (see also Pomey et al., 2024). Wagner emphasized six patient-centered components that could support patients with quality care for chronic diseases such as HF (Wagner, 1998). The six components are: community resources and policies, health system organization, self-management support,

decision support, delivery system design, and clinical information systems (Grudniewicz et al., 2023; Pomey et al., 2024). Because of issues associated with chronic diseases, Wagner's chronic care model was an appropriate framework for this study due to the focus on improving health care systems to better serve HF patients who could be at risk for hospitalization and readmission.

Wagner's chronic care model promotes the use of available resources to improve patient care such as patient population data, health promotion, coordinated service delivery, and patient participation. As Kang et al. (2025) reported, the escalating number of patients with HF is increasing the cost burden of both patients and organizations due to readmissions. Using Wagner's chronic care model could improve long term goals associated with disease management and help providers, health care administrators, and patients improve care delivery and decrease risks (Kang et al., 2025). This study focused on whether there are race, age, and gender differences associated with HF readmissions in Mississippi and the results of this study – together with Wagner's chronic care model – could add dimensions of care that would improve health outcomes.

### **Nature of the Study**

The nature of this study consisted of correlational quantitative research that focused on the dependent variables HF 30-day readmissions in Mississippi and the independent variables which are gender (male and female), race (Black/White), and age. A binary logistic regression analyses was used to determine a correlation between the variables (Creswell, 2018). Data were obtained from HCUP SID for 2019. The focus of the study was aligned with the problem which explains the issues associated with

readmissions for HF, the variables, the three RQs, and Wagner's chronic care model (Wagner, 1998). The chronic care model was developed to enhance care delivery by promoting identification of the essential components in the health care system that would encourage disease management and prevention for high-risk patients (Johnson & Waller, 2021). SPSS Statistics was used to analyze the data which was obtained from HCUP data center.

### **Literature Search Strategy**

A comprehensive search of the literature included the variables concerning HF readmissions, gender, age, and race. The following databases were used to explore the literature: Google Scholar, Pub Med of the National Library of Medicine, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Sage Journals Online, and Science Direct. Over 150 results were found before refining the search to include only peer-reviewed and academic journals dated 2015 and later. The variables for this study are addressed in the articles. The following key terms were used for the literature review search: *readmissions, heart failure, Hospital Readmission Reduction Program, plus gender, age, and race in relation to thirty-day readmissions.*

### **Literature Review Related to Key Variables and/or Concepts**

HF is one of the occurring causes of readmissions for Medicare patients in the United States (CMS, 2025). HF affected 6,700,000 Americans less than 20 years of age with a total annual cost estimated to be excess of \$30,000,000,000 (DeAngelo et al., 2025). Lawson et al. (2021) reported that 26% of all readmissions are for HF and that the next highest readmission is only 7.6%, indicating that HF should be a serious focus for

health care providers and administrators. One factor that contributes to the economic burden is that HF readmissions are unplanned and may result in lengthy hospitalizations due to comorbidities that have not been adequately addressed (Heo et al., 2023). Consequently, reducing HF readmissions has emerged as a leading objective for health care organizations seeking to enhance care quality and decrease health care expenditures (Kang et al., 2025).

### **Hospital Readmissions for Heart Failure**

Hospital readmissions for chronic and serious illnesses have been an expensive situation for many years leading to substantial costs for both CMS and private insurers. In 2012, the Hospital Readmission Reduction Program (HRRP) was implemented to address this issue by imposing penalties on hospitals with excess readmission ratios that surpass CMS standards (CMS, 2025). The HRRP includes ten diagnoses, with HF ranking highest in terms of readmission rates (CMS, 2025).

Because HRRP has financial consequences, there is growing recognition of the importance of enhancing care for seriously ill patients. Efforts such as better discharge planning, thoughtful placement decisions, thorough follow-up with providers, and careful monitoring - especially for those with heart disease and stroke - are now being prioritized (Arcopinto et al., 2022; Hoang-Kim et al., 2020). Although hospitals often perceive HRRP in a negative light, many have responded by increasing their commitment to patient-centered care for high-risk individuals, working to ensure that these patients get the proper follow-up after leaving the hospital (DeAngelo et al., 2025).

The Medicare Payment Advisory Commission's mandatory report from 2020 indicated that the HRRP contributed to reduced readmission rates (CMS, 2025). Any observed increase in mortality was associated with greater comorbidities among hospitalized patients (CMS, 2025). Additionally, analyses have shown that hospitals with initially higher readmission rates achieved more significant improvements compared to those performing better at baseline - aligning with the primary objectives of HRRP (Arcopinto et al., 2022; Hoang-Kim et al., 2020). Evidence suggests that HRRP may have played a causal role in enhancing both quality and value within transitional care.

For patients with HF an inverse relationship has been documented between readmission rates and mortality (AHA, 2025; Heidenreich et al., 2022). Concerns were raised that strategies aimed at reducing readmissions might inadvertently increase mortality; however, evidence does not support this outcome. Analysis of Medicare claims data has demonstrated that decreases in readmission rates were weakly correlated with reductions in 30-day post-discharge mortality for targeted conditions. These findings suggest that initiatives to reduce readmissions have not resulted in increased mortality among the original target populations (Heo et al., 2023).

### **Predictors of 30-Day Readmissions in Patients with Heart Failure**

To minimize HF readmissions and alleviate the economic impact on the health care system, it is essential for health care providers to enhance their understanding of risk factors. This knowledge enables the identification of patients at greatest risk for readmission, thereby facilitating the development of effective prevention strategies. Lawson et al. (2021) conducted a study involving 698,983 HF admissions (median age:

81), reporting that age-adjusted 30-day readmission rates increased by 1.4% annually, reaching 21%. Non-cardiovascular disease readmissions rose by 2.6% per year, while cardiovascular-related rates remained stable. Readmission patterns were consistent across genders but differed by ethnicity, with Black ethnicity and chronic kidney disease identified as significant predictors for HF readmission. The overall rise in 30-day readmissions disproportionately impacted disadvantaged populations.

Harmon et al. (2020), like Lawson et al. (2021), found that a range of medical and socioeconomic factors influence HF readmissions. Over a 7-month period, their study included 212 patients, most of whom were women (59.4%) and had a BMI above 30 kg/m<sup>2</sup> (58%). Common conditions among these patients included pulmonary hypertension (44.3%), anemia (68.8%), and arrhythmia (47.6%). Within 90 days post-discharge, 21.2% were readmitted due to HF, while 71.1% faced readmission within just 30 days. The primary risk factors identified for readmission were anemia, peripheral vascular disease, pulmonary hypertension, and valvular heart disease.

Steverson et al. (2023) focused on socioeconomic issues rather than medical to explain predictors of HF readmissions. The study involved 290 patients with an average age of 59 years. Of these, 71% (207 patients) were male. Regarding race and ethnicity, 42% (120) identified as Black or African American, and 22% (64) as Hispanic or Latino. Most participants (96%, or 278 people) had public insurance. Additionally, 28% (79) did not have stable housing, 19% (56) had a mental illness diagnosis, and many reported active substance use. The 30-day readmission rate was 25.5% ( $n = 88$ ) and conclusions

indicated that key predictors were race/ethnicity, housing issues such as homelessness, and substance abuse were all key indicators of readmissions.

DeAngelo et al. (2025) conducted a retrospective analysis involving 3,831,156 patients diagnosed with acute decompensated HF from 2016 to 2020. Of these, 673,844 patients (18.4%) experienced readmission within 30 days. The leading cardiovascular cause for readmission was hypertensive heart disease accompanied by chronic kidney disease Stages 1–4 (13.2%). Independent predictors associated with higher rates of readmission included discharge against medical advice, cirrhosis, and COPD. The findings demonstrated that approximately one in five patients with acute decompensated HF were readmitted within 30 days, with the rate of readmissions increasing over the study period. These results underscore the significance of identifying high-risk individuals to effectively reduce readmission rates.

Levinson et al. (2024) conducted a retrospective study utilizing an insurance database to examine predictors of HF readmission, enabling analysis of a substantial cohort comprising 97,529 patients. The research assessed the effectiveness of machine learning methods for predicting both 1-year all-cause and HF-specific readmissions following initial HF-related hospitalization, using outpatient statutory health insurance data from 2012 to 2018. Patients were followed for 1-year postadmission to identify subsequent readmissions. Key predictors for readmission included pantoprazole prescription, COPD, atherosclerosis, gender, rurality, type 2 diabetes mellitus, and coronary heart disease. Additionally, several established HF comorbidities were identified as significant features for HF-specific readmission.

In summary, the predictors for identifying HF readmissions varies widely depending on the population chosen for the study. The key medical indicators are type 2 diabetes, hypertension, obesity, and kidney disease (DiAngelo et al., 2025; Harmon et al., 2023; Lawson et al., 2021; Steverson et al., 2023). Socioeconomic factors relate to race (primarily Black men depending on study population), rural patients, and risk factors associated with alcohol consumption (DiAngelo et al., 2025; Levinson et al., 2024). The findings suggested that patients diagnosed with HF require careful monitoring to mitigate the progression of related factors and reduce the risk of initial hospitalization.

### **Financial Impact of Heart Failure and 30-Day Readmissions**

HF is among the most common diagnoses leading to hospital readmissions and is a major contributor to increasing health care costs. HF imposes significant expenses on both patients and hospitals, partly due to the intensive care these patients require. Additionally, hospitals may face reduced reimbursements, up to 3%, if their readmission rates exceed thresholds established by the CMS HRRP (CMS, 2025). Lowering readmission rates not only enhances patient outcomes and satisfaction but also helps decrease health care spending.

HF is a significant and expanding medical and economic challenge around the world, with more than 2 – 3% of health care budgets dedicated to HF treatments (Upadhyay et al., 2019). Over recent decades, the prevalence of HF has grown, and this trend will likely continue as the population ages. Despite improvements in therapy and preventive measures, rates of death and illness remain high, and patients' quality of life is still poor (Arcopinto et al., 2022).

Although diagnosis and treatments for HF have improved, rates of morbidity, mortality, and poor quality of life remain high, leading to serious consequences for those affected. The risk of death after a hospitalization related to HF rises to about 35% within 1 year, and this risk increases with each additional hospital stay (Jha et al., 2022). HF is among the most common causes of illness and death in the United States, and it is one of the primary conditions that CMS (2025) targets with payment penalties for hospitals that have frequent patient readmissions.

The increasing prevalence of HF is directly linked to rising health care expenditures. According to CMS (2025), the total cost associated with HF was expected to reach \$69,700,000,000 by 2030, up from \$30,700,000,000 in 2012. For individuals over 65 years of age, HF care costs are anticipated to nearly triple, while those aged 45–64 may see a 1.6-fold increase, and individuals between 18–44 could experience a twofold rise.

### **Heart Failure and 30-Day Readmissions in Mississippi**

In fiscal year 2024, CMS evaluated HF readmission rates using data from July 1, 2020 to June 30, 2023. The report noted that Mississippi typically had worse health outcomes, including higher readmission rates for major conditions such as HF. According to CMS (2025), disparities in health care are linked to variations in health outcomes among Medicare patients in Mississippi, especially regarding conditions like heart attack and stroke. These disparities contribute to ongoing inequities within the state and may similarly impact HF readmission rates (University of Mississippi Medical Center, 2025). Furthermore, CMS data from 2025 indicated that Mississippi's HF readmission rate is

20.6%, which exceeds the national average of 19.7% (University of Mississippi Medical Center, 2025).

HF presents a significant economic challenge to the health care system, with annual costs estimated at \$31,000,000,000 (AHA, n.d.; CMS, 2025; Mendy et al., 2022). It remains one of the primary causes of mortality in Mississippi across all age groups, races, and genders (AHA, 2025; CMS, 2025; Mendy et al., 2022). State health programs are developing targeted strategies designed to engage both health care providers and patients in reducing HF related deaths as well as preventing hospitalizations and readmissions, but these approaches take time. Despite these efforts, challenges persist due to an aging population and a substantial number of individuals without supplemental insurance to cover costs not reimbursed by Medicare, factors that may adversely affect health outcomes (Mendy et al., 2022).

Similar to Mendy et al. (2022), Jones and Malone (2024) analyzed heart disease mortality rates in Mississippi and found that HF remains a significant global health issue, resulting in 17.9 million deaths annually and remaining as the leading cause of death worldwide. In the state of Mississippi, heart disease was identified as the primary cause of mortality in 2017 and the data indicated important disparities in heart disease mortality related to race, age, and sex (Jones & Malone, 2024). Of the 695,000 heart disease deaths reported in the United States, 22.6% occurred among Black individuals, and 80% involved adults aged 65 years or older.

Jones and Malone (2024) reported an upward trend in heart disease mortality in Mississippi from 2010 to 2021, with elevated rates observed among Black individuals,

men, and those younger than 65 years. These findings are similar to statistics reported by the AHA (2025). Jones and Malone attributes these findings to prevalent lifestyle factors in southern states and recommend the implementation of targeted interventions aimed at promoting healthy behaviors, providing community education, and increasing awareness to enhance health outcomes and reduce mortality, particularly within populations at risk for hospitalization and readmission. Based on the increasing prevalence of HF in Mississippi, the rate of readmissions also continues to increase.

### **Gender and Heart Failure 30-Day Readmissions**

According to AHA (2025), both men and women have a similar rate of HF although their symptoms differ with men having higher cholesterol and decreased ejection fraction and women having depression and elevated hypertension. But women are treated less vigorously have an HF diagnosis and are therefore at more risk of being readmitted after a hospitalization. In fact, AHA reported that women have an increased risk of 20% more than men of dying within 5 years after a severe heart attack than men.

Hoang-Kim et al. (2020) did a review of 34 studies found that overall, men and women had similar rates of HF readmissions. However, timing made a difference: men showed higher readmission rates when the follow-up period exceeded 1 year, while women were readmitted more frequently than men during intervals shorter than 1 year. Future studies should use varied time frames and avoid composite measures like combined readmission and mortality rates, as these can be skewed by sex. Focusing on co-interventions and post-discharge strategies that account for sex differences could benefit HF patients. Khan et al. (2021) reported that gender differences did not

significantly influence readmission rates, nor were there notable disparities in the level of agreement regarding less aggressive treatment for women compared to men during follow-up decisions.

Ryan et al. (2019) reported that readmission rates for men and women varied across studies; however, differences in education and post-discharge follow-up were identified as key factors in preventing readmissions following initial HF admissions. The study underscored the importance of providing equitable education regarding reassessment of heart conditions to both men and women. Robinson (2021) concluded that low-income men are at a higher risk of 30-day readmissions compared to other cohorts, highlighting the necessity for targeted interventions after discharge to mitigate this risk. Overall, current literature does not focus on differences in prevalence but rather emphasizes the risks associated with inadequate follow-up and education for both genders (AHA, 2025; Greene et al., 2020).

### **Age and Race and Heart Failure 30-Day Readmissions**

As reported by the AHA (2025), age is a significant predictor of 30-day HF readmissions, with rates increasing substantially among individuals over 80 years old. Prevention remains an important focus for this population, and it is imperative that clinicians implement individualized interventions to address the needs of older patients. These prevention measures are substantiated by the findings of Steverson et al. (2023) and Robinson (2021), whose results demonstrate that socio-economic status - particularly in relation to age and race - serves as a significant indicator for enhancing outcomes and reducing 30-day readmissions among high-risk patients.

Murray et al. (2021) conducted a study involving a population of over 19,000 from 2010 to 2015 to assess the impact of age, gender, and race on 30-day readmission rates. The analysis revealed that patients in the lowest income quartile ( $\leq \$37,999$ ) experienced significantly higher odds of 30-day readmission across all conditions ( $p < 0.0001$ ). Conversely, female gender and rural hospital designation were linked to reduced odds of 30-day readmission for most conditions ( $p < 0.05$ ). Comparable results were observed among patients aged 65 years and above. The study demonstrated that socio-demographic and economic factors are associated with 30-day readmission rates, suggesting that these variables should be integrated into discharge planning strategies and interventions to reduce readmission risk.

The findings align with previous research addressing age, race, and socioeconomic factors, which indicated that certain populations are at increased risk and warrant targeted screening and follow-up. Factors such as income, geographic location (rural versus urban), race - particularly among lower-income Black men - and age should be considered in developing appropriate interventions (Patel et al., 2020; Pina et al., 2021; Robinson, 2021; Steverson et al., 2023).

### **Research Gap and Strengths and Weaknesses of the Research**

Several gaps were identified within the reviewed studies. Comparative analyses between HF patients and individuals with other chronic conditions did not account for disease severity within each patient population, nor did they evaluate the effects of treatment interventions over time. Additionally, comprehensive clinical data regarding the economic impact of HF was absent from the literature review. These factors may be

attributed to unrecorded cost variations, which can influence gender-specific disease outcomes and associated expenditures. In addition, there is limited published information regarding the indirect costs of HF, research on HF readmissions in Mississippi, and the progression of HF within the state. Lastly, current literature does not sufficiently address the broader societal implications of HF readmissions for the general population.

### **Literature Review Conclusion**

The literature review identified a broad range of studies between 2019 to 2025 representing HF readmission issues, cost consequences, and HF readmissions in Mississippi. Additionally, the variables of age, race, and gender were studied in relation to 30-day readmissions and whether studies indicated a correlation between these variables and readmissions. HF readmission rates are shaped by many different predictors, which often vary depending on the population being studied. Understanding these factors is key to managing patients well and designing specific strategies to lower hospital readmissions (Johnson & Waller, 2021).

Major medical conditions that raise the risk of returning to the hospital for HF include type 2 diabetes, hypertension, obesity, and kidney disease (DiAngelo et al., 2025; Harmon et al., 2023; Lawson et al., 2021; Steverson et al., 2023). These health issues are common among people with HF and regularly appear as important reasons for readmission. Socioeconomic factors relate to race (primarily Black men depending on study population), living in rural areas, and habits related to alcohol use can increase the chances of readmission. These details emphasize how vital it is to account for social determinants of health when caring for HF patients (DiAngelo et al., 2025; Levinson et

al., 2024). Overall, the research points to the need for thorough, ongoing monitoring of those diagnosed with HF. Addressing both medical and socioeconomic risks early is crucial for slowing the progress of the disease and preventing first-time hospitalizations.

### **Definitions**

*Gender related to readmissions:* Gender indicates socially constructed roles, behaviors expressions and identities of male and female and other gender diverse people. For the purpose of this study, gender refers to male and female (Canadian Institutes of Health, 2024).

*Heart failure (HF):* The medical term, heart failure, indicates a chronic, progressive condition in which the heart muscle is unable to meet the body's needs for blood and oxygen (AHA, 2025).

*Hospital Readmission Reduction Program (HRRP):* A Medicare value-based purchasing program that encourages hospitals to better engage patients and caregivers in discharge plans and, in turn, reduce avoidable readmissions (CMS, 2025).

*Thirty-day readmission:* For the purposes of this study, a readmission is defined as an admission to any hospital occurring within 30 days following discharge from the same or a different hospital (CMS, 2025).

### **Assumptions**

*Assumptions* refer to information that, while unverified, are regarded as true for the purposes of this study. One primary assumption was that health care organizations provided accurate submissions to the HCUP SID for 2019. A second assumption concerned the reliability of data and the accuracy of demographic details such as gender,

race, and age, as well as overall dataset integrity. Thirdly, it was assumed that the data collected through the search strategy enhanced the likelihood of obtaining sufficient information for strong analysis.

### **Scope and Delimitations**

I examined the impact of gender, age, and race among HF patients in Mississippi. The findings may enhance awareness regarding the value of implementing evidence-based research to reduce 30-day HF readmission rates in the state. This study was limited to patients diagnosed with HF rather than those with other cardiac conditions. The research specifically examined HF patients in Mississippi, excluding individuals from other states. Additionally, the study concentrated on gender, age, and race as they relate to 30-day HF readmissions, rather than addressing other issues linked to HF.

### **Limitations**

This study has the following limitations. The primary limitation of this study was its exclusive focus on the state of Mississippi, which may constrain the generalizability of the findings to other states. An additional limitation pertained to social determinants such as health literacy and socioeconomic status, which were excluded from the study. This exclusion was due to the study's specific focus on examining gender, age, and race differences related to HF readmissions. A third limitation pertained to the study data, which may not be applicable to all individuals diagnosed with HF.

### **Significance**

The findings of this study have the potential to inform health care professionals about protocols and programs designed to enhance service delivery for HF patients. The

implications for social change arising from this quantitative research encompass potential organizational advancements linked to the age, race, and gender demographics of individuals affected by HF. In the review of the literature, there are no other studies that use the variables of gender, age, race in association with HF 30-day readmissions in Mississippi. The results of this research might help develop better strategies and interventions tailored to the unique needs of HF patients according to their demographic characteristics. Notably, health care administrators could identify programs that directly enhance health outcomes for groups needing focused care.

### **Summary and Conclusions**

This study may be added to other published research on HF regarding the importance of assessing gender, age, and race to reduce the risk of 30-day readmissions. Further research is needed in these areas to determine interventions and strategies to reduce hospital readmission rates based on the effect of these three variables. A greater awareness of the differences in presentation of HF based on these demographic attributes is needed for health care professionals to improve therapeutic strategies and outcomes for patients. Admission guidelines should be more focused on issues related to age, race and gender because these characteristics can make a difference in treatment and health outcomes – additionally they present various risk factors that affect the clinical signs of HF. Section 2 discusses the methodology, power analysis, research design, and ethical issues associated with this study.

## Section 2: Research Design and Data Collection

### **Introduction**

The purpose of this quantitative study was to determine if a correlation exists between gender, race, and age and 30-day HF readmissions and admissions in Mississippi. Previous research indicated that early post-discharge follow-up was effective in reducing hospital readmissions (DeAngelo et al., 2025). Nonetheless, further improvement in patient outcomes is necessary, particularly regarding the reduction of 30-day readmission rates, as these events contribute to increased financial costs and negatively impact on quality of life (Kang et al., 2025). Hospitalization for HF represents a significant risk factor for subsequent readmissions and poor clinical outcomes.

When developing cost-of-illness profiles and conducting economic evaluations for patients with HF, it is important to account for HF readmission rates. Implementing strategies to reduce readmissions can enhance patient outcomes and mitigate penalties levied by the CMS on hospitals with higher-than-expected readmission rates (Kang et al., 2025). The significant economic burden associated with hospital readmissions among HF patients in Mississippi is well recognized. Reducing these readmissions is a priority, as Mississippi ranks among the states with the highest HF readmission rates, and HF remains the leading cause of death in the state (Mendy et al., 2022).

Wagner's (1998) chronic care model underscores the importance of comprehensive management strategies for chronic diseases, which are instrumental in enhancing quality of care and patient outcomes. Effective implementation of the chronic care model practices is a significant determinant of improved health outcomes. These

health care approaches not only yield better results for patients but also contribute to substantial cost savings within the health care system (Mendy et al., 2022). This study aimed to inform best practices for health care leadership by supporting the implementation and sustainability of interventions designed to reduce HF readmission rates. Ultimately, such initiatives can lower health care expenditures and reinforce the delivery of high-quality care.

### **Research Design and Rationale**

I used a quantitative correlational design to examine the relationship between HF patient readmissions and their correlation with age, race, and gender within the state of Mississippi. Data for 2019 were obtained from the SID, which is a division of HCUP. Utilizing secondary data offers greater accessibility and reliability compared to primary data, allowing researchers to allocate more time to the evaluation and assessment of demographic variables that are directly relevant to the study.

The correlation analysis was appropriately aligned with the Binary Logistic Regression, reflecting the comprehensive approach undertaken. Utilizing reliable data sources and selecting variables that accurately represent the Mississippi population concerning HF facilitate the identification of outcomes associated with key factors such as age, race, and gender. Findings derived from this research design may inform future health care policy and guide treatment strategies for patients.

### **Methodology**

This section outlines the steps that were taken for implementation of the current study. Information was provided on population, sampling, sampling procedures, data

collection techniques, and the data analysis plan. This research used a quantitative correlational approach to examine variables related to three specific RQs. Data on HF readmissions occurring within 30 days after patient discharge were analyzed to assess Mississippi's readmission rates based on age, race, and gender. The methodology accounted for both internal and external threats and paid close attention to ethical issues throughout the study.

### **Population**

The population under investigation in this study was comprised male and female individuals of diverse age groups in Mississippi diagnosed with HF who had experienced hospital readmission during 2019. Secondary data for the analysis was sourced from the SID for the year 2019, a component of HCUP.

### **Sampling and Sampling Procedures**

The SID site is a comprehensive database that provides data for the purpose of this study. All individuals included in this study were selected from the specified database and identified as having been admitted to a hospital for HF in Mississippi, followed by readmission for HF within 30 days. Subjects with incomplete information were excluded from the analysis. All participants were at least 21 years of age, and all personally identifiable data were omitted to ensure privacy. The extensive database provided robust support for this research, employing methodologies that adhered to established research protocols and ethical guidelines.

### ***Power Analysis and Sample Size Estimation***

G\*Power, a power analysis calculator, was used to conduct sample size analysis. Based on the results of the power analysis, the required sample size for the binary logistic regression analysis was 782 (power = 0.80, alpha = 0.10, and ratio 2), as shown in Table 1. The effect size of the odds ratios was computed using G\* Power's binary logistic regression analysis priori function. The results of the analysis indicated that a sample size of 782 was sufficient to detect a significant correlation with a medium effect size with a power of .80 and an alpha of .10.

**Table 1**

#### *Binary Logistic Regression Power Analysis Using G\* Power*

Input/output	Dimension	Statistical value
Input	Tails	2
	Effect size	0.10
	Power (1-B error probability)	0.80
Output	Total sample size	782
	Actual power	0.80001843

### **Instrumentation and Operationalization of Constructs**

#### ***Data Analysis Plan***

The data for this study was used to analyze and determine if a correlation exists between gender, race, and age and 30-day HF readmissions. Data for this analysis was obtained from the SID for the year 2019, which is a division of HCUP. To analyze the data, I used SPSS Statistics, Version 27. The secondary data was coded in Microsoft Excel before the analysis was performed. A binary logistic regression analysis was used to determine a correlation between variables. Additionally, standard descriptive statistics

for each variable was performed. SPSS Statistics was utilized to run means, tests of normality, and standard deviations for each variable.

### ***Operationalization of Variables***

The dependent variables are HF 30-day readmissions, and the independent variables are gender, race, and age. HF is a clinical syndrome caused by structural and functional defects in myocardium resulting in impairment of ventricular filling or the ejection of blood (Ayenew et al., 2024). The most common cause of HF is reduced left ventricular myocardial function, however dysfunction of the pericardium, myocardium, endocardium, heart valves or great vessels alone or in combination is also associated with HF (Benjamin et al., 2019). Table 2 provides a description of the variables and how they are operationalized for the purposes of this study.

**Table 2**

#### *Description and Operationalization of Variables*

Research question	Independent variable	Dependent variable	Analysis
RQ 1	Age (over 21)	Heart failure	Binary logistic regression
RQ 2	Gender (male/female)	30-day	
RQ 3	Race (Black/White)	readmissions	

HF remains a major contributor to morbidity and mortality, in addition to its substantial cost burden (Benjamin et al., 2019). For patients who are hospitalized, therapeutic objectives encompass minimizing the length of stay and reducing readmission rates, preventing organ system damage, and managing co-morbidities that may negatively impact prognosis (Ayenew et al., 2024). Evidence suggests that timely scheduling of

follow-up appointments after discharge can effectively lower the risk of hospital readmission (Lee et al., 2016).

As defined by CMS (2021) and DeAngelo et al. (2025), a 30-day readmission is any unplanned return to a hospital - either the original facility or another acute care institution - for any reason within 30 days following the patient's initial discharge. This study included 15,394 individuals: 1,643 were readmitted within 30 days and 13,751 were not. The sample was nearly evenly split by gender (49.2% female, 50.8% male) and comprised mostly White (50.8%) and Black (46.9%) participants. Age distribution was as follows: 25.5% over 80, 24.5% aged 70–79, 22.7% aged 60–69, 15.4% aged 50–59, 7.7% aged 40–49, and 4.2% aged 39 or younger. The following information completes this section with a discussion concerning internal and external validity, ethical procedures, and the summary.

### **Threats to Validity**

#### **External Validity**

CMS collects data from hospitals which may result in different approaches when identifying the readmission process. This activity may narrow the characteristics of participants in the study; however, this process also ensures that no assumptions are made about any individual outside the parameters of the study (Creswell & Creswell, 2023). Threats to validity also arise when researchers make inaccurate inferences from the sample to other people, settings, and past and future situations (Creswell & Creswell, 2023). In addressing threats to external validity, no generalizations were made beyond

this sample group concerning gender, age, and race in association with patients who have a diagnosis of and live in the state of Mississippi.

### **Internal Validity**

A threat to internal validity may occur when if practice style correlates with hospital quality, rather than patient acuity (Benjamin et al., 2019). HF patients usually present with other comorbidities, which contributes to a readmission risk. Patient misdiagnosis upon admission to the hospital is an identified threat to the validity of the data, as patients with HF often present with comorbidities and hospital care is based on the symptoms that determine the patient's acuity level and need for admission. Due to data availability, this study was based on the number of individuals with HF readmitted to hospitals in Mississippi and did not reflect all persons that are admitted and discharged from hospitals.

### **Ethical Procedures**

All patient information, including the data, was protected confidentially and was stored securely and accessed by user authentication login ID using strong passwords, utilizing anti-virus and malware protection, and will be deleted after the research is completed. It is vital that anonymity and confidentiality of the data are strictly maintained (Creswell & Creswell, 2023). The data itself was deidentified and all identifiable patient information was deleted. All professional, institutional, and federal standards for conducting this research were reviewed and approved by the Walden University Institutional Review Board. The approval (no. 02-02-23-0464002) expired when the study was completed.

## Summary

The methods and analysis plan for this study have been reviewed in Section 2. Measures to protect the secondary data, sources of the data and research sample are identified along with the plan to perform a binary logistic regression analysis of the variables. Also, in this section, the study design and rationale were examined, designating the population investigated along with data analysis strategy and techniques, the source of data, and data collection process. Threats to internal and external validity and ethical methods were discussed. Section 3 provides the analysis of the data and results. HF is a leading cause of illness, death, and hospital readmission among Medicare patients in the United States (CMS, 2021). These readmissions create significant clinical and financial challenges for patients and hospitals. Strategies like thorough patient education and prompt follow-up visits can help reduce 30-day readmissions. Section 3 details the statistical findings relevant to the RQs and hypotheses.

## Section 3: Presentation of the Results and Findings

### **Introduction**

Hospital readmissions are a priority issue for cost reduction and a frequent focus of hospital administrators due to Medicare regulations (CMS, 2019; Murray et al., 2021). Unplanned readmissions for patients with multiple chronic conditions continue to be a common occurrence, with a high rate of Medicare patients being readmitted within 30-days after their initial discharge (Steverson et al., 2023). HF is the most common cause of readmissions for Medicare patients (Reinhardt et al., 2022). As such, the purpose of this quantitative study was to determine if a correlation exists between gender, age, race, and 30-day HF readmissions. The three RQs that underpinned this study were the following:

RQ1: Is there a statistically significant difference in 30-day readmissions for gender (male and female) for patients with HF in Mississippi?

RQ2: Is there a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi?

RQ3: Is there a statistically significant difference in 30-day readmissions for race for patients with HF in Mississippi?

Section 3 includes information regarding data collection as well as the results of data analysis procedures, including descriptive statistics, assumptions testing, and hypothesis testing for the study's RQs. A summary concludes Section 3.

### **Data Collection of Secondary Data Set**

The dependent variable in this study was 30-day readmissions and the independent variables were gender, race, and age. The targeted population for this study

were individuals in Mississippi with HF who were readmitted to a hospital within 30 days after discharge. Data for this analysis was obtained from the SID for the year 2019, which is a division of HCUP. The data were systematically coded and refined using Excel prior to being transferred into SPSS Statistics for further analysis. The dependent variable, 30-day readmissions, was coded as 1 = *Yes* and 0 = *No*. The categories for gender, race, and age groups were also numerically coded to prepare for data analysis. All available data were utilized in the descriptive analysis as well as the binary logistic regression conducted to address the RQs for this study.

## **Results**

The results section of this study provides the findings from descriptive statistical analyses, assumptions testing, and hypothesis testing. Descriptive statistical analyses were conducted to describe characteristics of the sample. Assumptions testing was completed to determine whether data violates the assumptions of the binary logistic regression. Finally, binary logistic regression analysis was conducted to determine whether the null hypothesis is rejected or retained. The results of these tests are provided in this section.

### **Descriptive Statistics**

Frequencies and percentages were calculated for the categorical variables. Table 3 provides the frequencies in responses to variables, including whether the individual was readmitted to the hospital within 30 days, gender, age, and race. According to the results, 1,643 individuals were readmitted within 30 days and 13,751 were not readmitted within 30 days. In terms of gender, the sample included 7,578 women (49.2%) and 7,816 men

(50.8%). For the age range, there were 3,925 individuals above the age of 80 (25.5%), 3,774 individuals aged 70 to 79 (24.5%), 3,495 individuals aged 60 to 69 (22.7%), 2,368 individuals aged 50 to 59 (15.4%), 1,190 individuals aged 40 to 49 (7.7%), and 642 individuals aged 39 and below (4.2%). About 50.8% of the individuals included in the study were White ( $n = 7,816$ ) while 46.9% of the individuals were Black ( $n = 7,216$ ).

**Table 3**

*Descriptive Statistics for Categorical Variables*

Variable	<i>f</i>	%
Gender		
Male	7,816	50.8
Female	7,578	49.2
Total	15,394	100.0
30-day readmission		
No	13,751	89.3
Yes	1,643	10.7
Total	15,394	100.0
Age range (years)		
Below 39	642	4.2
40–49	1,190	7.7
50–59	2,368	15.4
60–69	3,495	22.7
70–79	3,774	24.5
80+	3,925	25.5
Total	15,394	100.0
Race		
White	7,816	50.8
Black	7,216	46.9
Hispanic	112	.7
Asian or Pacific Islander	36	.2
Native American	48	.3
Other	28	.2
Total	15,256	99.1
Missing	138	.9
Total	15,394	100.0

### **Assumptions Testing**

There are several assumptions associated with binary logistic regression that must be tested to determine if data violate the assumptions of parametric testing. First, binary logistic regression requires the dependent variable to be binary. This assumption is met because the dependent variable is dichotomous, with 1 = *yes* and 0 = *no*. Binary logistic regression also requires the observations to be independent of each other, meaning that the data does not come from repeated measurements. The data in this study meet this assumption because measurements were only recorded once.

Another assumption is that there is a large sample size logistic regression typically requires a large sample size. According to Bujang et al. (2018), the sample size for binary logistic regression should be whichever is greater, 500 or  $n = 100 + 50i$ , where  $i$  is the number of independent variables. This assumption was met because the sample size for this study was 15,394, which is greater than 500 samples.

The assumptions of parametric testing for binary logistic regression analysis also include that data are free from multicollinearity and outliers. However, each binary logistic regression involved only one predictor variable. Thus, the assumption on multicollinearity is not applicable. Moreover, the predictor variables were nominal in nature, thus, the assumption on outliers was also not applicable. The binary logistic regression considered the predictors as categorical variables. Therefore, all the assumptions of a binary logistic regression are met.

### Research Question 1

RQ1 was: is there a statistically significant difference in 30-day readmissions for gender (male and female) for patients with HF in Mississippi? Binary logistic regression was performed to measure the influence of gender on the likelihood that respondents would report they had been readmitted to the hospital within 30 days. The test of the model fit presented in Table 4 showed that the logistic regression model was statistically significant in predicting the 30-day readmission of respondents,  $\chi^2(1) = 5.234, p = .022$ . The results indicated that the model was able to distinguish between respondents who did and did not report readmission to the hospital within 30 days based on gender (see Table 4). As shown in Table 5, the gender group was a significant predictor of whether the respondent was readmitted to the hospital within 30 days. The model was able to predict 89.3% of the cases correctly. The odds ratio for gender is 1.127 indicating that 30-day readmission has higher likelihood to occur among male patients than female patients. Based on the results of this analysis, the null hypothesis was rejected.

**Table 4**

*Omnibus Tests of Model Coefficients for Gender*

		$\chi^2$	<i>df</i>	<i>p</i>
Step 1	Step	5.234	1	.022
	Block	5.234	1	.022
	Model	5.234	1	.022

**Table 5**

*Variables in the Equation for Gender as Predictor*

	B	SE	Wald	<i>df</i>	<i>p</i>	Exp(B)
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Step 1 <sup>a</sup>	Gender(1)	.120	.052	5.225	1	.022	1.127
	Constant	-2.187	.038	3288.731	1	0.000	.112

<sup>a</sup> Variable(s) entered on Step 1: Gender.

## Research Question 2

RQ2 was: is there a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi? Binary logistic regression was performed to measure the influence of age on the likelihood that respondents would report they had been readmitted to the hospital within 30 days. The test of the model fit presented in Table 6 showed that the logistic regression model was statistically significant in predicting the 30-day readmission of respondents,  $\chi^2(5) = 18.990, p = .002$ . The results indicated that the model was able to distinguish between respondents who did and did not report readmission to the hospital within 30 days based on age (see Table 6). As shown in Table 7, the age group for 50 to 59 was a significant predictor of whether the respondent is readmitted to the hospital within 30 days. The model can predict 89.3% of the cases correctly. The odds ratio for the age group 50 to 59 is 1.367 indicating that 30-day readmission has higher likelihood of occurring among patients from this age group than other age groups. Based on the results of this analysis, the null hypothesis was rejected.

**Table 6**

### *Omnibus Tests of Model Coefficients for Age*

		Chi-square	df	Sig.
Step 1	Step	18.990	5	.002
	Block	18.990	5	.002
	Model	18.990	5	.002

**Table 7***Variables in the Equation for Age as Predictor*

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup> Age			19.738	5	.001	
Age (1)	.179	.134	1.778	1	.182	1.196
Age (2)	.023	.110	.043	1	.835	1.023
Age (3)	.312	.081	14.905	1	.000	1.367
Age (4)	.056	.077	.525	1	.469	1.057
Age (5)	.009	.076	.014	1	.906	1.009
Constant	-2.201	.053	1706.210	1	0.000	.111

a. Variable(s) entered on step 1: Age.

### Research Question 3

RQ3 was: is there a statistically significant difference in 30-day readmissions for race (White/Black) for patients with HF in Mississippi? Binary logistic regression was performed to measure the influence of race on the likelihood that respondents would report they had been readmitted to the hospital within 30 days. The test of the model fit presented in Table 8 showed that the logistic regression model was statistically significant in predicting the 30-day readmission of respondents,  $\chi^2(5) = 15.689, p = .008$ . The results indicated that the model was able to distinguish between respondents who did and did not report readmission to the hospital within 30 days based on race (see Table 8). As shown in Table 9, none of the racial groups was a significant predictor of whether the respondent is readmitted to the hospital within 30 days. The model was able to predict 89.3% of the cases correctly. Based on the results of this analysis, the null hypothesis was retained.

**Table 8***Omnibus Tests of Model Coefficients for Race*

		Chi-square	df	Sig.
Step 1	Step	15.689	5	.008
	Block	15.689	5	.008
	Model	15.689	5	.008

**Table 9***Variables in the Equation for Race as Predictor*

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	Race			15.801	5	.007	
	Race (1)	.341	.735	.215	1	.643	1.406
	Race (2)	.533	.735	.526	1	.468	1.703
	Race (3)	.844	.780	1.173	1	.279	2.326
	Race (4)	.486	.905	.288	1	.592	1.625
	Race (5)	.413	.873	.224	1	.636	1.512
	Constant	-2.565	.734	12.218	1	.000	.077

a. Variable(s) entered on step 1: Race.

### Summary

The purpose of this quantitative correlational study was to determine if a correlation exists between gender, age, race, and 30-day HF readmissions. Before testing the hypotheses, descriptive statistics and assumptions testing were conducted. According to the descriptive statistics, 89.3% of the participants were not readmitted within 30 days. In terms of gender, the sample included 7,578 women and 7,816 men. About 50.8% of the participants were White, 46.9% were Black, about .7% were Hispanic, .2% were Asian or Pacific Islander, and .3% were Native American. There were more older participants than young participants. The results of assumptions testing revealed that the

data met the assumptions of parametric testing. The results of the binary logistic regression analyses determined that both gender groups and age groups were significant predictors of the 30-day readmission of patients. However, race was not a significant predictor of 30-day readmission of patients. Thus, there was sufficient evidence to reject the first and second null hypotheses while there was insufficient evidence to reject the third null hypothesis. A significance level of .05 was utilized for all analyses. Section 4 provides the interpretation of findings, study limitations, recommendations, and implications for professional practice and social change.

## Section 4: Application to Professional Practice and Implications for Social Change

### **Introduction**

The main purpose of this quantitative correlations study was to determine if there was a statistically significant difference in 30-days HF readmissions for the year 2019 in Mississippi associated with gender (male/female), age, and race (Black/White). The data were obtained from CMS. The increase in HF and associated detrimental effects on patients and health care costs was the primary impetus for conducting this research. In Mississippi, cardiovascular disease, which includes HF, is the leading cause of death in the state (Mendy, 2022). By analyzing various factors associated with gender, age, and race there could be ways to improve limited health care resources and also develop policies that could improve quality outcomes for this serious health problem.

### **Research Questions and Hypotheses**

RQ1: Is there a statistically significant difference in 30-day readmissions for gender (male and female) for patients with HF in Mississippi?

$H_01$ : There is not a statistically significant difference in 30-day readmissions for gender (male and female) for patients with HF in Mississippi.

$H_11$ : There is a statistically significant difference in 30-day readmissions for gender (male and female) for patients with HF in Mississippi.

RQ2: Is there a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi?

$H_02$ : There is not a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi.

*H*<sub>12</sub>: There is a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi.

RQ3: Is there a statistically significant difference in 30-day readmissions for race (Black/White) for patients with HF in Mississippi?

*H*<sub>03</sub>: There is not a statistically significant difference in 30-day readmissions for race (Black/White) for patients with HF in Mississippi.

*H*<sub>13</sub>: There is a statistically significant difference in 30-day readmissions for race (Black/White) for patients with HF in Mississippi.

### **Key Results**

Key results showed that gender and age had a statistically significant impact on HF 30-day readmissions but race did not. Various studies used in this research support the findings although there are several research articles that find race can be a factor for readmissions. This study was grounded in Wagner's chronic care model, which was designed to improve health care delivery by identifying key elements within the health care system that support effective disease management and prevention for high-risk populations, including individuals diagnosed with HF (Grudniewicz et al., 2023). Section 4 addresses the study results and interpretations, the findings related to literature, findings to theory, limitations of the study, recommendations, and implications for professional practice and social change.

## Interpretation of the Findings

### Analysis of Research Question 1

RQ1 related to whether there is a statistically significant difference in 30-day readmissions for gender (male and female) for patients with HF in Mississippi. Binary logistic regression was conducted to assess the relationship between gender and the probability that respondents reported hospital readmission within 30 days. The analysis showed that the logistic regression model was statistically significant in predicting the 30-day readmission of respondents,  $\chi^2(1) = 5.234, p = .022$ . Results further indicated that the model was able to distinguish between respondents who did and did not report readmission to the hospital within 30 days based on gender. The gender group was a significant predictor of whether the respondent was readmitted to the hospital within 30 days. The model was able to predict 89.3% of the cases correctly. The odds ratio for gender was 1.127 indicating that 30-day readmissions have a higher likelihood to occur among male patients more frequently than female patients. Based on the results, the null hypothesis was rejected and the alternative hypothesis accepted indicating that male patients are readmitted with greater frequency than female patients.

Research indicates that gender - particularly being male - may correlate with increased rates of readmission for congestive HF. This underscores the importance of initiating comprehensive discharge planning for older adult male patients early during hospitalization. Additional risk factors within this population include limited family support, non-adherence to therapeutic regimens, and health concerns such as smoking, alcohol consumption, and obesity (Kang et al., 2025). Enhanced understanding of these

factors may help reduce readmission rates and improve overall quality of life. The results of this study align with those of Arcopinto et al. (2022), who found that male patients with HF showed a higher prevalence of diabetes, ischemic heart disease, coronary atherosclerosis, peripheral vascular disease, renal failure, and liver disease. Once patients are admitted with HF and high-risk factors are determined, assessing discharge needs should be done collaboratively with patients, the medical team, and family members to optimize plans that will promote positive follow-up post discharge to avoid readmissions (Heo et al., 2023; Johnson & Waller, 2021).

### **Analysis of Research Question 2**

RQ2 related to whether there is a statistically significant difference in 30-day readmissions for age for patients with HF in Mississippi. Binary logistic regression was used to assess the association between age and the probability of respondents reporting hospital readmission within 30 days. The analysis for RQ2 showed that the logistic regression model was statistically significant in predicting the 30-day readmission of respondents based on age factors,  $\chi^2(5) = 18.990, p = .002$ . The results demonstrated that the model was able to distinguish between respondents who did and did not report readmission to the hospital within 30 days based on age. In particular, the age group for 50 to 59 was a significant predictor of whether the respondent is readmitted to the hospital within 30 days. The model was able to predict 89.3% of the cases correctly. The odds ratio for the age group 50 to 59 is 1.367 indicating that 30-day readmission has higher likelihood of occurring among patients from this age group than other age groups. Based on the results of this analysis, the null hypothesis was rejected and the alternative

accepted indicating that age is a predictor for readmissions particularly for individuals ages 50-59.

These findings are consistent with previous research indicating that age is a significant predictor of HF readmissions, especially among older populations (DeAngelo et al., 2025). DeAngelo et al. reported that one in five patients with HF who are readmitted have high-risk indicators that may warrant evaluation to improve outcomes. In a study by Steverson et al. (2023), 290 patients were analyzed to assess relationships between age and social determinants of health. The study found an average patient age of 59 years, and identified factors such as homelessness, substance abuse, and mental health concerns as contributing to an increased risk of readmissions. Age was also identified as a contributing factor in a study by Ayenew et al. (2024), which found that patients of advanced age had an increased likelihood of being readmitted following an acute episode of HF. The study further indicated that both advancing age, and the presence of multiple high-risk health conditions significantly raised the probability of hospital readmission (Ayenew et al., 2024).

### **Analysis of Research Question 3**

RQ3 related to whether there is a statistically significant difference in 30-day readmissions for race (White/Black) for patients with HF in Mississippi. A binary logistic regression analysis was conducted to assess the effect of race on the probability that respondents reported hospital readmission within 30 days. The analysis showed that the logistic regression model was statistically significant in predicting the 30-day readmission of respondents,  $\chi^2(5) = 15.689, p = .008$ . The results indicated that the

analysis was able to distinguish between respondents who did and did not report readmission to the hospital within 30 days based on race. However, none of the racial groups was a significant predictor of whether the respondent was readmitted to the hospital within 30 days and the model was able to predict 89.3% of the cases correctly. Based on the results of this analysis, the null hypothesis was retained indicating that race did not have an effect on whether a patient was readmitted for HF.

Previous research investigating the association between race and 30-day readmission rates has yielded results that contrast with those of the present study, a discrepancy frequently ascribed to the impact of social determinants of health across different populations. Patel et al. (2020) reported that, between 2010 and 2018, 29.4% of Black patients and 23.0% of White patients experienced HF readmissions. Furthermore, excess 30-day HF readmissions and mortality were consistently observed among Black patients across all neighborhood strata, with rates increasing in correlation with greater neighborhood socioeconomic deprivation (Patel et al., 2020).

Amankwah et al. (2025) found that unfavorable social determinants of health are linked to higher readmission rates among patients with acute myocardial infarctions. Evaluating these determinants at the time of hospital admission for cardiac conditions can enable clinical staff to prioritize precautionary measures, address issues related to health literacy and identify suitable social supports early in the hospital stay. This approach may help to decrease unnecessary readmissions and improve overall quality outcomes (Amankwah et al., 2025). Further, Piña et al. (2021) indicated that HF is more prevalent among Black adults compared to other racial groups, with earlier onset and elevated rates

of hospitalization and mortality. Environmental and socioeconomic variables, alongside social determinants of health, represent independent risk factors for HF and its associated adverse outcomes. Research evidence indicates that disparities in care can be effectively addressed but this requires the focus of a health care team (Piña et al., 2021).

### **The Findings in Relation to the Literature**

Mendy et al. (2022) found that cardiovascular disease, including HF, is the primary cause of mortality in Mississippi, and its prevalence is increasing. The study reported that age-adjusted death rates from cardiovascular disease decreased from 2000 to 2018 across gender, race (Black/White), and age categories, with varying degrees of decline among these subgroups. An age-specific analysis showed a significant annual increase of 1.7% in cardiovascular disease deaths for individuals aged 55 to 64 years during 2011–2018 (Mendy et al., 2022). These findings suggested that interventions focused on reducing cardiovascular risk, which includes HF, may be warranted for adults aged 55 to 64 years in Mississippi in relation to 30-day readmissions.

Numerous studies over the years have emphasized the seriousness of HF and its association with various social determinants of health, including gender, age, and race, the variables central to this study. Hoang-Kim et al. (2020) noted that gender is frequently examined due to differing risk factors among male and female patients. In a scoping review identifying 34 relevant articles, the majority (15 compared to 9) found that men faced a higher risk of HF readmission than women. The presence of significant risk factors such as smoking, alcohol consumption, and obesity was considered influential in these outcomes (Hoang-Kim et al., 2020).

Jha et al. (2022) investigated HF patients experiencing reduced ejection fraction and found that lower readmission rates were observed among individuals residing in small metropolitan or micropolitan areas, those of older age, female patients, and those with private insurance or without insurance. Their findings also indicated that social determinants of health, including stress and high-risk behaviors, significantly impacted overall cardiac function and mortality (Hoang-Kim et al., 2020; Jha et al., 2022). Given the complexity of HF, comprehensive diagnostic evaluations tailored to the patient's specific type of HF are essential for preventing 30-day readmissions. Furthermore, it is crucial to assess each patient's medical, social, and financial circumstances to ensure that appropriate resources are allocated effectively, thereby reducing the likelihood of readmission (Jha et al., 2022).

Patel et al. (2020) and Reinhardt et al. (2022) examined the financial implications of 30-day readmissions for HF and explored how racial factors may influence outcomes through various social determinants of health. Biases within health care teams and socioeconomic disadvantages can impact treatment effectiveness and patient outcomes, frequently leading to increased costs and reduced quality of care (Patel et al., 2020). Reinhardt et al. (2022) also noted that age is a relevant factor, as Medicare beneficiaries are commonly identified as requiring post-discharge planning due to HF admissions and subsequent readmissions. Additionally, Amankwah et al. (2025) highlighted the importance of preventive measures to not only improve HF management but also address related cardiac conditions.

### **The Findings in Relation to the Chronic Care Model**

Wagner (1998) developed the chronic care model to improve health care delivery and establish a framework for managing diseases among high-risk patient populations. HF, as a cardiovascular condition, necessitates coordinated efforts between patients, health care professionals, community resources, and social support networks. The chronic care model aims to transform chronic disease management by implementing standardized care practices suitable for both outpatient and inpatient settings (Wagner, 1998). This model is both goal-oriented and patient-centered, contributing to reduced hospitalizations and minimizing the likelihood of readmission after inpatient treatment (Grudniewicz et al., 2023). Integrating a patient-centered approach with comprehensive disease management enables patients to gain a thorough understanding of HF's medical implications and underscores the importance of adhering to recommended treatments (Grudniewicz et al., 2023).

Pomey et al. (2024) expanded upon the chronic care model to more fully acknowledge the patient's active role in their own care and the importance of promoting patient responsibility. Patients contribute unique backgrounds shaped by lifelong experiences and established habits. By facilitating behavioral change, supporting adherence, and identifying treatment modalities tailored to individual lifestyles, patients are empowered to enact positive changes more efficiently and appreciate their essential role within the care team. This approach to patient empowerment supports clinical treatments by ensuring access to systems-level resources and support (Pomey et al., 2024). Implementing these principles is expected to enhance management of chronic

disease complexity, such as HF, while fostering integration across care delivery, support services, eHealth initiatives, and determinants of health.

### **Limitations of the Study**

All studies possess inherent limitations linked to factors such as methodology, population characteristics, data sources, generalizability, and outcomes. This study utilized data from a single year, which may have influenced the observed variables and impacted on the findings related to both null and alternative hypotheses. Also, using a single year may have constrained the findings and results might have varied if multiple years had been examined. Additionally, while secondary data were appropriate for the research objectives, it did not provide insights into patients' perspectives regarding readmissions. A related consideration is that the study focused exclusively on HF, without addressing other forms of heart disease that may be associated with or serve as precursors to HF. Importantly, only one state, Mississippi, was used for the study and therefore generalizability was a factor that needs to be taken into consideration when considering the geographic scope of the study.

### **Recommendations**

Based on the findings and limitations of this study, several recommendations are proposed to broaden its scope through future research. The study offers valuable insights into the care of patients with HF, particularly concerning age, race, and gender variables. Further examination of these factors will enhance understanding and improve the generalizability of research outcomes.

### **The Use of a Wider Range of Variables**

In addition to demographic variables, incorporating a wider range of variables can enhance our understanding of how HF is influenced by chronic conditions such as COPD, diabetes, hypertension, and obesity. High-risk behaviors, including smoking, alcohol consumption, and drug use, also represent significant factors that may affect patient outcomes. Collectively, these health challenges contribute to adverse outcomes for patients, including increased rates of hospital readmissions.

### **Expansion of the Geographic Range From One State to Regions**

Only Mississippi was used for this study, which is important because cardiovascular disease is the highest cause of death in the state. Comparative analysis with other states may offer valuable insights for researchers and health care administrators regarding the underlying factors contributing to regional variations in HF prevalence, particularly in areas with lower incidence, and explain the reasons for these differences.

## **Implications for Professional Practice and Social Change**

### **Professional Practice**

#### ***Outpatient Settings***

It is essential for health care professionals to recognize the significance of collaborative care in management and prevention of HF among cardiovascular patients. Implementing comprehensive programs can enhance strategic planning to both reduce hospitalizations and, critically, prevent HF readmissions. Enhancing follow-up protocols within primary care and cardiology settings would underscore to patients the value of

adherence to medical regimens and the necessity of consistent communication with health care providers. Regular quarterly office visits can facilitate early intervention and promote ongoing treatment before health conditions become more severe. Implementing structured dietary programs and meal planning initiatives supports improved nutritional choices within patient populations. Collaborative meetings involving families, patients, and clinical teams in an outpatient setting enhance the collective understanding of prevention as a primary objective. Health care administrators in clinical environments should prioritize the development of these initiatives, as they can contribute to better patient outcomes and support the financial sustainability of both clinics and individuals.

### ***Inpatient Settings***

Upon hospital admission for HF, implementing a comprehensive team-based approach is essential to address demographic variables such as age, race, and gender, alongside other high-risk factors that may influence patient care and outcomes. Establishing coordinated efforts early facilitates the identification of risks affecting discharge planning and helps mitigate potential readmissions. Health care professionals should collaborate closely with patients' families, and, when family support is limited, accessing community resources becomes critical. Employing patient-centered care is fundamental for understanding and integrating the patient's perspectives, preferences, and future objectives into their treatment plan.

### **Positive Social Change**

Research has shown that social determinants of health (SDOH) play a role in the health outcomes of patients particularly if there are many negative SDOH that affect

patients such as low income, social isolation, lack of transportation, inadequate insurance and other factors. Health care professionals can make a difference in patient's lives if SDOH factors are addressed on an ongoing basis. Numerous biases exist in health care related to age, race, and gender, making it crucial for health care professionals to recognize these factors and strive to provide equitable, high-quality care to every patient. Such efforts promote positive social change by empowering patients and encouraging active participation in their health care outcomes. Furthermore, this underscores the significance of patient engagement and highlights the responsibility of health care professionals to advocate for optimal care for all individuals.

### **Conclusion**

HF 30-day readmissions are a serious issue for both patients and health care organizations. The literature review covered studies from 2019 to 2025 on HF readmissions, costs, and Mississippi-specific data. It examined age, race, and gender as predictors of 30-day HF readmissions and found that these factors often correlate with readmission rates, which can differ by population. Identifying these predictors is crucial for improving patient care and creating targeted strategies to reduce hospital readmissions (Johnson & Waller, 2021). Patients need to be assessed based on the reality of many factors concerning gender, age, and race to target preventative ways to avoid initial HF hospitalization.

The results of this study using binary logistic regression showed that gender and age groups significantly predicted 30-day patient readmissions, while race did not. The first and second null hypotheses were rejected, but there was not enough evidence to

reject the third. All analyses used a .05 significance level. This study contributes to existing research on HF by emphasizing the importance of considering gender, age, and race in lowering the risk of patient readmission. Additional studies are necessary to explore these factors further and develop effective interventions and strategies aimed at reducing hospital readmissions based on gender and related costs. Health care professionals must recognize how HF symptoms vary according to demographic traits to help improve treatment approaches and patient outcomes.

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