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Perceptions of Women with Cardiovascular Disease Who Chose Conservative Therapy Over Advanced Therapy

Vanessa Pugh
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Walden University

College of Nursing

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Vanessa Enita Pugh

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
2024

Abstract

Perceptions of Women with Cardiovascular Disease Who Chose Conservative Therapy

Over Advanced Therapy

by

Vanessa Enita Pugh

MSN, Chamberlain University, 2017

BSN, Chamberlain College of Nursing, 2009

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Nursing

Walden University

November 2024

Abstract

Cardiovascular disease is the leading cause of death for women. Women with cardiovascular diseases are less likely to receive the available advanced therapies such as defibrillators, pacemakers, and left ventricular assist devices as part of their cardiovascular care plan when compared to their male counterparts. Kelly's theory of personal constructs and his 11 corollaries were used as the theoretical foundation for this basic qualitative study to help explore and understand the perceptions of women who chose a conservative therapy instead of a more advanced therapy for their cardiovascular disease. Social media platforms and snowballing technique were used to recruit the six study participants who were interviewed using semi structured interviews. Thematic analysis was used to identify three emerging themes for the study. The three themes were perceptions of conservative therapy, perceptions of advanced therapy and experiences that affect perceptions of therapy. The findings of the study demonstrated how perceptions of both conservative and advanced therapy as well as how experiences affected the perceptions of women concerning their therapy choice. The results have implications for promoting positive social change as providers recognize the implications of women's experiences and perceptions on their decisions for treatment. Future studies to examine interventions early in the course of heart disease is recommended to promote awareness of treatment options for women with heart disease. Additionally, studies to examine the differences in treatment choices by age, and race/ethnicity may provide still further insights to improve health outcomes for women with heart disease.

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Dedication

This dissertation is dedicated to my children Nadia and Quincy, and to Mrs. Daisy. You all were truly the wind beneath my wings. You motivated me to go above and beyond and inspired me to never give up on my dreams. It has always been my goal to obtain my PhD and despite the long road and many obstacles, you have always supported me. I thank you from the bottom of my heart for all your love and patience as I completed my dissertation.

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Chapter 1: Introduction to the Study

The leading cause of mortality for women worldwide is cardiovascular disease (Gauci et al., 2022). In 2019, cardiovascular disease was responsible for 35% of the total deaths of women (Vogel et al., 2021). In addition, 44% of American women were diagnosed with a cardiovascular disease in 2021 (Wenger et al., 2022). The Centers for Disease Control and Prevention (CDC, 2023) estimated that over 60 million women in the United States suffered from cardiovascular disease, making it the leading cause of death for women. Worldwide, cardiovascular disease affects over 289 million women (Vogel et al., 2021).

Because cardiovascular disease is often referred to as a man's disease, women have been misdiagnosed or have experienced delays in treatment, which has led to poorer health outcomes for women (Gauci et al., 2022). Vogel et al. (2021) indicated that there was a higher rate of mortality and adverse outcomes for women who suffered from a myocardial infarction when compared to men. African American women have the highest death rate from heart disease (CDC, 2023). Women are often undertreated for cardiovascular disease, which leads to disability (Woodard, 2019). This problem is further compounded by the lack of research aimed at women with cardiovascular disease and the adequate treatment they need. Finally, according to the American Heart Association (AHA, 2022), both indirect and direct costs of cardiovascular disease were over 555 billion dollars a year and were expected to increase to 1.1 trillion dollars by 2035.

The problem I addressed was that despite advances in therapy for cardiovascular disease, women are not benefitting from these advanced therapies as much as their male counterparts. Although there are advanced therapies such as left ventricular assist devices (LVADs), implantable biventricular devices, cardiac resynchronization devices, heart transplants, and surgical procedures such as coronary artery bypass graft and heart valve replacements, women are not fully using advanced therapies (Garcia-Cosio et al., 2021; Hyun, 2019; Souder, 2021). Brethett et al. (2020) concluded that even though women are diagnosed more with heart failure than men, they receive less than one fourth of all LVADs. Women were also less likely to receive cardiac resynchronization therapy, which uses a biventricular pacemaker or an implantable cardioverter defibrillator, and when compared to men, women are three times less likely to receive a defibrillator (Silva et al., 2022).

This study was significant in that it may offer insight into why women with cardiovascular disease are less likely than men to benefit from advanced cardiovascular therapy. Adigun et al. (2018) discussed how cardiovascular disease and health care disparities continues to persist for women despite the advances in medicine and technology. The potential social implication of this study was that it may lead to processes and policies that will help to decrease health care disparity and improve outcomes for women with cardiovascular disease.

This study contributes to clinical practice because the information can help clinicians understand why women with cardiovascular disease do not choose advanced therapy. This could help clinicians to understand and examine how a woman's

perceptions concerning advanced therapy can affect her decision to pursue this therapy. This information can help nurse leaders, for example, with developing educational programs for both providers and patients. This study could help show the importance of establishing mentorship programs where women who have used advanced therapies can reach out to support women who are making the decision to proceed with advanced therapy. This chapter includes sections on the background of the study, the problem, purpose of the study, the research question, theoretical framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, and significance.

Background of Study

Although advances in therapy have improved the overall outcomes for patients with cardiovascular disease, women have not equally benefited. Women with cardiovascular disease have distinct risks that make them vulnerable to heart disease. For example, women have a different pathophysiology when compared to men, and they have hormonal changes from pregnancy and menopause that make them more prone to suffer from heart disease (Geraghty et al., 2020). A woman's pathophysiology differs from that of men in both the cardiac structure and function of the heart. Women have a smaller left ventricle chamber and higher systolic and diastolic stiffness, which can lead to high blood pressure and the heart's inability to pump blood to the body (Beale et al., 2018). According to Beal et al. (2018), when compared to men, women as they age have a decrease in cardiomyocytes, which make up the cardiac muscle and are responsible for the contraction of the heart. Furthermore, according to Beale et al., as women age, this decrease in cardiomyocytes predisposes women to heart failure, which leads to exercise

intolerance and increased heart rate when compared to men. In addition, this increase in heart rate can lead to cardiac arrhythmias for women such as atrial fibrillation. Women are also more likely to experience diastolic dysfunction in heart failure because they have higher pulse pressure, smaller and stiffer aortic arches, and greater arterial elastance, all of which affect diastolic function (Beale et al., 2018). With coronary artery disease, women have thicker arterial walls and microvascular and endothelial dysfunction, which increases a woman's risk of developing nonobstructive coronary artery disease when compared to men (Beale et al., 2018).

In addition to the pathophysiological differences in women when compared to men, Wenger et.al. (2022) suggested that women are often diagnosed more than men with autoimmune diseases such as lupus and inflammatory diseases that can often exacerbate cardiovascular diseases such as valvular and coronary disease. Other factors such as pregnancy and menopause can increase a woman's chance of developing cardiovascular disease. Cardiovascular diseases in this study included coronary artery disease, myocardial infarction or acute coronary syndrome, congestive heart failure and cardiac arrhythmias, all diagnoses which require advanced therapy. I explored why women are not benefitting from advanced therapy by first examining the impact of these diseases on women's health.

In 2022, heart failure affected over 2.6 million women in the United States (Deflippis et al., 2022). Women are more likely to die from heart failure than men (Ebong et al., 2022). According to Ghare et al. (2019), the number of deaths from heart failure for women was even higher than death from diseases such as breast cancer. Furthermore,

women are less likely than men to undergo cardiac catheterization which is used to determine the severity of heart failure disease and often do not receive implantable devices that could improve their outcomes (Ghare et al., 2019). Hyun et al. (2019) explained how cardiovascular disease is often not accurately diagnosed in some women, which leads to the underutilization of key treatments that are necessary to help decrease health care disparities and improve outcomes such as decreases in hospitalizations and improvements in daily activities of life.

Despite guidelines put in place to guide physicians in the care of women with cardiovascular disease, women are still not receiving the recommended therapy according to these guidelines (Vogel et al., 2021). The American College of Cardiology in collaboration with the AHA introduced the 2019 guidelines for physicians to help with the prevention of cardiovascular disease (Westerman & Wenger, 2019). Although these guidelines were not specific to women, the guidelines encouraged physicians to use the Pooled Cohort Equations to determine the cardiovascular disease risk score or atherosclerotic cardiovascular disease (ASCVD) risk (Westerman & Wenger, 2019). For example, if a woman suffers from an autoimmune disease that increases the risk of coronary heart disease, the ASCVD risk score would alert the physician to the increased possibility of a pending myocardial infarction and the risk for increased mortality in that woman (Westerman & Wenger, 2019). As a result of this alert, physicians would be guided in the best treatment plan. Another guideline involves exercise and activity. A lack of exercise has been linked to cardiovascular disease in women, and doctors often do

not instruct their patients about the recommended guidelines of 150 minutes of weekly exercise (Westerman & Wenger, 2019).

There are also guidelines that help physicians with the recommendation for implantable devices, but these guidelines are not applied equitably. For example, dual pacemakers could benefit women diagnosed with atrial fibrillation because women have an increased risk of developing atrial fibrillation as they age (Elango & Curtis, 2018). However, when compared to men of the same age, women were less likely to receive dual chamber pacemakers (Elango & Curtis, 2018).

Similarly, there are persistent disparities when it comes to implantable cardioverter defibrillator therapy (ICD) for women when compared to men. ICDs can prevent sudden cardiac death, but women are less likely to receive this life saving device (Silva et al., 2022). Using a cross-sectional retrospective analysis, Johnson et al. (2018) found that 25% of women compared to 36% of men received an ICD device. In a retrospective cohort study from 2008 to 2018, in adults diagnosed with cardiovascular disease that required a pacemaker or ICD, women were less likely to have a device implant (Silva et al., 2022). ICD and pacemakers are advanced therapies not only for heart failure, but for coronary artery disease, and cardiac arrhythmias. The lack of pacemakers, dual pacemakers, and ICD implants is significant in that, patients with these devices had a lower 30-day mortality than those with no devices (Silva et al., 2022). Women had a better 30-day mortality than men which means if implanted in women, pacemakers and ICDs could reduce the number of deaths for women when compared to women who did not receive the device (Silva et al., 2022). With the knowledge that these

implantable devices can improve the quality of life and prevent deaths, it is important to understand why women are not receiving these devices as part of their treatment plan.

In addition to ICDs, LVAD is an implantable device used in patients with severe or end stage heart failure and coronary artery disease. Although guidelines recommend the insertion of an LVAD for end stage heart failure, women are still less likely to receive an LVAD (Elango & Curtis, 2018). According to the Nationwide Inpatient Sample, the implantation of LVADs in women was 25.8% in 2004 but the use of these devices decreased to 21.9% in 2016, and the rate has not significantly changed or improved since 2008 (Gruen et al., 2020). It is not fully understood why the numbers have not increased or improved. This is important in that patients with end stage heart failure could benefit from LVADs when their diagnosis requires a heart transplant, but no donor hearts are readily available.

In clinical trials used to evaluate the effectiveness of LVADs, only 10% to 24% of the participants were women (Gruen et al., 2020). The lack of studies on women in LVAD trials means less research on how the LVAD functions in female patients and prevents the anticipation of problems that could occur. Studies have examined the pathophysiological differences of women and the lack of adherence to guidelines for treatment as reason for women not benefiting from advanced therapy, however, there is little information examined about a woman's perception of the benefits of advanced therapies and why they chose to use conservative therapy instead. Hyun et al. (2019) and Peters et al. (2019) examined the attitudes of physicians towards women and cardiovascular care. These authors concluded that more studies are needed to understand

how female patients view their disease process and treatments in comparison to the physician's view. This gap is why this study is needed to help identify the perceptions that women hold towards advanced therapy and factors that influence these perceptions. It will examine why women chose conservative treatment over more advanced therapy for their cardiovascular disease.

Problem Statement

The situation that prompted me to search the literature was that women with cardiovascular diseases are less likely to receive the available advanced therapy as part of their cardiovascular care plan when compared to their male counterparts (see Gao et al., 2019). It is important to understand the perceptions of women who chose a conservative approach, and to explore whether these perceptions could be influencing their decision to not choose an advanced therapy. If these perceptions are preventing women from choosing an advanced therapy, it is equally important to help women understand that these perceptions may be preventing them from receiving therapy that could potentially reduce or eliminate health care disparity, decrease health care costs, and reduce morbidity, disability, and mortality.

Incorrect diagnosis by physicians can lead to an increase in the number of hospitalizations for these women. Inconsistent care creates a burden not only for the health care system but for the individual families as well. For example, it is estimated that out-of-pocket health care costs account for over 20% of the income of these families and are often referred to as financial toxicity (Wang et al., 2021). In heart failure disease, a lack of advanced therapy is expected to create a 69.8-billion-dollar burden on the health

care system by 2030 (Patel, 2021). The median costs per day for hospitalization for heart failure was \$13,418 per patient which increased to \$15,732 for heart failure readmissions (Patel, 2021). The costs of lost wages due to increased morbidity and mortality from heart failure disease was \$12.4 billion in 2020 (Patel, 2021). Informal care for this disease is approximately \$836 per patient who often require more than 45 days of informal care once discharged to home (Patel, 2021).

According to the CDC (2023), cardiovascular disease in the year 2020 caused the deaths of 314,186 women. Furthermore, according to the study, about 44% of women did not know that cardiovascular disease was the number one killer for women (CDC, 2023; Mikail et al., 2022). Because it was widely believed that cardiovascular disease is a man's disease, women were more likely to be undertreated for cardiac symptoms, which could lead to acute coronary syndrome or myocardial infarction, strokes, and pulmonary embolisms, which also leads to increased mortality (Souder et al., 2021). Doctors focused more attention on breast health in women rather than on cardiovascular disease, which can account for the increase in mortality (Gao et al., 2019).

Despite advanced therapies such as ventricular assist devices, extracorporeal membrane oxygenation (ECMO), inotropic drug infusion, implantable biventricular devices, cardiac resynchronization therapy, heart transplants and surgical procedures such as coronary artery bypass graft and heart valve replacements, women are not fully utilizing advanced therapies (Garcia-Cosio et al., 2021; Hyun, 2019; Souder, 2021). Jin et al. (2020) reviewed data from 2010–2017 and discovered that even though more women were participating in heart failure clinical trials, overall, women in general were less

likely to participate in clinical trials aimed at treating cardiovascular disease. In addition, women are less likely to receive electrocardiography, the tool that guides the physicians in diagnosis of disease (Peters, et al., 2019). This simple diagnostic tool can provide valuable information about an impending myocardial infarction which leads to acute coronary syndrome.

Studies thus far have focused on socioeconomic status and gender bias as reasons for the lack of use of advanced therapy. For example, Redfors (2017) suggested that women are less likely to receive advanced therapy for myocardial infarctions because it is often seen as a male disease. Schultz et al. (2018) suggested that socioeconomic status played a role in women having access to advanced cardiovascular therapy. Schultz et al. also noted that researchers have also examined barriers such as level of education, employment status, and income level, which can have a direct impact on a woman's access to advanced therapy. Daugherty et al. (2018) examined how physician bias plays a role in assessing and treating women for cardiovascular disease. Finally, Graham and Taylor (2017) examined the idea of one size fits all for cardiovascular care and that this is one of the reasons women receive inadequate care and are not given advanced therapy in comparison with treatments that men received.

Mehta et al. (2023) examined how some ethnic, gender, and racial groups experience language barriers, discrimination, inadequate access to care, and even loss of cultural identity, which can lead to lack of care. There are also barriers in terms of how risk associated scores are skewed in terms of racial, gender, and ethnic groups when it comes to identifying traditional risk factors for cardiovascular disease such as

hypertension and family history of heart disease (Mehta et al., 2023). Other barriers to care include lack of traditional symptom presentation, lack of research and knowledge gaps, and lack of cardiac specialists for women in areas of obstetrics, oncology, and autoimmune disorders (Gulati et al., 2021). However, despite all the barriers shown in the research, it is still unclear that when women are diagnosed why they are not utilizing the advanced therapy and why perceptions could be a factor for pursuing more advanced therapy.

Purpose of the Study

My intent with this basic qualitative study was to explore the perceptions of women with cardiovascular disease that affect their views regarding advanced therapy and why they choose conservative therapy over advanced therapy. Cardiovascular diseases for women include coronary artery disease, myocardial infarction or acute coronary syndrome, congestive heart failure, and cardiac arrhythmias which all require advanced therapy (Souder et al., 2021). Advanced therapies for cardiovascular disease are LVADs, implantable biventricular devices, dual pacemakers, and implantable cardiovert defibrillators (Souder et al., 2021).

Research Question

What are the perceptions of women with cardiovascular disease who chose a conservative therapy instead of advanced therapy including LVADs, dual and biventricular pacemakers, and implantable cardiovert defibrillators?

Theoretical Framework for the Study

The theory for this study was Kelly's theory of personal constructs. Kelly introduced the theory in 1955 as a theory of personality in which an individual's behaviors are based on constructs that allow them to respond to events in their environment (Reynolds, 2013). According to this theory, when individuals are unable to process the meaning or understanding of knowledge, this creates a disconnect in their ability to perform cognitive integration of thought processes (Reynolds, 2013). This is important in, that perceptions of experiences can impact these thought processes, which help them to navigate and respond to different stressors such as those that occur in chronic diseases (Reynolds, 2013) As a result, this may affect the patient's perception of the benefits of advanced therapy. I used Kelly's (1963) personal construct theory to show that individuals use their personal theories about themselves to make the decision to proceed with therapies that can impact them and the environment around them. Individuals use their theories or perceptions to interpret and understand the events that happen in their environment.

Kelly (1963) referred to individuals in his personal construct theory as scientists and as a scientist, these women use their perceptions as part of their thought processes concerning their environment or event. In my study, the event was having a chronic illness such as cardiovascular disease. The environment included the relationship and interactions between physicians and patients.

Figure 1 shows the relationship between Kelly's eleven corollaries and how they correlate to women with cardiovascular disease, and the impact of their perceptions when

making decisions about treatment modality. It also shows the impact of physician -patient interactions, which can potentially affect these decisions and perceptions.

Figure 1

Kelly's Personal Construct Theory

Figure 1: George Kelly's Personal Construct Theory: 11 Corollaries

Women and Cardiovascular disease



Note: Adapted from "Theory of Personality: The psychology of personal constructs,"

G.A. Kelly, 1963.

Nature of the Study

To address the research question in this qualitative study, the specific research design was a basic qualitative approach using data obtained from semi structured interviews and a committee approved interview guide to identify themes or patterns. This thematic analysis, according to Braun and Clarke (2006), allowed me to not only identify themes and patterns but to interpret this data and to explain my problem and answer my research question. Thematic analysis allowed me to understand the data, to generate codes, and to define the themes that would lead me to a better understanding of how the perceptions of women diagnosed with cardiovascular disease can impact their decisions to choose conservative therapy (see Braun & Clarke, 2006).

I developed a data management plan to help collect, store, and organize the transcripts and developed files, which included the interview dates, location, and name of the participant in a secured document (see Ravitch & Carl, 2021). Ravitch and Carl also suggested using a timeline and I used this timeline to help with the different data collecting stages.

Operational Definitions

Acute Coronary Syndrome: Occurs when coronary arteries supplying blood to the heart muscle are suddenly blocked due to a blood clot or spasms in the coronary arteries (AHA, 2022).

Advanced Therapy: Implantable cardiovert defibrillators, biventricular pacemakers, dual chamber pacemaker, and left ventricular assist devices (Garcia-Cosio et al., 2021).

Atrial Fibrillation: Abnormal heartbeat in which the heartbeat is fast and irregular and involves the upper chamber of the heart called the atria (AHA, 2022)

Atrial Flutter: Abnormal heartbeat in which the heart is fast (about 250-350 times a minute) and regular and can cause strokes (AHA, 2022).

Biventricular Pacemakers: Implantable device that is implanted in patients with advanced heart failure who have heart function and rhythms (AHA, 2022).

Bradycardia: A slow heart rate that can require placement of a pacemaker to control (AHA, 2022).

Cardiac Arrhythmias: Irregular heartbeat and includes bradycardia, atrial fibrillation, atrial flutter, paroxysmal supraventricular tachycardia, ventricular tachycardia, and ventricular fibrillation which can be controlled or treated with medications, an implantable cardioverter defibrillators or pacemaker (National Heart, Lung, and Blood Institute, 2022).

Cardiovascular Disease: Coronary artery disease, heart failure, acute coronary syndrome, and cardiac arrhythmias (CDC, 2022).

Congestive Heart Failure: Disease of the heart involving either the right or left side of the heart and affects the heart muscles and their inability to pump blood (AHA, 2022).

Conservative Therapy: Lifestyle changes that involve improved diet, exercise, and medications (Wenger et.al., 2022).

Coronary Artery Disease: The most common type of heart disease and is often referred to as ischemic heart disease that is caused by plaque buildup in the coronary arteries of the heart (CDC, 2022).

Direct Costs: Costs associated with the care of patients with cardiovascular disease: hospital (66%), physicians (12%), and drugs (21%) (Grover et al., 2003).

Dual Chamber Pacemaker: Pacemaker that has two leads with one in the right atrium and one in the left atrium and is capable of sensing and correcting a slow heartbeat (AHA, 2022).

Health Literacy: An individual's motivation to understand and use information to maintain and promote healthy living (Vogel et al., 2019).

Implantable Cardiovert Defibrillators: battery powered lifesaving device placed in the body that can detect the electrical signals of the heart and produce a shock if an abnormal heartbeat or arrhythmia is detected (AHA, 2022).

Indirect Costs: Costs associated with premature mortality (60%) and long-term disability (36%) as a result of cardiovascular disease (Grover et al., 2003).

Kelly's 11 Corollaries in his theory: Construction, individuality, organization, dichotomy, choice, range, experience, modulation, fragmentation, commonality, and sociality (Kelly, 1963).

Left Ventricular Assist Devices: Battery operated pump placed in the left ventricle of patients with end stage heart failure to help pump blood throughout the body (AHA, 2022).

Nontraditional Risk Factors: Psychological stress, interpersonal and structural discrimination, financial stressors, childhood adversity, acute life events have all been associated with increased cardiovascular risks (Balla et al., 2020).

Paroxysmal Supraventricular Tachycardia: Abnormal heartbeat in the upper chambers of the heart in which the heartbeat is fast and abruptly starts and stops (AHA, 2022).

Traditional Risk Factors: Conditions that increase the change of cardiovascular disease, including hypertension, hyperlipidemia, obesity, smoking, sedentary, lifestyle, and diabetes prevalent among U.S. women (Wenger et.al., 2022)

Ventricular Fibrillation: Life threatening heartbeat that occurs in the ventricle and is fast and irregular (AHA 2022).

Ventricular Tachycardia: Fast abnormal heartbeat of about 100 beats a minute that starts in the lower chamber of the heart called the ventricles (AHA, 2022).

Assumptions

According to Simon (2012), assumptions are justifiable items in a study that help to give relevance and are the foundation for the research problem. One assumption was that the participants would answer the questions in the interview truthfully. To ensure that this occurred, I made sure that the participants understood their right to consent or not consent to the study and that all information they provided would be held anonymously and confidential (see Simon, 2012). A second assumption was that the sample used in the study represented the population in the study, which was women with cardiovascular disease. This allowed me to make the foundation for my research problem. These

assumptions are necessary for this study because I examined the perceptions of women, and it is important that the women in the study can speak freely about their perceptions and interactions with their physicians. In addition, to discover and understand why women are still not utilizing the advanced therapy, which evidence shows will improve outcomes and decrease mortality, it is important that a certain population is included in this study.

Scope and Delimitations

Delimitations are controlled by the researcher and represent consciously set limitations or boundaries (Theofanidis & Fountouki, 2019). Delimitations help to explain why I chose to discuss my research problem in a certain way. Delimitations in this study are based on my research question, the advanced therapies, the different cardiovascular diseases, the populations of women with cardiovascular disease, and Kelly's theory of personal construct. A theory that was considered but not used in this study was the middle range theory of self-care of chronic illness because this theory concerned both health and illness states and not specifically to the perceptions of women towards therapy (see Riegel et al., 2019).

The scope of the study was women 18 and older with no specific inclusion or exclusion of ethnic or racial groups who have been diagnosed with one of the cardiovascular diseases. I did not include women with genetic heart defects because care is typically structured for these patients beginning in their childhood. The potential transferability of this study, which is also referred to as generalizability, means that the research findings can be applied to other research settings or populations (see Nowell et

al., 2017). For example, I used social media platforms to recruit participants. This research can be applied to any study using a big or small facility and can also be applied to patient populations with other disease diagnoses.

Limitations

Limitations can occur in the design, method, transferability, and dependability of a study. Transferability and dependability help to give a study trustworthiness (Lincoln & Guba, 1985). One limitation to this study was access to participants and getting enough participants who meet the inclusion criteria to interview. To combat this limitation, I made sure that I made it convenient for the participants to participate. For their time, I offered a 25-dollar Visa gift certificate for participation.

Because time was a limiting factor, I needed to make sure I had enough participants with different cardiovascular diagnoses. This was important because cardiovascular disease is not one specific diagnosis but several diagnoses. I also needed to be prepared to have an additional interview with potential participants in case someone did not participate. This was achieved by having an alternate list of individuals to interview. If participants were not available in person, a Zoom was also an option. The interviews were scheduled in increments of 60 minutes. There was a brief 10-minute phone call to those agreeing to participate. This was to provide some background information and the interview process. Once the interviews and study were completed, I provided a summary of the results of the study.

Another limiting factor was bias. Bias can occur in any phases of a study including the study design, patient recruitment, interviewing process, or data collection,

and the researcher must acknowledge that biases can exist, and they must explain how these biases can be prevented (Pannucci & Wilkins, 2011). I acknowledged my own biases. It was important to list these at the beginning of the study. It helped to bring credibility to my study. For example, I am a female, who may hold my own biases and ideas about advanced therapy. Biases can occur in the interview process. To avoid bias in the interview process, I avoided leading questions and instead use open ended questions that are predetermined and approved by my committee. Each interview involved the same questions. Another area in which bias can occur was in the analyzing data stage and involved overlooking data that may be opposite of what the researcher was hoping to find (Smith & Nobel, 2014). It is important that researchers include and analyze data that is in opposition of the desired outcome.

Significance

This study was significant in that it may offer insight on why women with cardiovascular disease are not benefiting from advanced cardiovascular therapy. Adigun et al. (2018) discussed the impact of cardiovascular disease and health care disparities, which continue to persist for women despite the advances in medicine and technology when compared to men. According to the CDC (2023), cardiovascular disease in 2020 caused the deaths of 314,186 women. The CDC also noted that heart disease is the number one killer of women and that over sixty million women in the United States suffer from cardiovascular disease. According to Hyun et al. (2019) cardiovascular disease is often not accurately diagnosed in some women which leads to the

underutilization of key treatments that are necessary to help decrease health care disparities and improve outcomes.

I examined the perceptions of women with cardiovascular disease in hopes of better understanding how they view their disease process and advanced therapy. In this study, I answered whether these perceptions interfered with their decision to proceed with conservative therapy or advanced therapy. In addition, I included the perceptions of the benefits of advanced therapy. By considering Kelly's theory of how the perceptions of experience can impact thought processes, I have a better understanding of how individuals process information and I can help bring an awareness that perceptions are important when proposing policies and procedures that help bring this awareness. A positive social change would be the decrease in health care disparity and improved outcomes for women with advanced cardiovascular disease. This also can lead to decrease costs because of less hospital readmissions and loss labor due to the inability of the patient to work, which places a strain on both the patient and their families as well as health care facilities.

In addition to decreased disparity and improved outcomes, the study should contribute to clinical practice because the information can lead to a better understanding by clinicians on how to change care plans for women that involve using advanced therapy for cardiovascular disease. Clinicians can be better prepared to explain just how important advanced therapy is. Creating an open dialogue between physician and patient can lead to a better understanding of why these perceptions exist. This can be achieved through educational programs for providers and patients and the development of

mentorship programs for women who can support other women in making decisions to use advanced therapy.

Summary

In this chapter, I presented an overview on the background of how women have not benefitted from advanced therapy. I examined the problem statement, the purpose of the study, research question, theoretical framework, operational definitions, nature of the study, assumptions, delimitations and scope, limitations, and significance of the study. In Chapter 2, I present a robust literature review with a focus on women and cardiovascular disease, health care disparity and health care costs, morbidity, and mortality, cardiovascular disease awareness and perceptions of women who chose conservative therapy over advanced therapies and the benefits of the latter.

In Chapter 3, I present the research design, research methodology, data collection, the study population and setting. In addition, this chapter discuss the theoretical foundation and how it related to the study. Chapter 4 is a presentation of the study findings and interpretations. In Chapter 5, I present the discussion, conclusions, and recommendations.

Chapter 2: Literature Review

The issue that prompted me to search the literature is that women with cardiovascular diseases are not benefiting as much as their male counterparts from advanced therapies in cardiovascular care. Despite advanced therapies such as ventricular assist devices, ECMO, inotropic drug infusion, implantable biventricular devices, cardiac resynchronization therapy, heart transplants and surgical procedures such as coronary artery bypass graft and heart valve replacements, women are not fully using advanced therapies (Garcia-Cosio et al., 2021; Hyun, 2019; Souder, 2021). In this chapter, I discuss the literature search strategy used for the literature review. In the next section, I discuss Kelly's personal construct theory as the theoretical foundation and examine previous studies that used this theory. I cover the key concepts in the remainder of the study and present a summary of the chapter.

Literature Research Strategy

The key databases were CINAHL, PubMed, Medline, Science Direct, ProQuest Central, Psych Info Articles, SAGE, and CDC. The key terms used for this search were *women and cardiovascular, women and heart failure, women and coronary artery disease, women and cardiac arrhythmias, women and ACS, women and attitudes, physician and attitudes, physician and bias, women and advanced cardiac therapy, women and perceptions, cardiovascular disparity, patient-doctor relationship, women and cardiovascular clinical trials, outcomes and women and cardiovascular disease, implantable devices and heart failure, LVAD, women and LVAD, defibrillators, women and defibrillators, pacemakers, women and pacemakers, AICD, women and AICD,*

lifestyle, conservative treatment and cardiovascular disease, conservative treatment and heart failure, conservative treatment and cardiac arrhythmias,, conservative treatment and coronary artery disease, awareness and cardiovascular diseases, women and awareness, and cardiovascular disease, guidelines and cardiovascular disease, women and guidelines and cardiovascular disease, George Kelly, and personal construct theory. The dates for this literature search were 2018-2023 and further limited the search to peer reviewed articles. The initial search of cardiovascular disease and women yielded over 10,000 articles for women and cardiovascular disease. By adding additional search terms limiting the search to a specific disease and treatment, the number of articles was reduced to about 300 articles.

Theoretical Foundation

To gain a better understanding of why women are not using advanced cardiovascular therapy, I used Kelly's personal construct theory. Kelly (1963) proposed that people are scientists who construct their reality, and, in this reality, they develop expectations. Kelly defined what is called a fundamental postulate in which an individual's views are dependent on how he anticipates and interprets events. According to Winter (2013), these personal constructs can be analyzed using Kelly's role construct repertory grid, which helps to understand how a person sees their reality and how they interpret this reality based on the different roles they have in life. My goal was to examine how women construct or interpret these health events and if this interpretation affects decisions they make concerning their health. Constructs are equivalent to perceptions that women have concerning their environment and reality.

In addition to his postulate, Kelly (1963) proposed 11 corollaries to help explain his personal construct theory and how individuals construct their reality. Figure 1 showed the relationship between the 11 corollaries in his theory and how they relate to the question this study will answer, and the concepts covered. Each corollary is connected and or interrelated to the other corollary, hence the circular connection. The concepts in the question are women, perceptions, the idea of choosing, conservative and advanced therapy, and how do women form these perceptions, and how these perceptions affect decisions.

According to Kelly (1963), women, through the construction corollary, learn to predict from past experiences that because a conservative therapy did not work a more advanced therapy will also not work. They may also correlate a bad experience with a conservative therapy which may prevent them from moving on with a more advanced and invasive treatment. For providers, it is important to understand why and how a patient forms their reality.

Women must be able to define what events are affecting or leading to the perceptions about advanced therapy. Kelly (1963) called this the range corollary. Once they are able to define the perceptions, the experience corollary proposes that a woman must be able to understand her perceptions and how they affect her decisions (Kelly, 1963). As they begin to understand these perceptions, women may experience what Kelly calls the dichotomy corollary in which they have apposing perceptions about the direction they should take. For example, they may go from being decisive to undecisive about treatment and need guidance to make the appropriate decision.

The organization corollary involves organizing and arranging constructs or perceptions based on an assigned value (Kelly, 1963). For women, this may mean deciding which perceptions are not valid and understanding why they are not when it comes to her health. For example, a woman may have a perception that because she is a care giver, she cannot afford the time or money for an LVAD, which requires days in the hospital away from her family and adds health care costs to an already strained budget.

At this stage, women may choose what Kelly (1963) referred to as the choice corollary, which involves how one interprets their reality. The choice corollary assumes that a woman will choose a conservative therapy or try an invasive therapy based on her reality of how each treatment can affect her. Women may be faced with how advanced therapy may affect the different roles they have. In the fragmentation corollary, a woman's behavior may be inconsistent because of competing perceptions (Kelly, 1963). For example, female patients have different roles, a sick patient, mother, wife, sister, significant other, all which are competing for a higher assigned value in her life, which can lead to perceptions about treatment.

The next corollary by Kelly (1963), the modulation corollary, involves being open or closed to new constructs or perceptions about how their roles can affect their decisions for advanced therapy. This is crucial because it can empower women in making the decisions about their health. They may assign a higher value to the role as a patient than as a mother for example. Kelly's last three corollaries, individuality, commonality, and sociality, involve others understanding of a woman's perception. This includes doctors and other care providers. The individuality corollary states that people do not deal with

issues in the same way (Kelly, 1963). My interview questions were focused on understanding the perception and how women manage their condition and perceptions differently.

Kelly's (1963) commonality corollary involves understanding each other's reality and involves the patient/doctor interaction and attempts to answer whether a provider can understand how a woman's perceptions affect their reality about advanced therapy. The sociality corollary is defined as the ability to understand another's construct system often based on social interactions (Kelly, 1963). This involves understanding the root of perceptions in terms of cultural, or socioeconomic status.

What is important with his theory is that Kelly (1963) proposed that no two people are alike in their anticipation and interpretation of events. As a result, a woman's perception of her illness and the need for advanced therapy differs from that of other women and even providers. Therefore, it is important to understand what these perceptions are and how they are impacting a woman's decision.

Kelly's theory has been studied and used in other studies. Cipolletta and Ortu (2021) used the constructs of Kelly's theory to explain how the COVID-19 pandemic affected people differently. They examined several constructs of what the pandemic meant to Italian individuals to understand the impact of the pandemic. According to Kelly (1963), a person construes events differently based on their experiences. Cipolletta and Ortu point out that the experiences of those individuals experiencing the pandemic differed based on the region they lived in, and this information formed the basis of their study.

Cipolletta and Ortu (2021) based their analysis of the pandemic on the experiences of the people in each region. Using a qualitative narrative approach, Cipolletta and Ortu were able to identify the following perceptions or constructions of the pandemic: as a threat, as an anxiety, as a frame of meaning, as a war where death was defeat, as a conspiracy, and as an opportunity of change. Using Kelly's theory and corollaries, the authors were able to understand how the perceptions of the people of Italy affected their decisions concerning the pandemic and their response to the treatment. For example, those who saw the pandemic as a conspiracy were opposed to the vaccine and did not readily believe that people were dying (see Cipolletta & Ortu, 2021). In addition to this study, Starzomska and Smulczk (2011) also used Kelly's construct theory to help understand patients with anorexia nervosa.

Both anorexia and cardiovascular disease are considered chronic diseases or illnesses (Starzomska & Smulczk, 2011).. Using the personal construct theory, the authors proposed that people who suffered from anorexia nervosa have constructed their own reality. In this reality, thinness gives meaning to being fat and being fat gives meaning to being thin and this thinness gives them their identity (Starzomska & Smulczk, 2011). Furthermore, they also suggested that the personal construct theory helped to explain why women suffering from anorexia were resistant to treatment. They concluded that because the treatment can cure them, patients with anorexia would lose their reality and identity and this would lead them to refuse treatment (Starzomska & Smulczk, 2011). By using Kelly's repertory grid, the authors suggested that providers can better

understand the reality of the patients and create a treatment plan that is specific to that patient.

Finally, Kelly's (1963) personal construct theory was appropriate for this study in that it allowed me to examine what Kelly refers to as bipolar constructs . Bipolar, in this case, means the perceptions controlling the decision to choose advanced therapy or conservative therapy may be based on the reality that a woman has created concerning her disease process (Kelly, 1963). In the next section, I discuss the key concepts I found in the current literature review concerning women and cardiovascular disease.

Key Concepts

There were several key concepts that I discovered during the literature review that discussed the impact of cardiovascular disease on women and how women have not benefited from advanced therapies when compared to men. These concepts included cardiovascular disease as a health care disparity, the unique cardiovascular risk factors, morbidity and mortality, the health care costs associated with these diseases, the socioeconomic factors that impact women, and the lack of representation in clinical and investigational drug trials for women. These concepts also included the physician and patient relationship, particularly the Yentl syndrome, the awareness of cardiovascular disease in women, conservative therapy (which included lifestyle changes and medication), and advanced therapy (which included implantable cardioverter defibrillators, dual chamber pacemakers and LVADs). The review of these concepts helped to show the importance of this study and a gap in the literature for why women are not benefiting from advanced therapy.

Cardiovascular Disease: A Health Care Disparity

In this first section of the literature review, I discussed how cardiovascular disease affects women and how it has become a health care disparity with an emphasis on coronary artery disease, congestive heart failure, acute coronary syndrome, and cardiac arrhythmias. The World Health Organization (WHO; 2021) defined cardiovascular disease as a group of diseases that affect the heart and the blood vessels of the heart, including coronary artery disease, acute coronary syndrome, congestive heart failure, and cardiac arrhythmias. It is important to understand how cardiovascular diseases affect women and the unique factors that put women at risk for cardiovascular disease because cardiovascular disease is estimated to affect over 290 million women worldwide, which makes it the leading cause of death among all women (Vogel et al., 2021). Cardiovascular disease is also the leading cause of death among women in high-income countries (Woodard, 2019). In the United States, 44% of women older than 20 years of age have some form of cardiovascular disease (Wenger et al., 2022).

Therefore, if there are treatments to reduce cardiovascular disease for women, it is important to understand why these therapies are available but not being used. Because there are several diseases that fall under the overall category of cardiovascular disease, in the following subsections, I review each disease, how each disease affects women, and the overall morbidity and mortality of women with the specific cardiovascular disease. According to Gao et al. (2019), the belief that women were protected from cardiovascular disease because of hormones has resulted in women not being offered advanced therapy,

the necessary diagnostic tools, interventional procedures, and gender-specific treatments that could help to reduce the burden of cardiovascular disease.

Coronary Artery Disease and Acute Coronary Syndrome

In 2018, coronary artery disease in women was responsible for 12.6% of deaths or 360,900 deaths and was responsible for over 605,000 acute coronary attacks from 2005 to 2014 (AHA, 2022). In 2019, disability from coronary artery disease affected over 182 million people and caused the deaths of 9.14 million people (Roth et al., 2020). The number of women between 35 and 54 years of age who are diagnosed with coronary artery disease is increasing each year (Young & Cho, 2019).

Coronary artery disease, also called ischemic heart disease, is one of the leading causes of morbidity and mortality in women (Aggarwal et al., 2018). Coronary artery disease is the most common type of heart disease and is caused by plaque buildup in the coronary arteries of the heart (CDC, 2022). An acute coronary syndrome occurs when coronary arteries supplying blood to the heart muscle are suddenly blocked due to a blood clot or spasms in the coronary arteries (AHA, 2022).

It is important to examine and understand what places women at a greater risk for coronary artery disease and acute coronary syndrome when compared to men because this can help providers understand why the use of advanced therapy is important and how women are not currently benefiting from this therapy. There are several factors that increase a woman's risk for developing coronary artery disease and acute coronary syndrome including secondary disease, environmental pollutants, barriers such as lack of sex-specific treatment guidelines and evidence-based guidelines, poor communication,

lack of awareness of the disease by women and physicians, the experiences of women concerning their health, and genetic differences (Manrique-Acevedo et al., 2020; Vogel et al. 2021). Social factors, presentation of disease symptoms by women, lack of access to cardiac rehabilitation, lack of women in research, and the age of women are also factors linked to increased coronary artery disease and acute coronary syndrome in women (Aggarwal et al., 2018; Duda-Pyszny et al., 2018).

Women with coronary artery disease and women who experience acute coronary syndrome share risk factors from secondary diseases that increase their chances of developing coronary artery disease. These secondary diseases include hypertension, obesity, diabetes, and mental disease (Vogel et al., 2021). Women have a higher risk for acute coronary syndrome because they have a higher prevalence of hypertension, and women suffering from obesity have an increased risk for developing hypertension (Vogel et al., 2021). Obese women have a 64% chance of developing coronary artery disease compared to a 46% chance for men (Manrique-Acevedo et al., 2020). Obesity is not only linked to hypertension but also to diabetes in women. Diabetes is important in that it increases a woman's risk of developing coronary artery disease by 44% and increases the risk of developing acute coronary syndrome by 27% (Vogel et al., 2021). Women with Type 2 diabetes are three times more likely to die from coronary disease than nondiabetic women (Madonna et al., 2019). In addition to diabetes, hypertension, and obesity, there is a direct link between mental disease in women and coronary artery disease.

Mental disease, which includes depression and anxiety, has been found to affect women more than men and increases a woman's chances of developing coronary artery

disease (Vogel et al., 2021). Depression has been linked to worsening outcomes after an acute coronary syndrome event with a two to four times higher risk of adverse events (Vogel et al. 2021). According to Manrique-Acevedo et al. (2020), depression has been linked to mortality in patients with coronary artery disease. The researchers concluded that more research is needed to examine this link.

In addition to these secondary diseases, there are certain environmental factors that increase a woman's risk for developing coronary artery and acute coronary syndrome. In many cultures, women are responsible for the cooking and cleaning in the family. According to Vogel et al. (2021), women experience more environmental elements, such as pollution from the inhalation of materials used for cooking and cleaning products. Other environmental pollutants, including emissions from automobiles, trucks, and industrial pollutants, can lead to the calcification of arteries (Manrique-Acevedo et al., 2020). Air pollution causes inflammation, which can cause endothelial dysfunction and increased plaque production leading to coronary disease (Hamanaka & Mutlu, 2018).

As a result of secondary diseases and environmental factors, it is important that providers are able to recognize the link between the risk factors and coronary artery disease and acute coronary syndrome so that they can refer these women for the most appropriate therapy. The AHA (2022) has provided guidelines in the treatment of coronary artery disease and other cardiovascular diseases but not specifically for women. Mikail et al. (2021) suggested that a new clinical diagnostic classification and guidelines specifically for women are needed to maximize the treatment plan for coronary disease

and that this may be the reason women are not receiving or benefiting from advanced therapy.

Both Gao et al. (2019) and Vogel et al. (2021) agreed that women are suffering from the lack of recommended guidelines for women, especially younger women. For example, there are specific guidelines for patients who experience an acute coronary syndrome event. Patients who experience acute myocardial infarction and receive arterial revascularization through percutaneous coronary intervention have decreased mortality and improved outcomes (Chacko et al., 2020). However, according to the Cardiovascular Patient Outcomes Research Team Nonprimary Percutaneous Coronary Intervention Trial, incomplete revascularization occurred more in women than men, thus leading to higher cardiac death or myocardial infarction and acute coronary syndrome rates as high as 2% more when compared to men (Burgess, 2022).

Lack of awareness of the disease and disease process as well as treatment options and guidelines can lead to poorer outcomes for female patients. This lack of awareness does not only concern providers but also extends to patients as well. For example, Cushman et al. (2021) conducted a 10-year study to determine if a lack of awareness of cardiovascular disease and treatment for women was a reason woman did not seek or were not receiving advanced therapy. They also noted that awareness of cardiovascular disease decreased from 2009 to 2019, especially among Hispanic women and younger women in all ethnic and racial groups. Daponte-Codina et al. (2022) concluded that women were five times less likely to recognize coronary artery disease as a woman's disease, and women were not able to recognize the symptoms of a myocardial infarction.

However, both Cushman et al. and Daponte-Codina et al. recognized the need for more research to examine why this lack of awareness persists despite gains in cardiovascular care. This lack of awareness could also suggest that there is a lack of communication between female patients and physicians when the physicians are explaining coronary artery disease and acute coronary syndrome symptoms and treatments.

Communication between a patient and physician is important in that it helps to inform patients about their disease process so that they can make the best decisions concerning their health and care (Mohd-Salim et al., 2023). This communication can be both verbal and nonverbal and involves the physician's ability to listen effectively to understand the needs of their patients. A physician's communication skills are defined by their ability to gain information from the patient about their disease process and to incorporate this information into an accurate diagnosis and treatment plan that they can communicate back to the patient (Mohd-Salim et al., 2023). This communication helps to develop a relationship in which the patient trusts the physician with their care and is more likely to follow the recommendations that the physician may give concerning treatment. Okunrintemi et al. (2018) examined the experiences of women in terms of provider communication, their perceptions of health, and satisfaction with the care they received from providers. The authors discovered that patients reported less satisfaction when physicians who were ineffective with their communication skills concerning their disease process and were less likely to be open with the physicians concerning their symptoms and concerns about their coronary artery disease. This lack of communication can lead to

the worsening of coronary artery disease or acute coronary syndrome because of delayed treatment and referrals for advanced therapy leading to poor outcomes for women.

Secondary diagnosis, lack of specific guidelines for women, lack of awareness of coronary disease in women, and lack of communication are all modifiable; however, there are innate genetical differences that increase a woman's chance of developing coronary artery disease and determine how women are affected by coronary artery disease (Burgess, 2022; Gao et al., 2019). These genetical differences include smaller arteries and blood vessels, thinner muscular walls of the heart, and the presence of estrogen (Gao et al, 2019). According to Gao et al., the lack of recognition of the innate genetical differences between men and women has led to a lack of gender-specific diagnostic and surgical treatments, such as implantable devices. In addition, this lack of recognition has led to delays in care for acute coronary care syndrome, which has resulted in increased death rates for women (Wenger et al., 2022).

Because there is a link between innate genes and the presentation of disease and disease symptoms, Burgess (2022) found that the presentation of symptoms for women has led to a more than 30-minute delay in treatment, such as revascularization for myocardial infarction when compared to men. Furthermore, Burgess discovered that because of these genetical differences, 53% of women were told their symptoms were not cardiac versus 37% for men. This has resulted in delayed care and even lack of care for women, including advanced therapies.

Congestive Heart Failure

Over 26 million people worldwide were diagnosed with heart failure, and in 2018 heart failure caused over 300,000 deaths (Bowen et al., 2020). By 2030, over eight million people in the United States will be diagnosed with heart failure, and the mortality rate of these patients will be 90% within 10 years of diagnosis and 50% within five years of diagnosis (Bowen et al., 2020; Truby & Rogers, 2020). Of the 900,000 new heart failure diagnoses each year, women represent over half of the new cases or 505,000 cases (AHA, 2022). In 2019, women represented 53.5% or 46,076 of all heart failure deaths (AHA, 2022). According to AHA's 2016 report, *The Heart Disease and Stroke Statistics*, women made up 47.1% of all heart failure diagnoses, and heart failure affected over three million women 20 years and older (Gao et al., 2019). In addition, Black women were three times more likely to die from heart failure (Balla et al., 2020).

Congestive heart failure involves the dysfunction of the ventricular filling or contractability of the left ventricle, and the degree of heart failure is classified by the left ventricular ejection fraction (Balla et al., 2020). According to Balla et al., most heart failure patients have either a reduced ejection fraction (EF) or a preserved ejection fraction. Women with heart failure often have a preserved EF, which often suggests that their heart failure is less of a concern than those who present with a reduced EF (Mikail et al., 2021; Vogel et al., 2021). However, a preserved EF correlates with systemic hypertension, and hypertension is a risk factor for developing heart failure in women (Balla et al., 2020).

There are several factors that increase a woman's risk of developing heart failure, including higher symptom burden due to age that leads to frequent hospitalization, lack of

clinical trials for heart failure studies, clinician bias, and gender disparities because of social determinants (SDOH) of health (Balla et al., 2020; Mwansa et al., 2021; Vogel et al., 2021). Women often live longer than men and often have the added burden of mental disease, diabetes, obesity, hypertension, and renal dysfunction (Vogel et al., 2021). As a result of their higher symptom burden and the older age of women with heart failure, women experienced higher hospitalizations and higher mortality rates because of their symptoms when compared to men (Vogel et al., 2021). Women with heart failure are hospitalized more with cardiogenic shock and have poor survival rates when compared to men, and they present with atypical symptoms and delayed help seeking behaviors (Vishram-Nielson et al., 2020). Women with a reduced EF have more symptoms and have similar hospital mortality as men but do not receive the same care as men (Vogel et al., 2021).

In addition, older women with heart failure had additional comorbidities that may prevent them from seeking advanced therapy, such as mental health disease (Balla et al., 2020). More importantly, if these mental health issues are not addressed appropriately, it can lead to poor quality of life for women, lack of adherence to treatment, and worsening symptoms of heart failure (Balla et al., 2020; Celano et al., 2018). Because mental disorders, such as anxiety, posttraumatic stress disorder, panic disorder, and depression, have symptoms that are often similar to congestive heart symptoms, these diseases are often not diagnosed, and if diagnosed, are not treated effectively (Celano et al., 2018). Women with depression are less likely to adhere to healthy behaviors, such as diet and

exercise or limiting smoking and alcohol usage (Celano et al., 2018). Furthermore, women with depression may be less likely to adhere to advanced therapy.

It is also important to address mental disease because it is often linked to a lack of participation by women in clinical trials, which are helpful in understanding how women can benefit from advanced therapy for congestive heart failure (Balla et al., 2020). To determine if an advanced therapy, such as an implantable device, will improve the outcomes for a patient, clinical trials are performed to evaluate the effectiveness of the device. Therefore, increased participation in clinical trials could potentially help with the development of appropriate sex-based therapy, including advanced therapy devices (Balla et al., 2020).

One reason that women may not be participating is because of SDOH, such as health and social cultural factors, including anxiety, depression, and poor quality of life, which have been directly linked to a lack of participation in clinical trials and can prevent women from benefiting from advanced therapy and heart failure management programs (Mwansa et al., 2021). In terms of SDOH, women in certain ethnic groups have lower socioeconomic position, which is linked to underinsurance, limited health care access, low health literacy, and inadequate support, which is further linked to poorer outcomes for women with heart failure (Mwansa et al., 2021). Women often have caregiver responsibilities and a lack of access to study sites when compared to men and are least likely to be chosen for these trials because of this lack of access (Balla et al., 2020).

One reason that women are not chosen for trials is linked to physician bias, which can explain why women are not included in congestive heart failure clinical trials. For

example, African American women are viewed as financially unstable, and they are viewed as having a lack of social support when compared to men, and therefore, physicians would not consider them as candidates for a device trial (Mwansa et al., 2021). Some physicians view women as not being capable of taking risks with the advanced therapy, and this has led to physicians prescribing suboptimal therapy for women when compared to men and also not recommending them for clinical trials (Mwansa et al., 2021).

Addressing the health literacy of women with education and addressing physician bias can potentially increase women's participation in device trials for congestive heart failure. However, when these concerns are addressed, if there is not an improvement in the use of advanced therapy for women with congestive heart failure this presents a gap in the literature regarding why women are still not benefiting from advanced therapy for congestive heart failure.

Cardiac Arrhythmias

Each year over 500,000 adults are diagnosed with a cardiac arrhythmia, and 54.4% of those diagnosed are women (Khurshid et al., 2018). A cardiac arrhythmia is defined as an irregular heartbeat and includes bradycardia, atrial fibrillation, atrial flutter, paroxysmal supraventricular tachycardia, ventricular tachycardia, and ventricular fibrillation (National Heart, Lung, and Blood Institute, 2022). The chances of developing any arrhythmia increases by 4.84% for individuals between the ages of 65 and 73, and approximately 2.3 million people are diagnosed with atrial fibrillation in the United States, making it the most common arrhythmia (Khurshid et al., 2018). The number of

people diagnosed in the United States with atrial fibrillation is estimated to be more than 12.1 million by 2030 (Peters et al., 2019). The second most common type of cardiac arrhythmia for women is ventricular arrhythmias, which are responsible for sudden cardiac death (Khurshid et al., 2018). Women are more likely to have sudden cardiac arrest at home and are often diagnosed more with atrial tachycardia and paroxysmal supraventricular tachycardia when compared to men (Khurshid et al., 2018).

In this study, I focused on atrial fibrillation. Because women live longer than men, more women are being diagnosed with atrial fibrillation, and the significance of atrial fibrillation is that it can lead to stroke, costly hospitalizations, and even death (Ehdale et al., 2018). Therefore, it is important to understand the risk factors that predispose women to atrial fibrillation, including an aging population of women; the presence of secondary disease and other cardiovascular disease, hormonal changes related to pregnancy and menopause, the awareness of therapeutic options, and physician bias (Ehdale et al., 2018; Kloosterman et al., 2020; Odening et al., 2019).

Women account for 1.6–2.7 cases per 1,000 cases of atrial fibrillation, and it is estimated that one in four women will develop this cardiac arrhythmia (Ehdale et al., 2018). Kloosterman et al. (2020), in the Race II study, concluded that 36% of women who developed atrial fibrillation were older than 75 years of age compared to only 20% of men who developed this cardiac arrhythmia. In 2017, there were over 37.6 million people diagnosed with atrial fibrillation, and of this number, 17.8 million were women (Volgman et al., 2021). Based on the data analysis from the Framingham Heart Study,

women in low- and middle-income countries have increased age-adjusted mortality from atrial fibrillation when compared to men (Ehdale et al., 2018).

In addition to an aging population, women with other cardiovascular diseases also have increased risks for developing atrial fibrillation. For example, women with congestive heart failure have a 14-fold risk for developing atrial fibrillation when compared to men who have only an 8.5-fold chance of developing this cardiac arrhythmia (Odening et al., 2019). Women are also predisposed to developing atrial fibrillation if they have coronary artery disease and mitral valve regurgitation. For example, 27% of women with mitral regurgitation were diagnosed with atrial fibrillation compared with 13% of men (Kloosterman et al., 2020). According to Liang and Wang (2021), women with coronary artery disease were four times more at risk for developing atrial fibrillation when compared to men. Women with coronary artery disease and heart failure are often diagnosed with a secondary disease, which increases their risk of developing atrial fibrillation. Secondary diseases, such as hypertension, diabetes, renal dysfunction, and mental disorders, not only increase the risk of developing atrial fibrillation, but they are also associated with higher symptom burden, including dyspnea, fatigue, palpitations, and renal function impairment (Kloosterman et al., 2020). The authors also estimated that 70% of the women with atrial fibrillation were diagnosed with hypertension compared to only 57% of men. According to Odening et al. (2019), women have a lower quality of life as a result of the disease symptoms, and 70% of the women reported a lower quality of life compared to 50% of the men. In addition to secondary diagnoses and increased

symptom burden, hormonal changes also help to determine a woman's risk of developing atrial fibrillation.

The hormonal changes that occur in pregnancy and menopause have a direct link to the development of atrial fibrillation in women. Pregnancy represents a specific female risk factor that helps to increase the chances of a woman developing atrial fibrillation (Odening et al., 2019; Westerman & Wenger, 2019). According to data from the Women's Health Study, the risk of developing atrial fibrillation increases with the number of pregnancies because pregnancy hormones stress the left atrium of the heart (Westerman & Wenger, 2019). These authors also pointed out that women have a prolonged QT, which leads to longer duration of atrial pacing that helps to maintain atrial fibrillation (Westerman & Wenger, 2019). Atrial fibrillation increases after menopause as a result of decreases in estrogen (Odening et al., 2019).

The electrophysiology of the atrium, which is also influenced by hormones, differs in women when compared to men in that women have smaller maximal left atrial volumes, smaller left atrial diameter, and lower left atrial stroke volumes (Odening et al., 2019). This differences in electrophysiology can also predict how women respond to treatment and what therapeutic options are best for women.

Therapeutic options for arrhythmias, such as medications, ICD, and pacemakers, have often been limited to men because men have participated in clinical trials for these treatments (Ehdale et al., 2018). Women were more likely to be prescribed rate-controlled drugs, such as digoxin and a beta blocker, when compared to men and not recommended for device implants, such as pacemakers or an ICD (Kloosterman, et al.,

2020). These differences in treatment and recognition of atrial fibrillation in women may be a result of sex bias or cultural bias and, more importantly, physician bias in terms of referral to specialty clinic and centers for arrhythmia treatment (Ehdale et al, 2018). According to Zeitler et al. (2022) more research is needed to discover why there are inconsistencies in the treatment and management of arrhythmias in women when compared to men. Understanding these inconsistencies is important because women have unique risk factors that affect how they respond to these treatments.

Unique Risk Factors for Developing Cardiovascular Disease

There are both traditional and nontraditional risk factors associated with cardiovascular disease. Traditional risk factors for cardiovascular disease include hypertension, hyperlipidemia, obesity, smoking, sedentary lifestyle, and diabetes (Wenger et al., 2022). These risk factors are prevalent in U.S. women, and it is estimated that about 13.7% of women in the United States continue to smoke despite warnings about the dangers, and this creates a higher risk for cardiovascular disease in women when compared to men (Young & Cho, 2019). Furthermore, women who smoke have a 25% greater chance of developing coronary artery disease than women who do not smoke (Young & Cho, 2019).

Race and ethnicity also have a significant impact on women with traditional risk factors, which further increases their chances of developing cardiovascular disease. For example, hypertension is more prevalent in non-Hispanic, Black women who account for over 55.3% of hypertension diagnoses and whose hypertension is usually poorly controlled when compared to White women (Mehta et al., 2023). In addition, American

Indian and Alaskan Native American women account for 25% to 41% of all the hypertensive diagnoses when compared to non-Hispanic, White females (Mehta et al., 2023). Among the other risk factors, such as obesity and diabetes, the burden is also greater in non-Hispanic, Black females and Hispanic females when compared to non-Hispanic, White females (Mehta et al., 2023).

In addition to traditional risk factors, there are nontraditional risk factors including psychological stress, interpersonal and structural discrimination, financial stressors, childhood adversity, pregnancy, and acute life events (Balla et al., 2020). The unique risk factors that increase a woman's chance of developing cardiovascular disease and may place them at risk for not benefiting from advanced therapy include the pathophysiology of women, hormonal imbalance, hormonal changes with pregnancy and menopause, metabolic disorders, such as diabetes, mental health disorders, and lack of policies and procedures directed at women's care as well as a lack of gender-sensitive treatment guidelines (Balla et al., 2020; Beale et al., 2018; Geraghty et al., 2022; Mikail et al., 2022).

A woman's pathophysiology differs from that of a man in both the cardiac structure and function of the heart. Women have a smaller left ventricle chamber and higher systolic and diastolic stiffness, which can lead to high blood pressure and the heart's inability to pump blood to the body (Beale et al., 2018). Because women tend to have smaller arteries, they are affected by other secondary diseases that can cause changes to their heart and blood vessels (Beal et al., 2018).. When compared to men, as they age, women have a decrease in cardiomyocytes, which make up the cardiac muscle

and are responsible for the contraction of the heart (Beale et al., 2018). Furthermore, as women age, this decrease in cardiomyocytes predisposes women to heart failure, which leads to exercise intolerance and increased heart rate when compared to men (Beale et al, 2018). This increase in heart rate can lead to cardiac arrhythmias for women such as atrial fibrillation. Because of a different pathophysiology, physicians may believe that women might not respond to the advanced therapy, and therefore, physicians may not recommend these therapies because of these differences.

In addition to the pathophysiological differences, hormonal imbalances, hormonal changes that occur in pregnancy, and hormonal changes that occur during menopause can increase a woman's chances of developing cardiovascular disease (Mikail et al.,2022). For example, polycystic ovary syndrome, which results in an overproduction of hormones called androgens, can increase a woman's risk of developing cardiovascular disease (Balla et al., 2020). Also, preeclampsia, which occurs during pregnancy and results in the production of dangerous levels of protein by the kidneys, that often leads to a hypertensive crisis, can more than double a woman's chances of developing cardiovascular disease resulting in increased mortality (Young & Cho, 2019; Parikh et al., 2021).

Furthermore, Geraghty et al. (2022) concluded that hormonal changes that occur with recurrent miscarriages and preterm deliveries and women who experience hysterectomies, which leads to menopause, have an increased risk of developing cardiovascular disease. Hormonal changes that occur with pregnancy can lead to stress on the cardiac muscle and an increase in heart rate, resulting in cardiac arrhythmia (Mikail et

al., 2022). Finally, changes in the levels of estrogen during menopause can result in cardiovascular disease (Ryckowska et al., 2023). This fact would suggest that prescribing hormone replacement therapy would help lower the risk of developing cardiovascular disease (Vogel et al., 2021).

In addition to changes in hormone levels during pregnancy, women are at risk for developing gestational diabetes, which is a metabolic disorder associated with pregnancy. Gestational diabetes increases a woman's risk for cardiovascular disease by 44% (Woodard, 2019). According to data results from the Stockholm Heart Epidemiology Program (SHEEP) study, which was designed to compare the different risk factors between men and women for myocardial infarction, concluded that diabetes increased the risk of cardiovascular disease in women as much as seven times more than the rate for men (Young & Cho, 2019).

Mental and psychological disorders are also unique risk factors for women. These mental and psychological disorders include depression, anxiety, and intimate partner violence (Mehta et al., 2023). Women are diagnosed more with mental health diseases such as anxiety and depression (Mehta et al., 2023). Physical and psychological abuse of women affects 15-71% of women in their lifetime, and intimate partner violence is associated with increased cardiovascular disease (Vogel et al., 2021). Mehta et al. (2023) examined the relationship between mental distress and a woman's risk of developing cardiovascular disease, such as myocardial ischemia, which often leads to acute coronary syndrome. Women are also more likely to have higher levels of depression and anxiety years after the cardiac event when compared to men (O'Neil et al., 2021). Posttraumatic

stress from domestic violence, discrimination, and lack of social support, which occurs more frequently in women, increased a woman's risk of developing cardiovascular disease (Mehta et al., 2023). Direct physiological and indirect effects of abuse, which include chronic stress, can be challenging to a woman's mental health and can lead to modifications of healthy behaviors, for example, smoking as a coping mechanism, which can lead to hypertension (Vogel et al., 2021). Women who experience domestic violence or intimate partner violence have a 31% chance of developing cardiovascular disease, with 50% of the cases resulting in ischemic heart disease or coronary artery disease (El-Serag & Thurston, 2020).

Thus far in the paper, I have reviewed unique factors that affect the overall health of women and increase their risk of developing cardiovascular disease. I will examine how a lack of policies, gender-sensitive analysis, and gender-specific guidelines directed at women's care are unique factors that may help to increase a woman's chance of developing cardiovascular disease and thus causing women to not benefit from advanced therapy (Cho et al., 2020; Burgess, 2022; Kouvari et al., 2020).

For example, Kouvari et al. (2020) concluded that much of women's health is focused on reproductive and sexual health. Although lack of reproductive and sexual health can lead to cardiovascular disease, policies should include both reproductive and cardiovascular diseases. Because policies are often created to bring awareness to a particular issue or concern, these policies should reflect how intimate partner violence, for example, is linked to cardiovascular disease and how gender sensitivity policies for women could address this problem.

Cho et al. (2020) examined the American College of Cardiology and the AHA guidelines updates for the prevention of cardiovascular disease since 2011, which included the *2017 Updated Hypertension Guidelines*, the *2018 Updated Cholesterol Guidelines*; the *2019 New Atrial Fibrillation Guidelines*; and the *2019 ACC/AHA Primary Prevention for CVD Guidelines* and discovered that these guidelines were of value but concluded that they were not gender specific and that they did not address factors unique to women. These guidelines are necessary for providers to recognize and treat cardiovascular disease in women. A lack of gender-sensitive analysis and guidelines in terms of therapy usage for women has led to the need for the usage of advanced therapy for their cardiovascular disease (Burgess, 2022). Gender-specific care and guidelines are necessary because women presented differently with each of the cardiovascular diseases when compared to men (Kouvari et al., 2020). Lack of prescriber nonadherence to guideline-recommended drugs and underestimation of risk and treatment for women have led to poorer outcomes because women were less likely to receive guideline-based care, which includes treatment thresholds and referrals to advanced therapy (Burgess, 2022). Finally, providers can better understand how cardiovascular disease affects women by examining and understanding factors unique to women.

Morbidity and Mortality

The leading cause of mortality for women worldwide is cardiovascular disease (Gauci et al., 2022). The CDC (2023) estimated that over 60 million women in the United States suffer from cardiovascular disease. According to Vogel et al. (2021), in 2019, cardiovascular disease was responsible for 35% of the total deaths of women. In that

same year, the AHA (2022) estimated that cardiovascular disease was responsible for 420,812 female deaths, with 30% being non-Hispanic White females, 32.8% non-Hispanic Black females, 28.3% Hispanic females, and 31.5% Asian females. In that same year, 147,536, or 40% of women, died from coronary heart disease, and 42,585, or 40.8%, died from myocardial infarction (AHA, 2022). Both Vogel et al. and Balla et al. (2020) concluded that younger women have higher mortality rates from acute coronary events. In 2020, deaths from cardiovascular disease declined slightly to 314,186 women or 1 in every 5 women (CDC, 2023). Black women in 2020 had the highest death rate from heart disease (CDC, 2023). Black women had the highest maternal mortality rates from cardiovascular disease, and cardiovascular disease was responsible for over one-third of all maternal deaths (AHA, 2022). Worldwide, from 1990 to 2019, cardiovascular mortality increased from 6-10 million to 8 to 10 million or 204 deaths per 100,000 (Vogel et al., 2021)

Because cardiovascular disease is often referred to as a man's disease, women have been misdiagnosed or experienced delays in treatment, which has led to poorer health outcomes for women (Gauci et al., 2022). Delayed treatment resulted in higher mortality rates and adverse outcomes for women who suffered from a myocardial infarction when compared to men (Vogel et al., 2021). Women are often undertreated for cardiovascular disease, which leads to disability (Woodard, 2019). The Disability-Adjusted Life-Year estimated that women were increasingly affected by stroke and ischemic heart disease when compared to men (Young & Cao, 2019). Cardiovascular disease was responsible for 57.6% of all stroke deaths (AHA, 2022).

In the search of the literature, I found risk factors that influence morbidity and mortality for women, which include racial and ethnic groups and the presence of autoimmune and secondary diseases and other cardiovascular diseases, including acute coronary syndrome and mental disease (Balla et al., 2020; Geraghty et al., 2020; Mehta et al., 2023; Wenger et al., 2022).

Balla et al. (2020) proposed that women of racial and ethnic groups shared a higher symptom burden and had an increased number of hospitalizations and mortality rates than men and White women. Furthermore, they found that Black and Hispanic women were less likely to receive invasive management of coronary obstruction, which also led to increased hospital mortality. Cardiovascular disease was the leading cause of death for non-Hispanic Black women (African American, African, and Afro Caribbean), with over 60% of women being 20 years of age and older when diagnosed with either coronary artery disease or heart failure and was the leading cause of death for American Indians and Alaska women (Mehta et al., 2023). Although Vogel et al. (2021) made no distinction for women with congestive heart failure in terms of ethnic or racial groups, they noted that women, in general, had higher hospitalizations and higher mortality due to a higher symptom burden that often-required repeated hospitalizations. The average life span of non-White women was 75 years, and for Hispanic and Latina women, the death rate was 43% but 20% less than White females (Mehta et al., 2023).

Autoimmune diseases often affect women more than men and combined with cardiovascular disease, often lead to morbidity and mortality for women (Geraghty et al., 2020). For example, the risk for cardiovascular death is about 50% for women with the

autoimmune disease rheumatoid arthritis, and because women were not receiving aggressive therapy for cardiovascular disease when compared to men, this led to increased mortality for women who suffered from other autoimmune diseases (Gao et al., 2019). Women are often diagnosed more than men with autoimmune diseases such as lupus and inflammatory diseases that can often exacerbate cardiovascular diseases such as valvular and coronary disease (Wenger, 2022). Systemic lupus and rheumatoid arthritis are also risk factors for the development of cardiovascular disease (Rajendran et al., 2023). Lastly, patients with autoimmune disease have a higher risk of congestive heart failure and increased hospitalization and mortality (Sun et al., 2023).

The presence of secondary diseases and other cardiovascular diseases, including acute coronary syndrome, coronary artery disease, and mental disease, have a significant impact on the mortality and morbidity of women and are a reason that women do not benefit from advanced therapy. The mortality rate for acute coronary syndrome was higher in women with mental disease than in men and higher for women younger than 55 years of age (Jackel et al., 2021). Using a database registry of patients with coronary artery disease in 2017, Jackel et al. (2021) discovered that of the 79,342 patients reviewed in their study, 30% of the patients were females who had comorbidities such as atrial fibrillation, hypertension, pulmonary hypertension, and diabetes, and those with the acute coronary syndrome had a higher in-hospital mortality. In addition, they found that women often presented later for treatment and were often misdiagnosed, which led to poorer outcomes. According to Geraghty et al. (2020), women with acute coronary

syndrome had two times the six-month mortality rate of men for acute coronary syndrome.

The presence of both depression and anxiety in women increased the risk of cardiovascular disease and even death when compared to men (Wenger et al., 2022). According to Hert et al. (2018), mental disease and coronary heart disease together are a leading cause of morbidity and mortality worldwide. Furthermore, symptoms of mental disease, such as intense stress from posttraumatic stress disorders, increased a woman's chance of dying from a cardiac event (Hert et al., 2018). Women with severe mental diseases such as major depressive disorder are two to three times more likely to die, and this increased by 50% when cardiovascular disease was present (Hert et al., 2018).

Health Care Cost

The cost of treating one patient with cardiovascular disease was \$247,822 (Kumar et al., 2022). This cost was \$169,910 for inpatients, \$46,491 for procedures, \$4,633 for laboratory, \$3,459 for radiological images, and \$22,529 for administrative overhead costs (Kumar et al., 2022). Grover et al. (2003) defined direct costs as a breakdown of an inpatient stay which was hospital (66%), physicians (12%), and drugs (21%). Indirect Costs were costs associated with premature mortality (60%) and long-term disability (36%) as a result of cardiovascular disease (Grover et al., 2003). The total for direct and indirect costs associated with cardiovascular disease between 2016 and 2017 was \$363.3 billion dollars with \$216 billion for direct costs and \$147 billion for indirect costs (Virani et al., 2021). This increased to \$407.3 billion for both indirect and direct costs between 2018 and 2019 (Tsao et al., 2023)

The costs of treatment for cardiovascular disease were often related to a lack of advanced therapy. Incorrect diagnosis and inconsistent care created a burden not only on the healthcare system but also on patients and their families. For example, it is estimated that out-of-pocket healthcare costs account for over 20% of the income of these families and are often referred to as financial toxicity (Wang et al., 2021). Outpatient costs for medication and physician office visits, on average, cost between \$297 to \$3,859 per patient, \$1,441 for emergency room visits, and \$2,227 for home health care per patient per year (Urbich et al., 2020). Home health care costs are referred to as informal care. Informal care for cardiovascular disease is approximately \$836 per patient, and most patients require more than 45 days of informal care once discharged home (Patel, 2021). Women are burdened with the cost of cardiovascular disease, and there has been an increase in hospital admissions for women from 1998 to 2017 (Vogel et al., 2021). In order to understand the full impact of the costs for cardiovascular disease and how a lack of advanced therapy affects these costs, this paper will examine the costs related to the treatment of heart failure, coronary artery disease, acute coronary syndrome, and cardiac arrhythmia.

Costs of Treatment for Heart Failure

There were over 1.1 million heart failure emergency room visits and one million hospitalizations in 2014, which has increased since that year (Patel, 2021). Urbich et al. (2020) estimated that the median cost for heart failure-specific hospitalization was \$13,418 per patient and \$14,015 for patients with comorbidities. In comparison, Patel (2021) estimated that the median cost per day for hospitalization for heart failure was

\$13,418 per patient, which increased to \$15,732 for heart failure readmissions. If the patient was readmitted to a hospital different from the initial admission, the cost was \$25,879, with an average length of stay between 6.1 and 7.5 days (Urbich et al., 2020).

There are several estimates for the trajectory of healthcare costs for heart failure. According to Heidenreich et al. (2022), 75% to 80% of direct costs for heart failure are for inpatient stays, and the overall costs of heart failure will be 70 billion by 2030. In 2012, Patel (2021) estimated that the total cost of heart failure was 30.7 billion dollars, with two-thirds of that for direct costs, and that number was expected to rise to 69.8 billion dollars by 2030. Bowen et al. (2020) also estimated that indirect and direct costs of heart failure will reach 70 billion dollars by 2030.

The burden of the costs for heart failure disease has continued to rise, and this has created an urgency to understand why women are not benefitting from advanced therapy. The lack of advanced therapy is expected to create a 70-billion-dollar burden on the healthcare system by 2030 (Patel, 2021). If two advanced therapies, implantable devices, and mechanical support, such as LVADs, are administered to patients with heart failure, patients would have an 81% survival rate one year after the therapy (Patel, 2021). In addition, this could reduce the number of hospital admissions and readmissions.

Coronary Artery Disease and Acute Coronary Syndrome

According to Sheikhgholami et al. (2021), the average cost to treat coronary artery diseases in the United States was \$10.4 billion annually. The annual direct costs (including hospital inpatient care and drugs) per patient for acute coronary syndrome were \$4,387, \$4,710 for patients who underwent PCI, and \$6,543 for patients who had

coronary bypass surgery (Sheikhgholami et al., 2021). The breakdown of these costs is 81.2% for medical care and 18.18% for non-medical, which includes 64.5% for in-hospital care and 16.7% for outpatient care (Sheikhgholami et al., 2021).

According to Cowper et al. (2019), the treatment of an acute myocardial infarction includes coronary revascularization, and the average hospital costs, including this treatment, were \$18,652 and \$19,575 for patients older than 65 years of age. These numbers are expected to increase as the number of patients diagnosed with coronary artery disease and acute coronary syndrome increases.

Costs for Cardiac Arrhythmias

Volgman et al. (2021) estimated that the average cost of treatment for patients diagnosed with atrial fibrillation was \$ 18,601 per hospital stay in 2009, and the total costs for treating atrial fibrillation in 2016 increased to over \$28.4 billion. Deshmukh et al. (2022) used the Optum Clinformatics database and examined the costs of health care for patients diagnosed with atrial fibrillation and the costs for those with atrial fibrillation who sought care for symptoms of related cardiovascular disease. They found that the average costs for an inpatient visit for atrial fibrillation were \$30,859 per visit and \$16,206 for outpatient visits.

In addition, emergency visits and prescription drug costs were \$6,538 and \$5,565, respectively (Jiang et al., 2022). The costs for related services include using an ambulance and receiving care at a skilled nursing facility. Other visits related to other cardiovascular-related symptoms were \$299 for other medical visits, \$11,804 for

inpatient services, \$6,883 for outpatient visits, \$810 for emergency room visits, and \$5,565 for prescriptions (Deshmukh et al., 2022).

Socioeconomic Disparity

SDOH are factors that create barriers to care and limit access to advanced therapy (Lindley et al., 2021). Several socioeconomic factors create barriers for women, including income level, education level, demographics, cultural and language barriers, race and ethnicity, and racism and discrimination (Mehta et al., 2023; Shultz et al., 2018; Young & Cho, 2019). The barriers are defined in terms of education, employment status, and income level, which can directly impact a woman's access to advanced therapy (Shultz et al., 2018). According to Mehta et al. (2023), socioeconomic factors such as economic stability, social and community, and safe working and living environments have increased or decreased the risk of cardiovascular disease in women. In terms of developing cardiovascular disease, a lower socioeconomic status increases a woman's chance of developing cardiovascular disease (Geraghty et al., 2020). Women of lower- and middle-income comprise over 80% of all cardiovascular deaths (Young & Cho, 2019). The impact level of income often determines a woman's ability to pay for health care, and it is estimated that one-fourth of all women spend, on average, more than \$2,000 for out-of-pocket medical costs, and one-third will skip treatment because of these costs (Wenger et al., 2022).

This socioeconomic disparity is amplified for women of different racial and ethnic groups, and it has impacted women in terms of outcomes (Lindley et al., 2021). Moreover, according to Khariton et al. (2018), Black women and Hispanic women with

lower income and education levels had poorer health status, which further increased healthcare disparity. Both Geraghty et al. (2020) and Lindley et al. agreed that the burden of cardiovascular disease is more significant for women when compared to men but affects women of racial and ethnic groups differently.

Racism, discrimination, living in a rural area, and poor communication increased a woman's chances of having poorer cardiovascular outcomes (Lindley et al., 2021). According to Javed et al. (2021), racism has physical, behavioral, and emotional effects and is the driver of cardiovascular disparity. Racism can directly affect access to care due to job access or indirectly due to restrictions on access to employer-sponsored insurance (Javed et al., 2021). This racism extends to the care that women receive, particularly women of color, and perceived racism for women of color has been linked to behaviors such as smoking and drinking, which increase the risk of developing cardiovascular disease (Javed et al., 2021). Finally, racism and discrimination have led to limited education opportunities for women, which in turn diminishes their health literacy and ability to make decisions concerning advanced therapy (Javed et al., 2021). This inability to make decisions about therapy resulted in delayed treatment and increased risk for worsening cardiovascular disease (Wenger, 2022).

Zeitler et al. (2022) proposed that social determinants often affected outcomes for both conservative and advanced therapy in terms of delayed therapy and that based on the socioeconomic status of the patient, clinicians were less likely to prescribe advanced therapy, and women were less likely to choose advanced therapy. Zeitler et al. (2022) concluded that women who are using conservative therapy were less likely to consider or

even use invasive advanced therapy and less likely to participate in clinical trials because of cultural beliefs and lack of decision-making power to choose. They referred to this as socioeconomic invisibility, which resulted because of a biased belief system, lack of health care access, limited health literacy, delayed diagnosis, and the clinician's view that treatment would be a risk for these women (Zeitler et al., 2022). In addition, clinicians would only refer women for advanced therapy if they had a caregiver, which led to women being three times less likely to receive a recommendation for advanced therapy (Kelty et al., 2022).

Lack of Representation in Clinical Trials and Investigational Drugs Studies

Women's participation in clinical and investigational trials is meaningful because researchers can understand and adjust devices and drugs based on how women respond to a particular therapy (Ghare et al., 2019). Disease often affects women differently when compared to men, and women may respond differently to the same therapy and a lack of participation could be a reason woman are not benefiting from many of the advanced therapies (Mwansa et al., 2021).

According to Ghare et al. (2019), 70 to 80% of patients in cardiovascular device trials were men, and in terms of implantable devices, women received fewer implants than men. Zeitler et al. (2022) also found that women lagged behind men in the number of representations in electrophysiological clinical trials. Compared to other countries, the US ranked low on the representation of women in trials and drug studies (Ghare et al., 2019). Women represented only 31% of pharmacologic drug trials and 26% of procedural trials (Balla et al., 2020). Finally, women made up under 35% of the cardiac

resynchronization therapy utilization trials and observational studies for this therapy (Mwansa et al., 2021).

Despite recommendations by the FDA, women, especially younger women, were underrepresented in trials, and between 2010 and 2017, women represented only 38% of trials (Vogel, 2021). Because women have been excluded and underrepresented in clinical trials, providers often need help to measure the benefits of advanced therapy. There are several reasons why there is a lack of representation and participation, including economic instability, lack of policies to ensure participation, and a genuine fear by women of adverse reactions to the drug studies and trials (Ghare et al., 2019; Kouvari, 2020; Woodard, 2019).

According to the National Institutes of Health Office of Research on Women's Health, women were not consistently participating in clinical trials mainly because of economic instability and, in many cases, because of the lack of urgency in the healthcare system to include women (Ghare et al., 2019). Kelly's corollaries, dichotomy, and choice can be used to explain why women are so hesitant to participate in these trials. Women are often in distinct roles, such as mother, wife, and sister, and as a result, they rely heavily on their families, friends, and, in the case of clinical trials, this can greatly affect their decision to participate (Ghare et al., 2019). Family and friends may need help understanding the purpose of the trials or what is involved; hence, the advice may reflect something other than the patient's needs. Furthermore, women lacked the resources and time to be away from their families, especially their children, to participate in trials.

Participation of women in clinical trials in the United States, when compared to other countries, has remained low despite government-mandated sponsored trials (Ghare et al., 2019). As early as 1994, policy guidance was urged to consider women in clinical trials (Kouvari, 2020). Woodard (2019) emphasized the need for sex-specific analysis of research data to understand why women were not participating in trials. The Food and Drug Administration (FDA) has mandated and promoted the use of clinical trials by sex because drugs differ in efficacy in sexes, but these policies were not universal, and there have been no efforts to increase the number of women in these trials (Woodard, 2019). Furthermore, according to Woodard, there should be a sex-disaggregated approach to this research and more precise definitions of what cultural, social, and sexual differences mean. In addition to mandates by the FDA, the Drug Trials Snapshots Program, The American Heart Association's Go Red for Women Campaign, and Heart Health Centers for Women's Health proposed a care delivery modal to increase representation in cardiovascular trials and research, but women still lagged behind men (Balla et al., 2020).

In addition to economic instability and a lack of policies to ensure participation, women often have a fear of adverse reactions to drug studies and trials, and women did participate in trials because they have a fear of being harmed from the trials (Ghare et al., 2019). Also, according to Ghare et al., women have risk-averse behavior when compared to men, meaning that they are not willing to risk their lives for a treatment that could potentially have harmful side effects or outcomes. Furthermore, patient attitudes reflect their willingness to participate, and women have more negative attitudes about participating in trials (Gruca et al., 2018).

Physician and Patient Relationships: Yentl Syndrome

One of the key concepts in the literature that may determine whether or not women use advanced therapy was the relationship between the patient and the physician responsible for diagnosing and providing a treatment plan. A survey from 2012 revealed that only one in five patients reported that their doctor talked to them about cardiovascular disease (Kouvari et al., 2020). I found in the literature that physician bias, lack of appropriate physician assessment, and misdiagnosed cardiovascular disease in women played a significant role in women not receiving or benefitting from advanced therapy (Balla et al., 2020; Breathett et al., 2020; Geraghty et al., 2020; Woodard, 2019).

According to Woodard (2019), female patients had worse outcomes with male doctors than male patients with these same male doctors. Breathett et al. (2020) proposed that gender bias led to disparity in care and outcomes for women who needed advanced heart failure therapy. Women were often assigned lower cardiovascular risk scores and were less likely to be referred for diagnostic cardiac catheterization (Kouvari et al., 2020). Breathett et al. concluded that more research is needed to understand if gender biases affected a physician's decision to implement advanced therapies such as LVAD for advanced heart failure. The authors also discovered a lack of guidelines to help physicians determine how to diagnose and allocate advanced heart failure therapies.

Regardless of guidelines, women were often judged on their appearance, whether they had a social support system, and whether they had children, primarily when being referred for advanced therapy (Breathett et al., 2020). The Medical Colleges Council on Ethical and Judicial Affairs, as early as 1991, reviewed data and stated that gender bias

was a significant cause for the lack of advanced therapy for women. For example, Black women were less likely to be recommended for cardiac catheterization than White male patients (Breathett et al., 2020). In addition, women who had experienced an acute myocardial infarction had better outcomes when treated by female doctors and not male doctors (Burgess, 2022). These were often diagnosed with anxiety when they complained of chest pain (Vogel et al., 2021). Women were often assigned a lower risk category for cardiovascular disease, received less intensive medical therapy, including pharmacologic and invasive treatment, less lifestyle counseling, lower escalation of care, and less than 5% were referred to lifestyle change programs. (Balla et al., 2020). Cardiologists were also unlikely to use angiography on women, and women were less likely to receive a statin after an acute myocardial infarction as directed by the AHA 2007 guidelines that suggested this drug was needed after such an event (Woodard, 2019).

In addition to physician bias, women are often misdiagnosed when they present with cardiovascular diseases. This has been attributed to a lack of assessment skills by doctors for women with cardiovascular disease (Woodard, 2019). Only 22% of primary and 42% of cardiologists were prepared to assess cardiovascular disease in women, and only 16% of primary care doctors and 22% of cardiologists used treatment and prevention guidelines (Vogel et al., 2021). When women presented with a myocardial infarction, there was a 37% misdiagnosis by doctors when compared to men (Woodard, 2019). Because of this misdiagnosis, women who survived a myocardial infarction had poor survival rates once they left the hospital and were more likely to have a recurrent event (Woodard, 2019). Geraghty et al. (2020) noted that risk factors for women were

often overlooked, or not measured, and cardiovascular assessment was often not completed in women. The misdiagnosis of women who presented with cardiovascular disease and cardiac events would be eventually termed the 'Yentl Syndrome' (Khan & Basnet, 2021).

Dr. Bernadine Healy was the first to use the phrase 'The Yentl Syndrome' in her description of how women with coronary artery disease were not being diagnosed or treated for this disease when compared to men (Khan & Basnet, 2021). The concept behind the 'Yentl Syndrome' was that women were unlikely to describe their cardiac symptoms the same as men and, therefore, did not receive the same workup as men; however, if women presented with symptoms similar to those of men, they received the same care as men (Khan & Basnet, 2021). Women who had symptoms similar to men received advanced therapy, such as percutaneous coronary interventions and coronary artery bypass grafting, when compared to women who did not have similar symptoms, and this has led to poorer outcomes (Woodard, 2019). In addition, the doctor often influenced women when making decisions about therapy (Ghare et al., 2019). Women also had poor perceptions of their health status and decreased health-related quality of life (Balla et al., 2020). This was attributed to the poor relationship between physician and patient when diagnosing and prescribing treatment. Both Khan and Basnet (2021) pointed out that there is differential treatment of women in terms of therapy and that more research is needed to understand why this is occurring.

Awareness of Cardiovascular Disease in Women

The Heart Centers for Women was created as a result of an increasing number of deaths in women who suffered from cardiovascular disease. Between 1984 and 2012, at the time the Heart Centers for Women began, more women died of cardiovascular disease every single year when compared to men (Lundberg et al., 2018). The Heart Center developed education and research programs to address cardiovascular disease in women. The International Council on Women's Health Issues was also developed as a nonprofit organization aimed at addressing cardiovascular disease by policymakers, healthcare providers, and researchers. As I reviewed the literature concerning the awareness of cardiovascular disease in women, I found that a lack of education and awareness by providers, a lack of guidelines and policies concerning women and cardiovascular disease, and a lack of awareness by women and the public concerning cardiovascular disease were reasons that women were not benefitting from advanced therapy (Cushman et al., 2021; Kouvari et al., 2020; Wenger et al., 2022).

According to Wenger et al. (2022), one of the goals of the AHA was to improve outcomes for women with cardiovascular disease by 2024 through education aimed at removing barriers to care. This included education not only for patients but for health care providers as well. Approximately 70% of postgraduate medical trainees had not received adequate training concerning women and cardiovascular disease (Wenger et al., 2022). In addition, only 22% of primary care physicians and only 42% of cardiologists were able to adequately assess and understand the cardiovascular disease risk factors that increased a woman's chance of developing cardiovascular diseases (Wenger et al., 2022).

For example, providers lacked knowledge about the link between pregnancy and cardiovascular disease, and a 2004 survey revealed that less than one in five physicians were aware that more women died each year from cardiovascular disease, and many of them ranked breast health more of a concern than heart health (Kouviri et al., 2020). To increase the education of patients and providers concerning cardiovascular disease in women, Healy, the first female director of the National Institutes of Health (NIH), established the Women's Health Initiative to address chronic diseases in women (Kouviri et al., 2020).

Not only is there a lack of awareness by providers, but there is also a lack of awareness of cardiovascular disease by women and the general public. The awareness that heart disease was the leading cause of death increased from 30% in 1997 to 54% in 2012 but dropped to suboptimal levels after 2012, especially among young women (Lundberg et al., 2018). Furthermore, 10% of women in 1997 were able to recognize the symptoms of heart attack compared to 18% in 2012, but this number has remained low since 2012 (Lundberg et al., 2018). The Red Dress and American Heart Association Go Red for Women helped to increase the recognition of heart attacks from 54% in 2009 to 65% in 2012 (Cushman et al., 2021). However, the lack of awareness of heart attack symptoms has led to increased mortality, especially for younger women and minority women (Cushman et al., 2021; Geraghty et al., 2020). In a survey administered in 2009 and repeated in 2019, women were less aware of heart attack symptoms in 2019, which showed a lack of improvement in awareness and prevention of further cardiovascular disease, with 74% less likely to recognize heart disease as the leading cause of death

(Cushman et al., 2021). Women at considerable risk rated their risk low (Woodard, 2019). This sparked the need for more education to increase women's awareness of cardiac disease.

Clinical trials like the *Coronary Artery Surgery Study and Survival and Ventricular Enlargement* sought to bring education and awareness about women and cardiovascular disease and evidence that showed women were not receiving guideline-indicated treatment for coronary artery disease (Savage et al., 2022). The WISEWOMAN, or the Well-Integrated Screening and Evaluation for Women Across the Nation, was a program created in 1993 to inform providers information on heart disease and stroke prevention in women in lower-income groups and women between the ages of 40-64 who needed heart disease screening and methods to promote healthy lifestyles (Kouvari et al., 2020). This program aimed to help women understand their risks for cardiovascular disease and the steps they needed to take to reduce these risks and live a healthy life (Kouvari et al., 2020). The program also published evidence-based women-centered guidelines for primary and secondary prevention of chronic vascular atherosclerotic diseases (Woodard, 2019). In November 2011, The US House of Representatives introduced a bill that addressed preventing, diagnosing, and treating heart disease, stroke, and other cardiovascular diseases in women (Kouvari et al., 2020). The United Nations also stressed the need for gender-sensitive strategies in the sustainable development goals for 2030 (Woodard, 2019). These were done to bring a greater awareness about women and cardiovascular diseases.

In 1993, the NIH required that all NIH-funded clinical trials include female subjects and that these trials must include sex-specific analysis (Kouvari et al., 2020). As a result of the NIH mandates, the number of women in clinical trials increased from 18% in 1970 to 34% in 2006 but then dropped in 2007 to 30% and has continued to decrease (Kouvari et al., 2020). In response to this decline, the NIH in 2015 recommended that sex-specific reporting be used, or the researchers had to provide a valid reason detailing why more women were not used in trials and studies (Kouvari et al., 2020). The FDA published an action plan that increased the enrollment of women in research and clinical trials (Woodard, 2019). In 2010, the Canadian Institutes of Health Research and its Institute of Gender and Health subdivision also published a tool to help clinicians integrate sex and gender into their study designs (Kouvari et al., 2020).

Women and Conservative Therapy

My research question for this study was to explore the perceptions of women who chose conservative therapy over advanced therapy. It is important to understand what constitutes conservative therapy. Many of the drugs presented in this paper are used to treat heart failure. Most women who develop heart failure are also diagnosed with another cardiovascular disease, such as coronary artery disease or atrial fibrillation (Cho et al., 2020). Therefore, treatment of heart failure can be multifaceted and involves the treatment of other cardiovascular diseases in conjunction with heart failure.

According to Patel et al. (2023), conservative drugs are called guideline-directed medical therapy drugs (GDMT), which are used to treat cardiovascular disease and heart failure patients who have a reduced ejection fraction. These drugs included angiotensin-

converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), angiotensin receptor plus neprilysin inhibitors (ARNIs) or Entresto, sodium-glucose cotransporter-2 (SGLT2) inhibitors or Jardiance, and beta blockers (Patel et al., 2023). Drugs used to treat coronary artery disease, cardiac arrhythmias, and atrial fibrillation include many of the drugs that are used to treat heart failure. These drugs also include nitrates that help reduce the heart's workload, beta-blockers, calcium channel blockers, ACE inhibitors, ARBs, statins, anticoagulants, and antiplatelet drugs (Vij et al., 2021).

Other drugs used to treat heart failure include diuretics, potassium-sparing diuretics, digoxin, loop diuretics, and spironolactone (Blumer et al., 2021). In the literature search concerning women and conservative treatment, I found that the success of medical therapy is dependent on whether these drugs are prescribed for women, whether the patient has a reduced or preserved ejection fraction, whether the side effects of the drugs outweigh the benefits; whether the patient can afford the drugs due to the cost; whether the patient is in Stage D or lesser stage of heart failure; and whether the patient is pregnant (Blumer et al., 2021; Bozkurt et al., 2023; Zhao et al., 2020).

According to Bozkurt et al. (2023), these drugs can reduce rehospitalization and post-hospital costs and improve outcomes, but their use from 2020-2022 has remained the same for women. Women were less likely to receive GDMT therapy when compared to men, and as a result, experienced a decrease in their quality of life during and after hospitalization, as well as higher mortality rates and hospital admissions (Blumer et al., 2021). Zhao et al. (2020) pointed out that women were not prescribed ACE inhibitors, statins, and aspirin compared to men. About 41% of women were prescribed aspirin

compared to 56% of men, 60% of women received statins compared to 63% of men, and 68% of women received an antihypertensive compared to 69% of men (Zhao et al., 2020). The significance of the differences is that women were not likely to receive the drugs needed after a cardiac event, resulting in the increased mortality that was noted by Blumer et al. (2021).

Medications are important in the treatment of cardiovascular disease in women. However, there are more therapies and drug treatments for reduced heart failure than for preserved heart failure (Vogel et al., 2021). This creates a problem in the treatment of heart failure in women because more women with heart failure have a preserved EF (Vogel et al., 2021). Many of these drugs are used to treat both the disease and the symptoms of the disease, especially patients with multiple comorbidities (Bolam et al., 2018). This means that if women are not prescribed these drugs, they are also not benefitting from symptom relief.

In addition, there are also side effects associated with many of these drugs. For example, SGLTZ inhibitors for heart failure are linked to yeast infections. Women are more prone to ACE inhibitor toxicity, increased risk of malignant arrhythmias secondary to antiarrhythmic QT prolonging drugs, and higher plasma volume of beta blockers can lead to overdose and death (Balla et al., 2020). Further compounding this is that women are not equally represented in these drug trials and account for only 20-25% of the participants (Vogel et al., 2021). Stewart et al. (2019) also noted that women who used traditional medications had limited physical activity and quality of life.

Just as pregnancy and the hormonal changes that occur with pregnancy are risk factors for cardiovascular disease, drugs prescribed during pregnancy pose unique concerns. According to Kaye et al. (2019), there are physiological changes with pregnancy, which can affect the pharmacokinetics and pharmacodynamics of drugs used for heart failure. The recommended guidelines set by the 2017 American College of Cardiology recommend heart failure drugs, which are unfortunately teratogenic and contraindicated in pregnant women and can be harmful to babies (Kaye et al., 2019).

Finally, many of the newer medications, such as Jardiance, Sacubitril/valsartan, and Farxiga, another SGLT2 drug also used to treat Type 2 diabetes, are associated with a decrease in hospitalization and mortality but are costly (Betz, 2021). Barriers to access, such as requirements of prior authorization, high copays, and even higher deductibles, place a high financial burden on patients and their families and lead to the underusage of these therapies (Heidenreich et al., 2022).

Medications are often the initial treatment for many diseases, including cardiovascular diseases. Concerns such as side effects and delayed prescribing of these drugs can worsen the prognosis for women. Drugs are used in the initial stages of heart failure, but by Stage D, where symptoms can be severe and involve patients without a reduced EF, mainly women, the implementation of advanced therapy such as ICDs and even LVADs could increase the survival rate of women and decrease the symptoms of heart failure (Heidenreich et al., 2022). According to Vishram-Nielsen et al. (2020), the average survival rate for severe heart failure is six months, which makes it crucial that there is no delay in the referral for advanced therapy.

Underutilization and Benefits of Advanced Therapies

According to Khazanie (2019), about 20% of all LVADs are implanted in women. In most cases, women are more likely to die from heart failure than men, but when advanced therapies are implemented, women can benefit just as much as men from these therapies (Khazanie, 2019). ICDs help to improve patient outcomes by preventing sudden death from ventricular arrhythmias, especially in patients with heart failure according to The New York Heart Association guidelines, patients who are candidates for mechanical circulatory support such as LVADs and patients who are at risk for ventricular arrhythmias should receive an ICD (Hsich, 2019). Advanced therapies for cardiovascular disease are implantable devices such as ICDs, dual chamber pacemakers, biventricular pacemakers, and LVADs (Khazanie, 2019).

As I reviewed the literature to examine why women are not benefitting from advanced therapy, I discovered that women were less likely to be prescribed advanced therapy, that women experienced complications with these devices, and that women were less likely to be included in device trials which could explain the complications and lack of utilization (Breathett et al., 2020; DeFilippia et al., 2019; Hsich, 2019; Radhoe et al., 2023). Finally, I discovered evidence that despite the underutilization and complications, there are benefits to using advanced therapy.

Underutilization and Complications of Advanced Therapies

According to the PCHF-VAD registry, the number of LVADs implanted between 2014 and 2017 was 22% in women and 78% in men (Hsich, 2019). Since 2006, over 20,000 LVAD device implants, and the majority, 79%, have been implanted in men

(Hsich, 2019). Radhoe et al. (2023) and Breathett et al. (2020) concluded that women who were more likely to be diagnosed with advanced heart failure were less likely to receive an LVAD when compared to men. According to Vogel et al. (2021), even though 80% of LVAD was implanted in men, women had more complications.

Each year, there are, on average, 2,600 LVAD transplants and 3,800 heart transplants, but women receive less than a third of these heart transplants and LVADs (Mwansa et al., 2021). Between 2008 and 2018 of the 13,305 patients who needed an LVAD, only 20%, or 2,771, were women (DeFilippia et al., 2019). Furthermore, women waiting on a transplant list had a lower chance of receiving a heart transplant, only a 55% chance compared to 67.5% of the men who had a higher chance of receiving a donor heart (DeFilippia et al., 2019). As a transplant destination, LVADs allow the heart to rest until a suitable donor is found, and women, because they are less likely to receive an LVAD, do not have this valuable benefit (Mwansa et al., 2021).

According to Johnson et al. (2018), women are 2.5 times less likely to receive an ICD despite clinical guidelines recommendation of these devices to prevent sudden cardiac death from ventricular tachyarrhythmias. Black and minority women are also less likely to receive a pacemaker or ICD (Balla et al., 2020). Although biventricular pacemakers and cardiac resynchronization help to improve symptoms and reduce morbidity and mortality, women do not benefit from these devices when compared to men (Vogel et al., 2021). However, Hsich (2019) did note that when women received counseling concerning the need for an ICD, 63% of the women received an ICD compared to 19.3% who did not receive counseling. Hsich also suggested that when

women were supported with counseling and education, they were able to decide to receive an ICD. Mwansa et al. (2021) concluded that women do not seek cardiac resynchronization therapy or an ICD because physicians did not refer them for one and that women, due to the lack of guidance from these physicians, did not consider this therapy. In addition, women were often referred for LVAD when they were least beneficial, and this resulted in poorer outcomes (Radhoe et al., 2023). Radhoe et al. also noted that women were older than men at the time of the initial pacemaker and had higher complications from permanent pacemaker implants. The reasons cited for the delay are related to physicians ordering these devices for women (Zeitler et al., 2022).

There are a considerable number of complications from implantable devices, which could signal a reason that women were not benefitting from advanced therapy. For example, although women could benefit from cardiac resynchronization therapy more than men, women have higher rates of complications such as coronary sinus dissection and cardiac tamponade (Zeitler et al., 2022). Although Mohamed et al. (2021) reported limited evidence for gender as a determination for cardiac resynchronization, pacemaker, and defibrillator, they concluded that women were less likely to receive a defibrillator for cardiac resynchronization and are more likely to have complications.

Women with an ICD had more complications that included perforation, inappropriate shocks, infection, bleeding, higher 30-day related pneumothorax requiring chest tube, hematomas requiring transfusion, cardiac tamponade, mechanical complications, and 30-day mortality when compared to men (Hsich, 2019). In addition, women also experienced higher six-month readmission for heart failure when compared

to men and were 1.9-fold more likely to have a significant complication and 1.6-fold more likely to have a minor complication within one year when compared to men (Hsich, 2019). Finally, there was an increased chance of lead dislodgement for women than men, which is an adverse event (Hsich, 2019).

There were also complications found with LVADs in women. For example, women had a 54% risk of developing a hemorrhagic stroke and a 46% risk of ischemic stroke (Hsich, 2019). Infections from LVAD ranged from 20% to 60% and included LVAD pocket infections, drive line infections, and bloodstream infections, which could lead to thrombosis and ischemic stroke (Asleh et al., 2019). In addition to infections, 17 to 40% of patients experienced gastrointestinal bleeding (Asleh et al., 2019). There was also an increased risk of right ventricular failure after LVAD implantation, and 30% of patients experienced aortic insufficiency by one year, especially in hypertensive patients (Asleh et al., 2019). CF-LVADS (continuous flow LVADs) or HeartMate 2 had increased mortality and adverse complications such as stroke, infection, and bleeding, and women younger than fifty had increased mortality when compared to men (Gruen et al., 2020).

Benefits of Advanced Therapies

ICDs can prevent sudden cardiac death, but women are less likely to receive this life-saving device (Silva et al., 2022). Using a cross-sectional retrospective analysis, Johnson et al. (2018) found that 25% of women and 36% of men received an ICD device. In a retrospective cohort study from 2008 to 2018, in adults diagnosed with cardiovascular disease that required a pacemaker or ICD, women were less likely to have a device implant (Silva et al., 2022). ICD and pacemakers are advanced therapies not

only for heart failure but also for coronary artery disease and cardiac arrhythmias. The lack of pacemakers, dual pacemakers, and ICD implants is significant because patients with these devices had a lower 30-day mortality than those without (Silva et al., 2022). Women had a better 30-day mortality than men, which means that if implanted in women, pacemakers and ICDs could reduce the number of deaths for women when compared to women who did not receive the device (Silva et al., 2022). In addition, women were less likely than men to receive an ICD for primary and secondary prevention compared to men, which was 3.2% and 2.4% for women (Zeitler et al., 2022).

Two significant trials showed the importance of implantable devices and the benefits of using these devices in women. The first trial was *The Heart Failure Trial*. The results of this trial were that an ICD device helped to reduce mortality in patients, but only 23% of the participants in the trial were women, even though they had a lower mortality rate when these devices were appropriately used (Zeitler et al., 2022). In the second trial, the *Resynchronization- Defibrillation for Ambulatory Heart Failure Trial* study, resynchronization therapy with a defibrillator reduced the incidence of death and hospitalization in women (Hsich., 2019). Cardiac resynchronization therapy with an ICD prolongs survival and reduces mortality in patients with heart failure and poor left ventricular function (Leyva et al., 2019). Furthermore, cardiac resynchronization with ICD can improve the quality of life, help to increase the patient's EF, promote ventricular remodeling, and has even been shown to benefit women (Hsich, 2019; Mwansa et al., 2021). In addition to ICDs, the AHA guidelines recommended the insertion of an LVAD for end-stage heart failure, but women are less likely to receive an LVAD (Elango &

Curtis, 2018). According to the Nationwide Inpatient Sample, the implantation of LVADs in women was 25.8% in 2004, but the use of these devices decreased to 21.9% in 2016, and the rate has not significantly changed or improved since 2008 (Gruen et al., 2020). Why the numbers have not increased or improved must be fully understood. This is important in that patients with end-stage heart failure could benefit from LVADs when their diagnosis requires a heart transplant, but no donor hearts are readily available.

In clinical trials used to evaluate the effectiveness of LVADs, only 10% to 24% of the participants were women (Gruen et al., 2020). The lack of studies on women in LVAD trials means less research on how the LVAD functions in female patients, and increasing the participation of women in these trials can lead to improvements in the use of these devices in women. This, in turn, will help to reduce mortality in women.

Summary and Conclusion

There were key concepts that I discovered during the literature review that were associated with women not benefiting from advanced therapy. These concepts included cardiovascular disease as a health care disparity, the unique cardiovascular risk factors, morbidity and mortality, the health care costs associated with these diseases, the socioeconomic factors that impact women, and the lack of representation in clinical and investigational drug trials for women. These concepts also included the physician and patient relationship, particularly the Yentl syndrome; the awareness of cardiovascular disease in women; conservative therapy, which included lifestyle changes and medication; and the complications and underutilization of advanced therapy.

There were unique risks that I identified in the literature, such as pathophysiology and hormonal changes, mental health disorders, policies and procedures directed at women's care, and gender-sensitive treatment guidelines that could explain why women were not benefitting from advanced therapy. There was extensive information on how a lack of participation in clinical trials due to economic instability, lack of awareness and urgency about disease progression and physician bias, and a genuine fear by women of adverse reactions to the drug studies affected decisions to proceed with advanced therapy. However, there was little information on how the perceptions of women influenced these decisions. Even with the recognition that education was needed to bring awareness to the burden of cardiovascular disease in women, there was still a gap in the literature as to why women chose conservative therapy over advanced therapy even when conservative therapy was not effective.

During the literature search, I found studies that were focused on varied reasons women may not benefit from advanced therapy. Souder et al. (2021) reviewed the effects of cardiovascular disease in women and concluded that cardiovascular disease in women leads to increased disparities and mortality despite interventions used to improve outcomes in women. Hyun et al. (2019) and Peters et al. (2019) both stressed that more studies are needed to understand how female patients view their disease process and treatments compared to the physician's view. Zeitler et al. (2022) found that more research is needed to discover why there is inconsistency in the treatment and management of arrhythmias compared to men. They suggested that the reason may be belief systems, lack of access to care, and limited health literacy. Breathett et al. (2020)

concluded that more research is needed to understand if gender biases affect a physician's decision to implement advanced therapies such as LVAD. Ehdale et al. (2018) suggested that differences in treatment and recognition of atrial fibrillation, which is often present in heart failure, was due to sexual bias, cultural bias, and physician bias, especially when referring women to specialty clinics and centers for arrhythmia treatment. Peters et al. (2019) compared the cardiovascular treatment of men and women from the years 2001-2016 and concluded that even when programs were aimed at ensuring that women received the same therapies as men, including advanced therapy, women were still not benefiting. However, they did not provide information on why women choose conservative therapy over advanced therapy.

Finally, in Chapter 3, I will focus on the research design and rationale, my role as the researcher, and the methodology. I will be using a basic qualitative approach to interview women with Kelly's theory as my foundation to grasp a better understanding of why a woman would choose conservative therapy over more advanced therapy.

Chapter 3: Research Method

The situation that prompted me to search this topic is that women with cardiovascular diseases are less likely to receive the available advanced therapy as part of their cardiovascular care plan when compared to their male counterparts. The question I examined was “What perceptions women have when choosing a conservative therapy approach and whether these perceptions are influencing their decisions not to pursue advanced therapy?” It is important to help women and the physicians treating them understand that the perceptions of women with heart disease may be preventing them from receiving therapy.

Despite advanced therapies for cardiovascular diseases, such as LVADs, dual pacemakers, and ICDs, women are not fully using these recommended devices for treatment (Souder et al., 2021). According to Khazanie (2019), only 20% of all LVADs are implanted in women. Radhoe et al. (2023) and Breathett et al. (2020) concluded that women who were more likely to be diagnosed with advanced heart failure were less likely to receive an LVAD when compared to men. Furthermore, Johnson et al. (2018) discovered that women are 2.5 times less likely to receive an ICD despite clinical guidelines recommending these devices to prevent sudden cardiac death from ventricular tachyarrhythmias. These data suggest that women are not choosing these devices for therapy.

In this basic qualitative study I explored the perceptions of women with cardiovascular disease and how their views regarding advanced therapy may affect their decision to choose conservative therapy over advanced therapy. Cardiovascular diseases

for women include coronary artery disease, myocardial infarction or acute coronary syndrome, congestive heart failure, and cardiac arrhythmia, which in advanced stages require advanced therapy (Souder et al., 2021). In this chapter, I define the research design and rationale, the role of the researcher, the methodology, instrumentation, and data analysis plan, address trustworthiness issues, including credibility, transferability, dependability, confirmability, and ethical procedures, and provide a chapter summary.

Research Design and Rationale

Research Question

What are the perceptions of women with cardiovascular disease who chose a conservative therapy instead of advanced therapy, including LVADs, dual and biventricular pacemakers, and implantable cardiovert defibrillators?

Central Concepts

The key concepts that I discovered during the literature review included cardiovascular disease as a health care disparity; the unique cardiovascular risk factors, morbidity, and mortality; the health care costs associated with cardiovascular diseases; the socioeconomic factors that impact women; and the lack of representation in clinical and investigational drug trials for women. These key concepts also included the physician and patient relationship, particularly the Yentl syndrome; the awareness of cardiovascular disease in women; conservative therapy, which included lifestyle changes and medication; and advanced therapy, which included ICDs, dual chamber pacemakers, and LVADs. In addition to these concepts, I reviewed cardiovascular diseases, including

92coronary artery disease, acute coronary syndrome, congestive heart failure, and cardiac arrhythmia, which are responsible for creating a healthcare disparity for women.

Research Tradition and Rationale

The research tradition for this study was a basic qualitative approach. Qualitative research such as this study is pivotal in studying cardiovascular outcomes. According to McIlvennan et al. (2019), qualitative research can be used to examine patient's experiences, preferences, and values when evaluating therapy, interventions, and care delivery and is a tool that can be used to study cardiovascular outcomes. Qualitative research allows the researcher to examine people's experiences and perceptions to understand how these experiences and perceptions shape their environment and decisions about this environment (Ravitch & Carl, 2021). Through semi structured interviews, I presented questions to women to explore these perceptions and how they may affect conservative and advanced therapy decisions. Several approaches to qualitative research could have been used for this study, but I chose a basic approach instead of a phenomenological approach. Where basic qualitative research examines individuals' perceptions, which is how they view life events, the phenomenological approach involves the lived experience or how they live these experiences (Patton, 2015). The phenomenological approach often examines how a group of people experiences a single concept or phenomenon (Creswell, 2007). The basic qualitative approach allowed me to examine different perceptions of different women.

Role of the Researcher

According to Ravitch and Carl (2021), as the researcher, I was the primary instrument and a vital part of this research inquiry. Because I was central to the study, I reflected on how my position, assumptions, values, and identity can influence the study and results (see Ravitch & Carl, 2021). I was always aware of my role as a researcher and my power over the research process and findings (see Ravitch & Carl, 2021). I had to understand the possible answer to my question, the study's result, and how my professional community might critique this work (see Austin & Sutton, 2014). According to Creswell and Creswell (2018), my role as a researcher was to interview the participants, observe their behavior, and collect data to understand how perceptions influence a person's behavior and reality.

Personal and Professional Relationships

I did not have any personal or professional relationships with the participants in this study. I did not interview participants with any affiliation to my place of work or in which I had a personal relationship. According to McKenzie (2019), it is crucial to develop a professional relationship with participants by establishing confidentiality and privacy with them and making sure that the purpose of the research and their role in this research is clearly defined.

Possible Research Biases or Power Relationships

Bias can occur in any phase of a study, including the study design, patient recruitment, interviewing process, or data collection (Pannucci & Wilkins, 2010). The researcher must acknowledge that biases can exist, and the research must explain how

these biases can be prevented (Pannucci & Wilkins, 2010). As a researcher, I acknowledged my own biases. It was important to list these at the beginning of the study to bring credibility to my work. For example, I am a female who may hold my own biases and ideas about advanced therapy. I also have a female family member who has been diagnosed with a cardiovascular disease.

Biases can occur in the interview process and, according to Galdas (2017), can occur at the creation of the research question as well as with the data collection, recruitment of participants, and choice of location for the study. To avoid bias with the interview and question selection, I avoided leading questions and instead used open-ended questions that were predetermined and approved by my committee. The interview guide can be found in Appendix A. Each interview involved the same questions, which were asked in the same manner. To avoid participant and location bias, I made sure that I was clear with the participants about the purpose of the study and used a sample that included a diverse group of participants. Finally, to avoid bias during the data collection stage, I included any data that may contradict what I hoped to discover (see Smith & Nobel, 2014).

Ethical Issues or Concerns

To ensure the security of the data, I stored the data and information concerning the participants on my private device. This device remained locked when I was not using the device and was not left unattended in public areas. I set my computer screen to have a 15-minute lockout, and I required a password to gain access after this lockout. In addition, these devices, drives, and clouds, including Excel spreadsheets, are password

protected. I was the only one with this password, except for the designated person who will destroy the data if I cannot. Any printouts or non-electronic paperwork were kept in a locked file in my home office. Any required updates to software or applications for data analysis and storage will be made, and I have McAfee as my antivirus data software. All data used in this study will be kept in a location not accessible by the Internet for up to five years to ensure the privacy of all data. This data, including digital and hardcopy, will be destroyed after five years. I explained and reviewed the Informed Consent with each participant. This was done before the interview, and the consent with patient names is kept in a separate locked or coded file.

Methodology

Participation Selection Logic

Once the social media platform had been established and permission to use these platforms was obtained, I recruited participants using the flyer found in Appendix B. I did not have to recruit participants through email but had the email correspondence found in Appendix C readily available.

The scope of the study was women who were eighteen and older with no specific inclusion or exclusion of ethnic or racial groups who had been diagnosed with one of the cardiovascular diseases. The study did not include women with genetic heart defects because care is typically structured for these patients, as most congenital heart disease is discovered during pregnancy or right after birth (National Heart, Lung, and Blood Institute, 2022). The goal of my study was to interview ten participants or until saturation had occurred using social media platforms and snowball technique, which involved using

participants to recruit other participants (see Ravitch & Carl, 2021). Because time was a limiting factor, I ensured that I found enough participants with different cardiovascular diagnoses because cardiovascular disease is not one specific diagnosis but several diagnoses. I was also prepared to have an additional interview with potential participants if someone did not participate. I provided a Zoom call feature as an option for participants who were unavailable in person. The interviews were scheduled in increments of 60 minutes. There was a brief 10-minute phone call to those agreeing to participate. This call provided information about the goals of the study, allowed the participant to ask any questions they had, and provided instructions about the interview process. Once the interviews were completed, I summarized the study's results. I provided a follow up email to share the results with the participants.

Instrumentation

As the researcher, I was the main instrument used. I used a list of research questions that had been approved by my committee, as well as equipment to record the interviews. I used the audio recording feature on Zoom to also record the interviews.

Procedures for Recruitment, Participation, and Data Collection

Participants were recruited by using different social media platforms. Ravitch and Carl (2021) point out that sample size will depend on whether the researcher can answer and address the research question and the size that will allow the researcher to make decisions about a broader population. Patton (2015) states that there is no set rule for sample size and that a researcher must consider the purpose of the study, the time, the resources available, and, more importantly, what will help achieve credible results. As the

researcher, I collected the data, and I determined the frequency of the data collection which varied depending on the number of interviews. I scheduled the interviews during the week and on the weekends for convenience purposes, and I allotted the time for the interview to be about one hour. I used the Zoom recording feature for Zoom calls. There were no in person interviews, but I had planned to use the Apple's Voice Memos Application for any in person interviews. A digital voice recorder was available for backup.

The study participants were identified as Participants followed by a number. This numbering started with the number one and end with the final number of participants interviewed for the study. Phone numbers and emails were kept separately, and names were only associated with the confidential consent form. I hid any demographic data and referred to it only as a general location. For example, I used the country's southeast region as a location.

Data Analysis Plan

My data analysis included a data management plan that involved collecting, storing, protecting, organizing, and transcribing of the interview transcripts. According to Ravitch and Carl (2021) creating a timeline is an important step in the data analysis plan. My timeline included creating files that were updated after each interview. These files included the interview date and time, and the number assigned to the participant. I collected the primary data obtained from semi structured interviews using a committee-approved interview guide with pre-determined open-ended interview questions (see Appendix A). To begin the data analysis, I developed a precoding plan which helped me

to begin managing and transcribing the transcripts. The precoding was based on the core concepts in my research question. I used the NVIVO transcription software to transcribe the interviews and made sure to maintain the words of each participant as they answer the questions. In addition to this software, I listened to and transcribed the recordings.

I wrote notes and created memos during the interview process and at the end of the interview, reread the notes to seek a better understanding of the responses to each of the questions. According to Ravitch and Carl (2021) this is part of immersive engagement, and it helped to ensure that my questions were adequate and appropriate. Once the interviews had been transcribed, I began the process of coding the transcripts. Each transcript included page numbers and line numbers, which helped with any quotes or phrases from the participants. I defined what each code meant.

Finally, I used the NVivo software program to organize the data for analysis according to themes. Zamawe (2014) analyzed the use of the NVivo software for qualitative studies and found that this program is more compatible with thematic analysis. He concluded that this software program can use different analytical approaches and research designs (Zamawe, 2014). NVivo software made it easy to code and recognize themes, as well as transcribe the interviews. The software also used nodes to represent themes and codes, making recognizing patterns easier to recognize. Ravitch and Carl (2021) suggested looking for patterns of repetition, emotive language, agreement, and disagreement among the participants.

Issues of Trustworthiness

Credibility

According to Ravitch and Carl (2021), credibility involves the credibility of the researcher and methods, and the ability to acknowledge those things found during the research that are not easily explained. Triangulation can also ensure credibility and involves prolonged engagement or data observation (Ravitch & Carl, 2021). One way that I achieved credibility was by providing a thick description of the participants and their experiences (see Ravitch & Carl, 2021). According to Ravitch and Carl, the use of reflectivity which involves reflecting or addressing any biases that I had concerning the subject matter and ensuring that my interpretation of the data challenges any biases that I had. Another way to ensure credibility is to make sure that I included a rich data set and that my research method aligned with my research question.

Transferability

According to Ravitch and Carl (2021), transferability in qualitative research means that my research is transferable to other settings and contexts. Transferability was achieved by providing a thick description of the participants and their experiences. In order to achieve transferability for my study, I provided a complete description of the setting for the study. According to Ravitch and Carl transferability can also be achieved by providing a clearly defined research question that aligned with my research problem, study design, and an exhaustive literature review that was relevant to the research problem.

Dependability

According to Creswell (2007), dependability ensured that my research was consistent with my collected data. This consistency is achieved by using a reflexive journal and notes. The recordings and transcribing of the interviews, as relayed by the participants, also helped with the study's dependability. In addition, my usage of coding also helped with dependability in my research.

Confirmability

According to Ravitch and Carl (2021), confirmability is achieved by using the findings and answers of the participants' questions. To avoid biases, I used objective observation of the participants and avoided any judgments or subjective views (see Ravitch & Carl, 2021). Ways to achieve confirmability are through audit trails, negative case analysis, triangulation, and negative case analysis. Triangulation involved using multiple sources and not just one source, and negative case analysis involved using data different from what I was expecting to find in your literature review (see Ravitch & Carl, 2021).

Ethical Procedures

Following the guidelines of Walden University's Institutional Review Board (IRB) guidelines, I obtained approval before proceeding with actively recruiting individuals for this study. Walden University's approval number for this study was 02-26-24-0822057, and it expires on February 25, 2025. To ensure that the rights of the participants was observed at all times, I used an IRB approved consent for this study. The form contained information about the purpose of the study, who was being recruited for

the study, the interview time restraints, and stressed that the study was voluntary and at any time the participant could terminate the interview. Each participant was provided a copy of the consent and after the opportunity to review and ask questions, the participant were instructed to respond to the consent email, "I consent." The consent was also reviewed again at the time of the interview and the participant had the opportunity to ask questions or voice any concerns about the consent process.

To ensure the security of the data, I stored the data and information concerning the participants on my private device. This device remained locked when it was not in use and was in my private office in my home. I ensured that the computer screens had 15-minute lockout and required a password to access after the lockout period. In addition, these devices, drives, and clouds, including Excel spreadsheets, were password protected. I was the only person with the password, except for the designated person who will destroy the data if I cannot.

All printouts or non-electronic paperwork were kept in a locked file in my home office. Any required updates to software or applications for data analysis and storage were updated as needed, and my antivirus data software was maintained by McAfee. All data used in this study is being kept in a location not accessible by the Internet for up to five years to ensure the privacy of all data. This data, including digital and hardcopy, will be destroyed after five years.

Summary

In Chapter 3, I reviewed and discussed the research design and rationale, the role of the researcher, the methodology, including participant selection and data analysis plan,

and issues of trustworthiness, including credibility, transferability, dependability, and confirmability. In Chapter 4, I will present the study findings and interpretations of the results.

Chapter 4: Results

The intent of this basic qualitative study was to explore the perceptions of women with cardiovascular disease, how these perceptions affect their views regarding advanced therapy, and why they chose conservative therapy over advanced therapy. The research question was “What are the perceptions of women with cardiovascular disease who chose a conservative treatment instead of advanced therapy including LVADs, dual and biventricular pacemakers, and implantable cardiovert defibrillators?” Cardiovascular diseases for women included coronary artery disease, congestive heart failure, and cardiac arrhythmias which require advanced therapy (Souder et al., 2021). Advanced therapies for cardiovascular disease are LVADs, implantable biventricular devices, dual pacemakers, and implantable cardiovert defibrillators (Souder et al., 2021). Conservative treatments are lifestyle changes that involve improved diet, exercise, and medications (Wenger et.al., 2022).

In this chapter, I review the recruiting process, the data collection process, the data analysis process, and how I achieved credibility, transferability, dependability, and confirmability. Lastly, I review the results and gave a summary of the chapter.

Setting

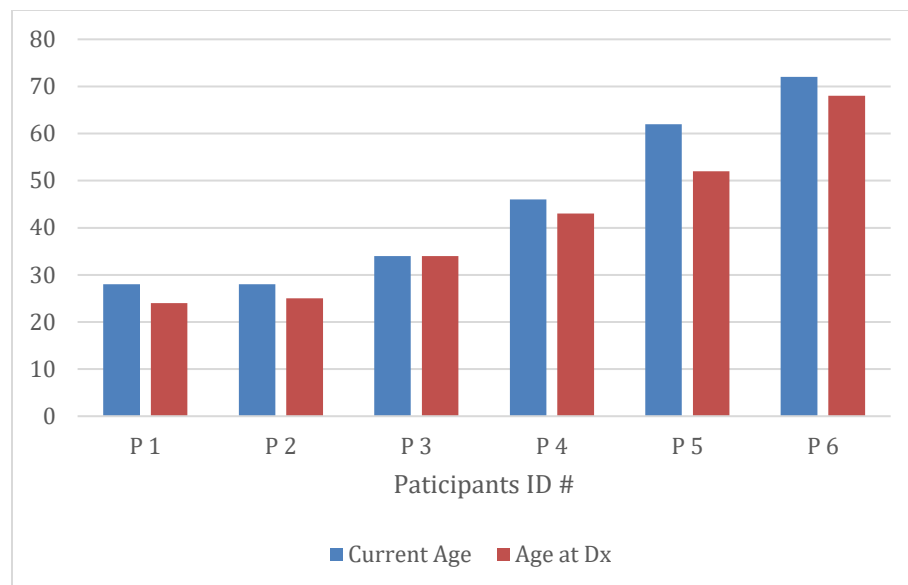
The platforms I used for this study were Instagram, Facebook, and LinkedIn. My initial contact with the participants was by email with the exception of one participant who reached out to me through Facebook. Information concerning the Zoom and phone calls were sent by email. The consent was emailed to all the participants. I conducted the

interviews in my private office at home. All the participants reported that they were in their private homes for the interviews.

Demographics

The participants in the study resided in the southeastern part of the United States. The participants were all female and met all the research inclusion criteria including age and cardiovascular disease diagnosis. Because the focus was on women and cardiovascular disease, all six of the participants were female by birth. The participants were all over the age of 18 and I included their current age and age at diagnosis (see Figure 2). This was done to show how long participants had been managing their disease process.

Three of the participants were African American, two were White Americans, and one was Hispanic American. Four of the women were single and two of the women were married. Five of the women had children, one did not have any children. Two of the women were caregivers to parents and husbands. One of the participants was a grandmother who had custody of her grandchildren.

Figure 2*Current Age and Age at Diagnosis***Data Collection**

The data collection method for the study was consistent with the method introduced in Chapter 3. After obtaining approval from Walden University IRB, I began the process of recruiting participants from social media outlets by posting the preapproved flyer (see Appendix B). These platforms included Instagram, Facebook, and LinkedIn. The initial response was low, so I repeatedly posted the flyer weekly on social media pages. I also obtained permission from various pages aimed at women, who suffered from cardiovascular disease to post the flyer on these pages. I received 15 responses but four were excluded because they were male respondents, and one was diagnosed with congenital heart disease, which was an exclusion criterion. The final 10 participants met the criteria of women who were 18 years and older with no specific

inclusion or exclusion of ethnic or racial groups, who had been diagnosed with one of the cardiovascular diseases. I began the process of setting up Zoom interview dates for the 10 participants who met the criteria. These times were convenient for the volunteers. Four of the respondents did not show up for their interview dates. A second attempt to reschedule was made but none of the four responded, and therefore, were excluded from the study.

I obtained email consent from the participants included in this study. Each participant was instructed to respond “I consent” to the email detailing and explaining the consent. The participant was asked if they had any concerns about the consent process before the interview. Participants were given the opportunity to ask questions about the consent; however, all expressed understanding and consented.

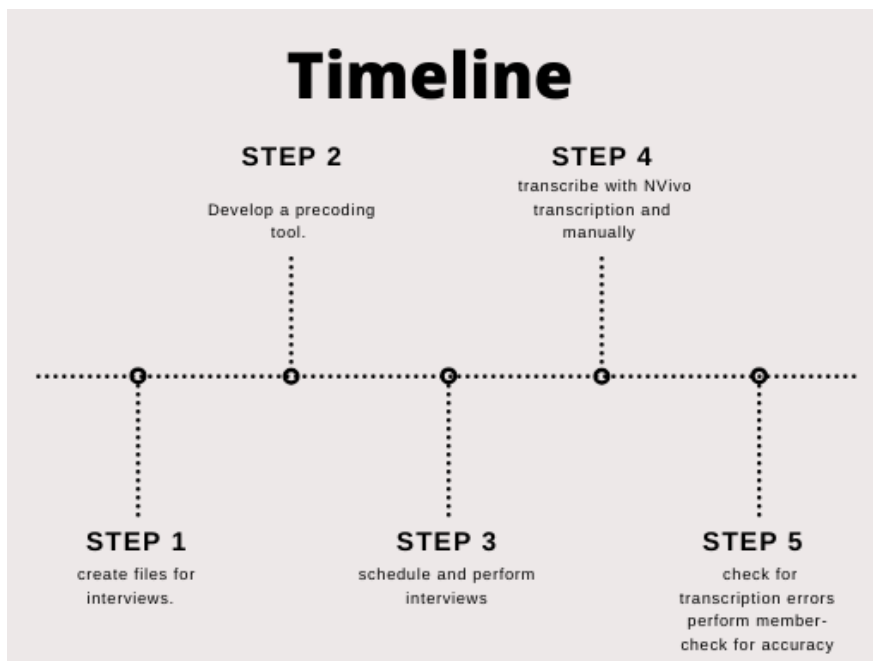
The dates and times of the interviews were made available to the participants during the week as well as on the weekends. Weekend interviews were held between 9 a.m. to 12 p.m. and during the week between 3 p.m. and 7 p.m. Four of the interviews were held on the Zoom platform and two of the interviews were held over the phone and were recorded using a mini recorder as the participants were unable to log into the Zoom Call feature. All participants consented to having the interviews audio recorded. The participants were identified using a numerical process with Participant 1-6. The total time for the interviews varied from 15 minutes to 30 minutes. The interviews were conducted over a three-month time period.

For the sake of clarification and repeating of questions, some closed-end questions were implemented. As I interviewed the participants, I used memos to capture responses and make notes concerning the interviews. A brief follow-up meeting was held

to review transcripts to clarify any items that were unclear from the transcripts. To increase the credibility of the study, I performed member checks in which the participants were allowed to review and approve the transcripts. Five of the six participants responded to the member checks. Four of the participants reported no needed changes and one participant clarified two sentences that did not capture their responses. This also ensured that their thoughts and ideas were captured. All transcripts and corresponding materials were stored in a password protected file.

Data Analysis

I created a data management plan that involved collecting, storing, protecting, organizing, and transcribing the interview transcripts. According to Ravitch and Carl (2019), an organized data management plan that includes a timeline helps to achieve a credible and trustworthy data analysis by ensuring data accuracy (see Figure 3).

Figure 3*Data Management Plan*

My timeline included files that were updated after each interview. These files included the interview date and time, and the number assigned to the participant. Primary data were collected from the semi structured interviews and from the pre-determined open-ended interview questions.

For this qualitative study, I performed a thematic analysis. Braun and Clarke (2006) described thematic analysis as a six-step or phase approach to analyzing data. According to Braun and Clarke, because qualitative methods can be complex, thematic analysis can serve as the foundation for this method in that, it allowed me to recognize patterns or themes. As I used this approach, I systematically organized and analyzed my data. Using the Braun and Clarke approach as a guideline, I completed my data analysis described below.

Phase 1 of thematic analysis involves becoming familiar with the data (Braun & Clarke, 2006). Although I used a transcription service through NVivo, I became familiar with the data because I interviewed the participants and created the memos with notes from the interviews. I also reviewed the transcriptions for transcribing errors. This also helped me to become familiar with the data. I further familiarized myself with the data by completing a post interview meeting where I asked clarifying questions for any responses that were not initially clear to me. Lastly, according to Ravitch and Carl (2021), reading, rereading, and listening to the transcripts is called immersive engagement, a process which helped me to rephrase any questions based on the participants understanding of the question and allowed me to fully understand the responses that I received.

After I familiarized myself with the data, I created a precoding list. The precoding was based on the core concepts in the research question. I created a table to see which of the precoding was present in the interviews. This precoding also assisted me as I used the NVivo software by providing the foundation for coding the transcripts. The codes included cardiovascular disease, conservative treatment, and advanced therapy along with the associated types of advanced therapy that were defined in Chapter 1 of the operational definitions. The code words for the advanced therapy were LVAD, biventricular and dual pacemakers, defibrillator, cardiovert, and implantable.

The next steps or phases in thematic analysis according to Braun and Clarke (2006) are to code the interviews and develop themes based on these codes. I used both NVivo and manual coding for each of the interviews. According to Zamawe (2014), the NVivo software is compatible with thematic analysis. To assist with the coding process, I

included page numbers and line numbers to help with any quotes or phrases made by the participants. I was careful to write the words just as the participants had spoken them.

Finally, I defined and clarified the meaning of the code. Ravitch and Carl (2021) suggested looking for patterns of repetition, emotive language, agreement, and disagreement among the participants. I considered these items when reading and rereading the transcripts, and I created a final list of coding from the interviews (See Table 1). There were 141 different codes listed.

Table 1*Coding of Transcripts*

Code	References	Cases
Conservative treatment	25	5
Perception experience with doctor	19	6
Affected decision for treatment	15	6
How it has improved your life	12	6
Emotions	8	4
Open to mentorship program	7	6
Cardiovascular disease	7	5
Education	7	5
Financial support	7	4
Medication	6	4
Understanding of disease	5	2
Did he offer defibrillator or pacemaker	4	4
Insurance	4	3
Misc. Factors affecting decision	3	2
Finance a deciding factor	2	2
Offered device and surgery	2	2
No family responsibilities	1	1
Status is a reason for not choosing	1	1
Would prefer surgery	1	1
Family support	1	1
Covid	1	1
Experience with nurse	1	1
Opportunity to do advanced therapy instead	1	1
Had to encourage self	1	1
Grand total	141	74

Finally, I used NVivo software program to organize the data for analysis according to themes. I isolated the responses of the participants onto a separate word document which was entered into the NVivo software program for analysis. For the final step of the data analysis, I placed all the codes in an excel sheet. This allowed me to get an overview and made it easier to identify patterns. I used the auto generated themes as a guide and I began to cluster all the codes based on a common theme into a word document. The process of clustering the codes helped me to develop final themes (See Table 2).

Table 2

Clustering and Developing Themes Based on Codes

Cluster 1 Perceptions of conservative treatment	Cluster 2 Perceptions of advanced therapy	Cluster 3 Experiences that affect perceptions
Conservative treatment (25)	Affected decision for treatment (15)	Understanding of disease (5)
How it has improved your life (12)	He offers defibrillator or pacemaker (4)	Education (7)
Medication (6)	Offered device and surgery (2)	Opportunity to do advanced therapy instead (1)
Cardiovascular disease (7)	Perception experience with doctor (19)	Would prefer surgery (1)
Status reason for not choosing (1)	Finance a deciding factor (2)	Emotions (8)
	Family support (1)	Physician experience (19)
	Misc. Factors affecting decision (3)	Encourage self (1)
	Financial support (7)	Open to mentorship program (7)
	Insurance Status (1)	

Evidence of Trustworthiness

Credibility

According to Ravitch and Carl (2021), credibility involves the researcher's ability to acknowledge those things found during the research that are not easily explained. They also proposed that triangulation, a process that involved prolonged engagement or data observation, also ensured credibility. One way that I achieved credibility was by providing a thick description of the participants and their experiences (see Ravitch & Carl, 2021).

I achieved credibility in that I allowed the participants the opportunity to relate their experiences and perceptions in their own words. I also asked questions that encouraged the participants to elaborate on their response. I repeated questions to make sure that I understood what the participants were saying. I solicited feedback from the participants about what I had transcribed. I also achieved credibility by comparing the transcription of the interview by NVivo with my manual transcription of the interview.

Transferability

According to Ravitch and Carl (2021), transferability in qualitative research means that my research was transferable to other settings and contexts. Much like credibility, transferability is achieved by ensuring that participants were able to share their experiences. To achieve transferability for my study, I also provided a complete description of the setting for my study and the participants interviewed for this study. I also achieved transferability by providing a clearly defined research question that aligned

with my research problem and study design, and I provided an exhaustive literature review that was relevant to the research problem (Ravitch & Carl, 2021).

Dependability

According to Creswell (2007), dependability ensured that research was consistent with the collected data. I achieved consistency by using a reflexive journal and notes, and by the way I collected the data and interviewed the participants. I collected and recorded the interviews with the same process and ensured that each transcription was free from transcribing mistakes.

Confirmability

According to Ravitch and Carl (2021), confirmability was achieved by using the findings and answers to my participants' questions. To avoid biases, I used objective observation of the participants and avoided any judgments or subjective views. I also used an audit trail to show all my steps in the research process. The process of audit trail was performed in the NVivo software as I set up my project, created memos, coded my data, used graphs and tables to present my data, and by generating reports and saving all my work.

Results

Research Question

This qualitative study was conducted to explore the question: “What are the perceptions of women with cardiovascular disease who chose a conservative treatment instead of advanced therapy, including LVADs, dual and biventricular pacemakers, and implantable cardiovert defibrillators?” Although advances in therapy have improved the

overall outcomes for patients with cardiovascular disease, women have not equally benefited.

After reviewing and coding interviews from six participants, I developed three major themes. As discussed in Chapter 2, I used Kelly's eleven corollaries as my theoretical foundation for this study. The themes generated were:

- Theme 1: Perceptions of Conservative Therapy
- Theme 2: Perceptions of Advanced Therapy
- Theme 3: Experiences That Affect Perceptions of Therapy

Theme 1: Perceptions of Conservative Therapy

Based on the interview responses, I coded these responses into a table (see Table 3). Overall, for this theme, I generated 50 codes. Two of the pre codes, *cardiovascular* and *conservative treatment* were identified as parent codes from the research question. The remaining parent codes were *how has it improved your life* and *medication*. The most repeated codes were under the parent code *conservative treatment* (25 reference codes) and *how has it improved your life* (12 reference codes). The remaining parent codes *cardiovascular disease* and *medication* had seven and six reference codes consecutively.

Table 3

Theme 1: Perceptions of Conservative Therapy

Name: Theme	Files: Cases	References: Code count
Theme: Perceptions of conservative treatment	7	50
A. How it has improved your life	6	12
B. Conservative treatment	5	25
C. Cardiovascular disease	5	7
D. Medication	4	6

negative response to conservative therapy. Participants 1, 2, and 3 all reported that they “felt better” with the conservative therapy. Participant 1 stated that “I don’t feel like I can’t breathe”. She also stated that my “heart does not hurt anymore.” Participant 2 stated that her life “had improved 100% “and she had a “positive perspective on life” after starting and continuing conservative treatment. Participant 3 stated that her life had “really improved”. However, Participant 4 stated “she did not feel well” and that my “blood pressure is still too high” despite following the conservative treatment which included medication. Participant 5 stated “I still can’t breathe” and that “my feet are still swollen”. She also reported that “I can’t walk very far.” Participant 6 in reference to her conservative treatment stated that “I still can’t catch my breath”. She also stated that “my heart still races and when I bend over, I get dizzy.” She also reported that “I cannot stand very long” and this prevented her from doing things with her family.

Theme 2: Perceptions of Advanced Therapy

The second theme, perceptions of advanced therapy had 39 codes (see Table 4). There were nine parent codes under this theme. The two parent codes that generated the most codes were *affected decision for treatment* (15 codes) and *financial support* (seven codes). However, the parent codes of *insurance*, *finances*, and *family support* could fit under one parent code of *finances* which when combined was a total of 14 codes.

Table 4*Theme 2: Perceptions of Advanced Therapy*

Name: Theme	Files: Cases	References: Code count
Theme: Perceptions of advanced therapy	6	39
A. Affected decision for treatment	6	15
B. Did dr. Offer defibrillator or pacemaker	4	4
C. Financial support	4	7
D. Insurance	3	4
E. Finances	2	2
F. Offered device and surgery	2	2
G. Misc. Factors affecting decision	2	3
H. Status	1	1
I. Family support	1	1

After I imported the responses from the interviews into NVivo, I generated the word cloud which represented the 39 codes that formed the foundation for theme two (see Figure 5).

was single grandmother who gained custody of her three grandchildren after her daughter died of an overdose stated” who will keep my grandchildren” when referring to an advanced treatment requiring an outpatient or hospital visit. Participant 2 was not a mother, wife, or a caregiver and stated that “family does not have an effect on my decision for a more advanced therapy”. Participant 5 stated “I can’t do another treatment because I have to take care of my family. I will keep taking my pills and eat right.”

Finances, insurance status, and family support had a negative impact on the perceptions of advanced therapy. Participant 1 stated that she did “not have insurance and I can’t afford to pay” and she also stated, “I have to get help from my family and friends, and they don’t have a lot of money”. She also stated that “I have some savings and, but I am affected when it comes to financials.” Participant 2 stated, “I get support 100% from family, siblings, and mother but I cannot afford a lot”. Participant 2 also stated “those advanced things sound really expensive”. Participant 3 stated that “surgery requires a lot of financial. I have no support.” Participant 4 stated she had “no family support” and reported that “I sometimes do not have money for medication, and I do not have insurance”. She also stated that she relies on “samples of medicine given out by my doctor.” Participant 5 stated that “I am on disability and Medicaid” and that “I do not have money to afford that”. She also stated “I do not have family support to take care of me” when referring to who would help her if something went wrong with the treatment. Participant 6 stated that “she did not have money for medications”. She stated, “I had to quit my job, and I just can’t afford to do anything else.” She also stated, “I can barely feed my grandchildren.”

Participant's perceptions of advanced therapy were based on whether the physician had talked about or recommended an advanced therapy. Participant 1 stated "yes surgery but we did not talk a lot about it". Participant 2 stated that she was "told about surgery and a defibrillator but was not told I needed one yet". Participant 3 stated that "he did mention surgery (bypass)" but "he said I had a "50-50 chance I would come out alive and I did not want that". Participant 4 said "he said that I needed a small thing in my heart to control the heart rate, and I would stay overnight". Participant 5 stated "I don't remember him talking about a defibrillator or pacemaker". Participant 6 stated that "I do not remember him saying that was something I needed" when referring to a defibrillator and pacemaker.

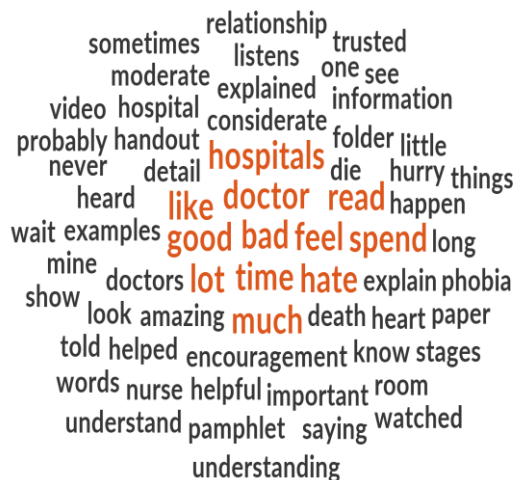
Theme 3: Experiences That Affect Perceptions of Therapy

The third theme generated was experiences that affect the perceptions of conservative and advanced therapy. There were a total of 48 codes generated, 19 pertained to the parent code *perception or experience with the office and doctor*, seven codes were related to parent code of *education*, and five codes were related to the parent code of *understanding of disease process*, eight codes pertaining to *willingness to try new approach* and nine codes pertaining to *emotional responses* (see Table 5).

Table 5*Theme 3: Experiences that Affect Perceptions of Therapy*

Name: Theme	Files: Cases	References: Code count
Theme: Experiences that Affect Perceptions of Therapy	6	48
A. Experience with doctor	6	19
B. Education	5	7
C. Understanding of disease	2	5
D. Willingness to try new approach	6	8
E. Emotional Responses	5	9

After I imported the responses from the interviews into NVivo, I generated the word cloud which represented the 48 codes that formed the foundation for theme three (see Figure 6).

Figure 6*Theme 3: Experiences that Affect Perceptions of Therapy*

The most repeated codes are represented by the larger font and the repetition decreases as you move from center to outer edges of the word cloud. The codes were generated as a result of the participants' experiences with the doctor's office and hospitals in general. Participant 2 stated that "I hate hospitals" and "I have a hospital phobia". Participant 6 stated that "I do not like hospitals or going to the doctor". Participant 3 stated "I felt bad but was given hope because others were surviving" when referring to the office visit and pictures of happy people in the pamphlet she received. Participant 4 stated that with her office visit she felt that "poor people are not treated the same as rich people". She felt that the staff "treated her differently" than others in the office. Participant 5 stated "I have to wait a long time to see him" when referring to her time in the waiting room. Participant 1 did not express any dislike or like for going to an office visit.

The second group of codes generated were from the responses of the participants concerning their experience with the doctor. These experiences were either positive or negative. Participant 1 stated "I have an amazing doctor. He is considerate and helps when I have problems." She further stated that her doctor was "very helpful and understanding." Participant 2 stated "he helped me with this" when referring to her sickness and symptoms. Participant 4 stated she was "frustrated" with her doctor because he "comes in and hurry out". She also stated that he "does not really listen" and that he made her feel like "I am not important." Participant 5 stated "he does not really spend a lot of time with me". She also stated that "he talks a few minutes and is gone." She further stated, "he never tells me anything new when I say I am not doing good."

Participant 5 also pointed out that “nurse stays longer than the doctor, and she is nice.”

Participant 6 stated that “nurses are ok”. When describing her doctor during her visit she stated, “I could not understand some of the words he was saying.” Participant 6 added that the doctor was “nice” but “is always running late”, and that he “doesn’t spend enough time with me and does not understand me”.

The codes that were generated under the parent code of *education* and *understanding of disease process* were in reference to the participants experience with understanding their disease and treatment options. Participant 1 stated “he showed examples” of how her heart looked and “he explained” things to her. She also stated that “I really did not understand a lot of it”. Participant 2 stated “I was given a pamphlet” and “I was told to read it so, I read it”. When asked further what she learned Participant 2 stated “my heart is bad, and I needed to take my medicine”. Participant 3 stated “he explained to me, but I did my own research”. Participant 4 stated “he explained to me”. She also said, “I watched a video and went over a lot of things about disease and what to eat.” She further stated” it was too much for one day and I don’t really remember it.” Participant 5 stated that “the nurse gave me a folder with some information”. However, she stated “I do not read good, so I really did not understand.” Participant 6 stated that she received “a paper or handout” but that “I forgot and left it in the office when I was leaving”.

The next nine codes generated were the participants’ experience with willingness to change their current thought process about their treatment and their willingness to try a mentor program. Participant 1 stated she would “love to hear about this” but stated “I

would do the same thing” when referring to changing her therapy plan. Participant 2 stated that “yes I would like that”, but that she “would not change” her therapy. Participant 3 stated “that she would “feel encouraged” and that initially she had “considered surgery” but that “my doctor really didn’t push me that way”.

Participant 4 stated “no, I do not need to talk to someone about being sick, I need help with medical bills”. She also stated, “I do not want to stick anything in my heart.” Participant 5 stated that “I really don’t know. I could talk to her, but I don’t’ know about sticking something in my heart. Finally, Participant 6 stated “I guess that would be okay. It would be nice to talk to someone who understands” but “I would not want to change my treatment if I had to be in the hospital. My grandkids have no one else.”

Finally, the last nine codes generated were the participants’ experiences with their emotional responses to illness and their office visits. Participant 1 stated “I was feeling bad. I was anxious about seeing the doctor.” Participant 2 stated that she was “scared and had anxiety”. She also stated, “I couldn’t eat because I was so afraid I was dying.” Participant 3 stated that she was “scared” but felt “relief” when she started “encouraging myself to get better and to eat better”. Participant 4’s experience was that she had a great deal of “frustration” with her doctor because “he was just not listening to me”. She also stated that she felt “discouraged and nervous.” Participant 5 stated that “I felt *despair* and helpless”. Finally, Participant 6 stated “I am always nervous and “scared”.

Summary

In this chapter, I reviewed the purpose of the study which was to explore the perceptions of women with cardiovascular disease who despite the advances in

cardiovascular care chose a conservative therapy. I presented the setting and demographics pertinent for this study. I reviewed my detailed data collection plan and how I analyzed the data. I also explained how I conducted, recorded, and transcribed the semi- structured interviews utilizing the committee approved questions. I presented both tables and word clouds to demonstrate how I developed my codes and themes for this study followed by a detailed description of the relationship between the codes and the interview responses in helping to develop the study themes.

In chapter 5, I will introduce the chapter, I will discuss the interpretations of the findings based on the 3 themes, the limitations of the study, the recommendations and implications of the study including the social implications and provide a conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

The leading cause of mortality for women worldwide is cardiovascular disease (Gauci et al., 2022). In 2019, cardiovascular disease was responsible for 35% of the total deaths of women (Vogel et al., 2021). In addition, 44% of American women were diagnosed with a cardiovascular disease in 2021 (Wenger et al., 2022). The CDC (2023) estimated that over 60 million women in the United States suffered from cardiovascular disease, making it the leading cause of death for women. Worldwide, cardiovascular disease affects over 289 million women (Vogel et al., 2021).

Women are often undertreated for cardiovascular disease, which leads to disability (Woodard, 2019). This problem is further compounded by the lack of research aimed at women with cardiovascular disease and the adequate treatment they need. Finally, according to the AHA (2022), both indirect and direct costs of cardiovascular disease were over 555 billion dollars a year and were expected to increase to 1.1 trillion dollars by 2035.

In this basic qualitative study, I explored how the perceptions of women with cardiovascular disease affected their views regarding advanced therapy and why they chose conservative therapy over advanced therapy. To gain a better understanding of why women were not using advanced cardiovascular therapy, I used Kelly's personal construct theory which proposed that people were scientists who constructed their reality, and, in this reality, they developed expectations (Kelly, 1963). I examined how women constructed or interpreted their health events and how this interpretation affected their

health care decisions. Kelly's 11 corollaries helped to form the foundation for the themes developed after the interviews were coded. There were themes that emerged:

- Perceptions of conservative therapy
- Perceptions of advanced therapy
- Experiences that affect perceptions of therapy

Interpretation of the Findings

The intent of my study was to answer the question of why, with all the advanced therapies available for cardiovascular disease, were women continuing to choose a conservative therapy over an advanced therapy. I examined the data for three themes: the perceptions of women who chose conservative therapy, the perceptions of women about advanced therapy, and the experiences that affected the perceptions of both conservative and advanced therapy.

Although there were some positive responses to the conservative therapy, my study confirmed that even with worsening symptoms while on the conservative therapy, women continued to proceed with a conservative therapy instead of a more advanced therapy. Even more importantly, their doctors did not prescribe advanced therapy for these women. According to Gauci et al. (2022), women with cardiovascular disease who experienced delays in treatment often had worsening of symptoms and outcomes. Furthermore, the undertreatment of women for their cardiovascular disease also led to increased disability (Woodard, 2019). This was also confirmed by participants in the study who reported disability especially with daily activities such as walking. Two of the

participants were no longer able to work or had reduced workloads as a result of the worsening symptoms.

Although my study could not confirm that physician assessment or bias was an issue for these women not being prescribed an advanced therapy for their worsening symptoms, there have been studies conducted in which physician bias, lack of appropriate physician assessment, and misdiagnosing of cardiovascular disease had played a significant role in women not receiving or benefitting from advanced therapy, and as a result, had worsening outcomes (Balla et al., 2020; Breathett et al., 2020; Geraghty et al., 2020; Woodard, 2019). Although two of the doctors mentioned surgery and one mentioned a defibrillator, the participants did not indicate that their doctors expressed a sense of urgency in changing the therapy plan despite the worsening symptoms.

Despite the fact the participants as part of their conservative therapy, were prescribed medication, half of them still had a negative response. To explain or understand why there was a negative response, my study confirmed the studies that showed the success of medical therapy is dependent on whether a patient had a reduced or preserved ejection fraction and whether the patient could afford the drugs due the cost (see Blumer et al., 2021; Bozkurt et al., 2023; Zhao et al., 2020). Two of the participants in my study reported difficulty with purchasing their medications, and one participant relied on the physician for samples. Although, I did not have information about ejection fractions for these women, research suggests that women on average have a preserved ejection fraction (Vogel et al., 2021). In addition, Vogel et al. (2021) pointed out that there are more therapies and drug treatments, such as guideline-directed medical therapy

drugs or GDMT, for patients with reduced ejection fraction when compared to patients with preserved ejection fraction.

My study also confirmed the literature that perceptions concerning finances, and the lack of family support were contributing factors for women continuing with a conservative therapy and not choosing an advanced therapy. In one study, the authors concluded that the level of income often determined a woman's ability to pay for health care, and it was estimated that one-fourth of all women spent, on average, more than \$2,000 for out-of-pocket medical costs, and one-third often skipped treatment because of these costs (Wenger et al., 2022). Furthermore according to Wenger et al., the costs of treatment for cardiovascular disease were often related to a lack of advanced therapy. Four of the participants did not have insurance to cover the advanced therapy, two of the participants were receiving Medicaid and one was receiving public assistance. The consensus from the interviews was that advanced therapy was costly and due to finances, lack of family support, and responsibilities the participants faced, these women chose a conservative treatment that was the better option for them. Lastly, studies have shown employment status, and income level, directly impact a woman's access to advanced therapy (Shultz et al., 2018).

Although my study involved the interviews of the participants only and not physicians, the results of my study suggested that the experience of the physician patient interaction may had a profound effect on a woman choosing a conservative therapy over an advanced therapy. Studies such as those performed by Breathett et al., (2020), noted that women were often judged on their appearance, whether they had a social support

system, and whether they had children, primarily when being referred for advanced therapy. All the participants, with the exception of one, had children and were responsible for the direct care of spouses and other family members.

One of the participants in the study specifically noted during her office visit that poor people were not treated the same as rich people. This participant also had a negative experience with her physician. According to Zeitler et al. (2022), social determinants often affect outcomes for women and based on the socioeconomic status of the patient, clinicians were less likely to prescribe advanced therapy, and women were less likely to choose advanced therapy. Zeitler et al. also concluded that women who are using conservative therapy were less likely to consider or even use an advanced therapy because of lack of decision-making power. This socioeconomic invisibility can lead to delayed diagnosis, and the clinician's view that treatment would be a risk for these women (Zeitler et al., 2022).

Lastly, clinicians only referred women for advanced therapy if they had a caregiver, which led to women being three times less likely to receive a recommendation for advanced therapy (Kelty et al., 2022). My study confirmed that participants of the study were caregivers, had no support, and were not referred for an advanced therapy despite worsening of symptoms. Two of the participants reported worsening of symptoms with their atrial fibrillation. These women did not have an advanced device such as a defibrillator or pacemaker and their physicians had not prescribed those devices. This is further supported by a study done by Johnson et al. (2018) in which they found that women were 2.5 times less likely to receive an ICD despite clinical guidelines

recommendation of these devices to prevent sudden cardiac death from ventricular tachyarrhythmias and atrial fibrillation.

My study confirmed that the experiences with education, understanding of disease processes, and the communications affect a woman's perceptions of therapy. According to Mohd-Salim et al. (2023), communication between a patient and physician is important in that it helps patients to be informed about their disease process so that they can make the best decisions concerning their health and care. This communication, according to Mohd-Salim et al., can be both verbal and nonverbal and involves the physician's ability to listen effectively to understand the needs of their patients. The participants who experienced a negative response described that their physician was either always running late or that the physician did not take enough time to explain or talk to them about their disease and symptoms. Furthermore, a physician's communication skills are defined by their ability to gain information from the patient about their disease process and to incorporate this information into an accurate diagnosis and treatment plan that they can communicate back to the patient (Mohd-Salim et al., 2023). This communication helps to develop a relationship in which the patient trusts the physician with their care and is more likely to follow the recommendations that the physician may give concerning treatment.

Another example that is aligned with the results of my study is the study by Okunrintemi et al. (2018) who examined the experiences of women in terms of provider communication, their perceptions of health, and satisfaction with the care they received from providers. The authors discovered that patients reported less satisfaction when physicians who were ineffective with their communication skills concerning their disease

process and were less likely to be open with the physicians concerning their symptoms and concerns about their disease.

Whether a woman uses advanced therapy is determined by the relationship between the patient and the physician responsible for diagnosing and providing a treatment plan. A survey from 2012 revealed that only one in five patients reported that their doctor talked to them about cardiovascular disease (Kouvari et al., 2020). My study also confirmed that a lack of education and understanding of the disease process affected decisions to pursue advanced therapy. Lack of awareness of the disease and disease process as well as treatment options and guidelines can lead to poorer outcomes for female patients. This lack of awareness does not only concern providers but also extends to patients as well. For example, Cushman et al. (2021) conducted a 10-year study to determine that a lack of awareness of cardiovascular disease and treatment for women resulted in women not receiving and choosing an advanced therapy.

My study had mixed results with the experience of a mentorship program on a woman's decision to choose a therapy. For half of the participants, the mentorship program would have had a positive effect on their decisions to choose therapy if they had a support system in which they could be mentored by someone with shared experiences. This is confirmed with a study done by Hsich (2019) who noted that when women received counseling concerning the need for an ICD, 63% of the women received an ICD compared to 19.3% who did not receive counseling. Hsich also suggested that when women were supported with counseling and education, they were able to decide to receive an ICD.

However, when participants in my study were not interested in a mentor program, this suggested that programs may need to be more patient specific and may need to be offered shortly after a diagnosis to help clear up any perceptions that affect decisions to proceed with an advanced therapy. This is consistent with the literature that suggested women who receive less lifestyle counseling, and in cases where they were less than 5% chance of being referred to lifestyle change programs, these women had poorer outcomes and less likely to choose advanced therapy (see Balla et al., 2020).

Finally, my study confirmed that the participants reactions and responses and feelings of being scared, fear of death, frustration, relief, encouragement, anxiety, discouragement, and nervousness had an impact on their decisions to proceed with a conservative treatment. Although my study did not explore mental disease with the participants, there are studies that suggest there is a correlation between mental disease and cardiovascular disease in women. Mental disease, which includes depression and anxiety, can impact a woman's emotions and can increase a woman's chances of developing coronary artery disease (Vogel et al., 2021). Furthermore, disorders such as depression have been linked to worsening outcomes after an acute coronary syndrome event with a two to four times higher risk of adverse events (Vogel et al. 2021). According to Manrique-Acevedo et al. (2020), depression has been linked to mortality in patients with coronary artery disease.

In addition, older women with heart failure who had mental health disease often did not seek advanced therapy (Balla et al., 2020). More importantly, if these mental health issues are not addressed appropriately, it can lead to poor quality of life for

women, lack of adherence to treatment, and worsening symptoms of heart failure (Balla et al., 2020; Celano et al., 2018). Women with depression are less likely to adhere to healthy behaviors, such as diet and exercise or limiting smoking and alcohol usage (Celano et al., 2018).

The ability of the physician to recognize and understand why the participants are having these emotional responses for example is important in that it should help them understand what perceptions a woman may have towards her disease and treatment. According to Ghare et al. (2019), the doctor often influences a woman when making decisions about therapy and missing this opportunity to understand her emotions and her perceptions could lead to her not making the best choice for therapy. A lack of understanding and a poor relationship between physician and patient has led to women having a poor perception of their health status and decreased health-related quality of life (Balla et al., 2020).

Kelly's Theoretical Implications.

The theory for this study was Kelly's (1963) theory of personal constructs and his 11 corollaries, which suggest that an individual's behaviors are based on constructs or perceptions that allow an individual to respond to events in their environment (Reynolds, 2013). Perceptions of experiences can impact thought processes that help participants navigate and respond to different stressors such as those that occur in chronic diseases (Reynolds, 2013). The implications of this theory can be explored by using the corollaries of the theory in three areas of this study: the perceptions of the participants, the participant-physician interaction, and the experiences that affect the perceptions of the

participants and their interactions with the physicians, mainly those experiences affected by the participants emotional response.

Based on Kelly's (1963) construction corollary, women with cardiovascular disease developed perceptions about conservative therapy based on past negative or positive experiences. The first perception was that because a conservative therapy did not work for them in the past, a more advanced therapy would also not work. The second perception was that because these women had positive results from the conservative therapy, they did not need to pursue another therapy, and their doctor did not need to implement an advanced therapy.

Furthermore, in keeping with Kelly's (1963) experience corollary, women with cardiovascular disease failed to fully understand the power of their perceptions on making decisions concerning their care. Hence these women continued with a therapy that did not improve the quality of their lives. In alignment with Kelly's(1963) fragmentation corollary, these women also failed to fully understand the extent of their roles as mothers, wives, and caregivers in creating unhealthy perceptions about the reality of the extent of their disease process. As a result, based on the organization corollary, women organized and arranged their perceptions based on an assigned value and this affected their decisions about conservative and advanced therapy. For example, their responsibilities for family outweighed the need for self-care.

According to Kelly's (1963) modulation corollary, women with cardiovascular disease have ability to change perceptions about their reality when considering their disease and treatment option. In the choice corollary, a woman can choose to change her

perceptions if it benefits her to change them based on her reality of how the conservative therapy or invasive therapy will affect her. Finally, Kelly's (1963) modulation corollary suggests that women can be either open or closed to how their perceptions affect their decision. This can occur with proper education and counseling concerning their disease and treatment options.

There were four corollaries that had implications for this study in terms of the physician patient interaction. These were the commonality, range, sociality, and dichotomy corollaries. For example, Kelly's (1963) commonality corollary suggests that if a physician is unable to understand the connection between the patient's reality and her perceptions, the physician will not recognize how a woman's perceptions has impacted decisions concerning her care. This is particularly important when considering an advanced therapy. Furthermore, Kelly's range corollary often predicts a positive or negative physician- patient interaction that can affect decisions the woman makes concerning her care and treatment plan. Kelly's sociality corollary implies that even though the physician may recognize the patient has perceptions, the physician is unable to understand the true meaning of the patient's perceptions towards conservative and advanced therapy. This creates a disconnect between patient and physician in terms of communication which also affects patient education. Finally, the implication of Kelly's dichotomy corollary is that as result of these perceptions and interactions, a woman may need guidance in deciding that a different treatment or more advanced treatment is needed. If she does not receive this guidance, she will not choose a more advanced treatment despite worsening of symptoms. If the physician cannot communicate

effectively with the patient a woman cannot recognize the benefits of an advanced therapy.

Finally, in keeping with Kelly's (1963) individuality corollary, women with cardiovascular disease based their decisions on their current emotional state. Kelly's individuality corollary offered two implications. The first is that a woman's perceptions are based on her emotional reaction and response to significant events such as making medical decisions. The second implication is that women do not deal or react to issues in the same way and physicians must recognize and treat women as a unique individual. Using Kelly's individuality corollary, providers are able to recognize that a woman's reactions and perceptions are unique to her and should be treated and addressed as such. Thus, my results indicate in keeping with Kelly's individuality corollary, the physicians may not recognize the underlying cause of the emotional responses and how it is affecting the participants' decision to choose not an advanced therapy for her worsening of symptoms, and she continues to choose a conservative therapy.

Limitations of the Study

One limitation to this study was the method of recruiting from the social media platform. Although social media platforms are popular, not everyone has access to these sites or the technology to access these platforms. In a study by Sledzieski et al. (2023), they noted that although social media platforms can offer a diverse population, there are still some participants who do not have access. Furthermore, they also noted that this can lead to exclusion of certain socio-economic or demographic groups that may be part of a

study inclusion criteria. This was also noted in the access to the Zoom feature in which two of the participants could not access the feature.

Because time was a limiting factor, the social media platforms posed some limitations in terms of the how much time it took for individuals to actually see the post and respond. According to Taylor and Choi (2022), social media algorithms often determine what individuals see on their social feeds. This was noted in how often I had to repost my original post for the study, and it can be concluded that social media algorithms affected and determined how often someone saw my posts.

Limitations can occur in the design, method, and in the transferability, and dependability of a study. Transferability and dependability help to give a study trustworthiness (See Lincoln and Guba, 1985). One limitation to this study was in recruiting participants with different cardiovascular diagnoses. Four of the participants in this study had been diagnosed with congestive heart failure while one participant was diagnosed with coronary artery disease, and two with a cardiac arrhythmia. According to Alavi et al. (2024), it is important to have a representative sample because in addition to transferability and dependability, a representative sample helps to achieve external validity.

Recommendations

One recommendation for future research is to further examine the impact of perceptions on a woman's decision-making process when choosing therapy. Although this study did not focus on race and ethnicity as in inclusion criterion, a second recommendation is to dissect how perceptions of conservative and advanced therapy vary

or are consistent by race and ethnicity. A third recommendation is to examine how education impacts a woman's perceptions and her decisions to choose one therapy instead of the other. Further research aimed at closely examining how age affects perceptions is another recommendation. I introduced the idea of a mentorship program for women with cardiovascular disease, a future study could examine how impactful such mentorship can be in helping a woman to make difficult decisions concerning her care. Finally, I focused on women and Kelly's theory, one recommendation for future research is to focus on physicians and other clinicians and how Kelly's 11 corollaries applies to their decision-making process which could help better understand the patient-physician relationship.

Implications

Health care disparities, particularly in the care of women with cardiovascular disease, continue to persist for women despite the advances in medicine and technology when compared to the care of men with the same cardiovascular disease (Adigun et al., 2018). Heart disease continues to be the number one killer of women and as of 2023 over sixty million women in the United States suffered from some form of cardiovascular disease (CDC, 2023). Because cardiovascular disease is often not accurately diagnosed in some women, this has led to the underutilization of key treatments that are necessary to help decrease health care disparities and improve outcomes for women who suffer from cardiovascular disease (Hyun et al., 2019).

There are potential impacts for positive social change as a result of this study. For women and their families this would be a decrease in health care disparity and improved outcomes. Decrease in health care disparity and improved outcomes can lead to a

decrease in health care costs because of reductions in hospital readmissions and a decrease in loss of labor as a result of a patient's inability to work, which further places a strain on both the patient and their families. Women are burdened with the cost of cardiovascular disease, and there has been an increase in hospital admissions for women from 1998 to 2017 (Vogel et al., 2021). Women with heart failure are hospitalized more with cardiogenic shock and have poor survival rates when compared to men, and they present with atypical symptoms and delayed help seeking behaviors (Vishram-Nielson et al., 2020). Women with a reduced EF have more symptoms and have similar hospital mortality as men but do not receive the same care as men (Vogel et al., 2021).

For example, the costs of lost wages due to increased morbidity and mortality from heart failure disease was \$12.4 billion in 2020 (Patel, 2021). In 2019, disability from coronary artery disease affected over 182 million people and caused the deaths of 9.14 million people (Roth et al., 2020). The number of women between 35 and 54 years of age who are diagnosed with coronary artery disease is increasing each year (Young & Cho, 2019). It is estimated that out-of-pocket healthcare costs account for over 20% of the income of these families and creates a financial toxicity for these women (Wang et al., 2021). The findings of this study can lead to ways to decrease this financial toxicity.

From an organizational and policy standpoint, a positive social impact is the reduction in the cost of treating women with cardiovascular disease by ensuring that women are receiving the full benefit of advanced therapy. The cost of treating one patient with cardiovascular disease on average is about \$247,822 (Kumar et al., 2022). Inconsistent care and failure to use available advanced therapies can create a burden not

only on patients and their families but also on the healthcare system as a whole. The lack of advanced therapy is expected to create a 70-billion-dollar burden on the healthcare system by 2030 (Patel, 2021).

In addition to decreased disparity and improved outcomes, the social impact of this study can contribute to improved clinical practice in terms of the relationship between patient and physicians and other clinicians who provide care for women with cardiovascular disease. If perceptions are leading women to choose conservative therapy over advanced therapy, educating clinicians and preparing them to recognize the impact of perceptions on decisions can improve how they are discussing and explaining treatment options to these women. Finally, organizations and practices can be made aware of the importance of developing a mentorship program that is unique to the individual patient. The implication of utilizing Kelly's theory and eleven corollaries for leaders is a better understanding of how perceptions of experiences can impact thought processes, and they can help bring this awareness when proposing policies and procedures aimed at improving cardiovascular care for women.

Conclusions

The leading cause of mortality for women worldwide is cardiovascular disease (Gauci et al., 2022). Cardiovascular disease affects over 289 million women worldwide (Vogel et al., 2021). In 2019, cardiovascular disease was responsible for 35% of the total deaths of women (Vogel et al., 2021). In addition, 44% of American women were diagnosed with a cardiovascular disease in 2021 (Wenger et al., 2022).

Cardiovascular disease traditionally had been referred to as a man's disease which has often led to the misdiagnosing of women for care and delays in treatment, which has led to poorer health outcomes for women (Gauci et al., 2022). Because women are often undertreated for cardiovascular disease this has led to disability (Woodard, 2019). This problem is further compounded by the lack of research aimed at women with cardiovascular disease and the adequate treatment they need. Finally, the indirect and direct costs of cardiovascular disease were over 555 billion dollars a year and are expected to increase to 1.1 trillion dollars by 2035 and women will share a large burden of this healthcare costs (AHA, 2022).

I presented an exhaustive literature review that included the data related to women with cardiovascular disease and the unique risk factors that women face for developing cardiovascular disease as well as the health care costs, the morbidity and mortality associated with failure to adequately treat women.

I examined the perceptions of women to better understand the impact of perceptions on a woman's decision to choose a therapy. It examined the perceptions of women who chose a conservative therapy and how these perceptions shaped their perceptions concerning advanced therapy. I focused on three major themes that discussed the perceptions of conservative therapy, the perceptions of advanced therapy, and the experiences that affected perceptions. It is the hope that this study will start the dialogue among providers and clinicians on the importance of considering perceptions when creating treatment plans, and the importance of education for providers on how to

recognize the role of perceptions for women when making decisions to choose a treatment therapy.

The participants in this study shared their perceptions and expressed their honest experiences with healthcare during their journey to fight their cardiovascular disease. They shared their beliefs about their treatment choice and expressed their fears and anxiety about advanced therapy and their outcomes in general. There were those who wanted to learn more about programs that could help them make better choices and others who honestly did not know what direction to go to but wanted to just “feel better.”

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Appendix A: Interview Guide

Qualitative Interview Guideline

Introduction

1. My name is Vanessa Pugh, and I am a doctoral student at Walden University working on my dissertation.
2. As explained during the consent process, I have questions pertaining to your disease and treatment decisions.
3. This interview will last 45-60 minutes. At any time, you have the right to stop the interview and to ask questions if you do not understand something.
4. I will be taking notes as the interview proceeds.

Interview Questions Based on Research Questions and George Kelly's Corollaries

1. Tell me what helped you make the decision to pursue the treatment offered by your doctor for your cardiovascular disease, what was the number one or most important reason for choosing this therapy.
2. Besides your current, what other treatment(s) has your doctor discussed with you and would you have made the same choice if you were not a mother, wife, or caregiver?
3. How would you say this treatment has improved your life or made no significant difference and if you had the opportunity to change your treatment plan, what would you change or do differently and why?
4. In what way (s) do you think finances, insurance, and family support influence your decision for treatment and not another treatment?
5. What has your experience with health care been during your doctor's visit and how did they help you to understand your disease and your treatment options?
6. How would you feel about a program that provided support to you as a mother, wife, caregiver and allowed you to try a different therapy that is considered more invasive than your current therapy?

Wrap Up

- What questions do you have after this interview?
- Explain the procedure for follow up after the study has been completed.

- Review information about 25-dollar gift card
- Thank you to the participant for taking the time to interview.

Appendix B: Flyer

Interview study seeks women with cardiovascular disease.

There is a new study about the perceptions of women with cardiovascular disease who chose a conservative therapy instead of an advanced therapy. The results will help physicians and other caregivers understand the importance of your perceptions towards your care plan. For this study, you are invited to describe and discuss your perceptions.

About the study:

- One 45-60-minute phone interview that will be audio recorded (no videorecording)
- You will receive a \$25 Visa gift card as a thank you.
- To protect your privacy, the published study will not share any names or details that identify you.

Volunteers must meet these requirements:

- 18 years old or older
- History a cardiovascular disease such as heart failure, cardiac arrhythmias, and acute coronary syndrome
Currently receiving conservative treatment such as medication and lifestyle changes

This interview is part of the doctoral study for Vanessa Pugh, a Ph.D. student at Walden University. Interviews will take place during March. **To confidentially volunteer, contact the researcher: Vanessa Pugh at. Email address at**

Appendix C: Email Invitation

Subject line:

Interviewing Cardiovascular patients in March (\$25 thank you gift)

Email message:

There is a new study about the perceptions of women with cardiovascular disease who chose a conservative therapy instead of an advanced therapy. The results will help physicians and other caregivers understand the importance of your perceptions towards your care plan. For this study, you are invited to describe and discuss your perceptions.

About the study:

- One 45–60-minute phone interview that will be audio recorded (no videorecording)
- You will receive a \$25 Visa gift card as a thank you.
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- History a cardiovascular disease such as heart failure, cardiac arrhythmias, and acute coronary syndrome
- Currently receiving conservative treatment such as medication and lifestyle changes

This interview is part of the doctoral study for Vanessa Pugh, a Ph.D. student at Walden University. Interviews will take place during March through July.

Please email to let the researcher know of your interest. You are welcome to forward it to others who might be interested.