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IMPROVING OUTCOMES: ADDRESSING CHALLENGES FACED BY BLACK WOMEN IN CARDIAC REHABILITATION

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Article Info

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Abstract

Cardiovascular disease (CVD), commonly known as heart disease, represents a multifaceted group of conditions impacting the heart and vasculature, encompassing ailments such as coronary artery disease, stroke, hypertension, atherosclerosis, congestive heart failure, and more. In the United States, CVD exacts a staggering annual toll, claiming the lives of over 600,000 individuals. Alarmingly, CVD displays a starkly disproportionate impact across racial and ethnic groups, with Black Americans, American Indians, Alaskan natives, Hispanics, and White men being the most affected. For Black Americans, CVD stands as the leading cause of death, magnifying the urgency of addressing this issue. This ethnic disparity is further compounded by the fact that Black Americans diagnosed with CVD face significantly higher mortality rates compared to their non-Hispanic white counterparts. They are 30% more likely to succumb to CVD and nearly 50% more likely to face CVD-related mortality compared to Hispanics and non-Hispanic Asians. Moreover, Black Americans face a 40% higher likelihood of developing hypertension, a key precursor to CVD, in comparison to non-Hispanic whites, but paradoxically, they experience more challenges in achieving blood pressure control. This dilemma is particularly striking when considering the gender aspect, where Black women face an even greater risk for CVD. They not only manifest CVD at an earlier age but also grapple with higher CVD-related fatality rates in comparison to White women.

1.0 Introduction

Cardiovascular disease (CVD), also commonly referred to as heart disease, describes conditions that affect the heart and vasculature, including coronary artery disease, stroke, hypertension, atherosclerosis, congestive heart failure, and more (Centers for Disease Control and Prevention, 2020). In the United States, CVD results in an annual death count of over 600,000 people (Centers for Disease Control and Prevention, 2020). CVD

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disproportionately affects all racial and ethnic groups and is the leading cause of death in Black Americans, American Indians, Alaskan natives, Hispanics, and White men in the United States (Centers for Disease Control and Prevention, 2020). Black Americans in the United States diagnosed with CVD are 30% more likely to die than non-Hispanic whites and almost 50% more likely to die than Hispanics and non-Hispanic Asians due to CVD (U.S Department of Health and Human Services, 2021). Additionally, Black Americans are 40% more likely to have hypertension than non-Hispanic whites. Still, they are less likely to have their blood pressure under control (U.S. Department of Health and Human Services, 2021). Black women have a greater risk for CVD, develop CVD earlier, and have more CVD-related deaths than White women (Kalinowski et al., 2019).

Cardiac rehabilitation, created in the 1960s, is an individualized outpatient program designed to improve cardiovascular health after an initial cardiac event and decrease the probability of reoccurrence (Mampuya, 2012; Mayo Clinic, 2020). Cardiac rehabilitation often involves exercise training, health education, and, more recently, emotional support. Patients qualify for and can benefit from cardiac rehabilitation following a cardiovascular event regardless of age, sex, and race. Patients include individuals who have experienced a myocardial infarction, underwent a cardiac procedure such as coronary artery bypass surgery or were diagnosed with heart failure or angina (American Heart Association, 2016).

Previous research has found that participation in cardiac rehabilitation is associated with a 32% decreased risk for all-cause mortality and a 25% decrease in the chance of rehospitalization after an acute myocardial infarction (Eijsvogels et al., 2020).

Regardless of these facts, however, cardiac rehabilitation is still underutilized by Black people and women with qualifying cardiovascular diseases (Patel & Brown, 2019; Patel et al., 2019). Black women are among the subgroups who are least likely to utilize cardiac rehabilitation (Eijsvogels et al., 2020; Dunlay et al., 2014; Li et al., 2018). Specifically, Li et al. (2018) found that Black women are 12% less likely to receive a referral to cardiac rehabilitation at hospital discharge than White women. The causes of this disparity and many others remain unknown. Therefore, this literature review aims to answer the following question: what are the barriers that Black women face before and during cardiac rehabilitation? A secondary aim of this review is to offer recommendations that will increase Black women's participation and improve adherence in cardiac rehabilitation settings.

1.1 BACKGROUND

In the 1930s, individuals who experienced acute cardiovascular events were recommended to observe six weeks of bed rest (Mampuya, 2012). Acute arm exercises while sitting in a chair, also known as chair therapy, was introduced in the 1940s to treat cardiovascular disease (Mampuya, 2012). In the 1950s, three-to-five-minute bouts of daily walking were recommended after four weeks of bed rest for patients who experienced cardiovascular events until in-patient cardiac rehabilitation was developed in the 1960s (Mampuya, 2012). The primary objective of cardiac rehabilitation as in-patient care in the 1960s was to address the physical decline that resulted from weeks of bed rest (Mampuya, 2012; Savage et al., 2011). During this period, most cardiac rehabilitation participants in the United States consisted of White males under 65 years old who experienced a myocardial infarction or had coronary artery bypass surgery (Savage et al., 2011). It was not until the mid-1960s that the Civil Rights Act of 1964 prohibited discrimination on the basis of race, color, religion, sex, or national origin in public settings. While this change in legislature allowed people of color more access to necessary healthcare interventions, discriminatory acts before these legal amendments have led to institutionalized racism that continuously perpetuates inequalities in healthcare, including cardiac rehabilitation (Johnson et al., 2021).

During this period, in-patient cardiac rehabilitation included light physical activity such as sitting up in bed or taking brief walks around the facility (Olson, 1994). Previous research from Olson (1994) reports that inpatient cardiac rehabilitation was associated with gradual improvements in the health restoration of coronary patients. Earlier discharges accompanied these improvements for patients (Olson, 1994). With technological advancements and the progression of diagnostic equipment, cardiac rehabilitation could extend beyond inpatient care in the 1970s and 80s (Savage et al., 2011). Physicians began prescribing physical activity to their cardiac patients and tailoring regimes for specific cases based on patients' prognosis and health goals (Olson, 1994).

Throughout the years, participation in cardiac rehabilitation has diversified only slightly as minority status continues to be a predictor of low cardiac rehabilitation participation rates (Vanzella et al., 2021). Previous research finds that only 24.4% of Medicare beneficiaries eligible for cardiac rehabilitation participate in the intervention (Ritchey et al., 2020). 90% of the eligible Medicare beneficiaries self-identified as non-Hispanic White. Of that 24.4%, individuals who self-identified as non-Hispanic Black were 11.2% less likely to participate than those who self-identified as non-Hispanic White. Non-Hispanic Black women specifically were 13.9% less likely to participate than their non-Hispanic White counterparts (Ritchey et al., 2020). Similar disparities exist for Black women in other realms of healthcare, including gynecology, oncology, and psychiatry. Chinn et al. (2021) found that the mortality rate for Black women during pregnancy and when giving birth is three to four times higher than that of White women.

Additionally, breast cancer incidence for Black women has continued to rise since 2012 while remaining constant for White women (Yedjou et al., 2019). Yedjou et al. (2019) also found that among all racial and ethnic groups, Black women have the worst breast cancer survival rate. Statistics such as these exist for various factors, including the persistence of institutionalized racism, intersectional multi-minority status, implicit bias of physicians and providers, and more. Until all elements are addressed, cardiac rehabilitation and other necessary healthcare interventions will continue to be a White-dominated field at the provider and patient levels.

In literature, the word minority is used to describe non-White racial groups, including Blacks or African Americans, Hispanics (excluding Hispanic Whites), Asians, and Native Americans in the United States. However, White people can still be considered minorities when discussing specific characteristics such as sexuality or religious beliefs. In this literature review, the term minority is rigidly used to describe racial subgroups outside the White majority. Additionally, the term Black is used in this literature review to denote individuals of African ancestry, including African American, African, and Afro-Caribbean (Agyemang, 2005). The terms Black and Black American are used interchangeably throughout this literature review. ―People of color‖ is a term used throughout this integrative review to describe individuals who belong to a race other than white.

2.0 **METHODS**

This integrative review is guided by the method laid out by Whittemore and Knafl (2005). An integrative review was the chosen method for this review because it can be applied to all types of research studies. Whittemore and Knafl's (2005) approach to creating an integrative review was used to conduct this research for several reasons. First, this method was recognized by Souza et al. (2010) for its ability to distinguish the integrative review from other review methods. Different techniques for completing integrative studies, such as those defined by Beyea & Nicoll (2005), Whittemore (2005), and Russel (2005), offer different methodological strengths and considerations (Souza et al., 2010). However, Whittemore and Knafl (2005) provide strategies to increase thoroughness and precision for an integrative review—a feature that the other methods lack.

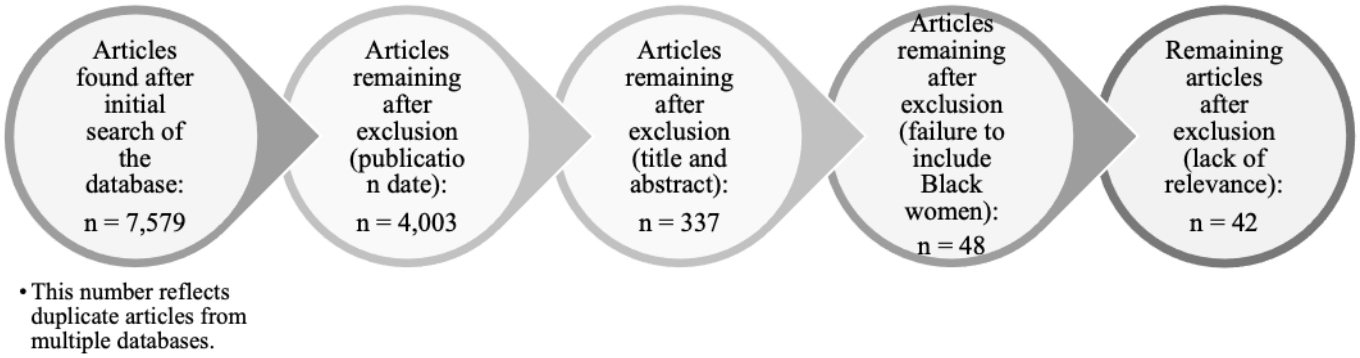
Additionally, Whittemore and Knafl's (2005) technique is the more widely utilized approach for conducting integrative reviews compared to the other methodologies. Using Whittemore and Knafl's method, the problem and purpose of this literature review were identified along with the variables of interest. A research question was formed using the identified problem and determination to find a solution. Following the formation of the research question, a literature search was conducted. The literature search was performed using Boolean logic in various health care focused databases and specific terminology, see Table 1 for details. The search strategy included the assistance of the Health Professions Librarian. The articles were reviewed for inclusion and exclusion criteria based on year of publication, language of publication, and subject of the report (Figure 1). Articles published before 2013, written in a non-English language, and failing to include Black women in the sample were all excluded from the collection as depicted in Figure 1. Collected articles were analyzed in an excel file containing the purpose, method design, sample size, findings, recommendations, limitations, and a summary. Articles in the excel file that were deemed irrelevant after breaking it into sections were also excluded leaving 42articles (Figure 1). The final 42articles were input into an excel file and organized by the leading author's last name.

The authors read each article to determine the direct relationship to the primary research aim of identifying the barriers that hinder the participation of Black women in cardiac rehabilitation programs. Articles were deemed applicable if they included Black women in the study sample and any insight on cardiac rehabilitation or cardiac rehabilitation-qualifying diagnoses: myocardial infarctions, heart failure, percutaneous coronary interventions (PCI), coronary artery bypass surgeries, and heart valve replacements. Further studies were included if they provided any information on health disparities and race-related medical mistrust. Following analysis of the 42 articles, four recurring themes were identified as observed in the results.

Table 1. Search strategies

Database	**Terms for search**	**Inclusion Criteria**
Google Scholar, PubMed, Michigan State University Library, Central Michigan University Library	**Terms related to gender:** women, female **Terms related to race:** Black, Black American, African American, Black persons **Terms related to CVD and treatment:** cardiac rehabilitation, cardiac rehabilitation services, CR, CR service, CVD treatment, heart disease treatment, coronary artery bypass, myocardial infarction, heart attack, cardiovascular event **Terms related to inequity:** Medical mistrust, racial disparities, health disparities, discriminatory health practice	Published between January 2013 and December 2021 Published or translated into the English language Gives any insight about Black women in relation to cardiac rehabilitation services, cardiovascular disease interventions, racial disparities in health care, and medical mistrust

Figure 1. Exclusion and screening process



3.0 Results

3.1 BARRIERS

Disparities in health care settings continuously impede Black women from receiving health care, including cardiac rehabilitation settings. Intersectionality is a term coined by Kimberle Crenshaw to describe how a person's characteristics—race, gender, sexuality, class, etc.—affect their lived experiences (Crenshaw, 1991). Based on the findings of Peters and Keeley (2018), the intersectionality of race, gender, and class are barriers to Black women who seek cardiac rehabilitation. While observing trends in cardiac rehabilitation participation following acute myocardial infarction, Peters and Keeley (2018) found that those less likely to utilize cardiac rehabilitation were more likely to be uneducated and identify as Black and female. Specifically, females had an odds ratio of 0.763 for cardiac rehabilitation participation, with males as the reference. Those identified as Black had an odds ratio of 0.700 for cardiac rehabilitation compared to those identified as White.

Patel et al. (2019) found that 76% of Black patients who underwent heart valve replacement surgery did not enroll in a cardiac rehabilitation program, even though cardiac rehabilitation attendance has decreased rehospitalizations by 34% within a year of discharge. Approximately 60% of women who underwent heart valve replacement

surgery did not enroll in cardiac rehabilitation (Patel et al., 2019). Additionally, a study investigating the correlation between perceived discrimination and stress levels found that experiences of discrimination were higher in Black women than in white women (Cedillo et al., 2020). Previous research has found that higher perceived stress is associated with an increased incidence of cardiovascular disease between55 and 65 years (Felix et al., 2019). Cedillo et al. (2020) found that Black women in this study had higher salivary and hair cortisol levels, increased diastolic blood pressure, and higher levels of high-sensitivity C-reactive protein (hs-CRP) (Cedillo et al., 2020). This finding suggests that being Black and female increases stress levels and, therefore, the risk of developing cardiovascular disease. The stressors of racial discrimination coupled with sex discrimination have an increasingly adverse effect on the cardiovascular health of Black women, putting them at a higher risk than other populations. The barriers that affect Black women have been classified into four themes: lack of physician referral, financial cost, lack of awareness, and lack of representation, discussed in the following sections.

3.1.1 Lack of physician referral

One barrier Black women face when seeking cardiac rehabilitation is the physician's lack of referral and endorsement of this intervention (Li et al., 2018). Research investigating sex and racial disparities in cardiac rehabilitation referrals at hospital discharge found that only 40% of patients eligible for cardiac rehabilitation received a physician referral (Li et al., 2018). Those less likely to receive referrals included Women—who were 12% less likely than men to receive a referral—and Black patients were 22% less likely than white patients to receive a referral (Li et al., 2018). In a study aiming to explore African Americans' experience in cardiac rehabilitation and investigate the physical activity patterns of African Americans with heart failure, Anstey et al. (2016) found that 80% of these patients were never referred to cardiac rehabilitation and never knew that this intervention was an option. McCarthy et al. (2015) also found that White men and women diagnosed with cardiac rehabilitation-qualifying disease were more likely to be referred than Black men and women with the same cardiovascular diseases.

Additionally, women and people of color referred to cardiac rehabilitation had lower mortality rates than those not referred (Li et al., 2018). From an intersectional approach, Black women receive fewer referrals than other patients with cardiac rehabilitation-qualifying diagnoses.

Findings from Mead et al. (2016) also reinforce the idea that there is a lack of physician endorsement through testimonies from minority patients. Many participants reported receiving no information about cardiac rehabilitation from their physicians, while other patients reported convincing their physicians that they needed cardiac rehabilitation (Mead et al., 2016). Physicians reported that their patient's race, gender, and age were personal characteristics that were considered and even interfered with their willingness to endorse cardiac rehabilitation (Mead et al., 2016). Mead et al. (2016) suggests that the specific reason for not referring patients to cardiac rehabilitation demonstrates behaviors that exacerbate the notion of medical mistrust that Black people have towards the United States healthcare system. These physicians have determined that the patient will not comply with cardiac rehabilitation based on the patient's race, gender, and age. These assumptions contribute to health disparities experienced by patients of certain races, genders, and ages. Further, this enforces discrimination as one of the driving factors for the lack of referral and endorsement of cardiac rehabilitation for patients who identify as Black women.

3.1.2 Financial cost

Cost and healthcare coverage of cardiac rehabilitation also serves as a shared barrier among Black women cardiovascular patients. In the United States, 15% of nonelderly Medicaid beneficiaries are White, while the percentage of Black Medicaid beneficiaries is twice as high at 33% (Kaiser Family Foundation, 2021a). Additionally, women make up more than half of Medicaid beneficiaries at 58% of enrollment (Kaiser Family Foundation, 2021b). Regarding cardiac rehabilitation, McCarthy et al. (2015) found that most patients who identified as Black or African American logged into the Acute Coronary Treatment and Intervention Outcomes Network (ACTION) Registry were more likely to lack insurance coverage or have Medicaid or Medicare, while

White patients were more likely to be insured by private insurance companies and health maintenance organizations (HMO). Minority patients reported that their insurance plans either did not include cardiac rehabilitation or limited the number of sessions they were allowed to attend, resulting in high out-of-pocket costs for those seeking the benefits of the intervention (Mead et al., 2016). Additionally, indirect costs of participating in cardiac rehabilitation such as missed employment, childcare, and transportation can also intensify financial barriers to participating in cardiac rehabilitation.

Insurance companies have continuously failed to provide adequate reimbursement for the physicians who refer their patients to cardiac rehabilitation (Elsakr et al., 2019; Valencia et al., 2011). Many cardiac rehabilitation programs rely on reimbursement from insurers to remain open and be a viable option for their consumers. Physicians have reported their patients' lack of insurance as a reason not to endorse cardiac rehabilitation, perpetuating the potential barriers that Black women face for physician referral (Mead et al., 2016). One physician reported not recommending minority patients to cardiac rehabilitation due to the lack of their own financial gain (Mead et al., 2016). Other physicians have reported a significant loss of revenue due to insurance companies not awarding the filled reimbursement as a barrier to remaining open for business (Mead et al., 2016). Subsequently, patients reported having to cease participation in cardiac rehabilitation because reimbursement issues led to the closure of the program they were attending (Mead et al., 2016).

3.1.3 Lack of awareness

Another barrier for Black women seeking cardiac rehabilitation is the lack of awareness about the seriousness of maintaining cardiovascular health and the benefits of the intervention. Previous research focused on minority adherence to cardiac rehabilitation found that Black patients with cardiovascular disease were less likely to adhere to and complete a cardiac rehabilitation program than their White counterparts (Anderson & Emery, 2014). Adherence, in this study, was correlated with having irrational health beliefs about the benefits of cardiac rehabilitation (Anderson & Emery, 2014). Irrational health beliefs are not based on medical evidence and rely on other factors such as personal health experiences, catastrophizing, and illogical inferences (Anderson & Emery, 2014). The Irrational Health Belief Scale (IHBS) measured the participants' cognitive distortion related to health (Anderson & Emery, 2014). The lack of faith in cardiac rehabilitation as an effective intervention may hinder Black women needing cardiac rehabilitation from enrolling in the intervention. Villablanca et al. (2016) found that 29% of Black women were knowledgeable about taking the appropriate actions after a cardiovascular event compared to 56% of White women.

Additionally, approximately 50% of Black women were knowledgeable about the risk factors for CVD and CVD symptoms compared to 60% of White women (Villablanca et al., 2016). There is also a lack of knowledge about the seriousness of certain cardiovascular diseases and risk factors. Jones et al. (2019) found that 86% of Black women underestimated the severity of their cardiovascular health complications suggesting that these patients lacked the proper health education in this area of importance.

3.1.4 Lack of representation

There is a need for representation from Black women in cardiovascular health research and cardiac rehabilitation settings as providers and patients. Participants in a previous study reported attending either one or a few cardiac rehabilitation sessions before discontinuing the program due to the lack of diversity in the patient group (Jones et al., 2019). One participant—a Black woman—stated that her entire class consisted of male patients (Jones et al., 2019). Anttila et al. (2021) found that participants in cardiac rehabilitation emphasized the importance of shared experiences and a sense of reciprocity to be crucial for the rehabilitation process. Additionally, representation from physicians who identify as Black women is vital for increasing Black women's adherence to cardiac rehabilitation interventions. Increasing diversity in personnel may aid in decreasing observed discrimination and increase the comfortability of Black women in these settings. Jackson et al. (2021) found that race discordant pairs were more likely to perceive their interactions as difficult when investigating the associations between patient-physician concordance and visit outcomes. In a study investigating how minority patients are offered

primary care appointments, Black patients were more likely to experience delayed care when facing a human gatekeeper for scheduling appointments (Wisniewski& Walker, 2020).

Similarly, Lin and Kressin (2015) found that physicians were less likely to inform minority patients about available treatment options and the rationale for recommendations. Studies report that less than 3% of the United States adult cardiology physician workforce is made up of Black doctors compared to 51% of White doctors (Johnson et al., 2021). Further, black patients are more likely to report perceived racial discrimination by physicians ranging from subtle to overt acts of disrespect (Brewer & Cooper, 2014). Research suggests that these types of behaviors from physicians lead to increased mistrust of medical infrastructure and a lack of adherence to interventions (Brewer & Cooper, 2014). Black patients have consistently reported higher levels of medical mistrust than their White counterparts (Williamson et al., 2019; Brenick et al., 2017). The lack of representation in cardiac rehabilitation professionals may be seriously hindering Black women from completing a program necessary for their health improvement (Johnson et al., 2021)

The lack of representation from Black women in cardiac rehabilitation research may also serve as a prominent barrier to receiving necessary care quickly. There is very minimal research focused on investigating the effectiveness of various cardiovascular interventions on Black women compared to other racial groups. Therefore, studies performed on study samples excluding Black women have been generalized to this population. However, evidence suggests Black women are impacted differently by certain cardiovascular diseases than White women. (Leigh et al., 2016; Iantorno et al., 2019). Iantorno et al. (2019) found that, when compared with White women, Black women who underwent PCI were more likely to present higher risk factors, including BMI (32 ± 8 vs. 30 ± 7, mean ± SD), hypertension (92.6% vs. 87.5%), diabetes (53.2% vs. 36.6%), cigarette smoking (23.1% vs. 18.5%), and ST-segment depression (24% vs. 18.4%) at least four years earlier. Black women were also more likely to experience an adverse event 1-year after PCI (Iantorno et al., 2019). Efird et al. (2015) found that Black women who underwent a coronary artery bypass graft (CABG) presented more diseased vessels than their White counterparts. Regarding blood pressure responses to high-intensity interval exercise, Carter et al. (2016) found that systolic blood pressure increased approximately 22 hours after high-intensity interval training in normotensive Black women. Inversely, White women showed favorable improvements after the 22 hours. This supports the idea that what is standard for other populations is not always generalizable to Black women and reinforces the need for Black women in research studies. Black women are constantly underrepresented in clinical research, which contributes to the continuous creation of interventions failing to meet their unique and exclusive needs.

3.1.5 Summary of barriers

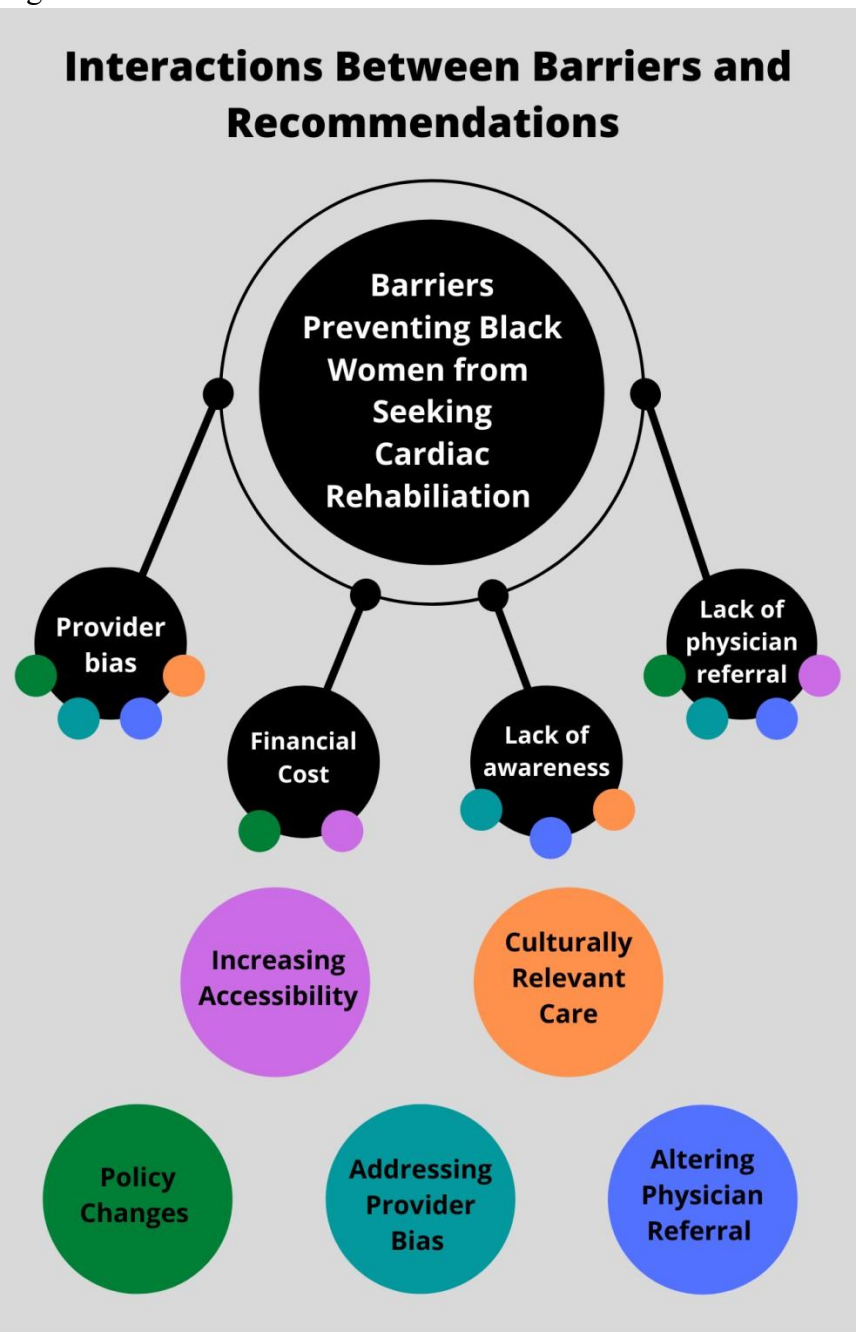
While there are probably several other unexplored barriers preventing Black women from completing cardiac rehabilitation following cardiac events, four consistent themes emerged during the information extraction process. Those themes included the lack of physician referral, financial cost, lack of knowledge about cardiac interventions, and a lack of representation from Black women as patients and providers. Future research should target each of these barriers to explore strategies to address and mitigate them. The following section will discuss recommendations from reviewed literature on addressing these barriers.

3.2RECOMMENDATIONS

Even though cardiac rehabilitation is an effective strategy for improving cardiovascular health, it remains underutilized by minority populations. White patients are more likely to initiate cardiac rehabilitation than Black patients (Prince et al., 2014). Consequently, Black women are experiencing lesser improvements in ischemic heart disease mortality rates than White men and women and Black men (Smilowitz et al., 2016). Barriers such as finances and lack of physician referral constantly contribute to Black women's lack of seeking and adhering to cardiac rehabilitation. However, an abundance of literature focuses on strategies to mitigate the known barriers that may improve Black women's enrollment in cardiac rehabilitation programs.

These recommendations include addressing provider bias, changing the approach for a physician referral, policy changes, improving accessibility, and providing culturally appropriate care. Figure 2 is showing interactions between the barriers and the recommendations necessary to address them.

Figure 2. Interactions between barriers and recommendations.



3.2.1 Addressing provider biases

Implicit biases are unconscious or automatic psychological associations between members of a particular social group and one or more stereotypes (FitzGerald et al., 2019). Physicians and healthcare providers inflicting their implicit personal biases onto patients may be limiting the number of referrals that minority patients, including those who identify as Black women, are receiving to cardiac rehabilitation programs (Castellanos et al., 2019; Mathews & Brewer, 2021). Mathews and Brewer (2021) suggest that implicit bias is a major contributing factor to why racial and ethnic minorities are less likely to be referred to cardiac rehabilitation programs. Specifically, these authors found that some cardiologists believed that individuals from minority groups, including African

Americans, had negative feelings towards exercise that would result in lower participation rates among this subgroup (Mathews & Brewer, 2021). Further, Mathews and Brewer (2021) also found that cardiologists implicitly believed that women benefit less from and would be less likely to utilize cardiac rehabilitation than men.

From an intersectional approach, the implicit biases held by cardiac rehabilitation professionals about African Americans and women individually may be inhibiting Black women from receiving this effective intervention needed to improve their health. Cardiac rehabilitation professionals must receive the necessary training to reduce individual implicit biases and prejudices to improve enrollment and completion rates among Black women. While there is minimal literature about the effectiveness of implicit bias training in healthcare settings, provider bias may also be overcome by increasing diversity among cardiac rehabilitation professionals. Castellanos et al. (2019) found that Black physicians showed no implicit preference for patients compared to White physicians. These researchers also found that women physicians showed significantly less bias towards patients when compared to male physicians (Castellanos et al., 2019).

3.2.2 Approaches to increasing referral

Referrals to cardiac rehabilitation have hindered Black women from participating in an effective and health-benefiting intervention (Li et al., 2018; McCarthy et al., 2015; Mead et al., 2016). One strategy for increasing referrals in this population includes using automatic referral systems (Valencia et al., 2011). Implementation of an automated system will allow cardiac rehabilitation referrals to be issued to every patient that qualifies based on specific criteria, including myocardial infarctions, heart failure, PCI, coronary artery bypass surgeries, heart transplants, and heart valve replacements. By doing so, cardiac rehabilitation will become a more accessible option for Black women who qualify. Grace (2011) has found automatic referral systems to improve both referral and enrollment rates for cardiac rehabilitation compared to manual physician referrals. Specifically, after implementing automated referral systems at multiple Canadian hospitals, Grace (2011) found that referral rates were three times higher than when referrals were the sole responsibility of the physicians. Additionally, cardiac rehabilitation enrollment rates were two times higher than before the intervention (Grace, 2011). Additional research comparing enrollment rates to cardiac rehabilitation from automatic referrals versus physician referrals found that patients referred via the automated system were referred to a cardiac rehabilitation program much quicker (Grace et al., 2007).

Vanzella et al. (2021) also highlighted the importance of having appointed liaisons accessible to patients during the cardiac rehabilitation referral process. Liaisons available to discuss and promote the referral process with patients one-on-one before they are discharged have been found to increase referrals and enrollment (Grace et al., 2007). Grace (2011) also found that referrals and enrollment in cardiac rehabilitation are significantly higher when hospitals and clinics use a combination of automatic referrals with cardiac rehabilitation liaisons. Previous studies have shown that the strength of a physician's referral influences whether or not patients decide to enroll in cardiac rehabilitation programs suggesting that Grace et al.'s (2011) strategy for increasing referrals and enrollment is an effective method (Ghisi et al.,2013). Lastly, implementing a patient liaison program to ensure that Black women receive culturally sensitive encouragement from someone who shares similar life experiences may increase the likelihood of Black women enrolling in cardiac rehabilitation.

3.2.3 Implementation of policy changes

Demonstrating policy changes may improve multiple barriers as depicted in Figure 2. Hospitals and clinics need to reevaluate their policies to examine how they directly affect Black women enrolled in cardiac rehabilitation programs. Some Black women may be deemed ―unqualifying‖ and, thus, excluded from cardiac rehabilitation due to wrongful diagnoses. Eastwood et al. (2013) found that Black women's myocardial infarction symptoms presented differently than White women. Specifically, Black women had lower mean chest pain scores and higher mean stomach pain scores (Eastwood et al., 2013). Subsequently, Black women presenting with atypical pain symptoms also had higher mortality rates than those presenting typical pain symptoms (Eastwood et al., 2013). Overall, Black women had a 33% higher cardiovascular-related mortality rate than their White counterparts.

Therefore, there is a need for culturally relevant policy changes to ensure that this subgroup is getting the proper diagnoses to receive necessary referrals to cardiac rehabilitation.

Black women may not be diagnosed at an equal rate as White women due to differences in cardiovascular disease biomarkers. In a study investigating the associations between race and diagnostic cardiometabolic biomarkers, research shows that Black women's biomarkers differ greatly from white women's (Hackler et al., 2019). After accounting for differences in cardiac structure and body composition, traditional risk factors, and socioeconomic factors, Hackler et al. (2019) found that Black women had higher levels of lipoprotein-a, D-dimer, osteoprotegerin, antinuclear antibodies, and suppression of tumorigenicity-2 than Black men and white people. Lipoprotein-a, antinuclear antibodies, D-dimer, and osteoprotegerin are found in atherosclerotic plaques, which may eventually lead to atherosclerosis of the vessels (Hackler et al., 2019). Suppression of tumorigenicity-2isa prognostic biomarker for heart failure and is associated with increased cardiovascular-related mortality (Liu et al., 2020).

Additionally, Black women had lower levels of adiponectin, soluble receptor to advanced glycation end products (RAGE), and N-terminal pro-B-type natriuretic peptide than Black men and white people (Hackler et al., 2019). In a separate study investigating the racial differences of malignant left ventricular hypertrophy among

Black patients, Lewis et al. (2020) found that malignant left ventricular hypertrophy was three times higher in Black patients than white patients. With further examination, the researchers found that the malignant left ventricular hypertrophy phenotype was more frequent in Black women than in White patients (Lewis et al., 2020). Healthcare administrators should direct physician practices towards becoming more aware of cultural differences. There is a need for practical, nationwide changes to how physicians and healthcare providers screen Black women before diagnosing.

To maintain improvements for Black women in health care, medical education must be altered to promote differences in care among racial subgroups, including Black women. Medical students have reported perceiving diversity in patients as something that creates problems for physicians (Nazar et al., 2015). Additionally, these same students reported observing questionable practices related to diversity but having no ability to question these acts (Nazar et al., 2015). These findings support a need for reform in medical education. Bolnick (2015) argues that geneticists, historians, sociologists, and anthropologists need to intervene in medical, and educational practices to reform the United States medical curriculum. This study highlights a significant disconnect between the training provided by medical schools on race and epigenetic variation and what physicians report that they should know about these topics. All medical students must obtain the necessary, multifaceted training on the complexities of race and the social constructs that may lead to health differences in certain groups, such as Black women. It is recommended that social medicine and epidemiology be incorporated into medical training (Bolnick, 2015). Implementing this change for medical students will emphasize the importance of understanding the sociocultural and environmental factors that form poor health behaviors and outcomes in minority groups. This will also allow physicians to make appropriate diagnoses and treatment decisions based on science rather than biases and stereotypes.

3.2.4 Increasing accessibility

Cardiac rehabilitation is an intervention that is not always accessible to those in need of it. In a study investigating the association between neighborhood socioeconomic status and cardiac rehabilitation participation, Bachmann et al. (2017) found that out of over 4,000 patients eligible for cardiac rehabilitation, only 8% participated in the intervention. Additionally, patients who lived in the most underserved communities were less than half as likely to start cardiac rehabilitation than patients who did not (Bachmann et al., 2017). Those in underserved communities are less likely to have reliable transportation, availability, and healthcare coverage to participate in cardiac rehabilitation (Mead et al., 2016). Black men and women are over-represented in underserved communities around the United States (U.S. Census Bureau, 2019). Therefore, one solution to increase participation in cardiac rehabilitation is to offer home-based program options. Langer et al. (2021) highlight the importance of having familiar settings to improve the participant retention rate. Home-based cardiac rehabilitation

will eliminate barriers linked to transportation and allow patients to receive needed care in the comfort of their own homes. Kraal et al. (2017) found that home-based cardiac rehabilitation programs with telemonitoring guidance produced the same benefits on physical activity levels, physical fitness, and health-related quality of life as clinic-based cardiac rehabilitation programs. However, patients who participated in home-based cardiac rehabilitation reported higher patient satisfaction scores and found this intervention to be more cost-effective than clinic-based cardiac rehabilitation (Kraal et al., 2017). Whittaker and Wade (2014) found that cardiac rehabilitation completion rates were almost twice as high for participants who enrolled in the home-based intervention compared to the clinic-based intervention. Additionally, patients who participated in home-based cardiac rehabilitation saved over $500 in costs compared to the patients who attended clinic-based cardiac rehabilitation (Whittaker & Wade, 2014). Offering home-based cardiac rehabilitation would provide a more accessible and costeffective means for Black women in need of cardiac rehabilitation.

Aside from offering home-based cardiac rehabilitation, healthcare organizations may assist the community by providing free or low-cost community-based options for Black women to provide care and promote regular physical activity in this population. Romero et al. (2018) and Sun et al. (2017) demonstrated a need for this type of intervention through their findings. Specifically, uninsured women and women with Medicaid had higher hospital readmission rates than patients insured by companies other than Medicaid(Romero et al., 2018).Sun et al. (2017) found that Medicaid beneficiaries and uninsured patients were among the demographic subgroups less likely to participate in cardiac rehabilitation.Moreover,in2017, 14.4% of Black women reported having no healthcare coverage, and 27% of Black women reported being covered by Medicaid (Kaiser Family Foundation, 2019a; Kaiser Family Foundation, 2019b).Mead et al. (2016) found that the lack of insurance coverage and reimbursement coupled with out-of-pocket costs act as a deterrent for cardiac rehabilitation participation. These findings suggest a need for more financially manageable care options outside of the hospital.

However, an intervention such as this would require many professionals' volunteer help, including exercise physiologists, nutritionists, and psychologists. In a systematic review examining the outcomes of community-based healthcare interventions, Haldane et al. (2019) found that community-based interventions consistently elicit positive health outcomes for participants, including reduced hospitalization, symptoms, and risk factors. These participants most favorably showed improved behavioral risk factors and quality of life scores (Haldane et al., 2019).

Similarly, Bowdon et al. (2018) found that Black women who participated in a structured exercise intervention not only saw significant decreases in body mass index (BMI), resting blood pressure, and total cholesterol post-conditioning but also adopted healthier dietary habits in the absence of any form of nutritional counseling. While these findings have been conducted in non-cardiovascular-related research, they may apply to a community-based cardiac rehabilitation program. Future researchers should collaborate with community partners to create and test community-based cardiac rehabilitation interventions' effectiveness on Black women’s participation and adherence.

3.2.5 Designingculturally relevantcardiac rehabilitation programs

Developing culturally relevant interventions could be an excellent solution for increasing Black women’s access and retention to cardiac rehabilitation programs. While culturally relevant cardiac rehabilitation programs have yet to be created, one could structure such a program using Ladson-Billings (2014) culturally relevant pedagogy as an outline. Researchers and physicians should first investigate what is working for patients who identify as Black women to begin constructing culturally relevant cardiac rehabilitation programs (Ladson-Billings, 2014). Further, identification of Black women’s needs in cardiac rehabilitation should be assessed and considered for further development of the culturally relevant programs. Black women have consistently presented a necessity for safe, inclusive, and judgment-free settings (Gary et al., 2015). Previous research finds that psychological influences affect Black women’s perceptions of receiving necessary healthcare (Abel et al., 2021; Jones et al., 2014). Among Black women with hypertension, delaying treatment and poorly adhering to medical instruction was associated with psychological factors such as shame and embarrassment associated with having hypertension

(Abel et al., 2021).Patients described the embarrassment of taking blood pressure medications in public and the humiliation of their diagnosis, signifying poor health and self-care (Abel et al., 2021).Recent studies have revealed that Black women diagnosed with cancer experience similar feelings of shame and embarrassment directed by their healthcare professionals (Jones et al., 2014). These feelings were attributed to negative perceptions from oncologists during patient-physician interactions (Jones et al., 2014). These findings support the need for culturally relevant healthcare programs, including cardiac rehabilitation programs.

Standard healthcare approaches—methods created through a White Eurocentric lens—have positively impacted Black women. However, the positive impacts seen in Black women are often less than that of other populations. For example, Johnson et al. (2015) found that Black women in standard cardiac rehabilitation programs saw minor improvements in health after participating in cardiac rehabilitation. Previous research has found that designing culturally relevant healthcare programs for Black women has resulted in higher participation rates and improved health outcomes (Jones, 2007; Haldane, 2019; Ware et al., 2019).While culturally relevant research is lacking for cardiac rehabilitation programs, other healthcare programs such as sexual health interventions and mental health groups have shown that culturally relevant programs positively impact Black women. In a systematic review focused on the effectiveness of sexual health interventions catered to Black women, Ware et al. (2019) found that culturally relevant programs specifically structured to benefit Black women significantly improved attitudes, intentions, self-efficacy, communication, sexual behaviors, adverse health outcomes, and knowledge on sexual health.

Additionally, Jones (2007) found that Black women who underwent a culturally relevant psychological intervention felt more in control of their emotions, increased their sense of control over life outcomes, and increased their ability to manage challenging circumstances compared to the control group who underwent a standard psychological intervention. This evidence suggests that developing culturally relevant healthcare programs for Black women would benefit and increase participation in cardiac rehabilitation for this population. To design culturally relevant healthcare programs, the main focus must be ensuring that Black women feel welcomed, comfortable, safe, and secure in the environments where they are receiving care. Encouraging conversations and sharing experiences between the patient and provider should be promoted to launch trustworthy relationships.

4.0 LIMITATIONS

This literature review has several limitations that need to be addressed. First, only four databases were used to search for articles. Therefore, we may have overlooked studies relevant to our literature review.

However, the searched databases contained articles from various healthcare discipline journals, including those specific to cardiovascular functioning, cardiac rehabilitation, and minority groups.

Second, only articles published between 2013 and 2021 were included in this literature review. Thus, articles relevant to this literature review but outside the specified dates may have been missed. However, the background section of this literature review was designed to provide context for and address cardiac rehabilitation years before 2013.Future studies should focus on cardiac rehabilitation participation before 2013 to understand how these barriers first arose and how healthcare settings have perpetuated these barriers throughout the years. Third, this literature review is specific to the needs of Black women. Therefore, all obstacles and recommendations may not generalize to other racial groups seeking or participating in cardiac rehabilitation. Future researchers should investigate the unique barriers that impact other races participating in cardiac rehabilitation. Future research must address how healthcare policies and provider biases contribute to poor cardiac rehabilitation participation for Black women. Studies should explore how in-home cardiac rehabilitation may help limit the access barriers to cardiac rehabilitation for patients who do not have the means or resources to avail themselves of the more conventional programs.

5.0 CONCLUSION

The literature review findings offer healthcare clinics—specifically, cardiac rehabilitation centers—the opportunity to transform into settings that are more inclusive and appropriate for Black women seeking treatment. All patients, regardless of personal characteristics, have the right to equal healthcare and fair treatment in healthcare settings. To promote social justice in cardiac rehabilitation programs, physicians and therapists must address their implicit and explicit biases and become advocates for their patients, including those who identify as Black women. All patients should be able to receive care in a way that is inviting, safe, inclusive, and culturally appropriate.

Healthcare administrators and executive staff must be considerate and purposeful when designing cardiac rehabilitation centers. Addressing the issues that perpetuate the barriers that Black women face when seeking cardiac rehabilitation is the first step to creating culturally relevant and appropriate environments for this population. Additionally, Black women should put themselves first and consider cardiac rehabilitation asself-care and a health maintenance activity to prevent further complications. Current and future cardiac rehabilitation programs must create an inclusive environment that welcomes diverse students into the field to foster a more culturally diverse and relevant program for patients.

Aside from healthcare personnel, insurance companies must also consider Black women's needs when designing insurance plans. Policymakers must utilize relevant literature to develop insurance plans that will be available and accessible to more than just the White majority. Insurance plans must be designed with minority groups in mind, including Black women. Future studies should focus directly on insurance and participation rates among Black women. Similarly, community interventions should begin targeting Black women and the spaces in which they occupy to increase participation among this group. When Black women begin participating in these interventions, researchers will be able to deem whether or not these interventions are truly beneficial to this subgroup.

The state of cardiac rehabilitation will continue to perpetuate an unwelcoming environment for Black women who need its services until the barriers are eliminated, and new and more inclusive solutions begin to emerge. It is essential to continue hearing the perspective of Black women in these settings and the physicians who get the opportunity to interact with patients who identify as Black women. It is also crucial that conversation in this area remain relevant to foster critical and necessary changes in the structure of cardiac rehabilitation. Future research should continue to delve into the obstacles Black women and other minorities face in cardiac rehabilitation to make this an intervention that is accessible and useful to more than just White people.

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