Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Signature:

_____

DeJa Love

Recommendations to Prevent Racial Discrimination in Health Care Delivery: A Review of Evidence About Physician Bias Toward African American Patients With Chronic Disease and Best Practices to Alleviate Institutionalized Prejudice as a Way to Promote Health Equity.

DeJa Love

Master of Public Health

Hubert Department of Global Health

_____

Mary Beth Weber, PhD, MPH
Committee Chair

Recommendations to Prevent Racial Discrimination in Health Care Delivery: A Review of Evidence About Physician Bias Toward African American Patients With Chronic Disease and Best Practices to Alleviate Institutionalized Prejudice as a Way to Promote Health Equity.

DeJa Love

Bachelor of Arts, Human Services
Lincoln University
2006

Thesis Committee Chair: Mary Beth Weber, PhD, MPH

An abstract of
A thesis submitted to the Faculty of the Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of

Master of Public Health
in the Hubert Department of Global Health
2015

Abstract

Recommendations to Prevent Racial Discrimination in Health Care Delivery: A Review of Evidence About Physician Bias Toward African American Patients With Chronic Disease and Best Practices to Alleviate Institutionalized Prejudice as a Way to Promote Health Equity.

By DeJa Love

Background: Increasingly, data are starting to reveal how physicians unknowingly have bias toward certain patients and how this affects patient care. Physician bias is a type of implicit or unconscious bias, the favoritism of one social group over another based on a person's attitudes or stereotypes that unconsciously affect one's understanding, actions, and decisions. Aims: The goal of this systematic review of literature is to increase public health and clinical medicine's awareness of physician bias toward African American patients with chronic disease with the following aims: Aim 1: To review and summarize the literature on physician bias in the management and treatment of African America's with chronic diseases; and Aim 2: Based on the current evidence, to make recommendations for best practices to prevent racial discrimination in health care delivery as a way to alleviate institutionalized prejudice and promote health equity.

Methods: A systematic review of literature was performed in Pub Med for all peer reviewed articles from the last five years on physician bias and chronic disease treatment and care in African American adults.

Results: This search results in 11 articles, which discussed physician bias in the treatment of African American patients with chronic diseases including, hypertension, prostate cancer, osteoarthritis, tumors, diabetes, breast cancer, oral cancer, and stroke. The results reveal that African American patients perceive their physicians have bias toward them and that physicians base clinical treatment decisions based on a patient's race and not always their physiological disease presentation.

Conclusions: Understanding physician bias as a public health concern and human rights issue is a way health providers, clinicians, public health practitioners, and researchers can attempt to address its negative health implications. Implementing debiasing trainings and incorporating consistent discussions to address bias are practical methods public health and clinical medicine can start the process of addressing implicit bias.

Recommendations to Prevent Racial Discrimination in Health Care Delivery: A Review of Evidence About Physician Bias Toward African American Patients With Chronic Disease and Best Practices to Alleviate Institutionalized Prejudice as a Way to Promote Health Equity.

DeJa Love
Bachelor of Arts, Human Services
Lincoln University
2006

Thesis Committee Chair: Mary Beth Weber, PhD, MPH

A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of

Master of Public Health
in the Hubert Department of Global Health
2015

Acknowledgements

I would not exist without the unwavering support of my family who always see greatness in me, even when I fail to feel it, and encourage me during the challenges that life can present. I greatly appreciate you all.

Thank you to Hannah Cooper for inspiring me to speak up about challenging topics that often go unspoken in public health. Thank you for teaching me how to frame issues of race in a public health context, as a way to spark awareness on race, as a determinant of population health. I greatly appreciate your humility, kindness, and respect you demonstrate to everyone. Thank you for being an advocate and helping me not feel alone in my passion of discussing challenging topics.

Thank you to Miriam Kiser for providing a class (Health as Social Justice) that goes against the grain of typical public health courses and for being a proponent of social justice in a structure that does not always support or value it.

Thank you to Richard Levinson for being open and receptive to my different perspectives while always wanting to learn and hear a non-traditional student's voice.

Thank you to my thesis adviser (Mary Beth Weber) and my committee member (Dawn Comeau) who both patiently advised me through several iterations of chapters and helped me condense broad ideas into evidence based research. Mary Beth, thank you for your consistent advisement, encouragement, and support. I appreciate you challenging me and allowing me to peruse my research interest, while always probing me to go deeper.

Thank you to Roger Presswood for always validating my unique experience at the Rollins School of Public Health and providing a real world context.

Thank you Winifred Thompson and Karen Andes for confidently modeling how public health is centered on social justice, which is my passion.

Table of Contents

Chapter I: Introduction

This thesis described the justification, methods and results for a systematic review of the literature on physician bias in the treatment and management of chronic diseases. This chapter provides the problem and purpose statement that warrants this research. The second chapter provides a detailed background of the significance of physician bias and research on its occurrence. Additionally, the second chapter includes research on health disparities in African Americans, racism and its role in health, physician bias, the outcome of physician bias, and how implicit bias threatens public health and clinical medicine. The third chapter presents the methodology for the systematic review and the fourth chapter details the results from this systematic review of literature. The fifth and final chapter presents the discussion (interpreting this study's results), conclusion, and recommendation to public health and clinical medicine.

Introduction and Rationale

Increasingly, evidence from previous studies is starting to reveal how physicians unknowingly have bias toward certain patients and how this affects patient care (Haider et al., 2011). Physician bias is a type of implicit or unconscious bias, the favoritism of one social group over another based on a person's attitudes or stereotypes that unconsciously affect one's understanding, actions, and decisions (Staats, 2014).

With the rise of health disparities in the United States and poor health outcomes increasing, physician subconscious bias is one contributing issue that leads to health disparities in health care (Jones et al., 2013). Even when all patients have access to health care regardless of race, such as in the Veteran's Health Administration, pervasive disparities in health care exist

(Sabin, Nosek, Greenwald, & Rivara, 2009). For instance, the Institute of Medicine's (IOM) report on racial and ethnic disparities (Unequal Treatment) validated that minorities receive poor quality of health care in areas such as cardiovascular disease, diabetes management, pain management, and other chronic diseases and aspects of health care (Sabin et al., 2009). As a result of the IOM report, health care provider bias (also termed physician bias) and stereotyping were deemed to be two instances that lead to health disparities (Sabin et al., 2009). Although literature bolsters the IOM's claim on the imperativeness of addressing physician bias, a gap in the literature exists in implementing evidence-based practices to mitigate its detrimental impact on patient's health. However, in order to design effective studies and practices guidelines to eliminate physician bias, a better understanding of the literature on the susceptibility to bias is essential in eliminating health disparities and attaining health equity.

In addition to the role physician bias contributes to health disparities, chronic disease is the focus of this systematic review because literature suggests that physician bias manifest in clinical decisions specifically for chronic conditions, which currently require a multifaceted approach, and bias can exacerbate the treatment decisions, rather than improve the outcome (Bodenheimer, Chen, & Bennett, 2009). One report cites that 133 million Americans have at least one chronic disease and this number is expected to increase to 157 million by 2020 (Bodenheimer et al., 2009). Since a significant portion of the population are impacted by chronic disease, understanding the role physician bias plays in decisions that affect a vast population as well as a marginalized group is crucial in attaining the goal of health equity for all Americans. African Americans have higher rates of chronic diseases compared to White Americans, thus understanding one of the contributing factors that leads to this disparity is important.

Problem and Significance Statement

This systematic review of literature will present recently published studies on physician bias in the treatment and management of chronic disease in an attempt to understand the overall research on this topic. By reviewing the literature on this topic, we hope to increase awareness of physician bias as a challenging behavior to measure and a contributor to racial health disparities of African Americans in the United States. Public health practitioners and researchers have an inadequate understanding of how physician bias impacts the public's health (Ansell & McDonald, 2015). Although clinical medicine and public health are increasingly collaborative and mutually beneficial, a gap remains in connecting the two disciplines, and as a result, public health researchers and practitioners may not be aware of clinical behaviors such as physician bias that lead to health disparities, which public health is centered on preventing and addressing. Thus, public health interventions may not be as effective since physician bias, if un-acknowledged, can create a cyclical process of perpetual health disparities. Ultimately, this systematic review will fill the gap in knowledge in acknowledging physician bias as threat to public health and clinical medicine's intent of preventing illness and health disparities.

Goal Statement and Research Aim

The goal of this systematic review of the literature is to increase public health's and clinical medicine's awareness of physician bias toward African American patients with chronic disease. In order to do this, we have the following aims:

Aim 1: To review and summarize the literature on physician bias in the management and treatment of African America's with chronic diseases

Aim 2: Based on the current evidence, to make recommendations for best practices to prevent racial discrimination in health care delivery as away to alleviate institutionalized prejudice and promote health equity.

This study intends to create awareness about a subtle social determinant of health that adversely impacts a significant portion of the population(Ansell & McDonald, 2015). This study aims to present and explain the complexities that create physician bias and its detrimental outcomes. Public health practitioners, researchers, and health providers can unknowingly perpetrate bias (Bassett, 2015a). Ultimately, this study plans to present recommendations on how to mitigate this behavior as a way to alleviate health disparities in African Americans. Since public health is rooted in social justice practices of promoting health equity, the aim of this study is to educate health professionals about physician bias and find effective ways to help health professionals acknowledge, identify, and overcome their own biases (Barry S. Levy, 2013). Although the focus of this study is on African Americans, we suspect that physician biases can extend to other minority groups. This study aims to be an initial step in the long term process toward eliminating bias.

Chapter II: Literature Review and Background

Introduction

The following chapter will provide a framework in understanding this study's research aim. First we will discuss health disparities in African Americans and social factors that perpetuate such disparities. Second, we will provide an overview of racism and the role of discriminatory practices in population health. Third, we will investigate physician bias and its function in contributing to racial health disparities. Fourth, we will discuss the outcome of physician bias. Last, we will clarify the knowledge gap in this research and explain why public health and clinical medicine must explore the role physician bias contributes to racial health disparities.

Health Disparities in African Americans

Chronic conditions (i.e., diabetes, cancer, hypertension, etc.) are increasing in prevalence in all race-ethnic groups. One report indicates that 133 million Americans had a minimum of one chronic disease in 2005 (Bodenheimer et al., 2009). This number is projected to increase to 157 million Americans in 2020 (Bodenheimer et al., 2009). Such an increase has vast public health and clinical medicine implications. For instance, the increased prevalence will strain the health care system while much needed prevention will be challenging to implement due to a lack of resources (Bodenheimer et al., 2009).

In spite of the advancement in medical technology and incorporating preventative approaches to mitigating diseases, health disparities continue to impact many populations in the United States. The Healthy People 2020 (a report on national objectives to improve the health of all Americans) defines health disparities as:

> *A particular type of health difference that is closely linked with economic, social, or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater social or economic obstacles to health based on their racial or ethnic group, religion, socioeconomic status, gender, age, or mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.* (P. Braveman, 2014).

The significance of understanding the definition of health disparities is attributed to a large body of literature validating how they propagate preventable illnesses (P. Braveman, 2014). Specifically, African Americans encounter one of the greatest burdens of health disparities compared to other ethnicities (Baldwin, 2003). An example of a health disparity that disproportionately affects African Americans is coronary heart disease (Woodard, Hernandez, Lees, & Petersen, 2005). In general, African American woman have a 63% higher heart disease rate than White women, and African American men have a 37% higher heart disease rate than White men (Fincher et al., 2004). Numerous studies (Williams & Jackson, 2005) (Plescia, Herrick, & Chavis, 2008) (Cynthia Hudley, 2014) (Gehlert et al., 2008) cite several causal pathways for this disparity such as lack of access to healthcare, advanced progression of the disease before seeking healthcare, and poor health behaviors, yet one important factors, the systemic cause of this disparity, is rarely discussed.

Other cardiometabolic diseases (diabetes, obesity, and hypertension) affect African Americans at disproportionately higher rates than their White counterparts. Diabetes is a chronic disease affecting African Americans at higher prevalence rates than most ethnicities (Goode & Jack, 2014). Compared to White Americans, African Americans have almost double the

prevalence of type 2 diabetes (Staiano et al., 2015). Obesity is a risk factor for type 2 diabetes, and one study reports that African American women have 58.6% prevalence of obesity and African American men have 38.8% prevalence, compared to White women at 33.4% and White men at 36.4% (Staiano et al., 2015). However, the location of where body fat is stored can predict type 2 diabetes, and although White Americans have higher levels of fat in critical areas that predict insulin resistance, compared to African Americans, Whites do not have higher prevalence of diabetes as African Americans, indicating that disease risk is more complicated and due to factors beyond obesity (Staiano et al., 2015). Hypertension is another risk and one of the most common risk factors for cardiovascular disease and African Americans generally have a higher prevalence (Rodriguez & Ferdinand, 2015). Compounding the high prevalence rate, African Americans experience an onset of hypertension at an earlier age (Rodriguez & Ferdinand, 2015). The factors that contribute to such stark disparities will be addressed below.

African Americans have a greater risk of mortality from all common types of cancer (Samuel et al., 2014). This may be due to differences in care provided to African Americans. For example, African Americans receive significantly less chemotherapy for treatment of colorectal cancer than White Americans (Zullig et al., 2013). A recent study could not explain this racial disparity in chemotherapy treatment, yet hypothesized that it is attributed to African American patients not receiving the same quality care from physicians who consequently do not recommend newer chemotherapy regimens, which are more effective in treating cancer (Obeidat et al., 2010). Other untested factors may contribute to this disparity in chemotherapy recommendations, such as patient preference, access to healthcare, and level of insurance (Obeidat et al., 2010).

Cervical cancer disproportionately affects African Americans (Bellinger, Millegan, & Abdalla, 2015). In spite of national preventive screening campaigns (such as pap smears) and the approval of HPV (human papillomavirus) vaccines by the U.S. Federal Drug Administration, African American woman have higher incidences and mortality from cervical cancer (Bellinger et al., 2015). The incidence rate of cervical cancer for African American women was 9.8 per 100,000 in 2010 and the incidence rate for White women was 7.2 per 100,000 (Bellinger et al., 2015). Race is not the sole factor that contributes to this, behaviors, awareness, and prevention contribute to this outcome (Bellinger et al., 2015).

Racism and its Role in Health

Despite significant progress in the United States in addressing racial equality, racism permeates every aspect of American society and manifest itself in negative health effects of non-White ethnic populations (Williams & Mohammed, 2013). These negative health effects include disparities in the onset of disease, disease severity, disease progression, mortality rates, and higher instances of concurrent chronic diseases (Williams & Mohammed, 2013). Socioeconomic status and income levels are consistently cited as one of the main causes of these disparities, even though a significant number of African Americans have attained education and income levels similar to their White counterparts (Williams & Mohammed, 2013). Encounters of racial discrimination create disease and impede wellbeing (Jackson et al., 1996). For instance, stressful life events such as traumatic experiences or not feeling in control of one's life are connected with the advancement of cardiovascular disease and type 2 diabetes, particularly in minority populations (Kelly & Ismail, 2015). Racial discrimination can reduce a person's opportunities in life such as employment, education, and housing (Jackson et al., 1996). Consequently, these measures predict socioeconomic status as well as health (Jackson et al., 1996). Experiences of

unequal treatment based on race negatively impacts psychological processing, and such experiences lead to psychological distress and mental illness (Jackson et al., 1996). For example, interacting with a person and providing different levels of support based on his or her race promotes unequal quality of health care, which can lead to inequitable health outcomes (Jackson et al., 1996).

From a holistic perspective, racism in health is associated with a history of medical experimentation on minority populations, which helps to understand why some members of minority populations may mistrust the health care system (Chen, Fryer, Phillips, Wilson, & Pathman, 2005). Systemic racism theory attempts to explain racism in the context of health (Feagin & Bennefield, 2014). The theory suggests that racism can incorporate decisions and policies based on a person's race as a way to minimize racial groups, which manifests in healthcare administration (Feagin & Bennefield, 2014). Consequently, institutionalized racism, which is defined as structures, policies, practices, and norms resulting in differential access to the goods, services, and opportunities of society by race (Camara Phyllis Jones, 2003), is not as evident or recognizable as an individual's actions but it is just as detrimental (Feagin & Bennefield, 2014). Systemic racism theory incorporates a framework in identifying the following aspects of racism that pervade the United States: dominant racial hierarchy (the structure of dominant racial groups inequitably apportioned positive social value such as wealth and power, and secondary racial groups inequitably apportioned negative social value such as low status and poverty) (Sidanius, Levin, Federico, & Pratto, 2001); individual and collective discrimination; reproduction of racial inequalities; hierarchal institutions (i.e., National Institutes of Health and American Medical Association whose board members and directors are disproportionately White at 85% and 83% respectively) under-representing Americans of color; and White racial framing

(Feagin & Bennefield, 2014). An example of White racial framing is the oversaturation of key decision makers, policymakers, researchers, and medical officials who are not members of minority populations who focus on health disparities that affect people of color, without addressing institutionalized structures that persist in perpetuating these inequalities (Feagin & Bennefield, 2014). Although Harvard University's School of Public Health cited racism in a 2003 article to the American Journal of Public Health ,"Does Racism Harm Health et.al?" (Krieger, 2003), as a determinant of public health, public health researchers are reluctant to accept its contribution in impacting health, mainly due to many perceiving racism to simplify the complexities of health disparities (Feagin & Bennefield, 2014).

Physician Bias

Although physicians adhere to the Hippocratic Oath of pledging to ethically treat all patients with respect and implement evidence based strategies to prevent discriminatory practices, physicians can unknowingly make assumptions and have bias toward patients who are different from themselves (Chapman et al., 2013). This subconscious bias, also referred to as implicit bias, stems from systemic racism (Godsil, 2011). Implicit physician bias manifest when physicians unintentionally provide preferential treatment to a patient based on his or her race, income, education, sexual orientation, etc. (Oliver, Wells, Joy-Gaba, Hawkins, & Nosek, 2014). Subconsciously preferring a White patient over a Black patient permeates physician practices and leads to health disparities in African Americans (Oliver et al., 2014).

The Institute of Medicine reports that ethnic and racial minorities receive different quality of medical care from physicians compared to White ethnicities, which propels health disparities

(Peek et al., 2010). Racial bias and adhering to stereotypes of racial minorities causes physicians to believe that African American patients are less educated, less intelligent, more likely to abuse drugs and alcohol, and less likely to follow treatment advice (Peek et al., 2010). This internal bias unnecessarily creates race as the primary factor in communication. As a result, interpersonal interactions between African American patients and White physicians can have power dynamics that hierarchs the physician as superior and the patient as inferior rather than a collaborative relationship where the physician values the patient's perspective (Peek et al., 2010). African American patients perceive this dynamic and may not trust their physician to support their needs, which threatens adherence to medical treatment and seeking subsequent care (Cuffee et al., 2013).

Key issues in this area are how physician bias leads to health disparities in populations of color, to what extent bias impacts clinical decisions, and the degree of pervasiveness in this bias. These issues are based on the lack of institutionalized strategies implemented to mitigate implicit bias across disciplines (i.e., public health and clinical medicine) as a way to promote health equity. Physician bias directly leads to disparities in healthcare as physician behaviors can create unequal health care standards for patients of different ethnicities (Chapman, Kaatz, & Carnes, 2013). Physicians maintain bias and stereotypes based on patient characteristics (i.e., race) and this bias influences their understanding of the patient's presented physiological symptoms. This results in clinical decisions significantly influenced by racial assumptions (Peek et al., 2010). Those who perpetuate this bias are unaware of their unconscious and sometimes conscious behavior. For instance, subtle messages from the media portraying African Americans as having lower income or only portraying African Americans working in low-income jobs can create an internal bias of preferring White Americans over African Americans. The danger of this

unspoken bias, specifically in people in positions of power and influence (i.e. physicians) is the correlation to health disparities and unequal health outcomes.

Outcomes of Physician Bias

Chronic discrimination of people based on their race or ethnicity, specifically persons of African origin, throughout a person's life contributes to the spread of disease and mortality (Bassett, 2015b). Physician bias is based on discriminatory behavioral practices. Such practices widen the disparity in negative health outcomes for African Americans (Bassett, 2015b). Although racial differences in health outcomes may result from individual choices and behaviors, a growing body of literature bolsters the connection between the adverse effects of physician bias in propelling health disparities (Bassett, 2015b). This does not negate nor oversimplify the complexities of health disparities, yet physician bias significantly contributes to its outcome since implicit bias impacts administrative policies and management decisions that impact populations (Ansell & McDonald, 2015).

Recent studies propose that implicit bias is the cause of racial clinical treatment disparities (i.e. physicians not recommending certain treatment to Black patients based on the assumption that they may not adhere to the recommendations) rather than explicit prejudice (Green et al., 2007). A method of measuring the outcome of physician bias, which is often unrecognized, is a computer based Implicit Association Test (IAT) from Harvard University's Project Implicit (Green et al., 2007). The aim of the IAT is to systematically recognize implicit bias by measuring the time it takes for a participant to match representatives of social groups (i.e. race, gender, age) to certain characteristics (i.e. bad, stubborn, cooperative, good) (Green et al., 2007). One study used the IAT to determine if physicians would recommend a treatment

decision in patients who are at risk for cardiovascular disease symptoms at the same rate in Black and White patients (if there was a bias in recommending one group over another). This study consisted of 220 physician participants who completed the IAT with questions to measure their explicit bias (i.e., Likert scale asking a preference of Black or White patients) and implicit bias (i.e., Likert scale asking if a physician believes that a White or Black patient is more cooperative) (Green et al., 2007). Ultimately, the study results reveal that physician's implicit bias and not explicit bias (overt self-reported beliefs of an individual) led to racial disparities in recommending treatment for cardio vascular disease (Green et al., 2007). For example, the physicians implicit anti-Black bias and the patient's race significantly impacted treatment recommendation (P=0.009) despite controlling for physicians explicit race bias, sex, and socio-economic status (SES) (Green et al., 2007).

Another example of the outcome of physician bias is a study examining patient preference in patients with renal disease. This study found that Black patients on dialysis were not as likely as similar White patients to report being advised by their physician about a kidney transplant prior to starting dialysis (van Ryn, 2002). Black patients were significantly less likely than white patients to be recommended by a physician to be placed on a kidney transplant waiting list, even when controlling for SES, health status, and type of health facility (van Ryn, 2002).

Physician implicit bias not only affects clinical decisions, but also treatment recommendations based on interpersonal communication (Blair, Steiner, & Havranek, 2011). Physicians with higher levels of implicit racial bias have lower quality interactions with minority patients, which is exhibited in discrete ways (Blair et al., 2011). This type of physician interaction causes the physician to demonstrate a lack of trust and commitment toward the

patient, which creates lower patient adherence (Blair et al., 2011). This dynamic is exacerbated as patients, perceiving a physician's lack of communication based on the patient's race, bring their own implicit bias to the clinical encounter, which confound clinical objectives (Blair et al., 2011).

Physician Bias as a Threat to Public Health and Clinical Medicine

A plethora of studies have attempted to elucidate the specific factors contributing to these disparities, but few studies explore the association between institutionalized racism and physician bias in perpetuating health disparities in African Americans. Since implicit bias, although unconscious, is rooted in prejudiced assumptions, understanding the role it contributes to health disparities in African Americans is vital, particularly for the fields of public health and clinical medicine. This systematic review of the literature aims to reduce this gap in knowledge.

A more complete understanding of the role of physician bias in health is important for understanding all the factors that influence health disparities. Since every person is susceptible to implicit bias, even those committed to an oath of impartiality (i.e., physicians and judges) cannot achieve their goals without a clear understanding of how implicit bias threatens population health (Staats, 2014). The objective of this systematic review is to shed light on implicit bias as an area that significantly impacts public health and clinical medicine. Specifically, the aim is to contribute to awareness on the role public health and clinical medicine contributes toward racial health disparities. We chose to focus this review on the literature around chronic disease care because it impacts a substantial portion of the population.

Chapter III: Methods

Institutional Review Board

The analysis presented in this study was determined to be exempt from the Institutional Review Board of Emory University because it is a systematic analysis of literature and the primary investigator did not conduct human research. Prior to the collection of data, all portions of this study were reviewed and approved by the Thesis Committee at Emory University.

Methods Overview

A systematic review of the literature was performed in Pub Med to identify all peer-reviewed articles from the last five years on physician bias and chronic disease in African Americans. A systematic review was selected as a way to distill the large body of literature on the topic, yet more importantly, present overall findings on a significant subject underrepresented in public health discourse. The primary investigator searched Pub Med using the following standardized Medical Subject Heading (MeSH) terms: “African Continental Ancestry Group”, “African American”, “physician-patient relations”, “physician”, “racism”, “prejudice”, and “bias”. The “Chronic disease” MeSH term was not used so that we could acquire more papers with the broader aforementioned search terms. Using the chronic disease MeSH term would have produced a narrow group of papers, which would not have been a robust systematic review of literature. However, after reviewing the papers, if any article did not explicitly address a chronic disease (such as diabetes, hypertension, or cancer), it was excluded. This ensured that the review of literature was rigorous and systematic in selecting appropriate papers, based on the inclusion and exclusion criteria. Additionally, chronic disease was selected since this represents a significant health disparity among African Americans.

Inclusion and Exclusion Criteria

Prior to the start of this systematic review, the inclusion criteria were established and focused on understanding the role physicians unknowingly contribute toward bias in their African American patients (compared to their White patients) in the delivery of health care services. Articles were determined eligible if they were published within the last five years, peer reviewed, and in the United States. The inclusion criteria guided the process by obtaining studies focused solely on physician's attitudes toward African American patients. Articles addressing chronic disease in African Americans were included. Similarly, articles that included measurements to assess physician's attitudes and behaviors toward their patients were included. In contrast, articles were excluded if they were published prior to 2011, did not focus on African Americans, and did not address a chronic disease.

Study Selection

Articles were selected through a three phase process. The first phase consisted of applying the inclusion and exclusion criteria to all the articles. Each article was reviewed by the principle investigator to determine if it would be included or not. The second phase consisted of reviewing the articles for a chronic disease focus. The third phase excluded articles published more than five years ago.

Data Extraction

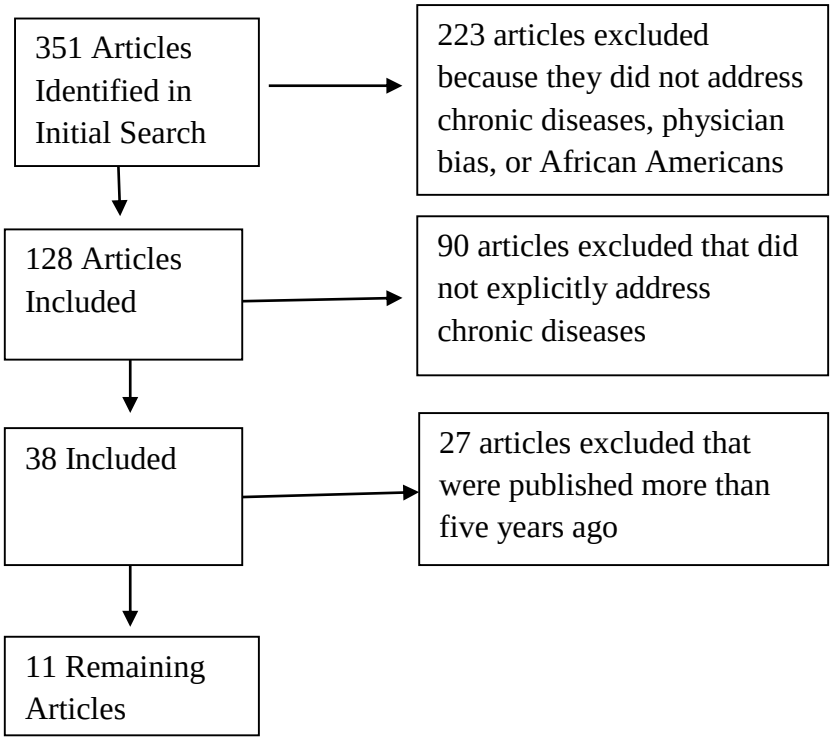
Data from the remaining articles that adhered to the inclusion and exclusion criteria was extracted to a Microsoft Excel file. The primary data elements extracted were: research aim, background data, methods, results, interpretation, and evaluation. The methods and outcomes extracted focused on those related to the primary research aim of the paper and included the

following: how was implicit bias measured, p values, reported instances of racial discrimination, physician's attitudes, validated measurement scales used, patient perceptions, and level of physician trust. Aside from the critical elements, supplementary extracted data consisted of background information on the study population, study design, study population attributes, variables of interest, hypothesis, and study limitations. The methods of reviewing the data consisted of comparing the identified elements to other extracted data as a way to understand if the outcomes are standardized across studies. For example, the measurements used to capture implicit bias were assessed across studies, which determined that variations of the same measurement scales are used in multiple studies to measure implicit bias. This approach helped assess the studies quality by confirming that the data measures are standard procedures across studies.

Chapter IV: Results

The first review in Pub Med used Mesh terms, which yielded 353 articles (See Figure 1). After an initial review of the articles, the primary investigator methodically determined 130 articles to meet the predetermined inclusion criteria and 223 met the exclusion criteria. From the 130 included articles, a second review was conducted to further exclude articles not published within the past five years (i.e., 2010-2014). This resulted in 40 remaining articles. The final review incorporated another level of detail by excluding articles not explicitly about a chronic disease.

Figure 1: Literature Inclusion and Exclusion Process



The final body of articles remaining in this systematic review of literature is 11. These papers are presented in Table 1. The 11 remaining papers discussed physician bias in the treatment of the following chronic diseases: hypertension, prostate cancer, osteoarthritis, chronic

pain, tumors, diabetes, breast cancer, oral cancer, and stroke. Primary findings of this body of work focused on the following topics:

-How physicians' clinical and treatment decisions are influenced by a patient's race

-How the physician and patient relationship is influenced by the patient's race

Race and Clinical Treatment Decisions

This section presents the results of four studies (Babu et al., 2013) (Weng & Korte, 2012) (Oliver et al., 2014) (Barnato et al., 2011) about how physician bias affects treatment decisions for African American patients. These papers included data on patients with a range of chronic conditions, including osteoarthritis, chronic pain, tumors, oral cancer, hypertension and pancreatic cancer. The selected papers consist of several study designs, including a cohort based study, randomized trial, web-based survey, and an analysis of surveillance data. The sample sizes were also varied. The randomized trial had 33 participants, the cohort study had 6,225 participants, the web-based survey had 587 participants, and the surveillance data extracted 68,445 cases. Two studies measured physician bias with the Implicit Associations Test (IAT) and the Medical Cooperativeness IAT. The remaining studies did not explicitly measure bias, but reported on the patient's encounters with physicians based on race.

Two studies reported that African American patients were less likely to be recommended for surgery than White patients. Babu, et al found that African American patients with tumors are less likely to be recommended to receive surgery (P-value= 0.0004) for their tumors, compared to White patients, even though patients of other races receive surgery for tumors at similar levels of White patients (P-value=0.63), although this is statistically insignificant (Babu et al., 2013). Specifically, African American patients experience higher chances of less aggressive methods to

resolve the tumor compared to White patients (Babu et al., 2013). Similarly, African American patients with oral cancer are more likely (Odds Ratio [OR]=2.0 at a 95% Confidence Interval [95%CI] of 1.9 to 2.1) to not receive a recommendation for oral cancer surgery compared to White patients (Weng & Korte, 2012). The association between race and a surgery recommendation for oral cancer may be impacted by a patient's location or residence, year of diagnosis, tumor stage, and tumor site (Weng & Korte, 2012). African American patients with lip cancer who live in a rural location encounter the most extreme racial disparities with being recommended for surgery; in contrast, patients with oral cancer who live in an urban location have the smallest difference in surgery recommendations for African American and White patients (Weng & Korte, 2012). Additionally, Chae et al found that the association between racial discrimination and hypertension is different for individuals with pro-Black compared to anti-Black bias (P-value=0.027) (Chae, Nuru-Jeter, & Adler, 2012).Consequently, a positive connection between racial discrimination and hypertension risk among patients with an implicit anti-Black bias and a negative connection for individuals with implicit pro-Black bias (Chae et al., 2012).

Conversely, two studies found no difference in patient treatment by race. In Oliver, et al the race of patients with osteoarthritis did not significantly impact recommendations for a Total Knee Replacement (TKR) (P-value=0.888), even though physicians reported being more comfortable with White patients (Oliver et al., 2014). Even though TKR recommendations did not differ, physicians did report that they believed that bias influenced their clinical decisions and that training in identifying their subconscious bias was needed (Oliver et al., 2014). In another study of patients with pancreatic cancer, there was also no difference in treatment by race, although physicians believed that African American patients with metastatic pancreatic

cancer were more likely (P-values=0.07 and 0.003) than similar White patients to prefer life-prolonging treatments (e.g., chemotherapy over palliative care, use of mechanical ventilation) (Barnato et al., 2011).

Race and the Physician-Patient Relationship

This section presents the results of eight studies (Campesino, Saenz, Choi, & Krouse, 2012) (Cuffee et al., 2013) (Greer, Brondolo, & Brown, 2014) (Song et al., 2014) (Oliver et al., 2014) (DiIorio et al., 2011) (Chae et al., 2012) (Peek, Nunez-Smith, Drum, & Lewis, 2011) about the physician and patient relationship and how it is influenced by the patient's race. The studies included data on patients with a range of chronic conditions, including breast cancer, hypertension, and prostate cancer. The selected studies incorporate three primary study designs, mixed methods, cross sectional, and cohort based. The samples sizes include 39 in the mixed methods study, 100-1,854 in the cohort based studies, and 100 in a cohort. The studies used the following methods to measure physician bias or perceptions of physician bias: critical race theory, Experiences of Discrimination Scale (EOD), Group-Based Medical Mistrust Scale, Provider Bias Measure, Structural Equation Modeling (SEM), and, Implicit Association Test (IAT), The Medical Cooperativeness IAT, items on a Likert scale, the Black White Implicit Association Test , and the Primary Care Assessment Survey.

Five Six studies reported that African American patients perceive discrimination when seeking health care. Campesino, et al found that African American patients with breast cancer are more likely to describe discrimination in primary care settings instead of in their oncology care and that they perceive this discrimination is due to their race, gender, and lack of healthcare insurance or insufficient access to care (Campesino et al., 2012). Patients who perceive

healthcare discrimination had an earlier stage breast cancer diagnosis (stage I or II) compared to those who did not perceive discrimination (stage III or IV) (P-value < 0.001) (Campesino et al., 2012). Similarly, perceived discrimination and trust in the physician is significantly associatiated (P-value <0.001) among African American patients with hypertension (Cuffee et al., 2013). Perceived discrimination from a physician impacts medication adherence in women (P-value <0.05) and men (P-value < 0.05) (Cuffee et al., 2013). Greer, et al also found that African American patients who perceived low-level systemic racism had reduced adherence to hypertension medication (P-value <0.01) (Greer, Brondolo, & Brown, 2014). Likewise, Dilorio, et al found that African American patients are 12 times more likely to agree or strongly agree that physicians treat White patients better (DiIorio et al., 2011). Peek, et al found that The Discrimination in Medical Settings (DMS) Scale is connected with African American's overall Trust in Health Care scale (P-value=0.02) as well as two subscales (racism: P-value<0.001; disrespect: P-value<0.001) (Peek et al., 2011). As discussed above, in Oliver, et al providers reported being significantly more comfortable with White patients than African American patients (P-value <0.0001) and that this bias influenced their patient care, even though rates of TKR did not differ by race (Oliver et al., 2014).

Furthermore, two studies (Greer, Brondolo, & Brown, 2014) (Song et al., 2014) report that African American male patients' mistrust of health care is associated with perceived provider bias. Greer, et al found a connection between frequent experiences of provider bias and mistrust of health care (P-value <0.0001) (Greer et al., 2014). Song, et al reports that African American patients do not have good communication with their physicians (P-value <0.001) resulting in African American patients having reduced trust in their physicians (P-value <0.001) (Song et al., 2014).

Table 1: Characteristics of the Reported Studies By Date and First Author's Last Name

Article	First Author and Year	Study Type	Data Collection Method	Analysis Method	How Perceived Bias is Measured	How Racism is Measured	Main Findings and Outcome
Vestibular schwannomas in the modern era: epidemiology, treatment trends, and disparities in management.	(Babu et al., 2013)	Cohort based study	6,225 patients were identified through the U.S. National Cancer Institute's SEER Program database	Chi-square test and T-test	Tumor management based on race	N/A	Half of all White patients received surgery (50.2%), with only 39.1% of African American patients receiving surgery (P-value = 0.0004). African American patients underwent tumor observation (30.8%) at significantly higher rates than Caucasians (23.7%) and patients of other races (22.1%) (P-value = 0.0074 and 0.0052)
A randomized trial of the effect of patient race on physicians' intensive care unit and life-sustaining treatment decisions for an acutely unstable elder with end-stage cancer.	(Barnato et al., 2011)	Randomized trial	High fidelity simulations for 33 participants	McNemar test, fisher's exact test, logistic regression, and Wilcoxin signed rank test	N/A	N/A	No differences in the treatment decisions for African American verses European American patient Physician participants believed that a Black patient with metastatic pancreatic cancer was

							more likely than a comparable White patient to want potentially -life prolonging chemotherapy over palliative treatment (p=.07) and to want mechanical ventilation for a week's life extension (p=.003), and less likely to want a "Do not resuscitate" (DNR) order if hospitalized (p=.003)
Perceived discrimination and ethnic identity among breast cancer survivors.	(Campesino et al., 2012)	Mixed-method design	39 participants	Triangulation matrix analysis, descriptive statistics, T-test, Chi-square, ANOVA	Critical race theory was a guiding framework	National Commonwealth Fund's Health Quality Survey	Participants were more likely to describe discrimination in primary care settings rather than in their oncology care African American participants perceived healthcare discrimination related to race, gender, and lack of healthcare insurance or restricted access to care Women who reported perceived healthcare

							discrimination in the interviews had earlier stage breast cancer diagnosis (stage I or II) compared to those who did not perceive discrimination (stage III or IV) (P-value < 0.001)
Implicit racial bias as a moderator of the association between racial discrimination and hypertension: a study of Midlife African American men.	(Chae et al., 2012)	Cross sectional study	Observation	Modified Poisson Regression Model	The Black-White Implicit Association Test	Every Day Discrimination Scale	No associations between racial discrimination, implicit racial bias, and hypertension A significant association between racial discrimination and hypertension from participants 's with a pro-Black vs. anti-Black bias *(* P-Value = 0.027) A positive relationship between racial discrimination and hypertension risk among participants with an implicit anti-Black bias, but a negative relationship

							among those with an implicit pro-Black bias.
Reported racial discrimination, trust in physicians, and medication adherence among inner-city African Americans with hypertension.	(Cuffee et al., 2013)	Cohort based study	Surveys to 780 people	Analysis of variance	Experiences of Discrimination (EOD) Scale	Hall General Trust Scale	Significant correlation between trust and discrimination (P-value <0.001) Among women 39% of the relationship between discrimination and medication adherence was influenced by trust, compared with 28% for men (P-Value <0 .05 for both)
Differences in treatment-based beliefs and coping between African American and white men with prostate cancer.	(DiIorio et al., 2011)	Cohort based study	320 participants through the Georgia cancer registry and pathology reports	Multivariate linear and logistic regression analyses	The following item on a scale: "Doctors sometimes treat white people better than African Americans."	N/A	African American participants were more likely to report physician bias in agreeing with the statement that doctors treat Whites better. African-Americans were 12 times more likely to agree or strongly agree that doctors treat whites better.

Systemic racism moderates effects of provider racial biases on adherence to hypertension treatment for African Americans.	(Greer et al., 2014)	Cohort based study	100 surveyed African Americans at an outpatient medical clinic	Regression Analysis	Group-Based Medical Mistrust Scale Provider Bias Measure	Index of Race-Related Stress	A significant, positive relationship was revealed between perceived provider biases and mistrust of health care. Perceived provider racial bias was the strongest predictor of health care mistrust.
Do physicians' implicit views of African Americans affect clinical decision making?	(Oliver et al., 2014)	Web-based survey using clinical vignette	Direct and Indirect sampling of 587 medical doctors through Project Implicit	Paired sample T-test Two sample T-test Logistic regression model	Implicit Association Test (IAT) The Medical Cooperativeness IAT	Clinical vignette The Race Preference IAT	Subconscious bias influences clinical decisions (P-value <0.0001) Physicians innately preferred White patients over Black patients (P-value <0.0001) The impact of a patient's race on Total Knee Replacement was not statistically significant (P-value=0.73)
Adapting the everyday discrimination scale to medical settings: reliability and validity testing in a sample	(Peek et al., 2011)	Cross Sectional Study	Survey of 20 participants	Exploratory principal components factor analysis	The Williams' Everyday Discrimination Scale (EDS)	The Krieger Experiences of discrimination (EOD) Scale	The DMS was significantly connected with the overall measure of societal

of African American patients					The Discrimination in Medical Settings (DMS) Scale		discrimination (EOD) (*P*<.001) The DMS was connected with African American's overall Trust in Health Care scale (*P*=.02) as well as two subscales (racism: *P*<.001; disrespect: *P*<.001)
Associations between patient-provider communication and socio-cultural factors in prostate cancer patients: A cross-sectional evaluation of racial differences.	(Song et al., 2014)	Population based cohort study	Survey of 1,854 men	Chi-square test	Structural Equation Modeling (SEM) Indicators measured using scales from Primary Care Assessment Survey	Physician trust was measured using Medical Mistrust Index Perceived Racism was measured using a Racism Index	White men had greater interpersonal treatment (P-value 0.005), prostate cancer communication, physician trust (both p-value <0.001), and lower mean score of perceived racism and religious belief
Racial disparities in being recommended to surgery for oral and oropharyngeal cancer in the United States.	(Weng & Korte, 2012)	Extracted data from the Surveillance Epidemiology and End Results (SEER) database	A total of 68,445 cases extracted	Multiple logistic regression	N/A	N/A	The odds for not being recommended for surgery was twice as high for Black patients than for White patients (OR, 2.0;95% CI, 1.9-2.1) Racial disparities were most extreme in rural patients with lip and buccal cancer, with a

							four time increase in the odds of non-recommendation to surgery among black patients (OR, 4.4; 95% CI, 2.6–7.5) The racial disparity was least evident in urban patients with only a 20 percentage increase in odds for Black patients with oropharyngeal cancer

***Abbreviation Key: OR= Odds Ratio, CI= Confidence Interval, P-value=Probability Value

Chapter V: Discussion

This systematic review reveals that African American patients perceive physician bias in a way that affects the patient-provider relationship; in some cases there are differences in medical treatment by race; and in some cases, physicians report innately preferring White patients over Black patients. The United States has achieved progress in eradicating explicit forms of racism; for instance, one study cited broad exposure related to President Barack Obama is associated with a significant reduction in implicit bias against Black people (Williams & Mohammed, 2013). However, as shown in the manuscript, racial bias still exists. With the rise of "post-racial" ideology promulgated in our society, contemporary racism rejects overt discrimination, yet unintentionally adheres to implicit bias of supporting White people over Black people; astonishingly, 70% of Americans unintentionally favor White people over Black people (Williams & Mohammed, 2013).

This systematic review sheds light on the occurrences of patients receiving varying levels of quality health care (i.e., less aggressive treatment, reduced physician communication, reduced clinical recommendations, etc.) based on race. This data supports the view that favoring certain racial groups over others has the potential to create disparities in quality of care, which leads to negative health outcomes (Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003). Since patients who perceive discriminatory practices typically do not adhere to treatment recommendations or seek medical services, a physician's behavior has broader implications than merely one interaction with a patient (Pascoe & Smart Richman, 2009). The population level impact is that bias can create a system of health care focused on fairly serving homogeneous populations rather than diverse groups. Consequently, biased practices are the antithesis of public health. Acknowledging bias and its role in contributing to health disparities and health inequity

can help in attaining the ethos of public health: all groups and individuals equally entitled to health protection (Sidwel, 2013).

This systematic review of literature bolsters the current debate that institutionalized racism, manifested through physician bias, is not an antiquated paradigm. More important, this study elucidates a growing body of literature connecting physician bias to subconscious preferential treatment based on a person's race, which is a form of racism that creates unequal health outcomes in African Americans. For clinical decisions of patients with chronic pain, physicians have pro-White bias in pain recommendations and provide aggressive treatment for White patients and not African American patients (Tait & Chibnall, 2014). Consequently, race impacts the level of pain clinically decided upon. Racial bias manifest when the health care provided is not respectful of the patient as a person, which results in African American patients perceiving their providers as unreceptive to their needs (Tait & Chibnall, 2014).

Researchers in the field of bias are proponents of debiasing, which can be achieved since biases are a learned behavior (Staats, 2014). Debiasing is not achieved through repressing biased thoughts, which can exacerbate implicit bias, yet can take place through counter-stereotypic training (Staats, 2014). This form of training assists individuals in creating new associations through visual and verbal cues as a way to contradict previously held associations (Staats, 2014). There are other successful training tactics to assist in reducing bias and public health professionals and clinicians could benefit from such training as a way to reduce a behavior that everyone is vulnerable in exhibiting (Staats, 2014). Lilienfeld et al found that perspective taking is a method to reduce bias as well as other strategies such as active open-mindedness, consider the opposite, and consider an alternative (Scott O. Lilienfeld, 2009). Similarly, delayed decision making is a method utilized by physicians to reduce bias when making clinical decisions (Scott

O. Lilienfeld, 2009). Additionally, basic training in understanding bias can decrease an individual's biased behavior(Scott O. Lilienfeld, 2009).

We were able to find a few studies (Barnato et al., 2011) (Campesino et al., 2012) (Chae et al., 2012) where race did not lead to poorer health outcomes. Bernato, et al found no difference in the treatment decisions for African American and White American patient's with end stage cancer (Barnato et al., 2011). Similarly, patients with breast cancer reported less physician bias in their oncology care than primary care (Campesino et al., 2012). Chae, et al found no associations between racial discrimination, implicit racial bias, and hypertension (Chae et al., 2012). Other factors could be influencing the results of the studies reported here. Race and income are sometimes cited synonymously when discussing health disparities or health outcomes generally. Socioeconomic (SES) status is a major predictor of health and Americans with lower SES tend to experience health challenges that people with higher SES do not experience until much later in life (Williams & Jackson, 2005). In the United States, SES markers are ordered around race, thus racial differences in SES lead to racial differences in health (Williams & Jackson, 2005). Although race and class are not mutually exclusive, health disparities data and health data in general is typically stratified by race and not income (P. A. Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010). This is mainly attributed to people of color (specifically African Americans) excessively represented as low SES (Kawachi, Daniels, & Robinson, 2005). As a result, race often is used as a substitute for class (Kawachi et al., 2005). Although presenting race has become a standard practice when reporting health statistics, race as the sole measurement of interest in studying health disparities is an oversimplification. The Hispanic Paradox is a paradigm in understanding how a socioeconomic marginalized group, such as Hispanics, experiences better health outcomes than other marginalized populations (National

Research Council Panel on Race and Health in Later (2004)), which might imply that solely looking at race as the measurement of interest in studying health disparities negates the complexity of health disparities.

Strengths and Weaknesses

One strength of this systematic review on physician bias is the ability to consolidate studies while comparing their results. Since the literature on physician bias is growing, this systematic review presented recent studies and shed light on their work in attempting to fill the gap in knowledge. Additionally, this study was able to present patient perceptions of bias, which are not generalizable to the public, yet provide richness in understanding the experiences of some individuals as a way to gain insight into the complex issue of physician bias. In contrast, one weakness of this study is its small final set of included studies, which prohibit the results from becoming generalizable. Similarly, the relatively small sample sizes of the selected studies limit our ability to present direct causal pathways of physician bias in creating health disparities in African Americans. Finally, few studies included measures, like the IAT, which directly measure bias in the physicians; however, the rich data collected by assessing perceived bias on the part of the patient still provide valuable data.

Recommendations and Implications

Based on this systematic review, more exhaustive research is needed in recognizing physician bias as a source of health disparities in African Americans. Although the majority of the studies presented focused on patient's perceptions of bias, further research in proving this perception is needed since the field does not always value the perspectives of individuals, if it

can not be empirically proven. Thus, studies that can provide data on bias operating among physicians would bolster the aim of this systematic review in striving to provide evidence-based awareness of a threat to public health and clinical medicine. If left unaddressed, implicit bias leads to disparities resulting from differing levels of care provided at hospitals targeting African Americans, which are often not the same standard of care provided for non-minorities (Samuel et al., 2014).

To challenge this, researchers suggest medical school education incorporate a training sessions on implicit bias; these sessions should be described as trainings on personal development so medical student do not initially deny the impact of implicit bias (Staats, 2014). When presented as personal development, medical students are more apt to completely incorporate the strategies to reduce implicit bias (Staats, 2014). Health Care provider's attitudes, cultural bias, and lack of cultural awareness in medical school perpetuate health disparities and reduce health outcomes in racially diverse patients (Wear, 2003). Furthermore, medical pedagogy does not include a patient-focused paradigm that values and seeks to understand the multifaceted cultural background of patients (Wear, 2003). Specifically, a patient focused approach maintains the belief that a healthcare provider cannot adequately provide care or treatment for patients without understanding their values, beliefs, and cultural context (Betancourt et al., 2003). While clinical medicine perceives "normalcy" as White and anything outside this narrow construct to be against the standard, this paradigm can create bias in medical care (Burgess, van Ryn, Dovidio, & Saha, 2007). This adversely affects health through stereotypes, stigma, prejudice, and racial discrimination of non-White populations (Williams & Mohammed, 2013). We recommend the following macro level changes as an approach to address physician bias:

1. Increasing the number of minority students and faculty at medical schools as a way to infuse a different perspective into the curriculum. This provides exposure and access to different cultures and ideologies, which has the potential to create a well-rounded and inclusive academic experience, rather than the current homogeny (Hurtado, Cabrera, Lin, Arellano, & Espinosa, 2009). This can be achieved through creating partnerships with local organizations that represent minority populations (i.e., high schools, colleges, Boys and Girls Club of America, professional associations, civic groups, churches, etc.) where medical schools are located and recruiting potential students and faculty. Additionally, since most medical schools are racially homogeneous, admissions officers can institute pipeline projects that mentor young minority students in local high schools and colleges that set the trajectory for students interested in clinical medicine who may not perceive medical schools as accessible or attainable.
2. Incorporating trainings to recognize internal bias in medical schools (for faculty and students), during residency, throughout medical fellowships, for providers, medical staff, public health researchers, public health practitioners, and public health students.
3. Increasing trainings on the socio-contextual determinants of health as a skill in recognizing the multidimensional factors associated with physician bias.
4. Providing opportunities for open non-judgmental dialogue among an array of health professionals (such as those previously noted) to candidly discuss issues related to physician bias. Individuals and institutions can learn to understand that everyone harbors implicit bias, which does not imply that every person is a racist.

Conclusion

This systematic review found that physicians' clinical and treatment decisions and the physician- patient relationship are influenced by patient's race. Understanding physician bias as a public health concern and human rights issue is a way health providers, clinicians, public health practitioners, and researchers can attempt to address its negative health implications. Recognizing one's bias and then humbly striving to change the behavior is ultimately the initial step in working toward eliminating bias. Specifically for physicians, public health practitioners, and researchers who generally have an influential position of power, identifying bias is vital toward ethical practice. More important, bias identification has the potential to narrow the health disparity gap (Betancourt et al., 2003). This does not oversimplify the multidimensional facets which create health disparities, yet the intent is to shed light on one aspect that has a growing body of literature aimed in understanding how bias contributes to health disparities. The World Health Organization (WHO) presents a guiding definition of health as " a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity."(Huber et al., 2011) However, physician bias jeopardizes the actualization of this guidance as the presented findings propose that bias is one behavior that leads to health disparities in African Americans (Bassett, 2015b). To address this issue we recommend increasing the number of minority student and faculty at medical schools, incorporating training on implicit bias at medical schools, increasing trainings on socio-contextual determinants of health as a tangible skill, and providing non-judgmental open forums with health professionals to explore implicit bias.

References

Ansell, D. A., & McDonald, E. K. (2015). Bias, black lives, and academic medicine. *N Engl J Med, 372*(12), 1087-1089. doi: 10.1056/NEJMp1500832

Babu, R., Sharma, R., Bagley, J. H., Hatef, J., Friedman, A. H., & Adamson, C. (2013). Vestibular schwannomas in the modern era: epidemiology, treatment trends, and disparities in management. *J Neurosurg, 119*(1), 121-130. doi: 10.3171/2013.1.jns121370

Baldwin, D. M. (2003). Disparities in health and health care: focusing efforts to eliminate unequal burdens. *Online J Issues Nurs, 8*(1), 2.

Barnato, A. E., Mohan, D., Downs, J., Bryce, C. L., Angus, D. C., & Arnold, R. M. (2011). A randomized trial of the effect of patient race on physicians' intensive care unit and life-sustaining treatment decisions for an acutely unstable elder with end-stage cancer. *Crit Care Med, 39*(7), 1663-1669. doi: 10.1097/CCM.0b013e3182186e98

Barry S. Levy, V. W. S., William H. Foege. (2013). *Social Injustice and Public Health* New York, New York: Oxford University Press.

Bassett, M. T. (2015b). #BlackLivesMatter - A Challenge to the Medical and Public Health Communities. *N Engl J Med, 372*(12), 1085-1087. doi: 10.1056/NEJMp1500529

Bellinger, J. D., Millegan, W., & Abdalla, A. E. (2015). "I'm Not Ashamed to Talk on It!": African-American Women's Decisions About Cervical Cancer Prevention and Control in South Carolina. *Womens Health Issues, 25*(2), 120-127. doi: 10.1016/j.whi.2014.10.006

Betancourt, J. R., Green, A. R., Carrillo, J. E., & Ananeh-Firempong, O., 2nd. (2003). Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. *Public Health Rep, 118*(4), 293-302.

Blair, I. V., Steiner, J. F., & Havranek, E. P. (2011). Unconscious (implicit) bias and health disparities: where do we go from here? *Perm J, 15*(2), 71-78.

Bodenheimer, T., Chen, E., & Bennett, H. D. (2009). Confronting the growing burden of chronic disease: can the U.S. health care workforce do the job? *Health Aff (Millwood), 28*(1), 64-74. doi: 10.1377/hlthaff.28.1.64

Braveman, P. (2014). What are health disparities and health equity? We need to be clear. *Public Health Rep, 129 Suppl 2*, 5-8.

Braveman, P. A., Cubbin, C., Egerter, S., Williams, D. R., & Pamuk, E. (2010). Socioeconomic disparities in health in the United States: what the patterns tell us. *Am J Public Health, 100 Suppl 1*, S186-196. doi: 10.2105/ajph.2009.166082

Burgess, D., van Ryn, M., Dovidio, J., & Saha, S. (2007). Reducing racial bias among health care providers: lessons from social-cognitive psychology. *J Gen Intern Med, 22*(6), 882-887. doi: 10.1007/s11606-007-0160-1

Camara Phyllis Jones, M. D., M.P.H., Ph.D. (2003). Confronting Institutionalized Racism. *Phylon*, 22.

Campesino, M., Saenz, D. S., Choi, M., & Krouse, R. S. (2012). Perceived discrimination and ethnic identity among breast cancer survivors. *Oncol Nurs Forum, 39*(2), E91-100. doi: 10.1188/12.onf.e91-e100

Chae, D. H., Nuru-Jeter, A. M., & Adler, N. E. (2012). Implicit racial bias as a moderator of the association between racial discrimination and hypertension: a study of Midlife African American men. *Psychosom Med, 74*(9), 961-964. doi: 10.1097/PSY.0b013e3182733665

Chen, F. M., Fryer, G. E., Jr., Phillips, R. L., Jr., Wilson, E., & Pathman, D. E. (2005). Patients' beliefs about racism, preferences for physician race, and satisfaction with care. *Ann Fam Med, 3*(2), 138-143. doi: 10.1370/afm.282

Cuffee, Y. L., Hargraves, J. L., Rosal, M., Briesacher, B. A., Schoenthaler, A., Person, S., . . . Allison, J. (2013). Reported racial discrimination, trust in physicians, and medication adherence among inner-city African Americans with hypertension. *Am J Public Health, 103*(11), e55-62. doi: 10.2105/ajph.2013.301554

Cynthia Hudley, R. D., Dionne Jones, Kipp Pietrantonio, Ruth Riding Malon, John Ruiz, Keyona King-Tsikata, Ieshia Haynie. (2014). *Examining the Complexities Between Health Disparities and Poverty*. Washington , District of Columbia: American Psychological Association Office on Socioeconomic Status.

DiIorio, C., Steenland, K., Goodman, M., Butler, S., Liff, J., & Roberts, P. (2011). Differences in treatment-based beliefs and coping between African American and white men with prostate cancer. *J Community Health, 36*(4), 505-512. doi: 10.1007/s10900-010-9334-6

Feagin, J., & Bennefield, Z. (2014). Systemic racism and U.S. health care. *Soc Sci Med, 103*, 7-14. doi: 10.1016/j.socscimed.2013.09.006

Fincher, C., Williams, J. E., MacLean, V., Allison, J. J., Kiefe, C. I., & Canto, J. (2004). Racial disparities in coronary heart disease: a sociological view of the medical literature on physician bias. *Ethn Dis, 14*(3), 360-371.

Gehlert, S., Sohmer, D., Sacks, T., Mininger, C., McClintock, M., & Olopade, O. (2008). Targeting health disparities: a model linking upstream determinants to downstream interventions. *Health Aff (Millwood), 27*(2), 339-349. doi: 10.1377/hlthaff.27.2.339

Godsil, R. (2011). Implicit Bias and Social Justice. In H. Roberts (Ed.): Open Society Foundations

Goode, T. D., & Jack, L., Jr. (2014). The alliance to reduce disparities in diabetes: infusing policy and system change with local experience. *Health Promot Pract, 15*(2 Suppl), 6s-10s. doi: 10.1177/1524839914545784

Green, A. R., Carney, D. R., Pallin, D. J., Ngo, L. H., Raymond, K. L., Iezzoni, L. I., & Banaji, M. R. (2007). Implicit bias among physicians and its prediction of thrombolysis decisions for black and white patients. *J Gen Intern Med, 22*(9), 1231-1238. doi: 10.1007/s11606-007-0258-5

Greer, T. M., Brondolo, E., & Brown, P. (2014). Systemic racism moderates effects of provider racial biases on adherence to hypertension treatment for African Americans. *Health Psychol, 33*(1), 35-42. doi: 10.1037/a0032777

Haider, A. H., Sexton, J., Sriram, N., Cooper, L. A., Efron, D. T., Swoboda, S., . . . Cornwell, E. E., 3rd. (2011). Association of unconscious race and social class bias with vignette-based clinical assessments by medical students. *Jama, 306*(9), 942-951. doi: 10.1001/jama.2011.1248

Huber, M., Knottnerus, J. A., Green, L., Horst, H. v. d., Jadad, A. R., Kromhout, D., . . . Smid, H. (2011). *How should we define health?* (Vol. 343).

Hurtado, S., Cabrera, N. L., Lin, M. H., Arellano, L., & Espinosa, L. L. (2009). Diversifying Science: Underrepresented Student Experiences in Structured Research Programs. *Res High Educ, 50*(2), 189-214. doi: 10.1007/s11162-008-9114-7

Jackson, J. S., Brown, T. N., Williams, D. R., Torres, M., Sellers, S. L., & Brown, K. (1996). Racism and the physical and mental health status of African Americans: a thirteen year national panel study. *Ethn Dis, 6*(1-2), 132-147.

Jones, P. R., Taylor, D. M., Dampeer-Moore, J., Van Allen, K. L., Saunders, D. R., Snowden, C. B., & Johnson, M. B. (2013). Health-Related Stereotype Threat Predicts Health Services Delays Among Blacks. *Race Soc Probl, 5*(2), 121-136. doi: 10.1007/s12552-013-9088-8

Kawachi, I., Daniels, N., & Robinson, D. E. (2005). Health disparities by race and class: why both matter. *Health Aff (Millwood), 24*(2), 343-352. doi: 10.1377/hlthaff.24.2.343

Kelly, S. J., & Ismail, M. (2015). Stress and type 2 diabetes: a review of how stress contributes to the development of type 2 diabetes. *Annu Rev Public Health, 36*, 441-462. doi: 10.1146/annurev-publhealth-031914-122921

Krieger, N. (2003). Does racism harm health? Did child abuse exist before 1962? On explicit questions, critical science, and current controversies: an ecosocial perspective. *Am J Public Health, 93*(2), 194-199.

National Research Council Panel on Race, E., & Health in Later, L. (2004). The National Academies Collection: Reports funded by National Institutes of Health. In N. B.

Anderson, R. A. Bulatao & B. Cohen (Eds.), *Critical Perspectives on Racial and Ethnic Differences in Health in Late Life*. Washington (DC): National Academies Press (US)

National Academy of Sciences.

Obeidat, N. A., Pradel, F. G., Zuckerman, I. H., Trovato, J. A., Palumbo, F. B., DeLisle, S., & Mullins, C. D. (2010). Racial/ethnic and age disparities in chemotherapy selection for colorectal cancer. *Am J Manag Care, 16*(7), 515-522.

Oliver, M. N., Wells, K. M., Joy-Gaba, J. A., Hawkins, C. B., & Nosek, B. A. (2014). Do physicians' implicit views of African Americans affect clinical decision making? *J Am Board Fam Med, 27*(2), 177-188. doi: 10.3122/jabfm.2014.02.120314

Pascoe, E. A., & Smart Richman, L. (2009). Perceived discrimination and health: a meta-analytic review. *Psychol Bull, 135*(4), 531-554. doi: 10.1037/a0016059

Peek, M. E., Nunez-Smith, M., Drum, M., & Lewis, T. T. (2011). Adapting the everyday discrimination scale to medical settings: reliability and validity testing in a sample of African American patients. *Ethn Dis, 21*(4), 502-509.

Plescia, M., Herrick, H., & Chavis, L. (2008). Improving health behaviors in an African American community: the Charlotte Racial and Ethnic Approaches to Community Health project. *Am J Public Health, 98*(9), 1678-1684. doi: 10.2105/ajph.2007.125062

Rodriguez, F., & Ferdinand, K. C. (2015). Hypertension in Minority Populations: New Guidelines and Emerging Concepts. *Adv Chronic Kidney Dis, 22*(2), 145-153. doi: 10.1053/j.ackd.2014.08.004

Sabin, J., Nosek, B. A., Greenwald, A., & Rivara, F. P. (2009). Physicians' implicit and explicit attitudes about race by MD race, ethnicity, and gender. *J Health Care Poor Underserved, 20*(3), 896-913. doi: 10.1353/hpu.0.0185

Samuel, C. A., Landrum, M. B., McNeil, B. J., Bozeman, S. R., Williams, C. D., & Keating, N. L. (2014). Racial disparities in cancer care in the Veterans Affairs health care system and the role of site of care. *Am J Public Health, 104 Suppl 4*, S562-571. doi: 10.2105/ajph.2014.302079

Scott O. Lilienfeld, R. A., and Kristin Landfield. (2009). Giving Debiasing Away: Can Psychological Research on Correcting Cognitive Errors Promote Human Welfare? *Perspectives on Psychological Science 4*, 9.

Sidanius, J., Levin, S., Federico, C., & Pratto, F. (2001). Social Dominance Approach. *Psychology of legitimacy*, 307-322.

Sidwel, B. S. L. a. V. W. (2013). *Social Injustice and Public Health*. New York: Oxford University Press.

Song, L., Weaver, M. A., Chen, R. C., Bensen, J. T., Fontham, E., Mohler, J. L., . . . Sleath, B. (2014). Associations between patient-provider communication and socio-cultural factors in prostate cancer patients: a cross-sectional evaluation of racial differences. *Patient Educ Couns, 97*(3), 339-346. doi: 10.1016/j.pec.2014.08.019

Staats, C. (2014). State of the Science:Implicit Bias Review 2014 (pp. 90). Columbus: Kirwan Institute for the Study of Race and Ethnicity.

Staiano, A. E., Harrington, D. M., Johannsen, N. M., Newton, R. L., Jr., Sarzynski, M. A., Swift, D. L., & Katzmarzyk, P. T. (2015). Uncovering physiological mechanisms for health disparities in type 2 diabetes. *Ethn Dis, 25*(1), 31-37.

Tait, R. C., & Chibnall, J. T. (2014). Racial/ethnic disparities in the assessment and treatment of pain: psychosocial perspectives. *Am Psychol, 69*(2), 131-141. doi: 10.1037/a0035204

van Ryn, M. (2002). Research on the provider contribution to race/ethnicity disparities in medical care. *Med Care, 40*(1 Suppl), I140-151.

Weng, Y., & Korte, J. E. (2012). Racial disparities in being recommended to surgery for oral and oropharyngeal cancer in the United States. *Community Dent Oral Epidemiol, 40*(1), 80-88. doi: 10.1111/j.1600-0528.2011.00638.x

Williams, D. R., & Jackson, P. B. (2005). Social sources of racial disparities in health. *Health Aff (Millwood), 24*(2), 325-334. doi: 10.1377/hlthaff.24.2.325

Williams, D. R., & Mohammed, S. A. (2013). Racism and Health II: A Needed Research Agenda for Effective Interventions. *Am Behav Sci, 57*(8). doi: 10.1177/0002764213487341

Woodard, L. D., Hernandez, M. T., Lees, E., & Petersen, L. A. (2005). Racial differences in attitudes regarding cardiovascular disease prevention and treatment: a qualitative study. *Patient Educ Couns, 57*(2), 225-231. doi: 10.1016/j.pec.2004.06.004

Zullig, L. L., Carpenter, W. R., Provenzale, D., Weinberger, M., Reeve, B. B., & Jackson, G. L. (2013). Examining potential colorectal cancer care disparities in the Veterans Affairs health care system. *J Clin Oncol, 31*(28), 3579-3584. doi: 10.1200/jco.2013.50.4753