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Complexity of Prostate Cancer Diagnosis in African American Men in the United States

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Walden University
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Abstract

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MBA, Phoenix University, 2007

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Dissertation Submitted in Partial Fulfillment

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Doctor of Philosophy

Public Health

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Abstract

Researchers have identified higher incidence rates and mortality rates among African American men (AAM) diagnosed with prostate cancer than they have among urban African American men. This quantitative descriptive study was conducted to measure the association between advanced stage and grade of prostate cancer, demographic location, and prostate specific antigen (PSA) levels over a 5-year period in AAM and European American men (EAM) in rural versus urban communities. This study addressed 4 research questions concerning cancer grade, cancer stage, age, geographic location, PSA level, and the impact that each of these variables had on prostate cancer diagnosis in AAM in the United States. Social cognitive theory was used as a conceptual framework, which was to focus on AAM, and their behavior with prostate cancer diagnosis, in rural versus urban communities. The sample was derived from data collected from the Surveillance, Epidemiology, and End Results Program (SEER) database. The population sample size was greater than 20,000. These data were categorically analyzed using a Chi-square test and a *t* test. Overall, the results of the study showed that there was a statistical difference in rural versus urban populations between AAM and EAM diagnosed with prostate cancer over a 5-year period, and when comparing AAM with EAM in urban versus rural communities over a 5 year period, there was a significant difference in men diagnosed with prostate cancers as well as a significant change among men annually diagnosed with advanced stage prostate cancer. Information provided may have implications for positive social change affecting both rural and urban AAM in reducing fear and promoting prostate cancer awareness. This awareness may reduce advanced stage or grade diagnosis in AAM in both rural and urban communities.

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Dedication

First and foremost, all praise and honor go to my Creator of the Universe for giving me the ability to continue my education to this degree. I want to dedicate this thesis to my mother, who passed away during my sophomore year of undergraduate studies. She was the motivating factor that kept me wanting to learn because of her persistent ways of making sure I completed my education in order to advance in life. I also want to dedicate this to my loving wife, Denice, who stood by me the entire time I was working on this degree, and whose understanding that I was driven to complete this process caused her to sacrifice while I continued my education. I love you for this and will always be by your side for hanging in there with me during this long and tedious process.

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Sincere thanks are given to Dr. Willie Underwood; you kept me focused on why I was studying African American men and prostate cancer. Your knowledge and ability to keep me in the loop helped me tremendously, and I will never forget you. Dr. William Burhan, for reviewing my writing and lending an ear to my findings, I greatly appreciated your guidance and thank you for being the person you are.

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Chapter 1: Introduction to the Study

Introduction

The lifetime risk of developing prostate cancer and possibly dying from prostate cancer is substantially higher among African American men (AAM) than among European American men (EAM); Smith, Cokkinides, Brooks, Saslow, & Brawley, 2010). Recent attention has been directed toward the reasons that higher rates of prostate cancer exist among AAM. Prostate cancer has been known to be the leading cause of cancer incidence among males in the United States across all races, and AAM have twice the risk of any other ethnic group to be diagnosed with advanced-stage disease (Hoffman et al., 2001). Cancer in general has become a major public health dilemma in the United States and throughout the world (Smith et al., 2010).

There have been many studies on prostate cancer treatments in regard to racial differences, prostate cancer care, age, and multiple risk factors (Hoffman et al., 2001). This study was designed to address the differences in rural versus urban communities with a focus on the diagnosis, stage, and grade of disease; prostate specific antigen (PSA) levels; and knowledge of prostate cancer within each population. To investigate all factors, I calculated the differences in advanced stage disease that were associated with ethnicity, adjusting for demographic region and socioeconomic status. In this study, I looked at data over a 5-year period to determine whether there was a difference in diagnoses between communities. The study used secondary data collected from the Surveillance, Epidemiology, and End Results (SEER) database, and parameters were set to obtain the necessary data.

AAM have the highest incidence and mortality rates for prostate cancer, with these rates exceeding those of EAM ; Mohler, 2007). Several studies have indicated that differences in prostate cancer rates between men of different geographical origins may not be unique to the United States (Mohler, 2007; Smailyte & Kurtinaitis, 2008).

Urologists have indicated that a new patient is diagnosed with prostate cancer in the United States every 3 minutes, and another patient dies every 17 minutes (Jones, Underwood, & Rivers, 2007). This study may support positive social change, in that it may provide AAM with tools to change their behavior in relation to trust and fear in regard to medical treatment, as well as with knowledge of prostate cancer. The burden of this form of cancer for AAM seems to be related to a complex interplay of social, cultural, and biological factors that have resulted in screening rates being low and the stage and grade of the disease being higher at diagnosis for this population. These patterns could result in diminished access to timely treatments and compromised quality of care. Healthcare providers must have a working knowledge of all of the barriers to cancer care experienced by AAM in order to contribute to effective treatment recommendations. Many patients confronted with receiving a diagnosis of cancer state that they are not equipped with sufficient information to make a decision on their treatment. Such patients may request that a physician make the decision for them; however, individuals would like to be fully informed (Forrester-Anderson, 2005).

This chapter focuses on the history of prostate cancer in AAM compared to their counterparts. A major focus is the problems the disease causes among men, and to what degree researchers try to distinguish between AAM and EAM in terms of experiences of

the disease. Social change is discussed in relation to the significance of this study designed to address the understanding for education and screening programs among AAM. The ultimate goal of the study is to improve the level of knowledge that exists among AAM concerning prostate cancer.

Background

Prostate cancer is the most commonly diagnosed cancer and the second leading cause of cancer deaths among men in the United States (American Cancer Society, 2009; Centers for Disease Control and Prevention, 2013). More than 192,000 men were diagnosed with prostate cancer and about 27,300 died of the disease in 2009 (American Cancer Society, 2009; Centers for Disease Control and Prevention, 2013). Men in the United States have a 16% lifetime chance of being diagnosed with prostate cancer and a 3% chance of dying from the disease within 5 to 7 years of diagnosis once they reach age 65 or older (Aetna, 2002). The SEER database indicated that in 2014, there would be an estimated 233,000 new cases of prostate cancer and those 29,480 deaths would occur (Centers for Disease Control and Prevention, 2013). As of 2014, men in the United States had a 36.3% chance of being diagnosed with prostate cancer at age 66 or older (Centers for Disease Control and Prevention, 2013). Over the last 10 to 12 years, prostate cancer has been on the rise in the United States (American Cancer Society, 2009; Centers for Disease Control and Prevention, 2013). Early detection is essential to men receiving effective treatment for prostate cancer. Patients who undergo regular PSA testing have a higher likelihood of undergoing prostate biopsy and being diagnosed with prostate cancer

compared with men who do not undergo PSA testing. PSA testing is available to all men and is the critical component of early detection (Aetna, 2002).

Racial/ethnic disparities in health care may be a contributing factor to mortality from prostate cancer among AAM (Demark-Wahnefried et al., 1995). Demark-Wahnefried et al. (1995) found that a majority of AAM older than age 50 who knew about PSA testing reported that they had never been screened or had the test done. These inequalities often encompass the entire spectrum of care, starting with screening and prevention activities and programs, leading to diagnosis and treatment, and ending with palliative and end-of-life care (Heyns, 2008).

AAM in the United States are diagnosed more often than EAM with advanced, incurable prostate cancer, mainly due to their more limited access to health care, their socioeconomic status, and their decreased participation in early detection programs (Mohler & Marshall, 2011). AAM have also been reported to be less likely to seek care for symptoms of prostate cancer because they frequently do not know about screening programs. In turn, treatment for prostate cancer is limited because the stage of the disease at which they are diagnosed is often advanced (Mohler & Marshall, 2011). Prostate cancer is also biologically more aggressive in AAM than in EAM, as reported in the literature (Mohler, 2012). When AAM patients are diagnosed with potentially curable prostate cancer, they are less likely to choose an effective treatment, and at some point in time, treatment may not be offered to them (Mohler, 2012).

Several factors may explain why AAM develop prostate cancer at a higher rate than EAM. One factor may be lack of knowledge of the disease. Cultural barriers must

be surmounted within the African American community when it is related to the stereotype of ignorance as a component of their heritage. AAM have been labeled as individuals that do not have the knowledge to comprehend the severity of their disease. It is especially important that AAM and their families achieve a greater understanding that early detection leads to a better outcome for this disease.

If knowledge of cancer prevalence increases, influencing priorities for research and the distribution of resources, cancer screening may become more beneficial to all cancer patients in all communities, not just AAM dealing with prostate cancer. It is conceivable that no test for prostate cancer will ever be 100% sensitive (Mohler, 2012). Therefore, it may be the case that both "false negative" and "false positive" results leading to unnecessary treatment will always be present. Despite the false negatives and false positives, most medical experts agree that screening for prostate cancer saves lives (Heyns, 2008). However, there is not enough evidence for experts to decide whether the potential benefits outweigh the potential risks when screening precedes treatment (Schiavo, 2007).

Social disparity has been identified as a factor that makes a significant difference in prostate cancer diagnosis (William & Jackson, 2005). Socioeconomic status accounts substantially for differences between AAM and EAM in prostate cancer diagnosis (Bach et al., 2002). Decision making (related to treatment of prostate cancer)is much less likely to occur when AAM have lower levels of education and less health insurance along with distrust in health care providers and fear of losing their manhood (Smith et al., 2010). Evidence in the literature points to the idea that AAM do not receive the information

necessary to understand prostate cancer, or that they may not understand this information in the way in which it is presented to them in order to make a wise decision regarding treatment (Smith et al., 2010). Men and their physicians must talk more about the effects of prostate cancer at an early stage, with all necessary documentation presented to the patient.

Disparities in treatment and health inequality have been noted as at least partly responsible for the difference in the status between AAM and EAM communities. For example, the rate of prostate cancer in AAM is 10% higher than among EAM(Parham, 2005). Many of the disparities that have been noted in the results of prostate cancer treatment among AAM are related to lack of understanding of the disease and available treatments, differences in socioeconomic status, differences in access to health care, lack of trust in health services, and perceived threats to manhood (American Cancer Society, 2009).

AAM have a higher risk of developing prostate cancer at an earlier age than men in other ethnic groups; this partly accounts for the poor survival rate of this disease in AAM (Parham, 2005). AAM, when faced with prostate cancer decisions, need to have more information in order to overcome the burden related to the roadmap for future life expectations understanding what lies ahead for them(Oliver, 2007).

The particular cause of this disease is not known to the degree at which researchers could identify a cure. However, deprived health, lower socioeconomic status, lack of education and knowledge, and lack of relationships with healthcare providers are indicators that point to factors for increased mortality rates for AAM with prostate cancer

(Jones et al., 2007). There is a gap in the existing literature on screening and awareness, and these factors can affect the diagnosis of prostate cancer in AAM in relationship to EAM in rural versus urban communities. There is a greater amount of literature on treatment and prevention. This study focused on the diagnosis of prostate cancer in AAM compared to EAM in rural versus urban communities.

Problem Statement

The primary goal of any cancer prevention program is to reduce the effects of risk factors for cancer (American Cancer Society, 2009). This goal is accomplished through identification and assessment of risk factors for cancer and development of interventions for cancer prevention at all primary, secondary, and tertiary levels (American Cancer Society, 2009). The literature indicates that treatment along with early detection can reduce mortality rates for prostate cancer patients (Mettlin, Jones, Averette, Gusberg, & Murphy, 1993). Mettlin et al. (1993) stated that 94% of EAM, when their tumors have been diagnosed at a localized stage, have a 5-year survival rate, compared to AAM diagnosed with advanced stage disease.

AAM develop prostate cancer twice as frequently as EAM, and though genetics may play a role, dietary differences between these groups of men are clearly involved as well (American Cancer Society, 2009). The incidence rate of prostate cancer in AAM in 2010 was 192.9 per 100,000 men and was the highest among all ethnic groups reported (Centers for Disease Control and Prevention, 2013; Mohler & Marshall, 2011). Additionally, AAM in lower socioeconomic groups receive less consistent primary care, which correlates to the overall lower level of health in AAM (Barber et al., 1998).

Making AAM aware of the disparities of prostate cancer incidence in their communities should occur through education and screening programs (Oliver, 2007). What is unclear from the literature is whether these education and screening programs are having an impact on AAM. This study provides information about how education and screening impact the advanced-stage diagnosis rate in AAM. For this study, I investigated potential shifts in the proportion of prostate cancer over a 5-year (2008-2013) period in AAM compared to EAM; attempted to understand the level of knowledge AAM have, in comparison to CM, when being diagnosed with prostate cancer; and determined the amount of screening each group received before diagnosis in order to ascertain whether this reduced the rate of advanced-stage diagnosis of the disease in AAM. Although there is current controversy about the use of digital rectal examination (DRE) and PSA testing combined, providers typically conduct both tests when screening patients for prostate cancer (Smith et al, 2010).

Social change can be created if it is learned that prostate cancer awareness and education are generating the preferred impact that would lead to reducing the incidence of prostate cancer in AAM. Nevertheless, in discussing ethnic groups, it is important to acknowledge the sociocultural aspects that explain both constructs and the correlations that exist in AAM risk factors(Deshpande, Sanders, Thompson, Vaugh, & Kreuter, 2009). With this in mind, social change will take an important step in the lives of AAM, while changing the culture of AAM as it relates to health behaviors.

Purpose of Study

The overachieving goal of this quantitative study was to compare shifts in prostate cancer diagnosis in AAM in recent years to shifts in prostate cancer diagnosis in EAM during the same time frame. This research also compared the survival rate of AAM diagnosed with prostate cancer compared to EAM diagnosed with prostate cancer in rural and urban communities. Understanding derived from this study may lead to social change if prostate cancer awareness and education are creating the desired impact of reducing the incidence of prostate cancer in AAM. Literature, compared the education levels of AAM and EAM and provided insight on the impact of early detection and screening programs in each community. The communities this study addressed are rural communities and urban communities within the United States. *Rural communities* were defined as counties greater than 20 miles from a metropolitan area. This definition was based on the guidelines used for the SEER database. In this study, for example, Atlanta was considered a metropolitan area, and surrounding counties 20 miles or more from the Atlanta metropolitan area were considered rural communities.

Significant differences exist in clinical presentation, sociodemographic characteristics, and health-related quality of life between AAM and EAM with prostate cancer. This health-related quality of life difference persists after prostate cancer treatment (Mohler, 2012). *Quality of life* in this context refers to the overall wellbeing of individuals with prostate cancer as they return to the communities in which they reside, reestablish their lives, and cope with behavioral changes. Although, as reported in the literature, prostate cancer is biologically more aggressive in AAM,(Mohler, 2012),

physicians should be aware that concepts of race and ethnicity are social constructs without direct relationship to biology and genetics (Mohler, 2012). Prostate cancer is a major contributor to morbidity and mortality in the male population, but public awareness of this type of cancer has been limited (Agho & Lewis, 2001). The lower level of knowledge among AAM compared to EAM regarding prostate cancer etiology and clinical factors highlights the need for educational programs on prostate cancer to target minority communities (Oliver, 2007). Because of the fear of prostate cancer as a threat to their manhood that exists among AAM and their families, there is also a need for discretion on the part of physicians in their discussions of prostate cancer with AAM—for example, by providing minority favored access to screening and through consultation with the patient without family members present (Barber et al., 1998). Important differences exist in access to screening, perceptions of the disease and its treatment, and knowledge of risk factors between the different racial groups in the United States. These represent significant barriers to early detection among AAM (Oliver, 2007).

Research Questions and Hypotheses

Identifying whether differences occur in treatment and outcome between AAM and EAM may help to determine why the diagnosis of prostate cancer differs between these populations and if there are differences in survival rate between rural and urban communities. Assessing differences in the stage of prostate cancer at the time of diagnosis between AAM and EAM populations in rural versus urban communities may establish whether these differences are related to the prevalence of the disease.

RQ1: Is there a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States between 2008 and 2013?

Ho1: There is no significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period (2008-2013).

Ha1: There is a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period (2008-2013).

RQ2: Is there a significant difference in the proportion of AAM and the proportion of EAM living in urban areas in the United States annually diagnosed with prostate cancer between 2008 and 2013?

Ho2: There is no significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period (2008-2013).

Ha2: There is a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period (2008-2013).

RQ3: Was there a significant change in the proportion of men annually diagnosed with advanced-stage prostate cancer in rural versus urban areas in the United States between 2008 and 2013?

Ho3: The proportion of men annually diagnosed with advanced-stage disease in a rural community versus an urban community did not change during the 5-year period (2008-2013).

Ha3: The proportion of men annually diagnosed with advanced-stage disease in a rural community versus an urban community changed significantly during the 5-year period (2008-2013).

RQ4: Did PSA levels of men annually diagnosed with advanced stage prostate cancer significantly changes in rural versus urban areas in the United States between 2008 and 2013?

Ho4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community did not change during the 5-year period (2008-2013).

Ha4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community changed significantly during the 5-year period (2008-2013).

Conceptual Framework for the Study

This study, which focused on AAM and their behavior in relation to prostate cancer diagnosis in rural versus urban communities, was based on social cognitive theory (SCT). SCT involves an assumption that individuals will make reasonable decisions concerning whether one should take preventive action (Myers, 2005). SCT also signify a difference in the structure of various life domains, such as family, health, demographic location, employment, and health care providers. SCT is a cognitive theoretical model

that includes many variables that assist an individual in performing and achieving valued goals. Figure 2 (presented in Chapter 2) depicts the framework that was employed for this study (Bandura, 1999).

SCT was developed by Bandura (1999) for the purpose of each individual to express a type of control system that will have some interaction between the person and their environment or surrounding demographic area (Myers, 2005). This model was beneficial to this study because it served to assess the need for AAM to select specific responses to threats that may be related to health concerns, especially that of prostate cancer. This model consists of cognitive encodings, values, and goals and suggests that individuals select behavioral options to maintain physical, emotional, and social states within their communities. AAM with prostate cancer and their families have to manage the stress of the diagnosis, along with trying to interpret large amounts of complex and conflicting information on treatment options and to understand the outcome of what has been placed in front of them. Some studies suggest that SCT encourage individuals to gain personal success by observing others who have succeeded while facing similar obstacles (Bandura, 2009).

The purpose of this study using the SCT framework was to describe the information sources that AAM have access to when confronted with prostate cancer, the decisions they make on health-related problems concerning the diagnosis, and the benefits and risks associated with the outcome of this decision making. SCT helped in determining whether demographic location and cognitive factors were independently associated with AAM who were treated or diagnosed at a cancer institutes or treatment

centers. This study used data on PSA levels, which were monitored during the treatment of patients to assess symptom progress and could help in patients' decision making moving forward.

This study used standard demographic information, including age, race, geographical location, education, stage of disease, and PSA test value. SCT was the most efficient framework to address all of the needs of this study. Informed decision making encompasses knowledge, and a relationship between the patient and health care provider. Even with the awareness of the potential benefit of early detection, there may be concern regarding unnecessary surgeries for prostate cancer in AAM that is not life threatening. AAM may withdraw from and avoid a situation that seems too threatening or overwhelming. This may be the reason that AAM make the decision to remove themselves from cancer screening programs.

Change is something that does not come easily to individuals; for this reason, SCT addresses the issue of perceived barriers to change. Individuals' self-evaluation of any obstacles in the way of adopting change has an effect on these barriers and on the promotion of new behaviors. Individuals need to believe in the benefits of a new behavior before they will be willing to adopt a change (Centers for Disease Control and Prevention, 2013; Mohler & Marshall, 2011).

Nature of the Study

In addressing the research questions presented in this study; a retrospective, quantitative methodology was used to assess trends in prostate cancer diagnosis among AAM and EAM living in urban and rural areas over a 5-year period. The SEER database

stores data on several geographical locations throughout the United States, such as cities, counties, and states, and is based on data from state cancer registries. Secondary data routinely collected from hospital medical records are housed by the Centers for Disease Control and Prevention in the larger SEER database. This database provides a consistent source of information on prostate cancer that can be used for research purposes. As such, the SEER database was used for the purpose of analyzing differences between AAM and EAM populations in urban and rural communities during the 5-year period of interest. This study investigated the reason for differences between AAM and EAM in relation to prostate cancer by evaluating ethnicity, income, and advanced-stage disease, adjusting for demographic region, socioeconomic status, clinical factors, and pathological factors. Analysis of the data involved both descriptive and inferential statistics. In order to identify patients with advanced-stage disease, the data were supplemented by abstracting data from a sample of hospital records at the Roswell Park Cancer Institute (RPCI) urology department.

Definitions

Digital rectal exam (DRE): Palpation of the rectum by a physician using a glove and his or her index finger in order to search for an enlarged prostate (Mohler, 2007).

Health belief model (HBM): A highly used framework introduced by a cohort of psychologists associated with public health services for the purpose of establishing individuals' beliefs and attitudes to determine their health-related actions (Rosenstock et al., 1988).

Prostate cancer: A malignant tumor growth that occurs in the prostate gland of

men (Underwood et al., 2005).

Prostate-specific antigen (PSA): Affected , treasured tumor marker; also the most clinically useful means to monitor disease recurrence after the treatment of prostate cancer (Polascik, Oesterling, & Partin, 1999).

Quality of life (QOL): a measurement used to integrate objective and subjective indicators for a wide range of life domains and individual values (Felce & Perry, 1995).

Socioeconomic status (SES): Often based on an individual's income, education level, occupation, and factors such as social status in a surrounding community where the individual resides (Forrester-Anderson, 2005).

North Carolina-Louisiana Prostate Cancer Project (PCaP): A multidisciplinary study of social, individual, and tumor-level causes of racial differences in prostate cancer aggressiveness (Schroeder et al., 2006).

Social cognitive theory (SCT): A framework developed by Bandura in 1999 for the purpose of giving an individual a means to mediate interactions between individuals and their environment (Myers, 2005).

Assumptions

This study required the assumption that all data collected from the SEER database would have all information necessary in order for the individuals who consented to participate in the study to meet the inclusion criteria. Further, it was assumed that enhancing knowledge and awareness of the need for prostate cancer education for AAM in rural and urban communities had the potential to aid in early detection of this disease. It was thus assumed that this study might help to reduce the number of men diagnosed

with prostate cancer as well as the mortality rate throughout the United States.

Many factors are used to promote a healthy understanding regarding prostate cancer as it relates to diagnosis, knowledge, and understanding. Observing these factors could cause individuals to have recall bias when asked certain questions pertaining to their health. It was assumed that the information received from their health care providers was correct and that areas of concern were addressed in this study.

AAM, when compared to EAM, may avoid participating in prostate cancer screenings, which may result in the progression of advanced-stage prostate cancer (Jones, Steeves, & Williams, 2010). Untrustworthy patient-provider relationships, education, and lack of financial resources contribute to most screening delays (Jones et al., 2007). The 5-year prostate cancer survival rate for AAM is lower than that of EAM in the United States (Jones et al., 2007).

In rural communities, a lack of urologists and radiation oncologists may account for the frequency of advanced-grade prostate cancer (Smailyte & Kurtinaitis, 2008). Most prostate cancer patients in rural areas travel to urban areas for care; thus, it is possible that high rates of ultimate prostate cancer treatment for AAM living in remote, small rural communities reflect their care in urban areas (Smailyte & Kurtinaitis, 2008). If it is assumed that there is a scarcity of local cancer specialists or cancer treatment centers in rural areas, one may assume that AAM who reside in those areas have more limited treatment sources than those in urban communities. Travel distance and specialized healthcare facilities may impact the type of care AAM may receive in rural communities.

Scope and Delimitations

The participants of this study included AAM who had been diagnosed with prostate cancer and were at least 40 years of age. This study focused on identifying factors associated with intentions to test for prostate cancer risk for AAM and EAM. This study used the SEER database to gather data.

The data collected for this study was determined by county, city, and state; this information was used to differentiate between rural and urban communities. SEER data encompass all cancer registries throughout the United States (American Cancer Society, 2009). The PCaP data were differentiated from SEER data based on a geographic information system (GIS) coding technique for identifying addresses. The data reflect a 5-year period between 2009 and 2013. This is considered a retrospective study consisting of secondary data.

Limitations

The major limitation of this study related to ensuring that the data were up to date within the SEER database. The men whose data this study chose were patients in an established heath care system in urban and rural communities. In terms of data collection, information on personal background, including family history of prostate cancer and accuracy of the SEER data, were based on self-reporting. A third limitation was not having data to determine whether social support was present and what the educational level of the patient was in relation to prostate cancer before diagnosis. A fourth limitation involved the interpretation of the data and lack of understanding of whether prostate cancer was a primary or secondary disease. A fifth limitation was the possibility of a lack

of culturally appropriate communication of information between healthcare provider and patient in relation to factors such as distrust, fear, and disconnect, which could affect whether the patient participates in prostate screening. The sixth limitation was the limited amount of data on individual cancers in rural areas. The final limitation involved determining how much data for prostate cancer was in the registries for patients aged less than 50 years.

Significance

Prostate cancer is the most common cause of death for AAM (American Cancer Society, 2009; Centers for Disease Control and Prevention, 2013). Prostate cancer is also the most commonly diagnosed visceral cancer (Hoffman et al., 2001). Many theories have been developed to account for these facts, but there is no concrete evidence to indicate why these patterns occur. Major factors could include delayed diagnosis and limited access to treatment. Many AAM may not have medical coverage or may not receive regular medical treatment for personal reasons; by the time symptoms become evident for such AAM, the disease has become more challenging to deal with.

Prostate cancer screening and education may both be significant strategies for reducing mortality rates in AAM. Most of all, the relationship between sociocultural individuality and patterns of disease risk, health behaviors in AAM, and delayed diagnosis have not been studied fully or documented and have not been well understood by AAM (Consedine & Skamai, 2009). Recognizing and understanding the risk factors associated with the development of prostate cancer, along with the outcome of delayed initial screenings and diagnosis, were important goals of this study. My aim was to

measure the relationship between knowledge, demographic variables, patient-provider relationships, and AAM awareness of the benefits of early detection and their decision to participate in prostate cancer screenings.

Prostate cancer is the leading cancer diagnosis among AAM in the United States (Johnson, Saha, Arbelaez, Beach, & Cooper, 2004). It has been stated that higher mortality is coupled with late detection of the disease (Geronimus, Bound, Waidmann, Hillemeier, & Burns, 1996). The causes for higher rates of prostate cancer among AAM are not clear. The goal of Healthy People 2010 (2013) is to reduce incidence and mortality rates in conjunction with prostate cancer for rural and urban populations throughout the United States. Accomplishing these goals will require much more research throughout many communities. A change in the stage of the disease at diagnosis is seen in all ethnic groups throughout the United States (Haas, Delongchamps, Brawley, Wang, & de la Roza, 2008).

Social change may be possible if it is learned that prostate cancer awareness and education are generating the preferred impact, which will lead to reduction of the incidence of prostate cancer in AAM in both rural and urban communities, as well as in their family's involvement as it pertains to history of their prostate cancer.

Summary

Currently, the exact causes of prostate cancer remain unclear; however, age, race, culture, heredity, and diet have all been identified in the literature as contributory risk factors for this disease. Screening individuals who are asymptomatic is crucial, particularly when testing is precise, specific, and most importantly, cost effective.

Numerous studies have indicated that the increased number of men diagnosed with prostate cancer may be attributed to lack of knowledge and understanding about the risk factors and screening procedures for prostate cancer, especially for those individuals who are classified as being in a high-risk category such as AAM and for those men with a genetic history of prostate cancer. AAM have significantly higher prostate cancer mortality rates than any other ethnic group (CDC, 2003).

Studies indicate that the decision to participate in prostate cancer screening is less likely to be made when AAM have low levels of education and is not receiving all the necessary information to make a wise decision concerning their healthcare (Deshpande et al., 2009). The role that insurance plays in care for cancer diseases, along with income and health status, may contribute to the later disease stage of prostate cancer at diagnosis (Griffith et al., 2007). A majority of men trust that if prostate cancer were a potential problem, their healthcare providers would explain the seriousness of this disease to them. The evidence points to poor provider-patient communication, along with a lack of understanding and respect for AAM culture among providers.

AAM continue to experience a greater burden of prostate cancer diagnosis compared to any other ethnic group in the United States (Odedina, Ogunbiyi, & Ukoli, 2006). There are more questions than answers when it comes to explanations for the high rate of prostate cancer in AAM. Recent studies have provided further evidence of high prostate cancer risk among AAM compared to EAM(Odedina et al., 2006). As there have been reported differences in prostate cancer among AAM, it has been stated that prostate cancer in AAM can be attributed to multiple factors, which include underreporting, lack

of diagnosis, limited access to healthcare providers, and the quality of cancer data systems (Odedina et al., 2006).

Where do researchers go from here? Can they explain why AAM have been unduly burdened by prostate cancer, with higher death rates, later stage disease at diagnosis, and unequal survival rates compared to EAM? Chapter 2 provides insight on past and present developments as to the direction in which prostate cancer has evolved in history.

Chapter 2: Literature Review

Introduction

Prostate cancer historically has been known as the most commonly diagnosed and second leading cause of death among AAM in the United States (Steenland et al., 2011). The lifetime risk of an AAM developing and dying from prostate cancer is elevated by a factor of two as compared to EAM (Myers et al., 1999). It has been reported that AAM are at a substantially higher risk of being diagnosed with advanced-stage disease (Hoffman et al., 2001).

Recent data have indicated that prostate cancer survival, when adjusted based on the stage of the disease, may not represent a disadvantage for AAM compared to EAM (Newcomer, Stanford, Blumenstein, & Brawer, 1997). What is indicated here is that because of the aggressive nature of the disease, there may not be a racial difference based on the risk of the disease (Wender et al., 2013). Agho and Lewis (2001) pointed out that several factors may account for why AAM develop prostate cancer at a much higher rate than EAM. The barriers related to the abovementioned factors include stereotyping, cultural barriers, and knowledge (Shelton, Weinrich, & Reynolds, 1999).

Variance in the outcomes of prostate cancer treatment has not been shown to be due to delays related to lack of access to care along with problems associated with prevention and diagnosis: however, it may reflect the inferior quality of medical services in some underprivileged areas (Barnato, Lucas, Staiger, Wennberg, & Chandra, 2005). Minorities and low-income persons receive lower quality care and face more barriers to healthcare access (Koh, Graham, & Glied, 2011). Factors adding to differences in

healthcare include poverty, lack of access to healthcare, inefficient insurance, language and literacy barriers, and poor expectancies of the outcome of cancer treatment, along with physicians and the healthcare system (Shelton et al., 1999). Even though causes that restrain access to care are multifactorial, racial and ethnic disparities in healthcare contribute significantly to this problem in the United States. Research shows that AAM are in inferior health relative to EAM, and they experience more substantial obstacles to receiving care (Hughes-Halbert et al., 2007).

Literature Search Strategy

Information on this topic came from a systematic literature review, in which I retrieved information from multiple databases such as PubMed, Cancer Lit, and Medline. Google Scholar and EBSCO, accessed through the Walden University library, were the major search engines used to collect articles pertaining to this topic. The Roswell Park Cancer Institute library was also a resource for information on the subject. Other search engines included SAGE, Cochrane WebMD, and High Wire. The search terms used for the purpose of this review were *prostate cancer*, *rural and urban communities*, *AAM*, *CM*, *DRE*, and *PSA*. The literature reviewed encompassed a period of more than 20 years.

Conceptual Framework

This study was based on using SCT to focus on AAM in rural and urban communities in relation to their behavior concerning prostate cancer. SCT was a beneficial framework because it is a model that addresses cognitive encodings, values, and goals and suggests that individuals will select behavioral options for succeeding in maintaining physical, emotional, and social states within their communities. SCT has

been confirmed to have applicability to preventive health behavior and flexibility in cancer treatments; thus, it is a useful theoretical framework for prostate cancer studies. According to the literature, SCT, which is a cognitive theoretical model, consists of a set of interrelated variables that, when accurately documented and multiplicatively correlated, will identify the reason that individuals will be motivated to participate in health behavior studies (Rosenstock et al., 1988). Figure 1 demonstrates the framework that was used for this study (Bandura, 1999).

Social Cognitive Model

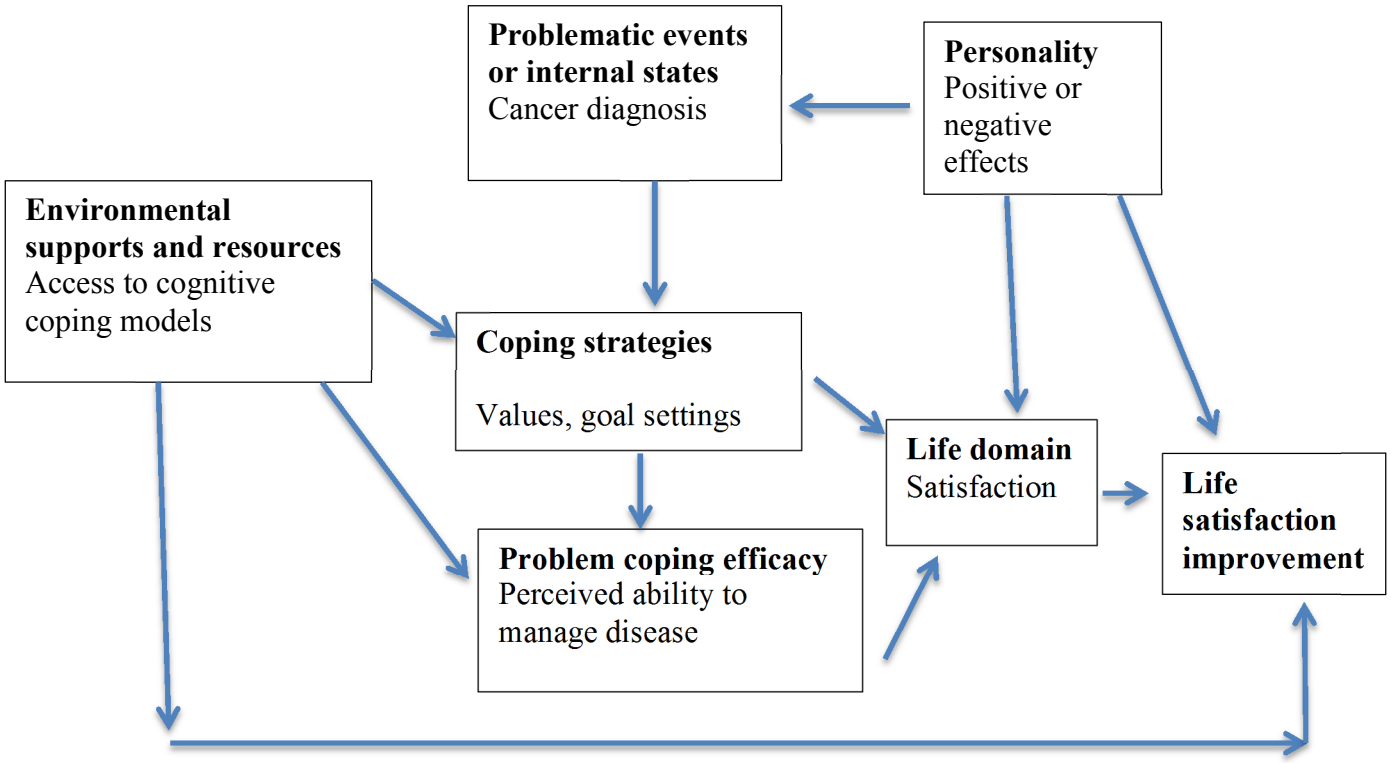

Figure 1. SCT diagram**.** From "Social Cognitive Theory of Personality," by A. Bandura, 1999, in A. Pervin & O. P. John (Eds.), *Handbook of Personality: Theory and Research* (2nd ed., pp. 154-196). New York, NY: Guilford Press.

Literature Review

History

Prostate cancer is the most commonly diagnosed cancer throughout the United States, especially among AAM (Oliver, 2007). According to Oliver (2007), AAM are diagnosed with prostate cancer up to 65% more frequently than EAM. This disparity raises important questions about how it arises and how it impacts treatment of prostate cancer in AAM. Some of this disparity is related to a higher risk of inherited genetic factors contributing to prostate cancer in AAM (Odedina et al., 2006). An additional explanation for this disparity, however, may be that AAM do not avail them of prostate cancer screening as frequently as EAM. Oliver (2007) stated that the underlying reasons why this is the case are the subject of continuing study.

Disparities

Health disparities and health inequality have been noted to be related to a difference in the status of one group of people as compared to another group (Oliver, 2007). Studies have shown overwhelming evidence that AAM receive substandard healthcare compared to EM in many geographical locations (Steenland et al., 2011). One of the goals of health care professionals should be to eliminate this disparity, specifically when it is related to cancer. Pursuing this goal is expected to lead to better health for all underserved populations with respect to many diseases in addition to prostate cancer.

The disparity in prostate cancer care in AAM compared to EAM is particularly a problem in rural communities. Smedley et al. (2000) stated that there is a great deal of diversity among rural African American communities as compared to the U.S. population

as a whole, and most members of these communities experience disparities in their health care status (Hughes-Halbert et al., 2007). It is not clear whether this disparity is related to less frequent access to doctors, difficulties finding adequate health care facilities in rural versus urban populations, or perhaps fewer visits to health care facilities for other reasons (Oliver, 2007). It has been stated in the literature that one in every six American men will develop prostate cancer during his lifetime (Oliver, 2007). This being said, studies have also shown that AAM have the highest risk of developing prostate cancer and are twice as likely to die from this disease compared to EAM as prostate cancer patients (Oliver, 2007). In the United States, men are 33% more likely to develop prostate cancer than American women are to develop breast cancer (Smart, 1997). A contributing factor is that there is far less public awareness of the need for prostate cancer screening promoted through television and radio advertisements compared to breast cancer screening (Oliver, 2007).

Morbidity and Mortality

Recent studies have shown that despite prostate cancer having a high morbidity and mortality rate, AAM far less frequently participate in prostate cancer screening compared to EAM(Oliver, 2007). One may speculate on the reasons for this fact. However, it has been suggested that there have not been any qualitative studies performed that shed light on why this phenomenon takes place (Oliver, 2007). Some of the factors cited as contributing to prostate cancer in AAM are age, family history, diet, and lack of health care information and understanding (Oliver, 2007). These factors, when combined with the reduced frequency of screening and absence of education for

AAM, could lead to some of the disparities that have been identified in prostate cancer morbidity and mortality within the African American population (Oliver, 2007). If researchers had a better understanding of one's personal experiences with prostate cancer and screening of AAM, they might be able to develop more effective programs and targeted interventions for at-risk populations of AAM, as well as men of other ethnicities.

The effectiveness of prostate cancer screening based on current guidelines and information remains unclear (Oliver, 2007). The exam initially employed to screen for prostate cancer was the digital rectal exam (DRE). After many years of employing the DRE an additional exam was developed, which is known as the prostate specific antigen blood test (PSA). Both are employed to detect early prostate cancer (Demark-Wahnefried et al., 1998). This study has shown that prostate cancer screening should be performed for all men of ages 40 to 70 (Oliver, 2007). This study consisted of 179 CM and 115 AAM (Oliver, 2007).The earlier prostate cancer is detected, the greater the probability of survival and the more likelihood there is for a healthy outcome.

In men, the incidence of prostate cancer increases dramatically with age (Oliver, 2007). However the incidence of prostate cancer in AAM well exceeds that of their Caucasian counterparts. When looking at age as a risk factor for prostate cancer in CM who have no family history of the disease, the increased risk begins at age 50, while in AAM it begins at age 40 (Oliver, 2007). Although delayed screening has been identified as a possible reason for the differences in prostate cancer diagnosis in AAM compared to EM, other factors that have also been identified as likely contributors to this disparity are

lack of knowledge, communication, social support, quality of care, and perceived threats to men's sexuality (Oliver, 2007).

Focus groups of older AAM have identified and examined the psychological factors that influence the screening behaviors among this group (Hsing & Devesa, 2001). Oliver's study consisted of 26 males and 19 females who participated in the focus group. The findings of this study suggested that most individuals view cancer screening positively. Furthermore, it identified increasing age as a primary motivating factor to obtain any type of cancer screening (Oliver, 2007). Men in this focus group tended to express their distrust of the medical system and looked at cancer as a death sentence (Oliver, 2007). AAM were less likely to pursue cancer screening on their own and relied strongly on encouragement from family members (Steenland et al., 2011).

Rural Versus Urban Populations

Studies also suggests there is a difference in cancer staging among rural compared to urban population; rural population are diagnosed at a more advanced stage (Griffith et al., 2007). AAM in rural areas are particularly at risk of late stage cancer diagnosis. It is also documented that rural dwellers have less access to and are less likely to utilize early cancer detection programs (Goovaerts & Xiao, 2011). Even though numerous studies have highlighted the need for prostate cancer screening among AAM, no studies have addressed the concerns and attitudes of rural AAM about prostate cancer and cancer screening programs (Oliver, 2007). It has been suggested that rural AAM know very little about the symptoms of prostate cancer or what is involved in prostate cancer screening (Odedina et al., 2009). This could lead to embarrassing situations for individuals who

have no concept of what symptoms are associated with prostate cancer or what is involved in prostate cancer screening. Additional knowledge in this regard would be a powerful tool. However, this knowledge is not always utilized because AAM often dismiss this knowledge because they view it as a threat to their manhood (Oliver, 2007). Most AAM have a problem verbalizing the fear that having a DRE will make them feel as if they are being violated (Oliver, 2007). It has also been reported that because of these attitudes, African-American physicians and healthcare providers are reluctant to discuss prostate health information in ways that their patients will understand (Oliver, 2007).

All of these considerations point to a critical need for more research into the social, economic, and cultural barriers that contribute to the disparity in prostate cancer morbidity and mortality of rural populations of AAM, in addition to factors such as a shortage of professionals, geography, and distance (Oliver, 2007). Information provided by this research should prove invaluable to AAM, who can be influential in providing guidance to scientists and healthcare providers. It should also facilitate the adoption of educational materials and activities that are better suited for AAM as it relates to prostate cancer and screening for early prostate cancer (Oliver, 2007).

The disparity between prostate cancer cares for African Americans compared to Caucasians exists in urban populations in the United States as well, and in populations outside the United States. In 2002, the International Agency for Research on Cancer estimated that based on the incidence and prevalence of mortality from 27 cancers throughout all countries, prostate cancer ranked first among five year prevalent cases of

all cancers in men (Odedina et al., 2006). In 2005, United States cancer mobility and mortality estimates reported by the American Cancer Society indicated that prostate cancer will continue to be the leading cause of new cancer cases and the second-leading cause of cancer death in men (Odedina et al., 2006). A disproportionate burden is experienced by AAM, because of the 232,090 cases of prostate cancer that was reported in the year 2005, AAM were 2.4 times more likely to die from prostate cancer compared to EAM(Odedina et al., 2006). AAM also have the highest incidence of prostate cancer compared to other racial ethnic backgrounds in the United States (Odedina et al., 2006). Studies show that the differences in the incidence of prostate cancer and the variations in incidence among ethnic groups are caused by multiple factors, including genetic susceptibility, external risk factors, health differences, and cancer limited programs (Odedina et al., 2006). A complete understanding of the reasons for the ethnic variations in prostate cancer incidence within the United States remains undefined (Smart, 1997). An additional question that has not yet been answered is does prostate cancer disparity exist among the original source population of African Americans?

Prostate cancer morbidity and mortality rates tend to vary worldwide among diverse groups (Odedina et al., 2006). It has been stated that generally more developed regions have higher morbidity and mortality compared to less developed regions (Odedina et al., 2006). If one examines the incidence of prostate cancer among AAM in the United States compared to men in the rest of the world, can we conclude that it is higher in AAM? In the absence of any type of viable cancer registration system that would allow comparison of population-based information on prostate cancer incidence

and outcome, we cannot conclude that prostate cancer burden among AAM is higher than that of any other group (Odedina et al., 2006). Although AAM have the highest incidence of prostate cancer in the United States, African Caribbean men have the highest rate of prostate cancer in the world (Odedina et al., 2006).

AAM have an earlier onset of prostate cancer along with a higher PSA level at diagnosis, and have been diagnosed more frequently with an advanced stage of the disease along with a higher mortality rate compared to EAM(Thompson et al., 2001). The African American ethnic background confers a greater risk of disease with advanced stages, which signifies a poorer prognosis for AAM. This could reflect the later stages of the diagnosis and consequently poorer prognostic features of the disease in AAM, or it could reflect a biological difference in the disease (Thompson et al., 2001). Several studies have provided evidence to support the above theory (Thompson et al., 2001). However, the sample size from Thompson's study was small and variables such as treatment type and patient characteristics were difficult to control (Thompson et al., 2001).

Thompson's study compared the survival rate between AAM and other ethnic backgrounds. The results of the study said that there was no difference noted between treatment assignments and ethnicity (49.3% of the patient population was AAM and 50.2% were EAM and they were randomly assigned to the study) (Thompson et al., 2001). AAM exhibited poorer survival compared to EAM in the study, most likely because of the later stage of the disease at which they were diagnosed (Thompson et al., 2001). The investigators stated that the poorer survival among AAM was a reflection of

poor prognostic factors. To control for this factor they employed a proportional hazardous regression model to investigate the mortality relationship between the compared groups (Thompson et al., 2001). Thompson's study also showed that AAM were more likely to have locally advanced or metastatic disease accompanied by bone pain and a poor performance status. They were also diagnosed at a younger age and with a higher Gleason score and higher PSA levels (Thompson et al., 2001). Compounding variables also showed that African-American patients had an higher hazard rate for death (1.23 with the 95% CI = 1.04 to 1.47; this increase risk was statistically significant to a P = .018) (Thompson et al., 2001).

Researchers have suggested that arrays of care and health behaviors may affect the outcome of prostate cancer in AAM (Thompson et al., 2001). For example, early diagnosis in AAM may increase mortality compared to CM because when they are diagnosed earlier, they are less prone to follow-up with treatment. (Thompson et al., 2001). Marketing research has shown that advertising methods to educate men on the beneficial aspects of early diagnosis are effective in some communities, but less in communities of AAM. This problem could be mitigated by offering educational programs at work or at church or through peer testimonials (Thompson et al., 2001).

The outcome of treatment for AAM and EAM has been compared in multiple populations in attempts to correct for variables that may affect the outcomes, such as access to healthcare (Thompson et al., 2001). The problem is these results contradict the results of other studies, and have not been shown to be beneficial in multiple studies (Thompson et al., 2001). One explanation for the differences in outcome between African

Americans and Caucasians may be that it reflects a difference in how these two groups of men access their healthcare, as was suggested in a study of Medicare beneficiaries in New York State (Thompson et al., 2001). Thompson et al., reported these differences in the literature as well as in two reviews of United States experiences documented by the Surveillance Epidemiology and End Results (SEER) program (Thompson et al., 2001).

Summarizing Thompson's study, AAM are at a statistically significant greater risk of death following their hormonal therapy for advanced prostate cancer (Thompson et al., 2001). The study concludes that these ethnic differences are important and warrant further investigation to identify the cause of the differences and to subsequently develop more effective therapies (Thompson et al., 2001).

Multiple explanations have been proposed to account for the disparities related to stage of disease and diagnosis of prostate cancer in AAM (Reynolds, 2008). As stated earlier demographic characteristics, social economic status, and comorbidity are examples that may limit cancer screening in African American population and may contribute to the delay in diagnosis (Reynolds, 2008). In a study conducted by Hoffman et al. (2001) a different explanation was being looked at, the explanation pointed to racial differences in tumor biology which was linked to attributable differences in diet, molecular factors and hormonal differences. This explanation attributed to the more aggressive tumor theory, stating that African Americans having differences in the above mentioned factors will be candidates for aggressive tumor growth in the prostate (Hoffman et al., 2001).

Hoffman and others (2001) conducted the study known as the Prostate Cancer Outcomes Study (PCOS), which was used to collect data from populations consisting of a cohort of men with newly diagnosed prostate cancer, in an effort to assess the effects of treatment which involved radiation therapy, or prostatectomy on patients that had a health related quality of life outcome. The data came from the tumor registry system from the National Cancer Institute's SEER program, which provided cancer incidence and the survival data on patients in the United States (Hoffman et al., 2001). The patients were selected based on age, ethnicity, demographics, and race (Hoffman et al., 2001). The study sample size total was 5,672 citizens from a total of 11,137 qualified prostate cases (Hoffman et al., 2001).

The PCOS study showed that AAM had the highest proportion of advanced disease (12.3%) compared to EAM(6.3%) (Hoffman et al., 2001). Among the men that participated in the cohort study African Americans were younger and less educated, economically deprived, and were less likely to have had a PSA test (Hoffman et al., 2001). The study also showed that African Americans had the most comorbidity and the highest PSA levels (16.8%) than any other ethnic group (Hoffman et al., 2001). From observing these factors the study pointed out that AAM were more likely to be present with clinically advanced stage prostate cancer as compared to EAM within the same parameters (Hoffman et al., 2001).

Racial and ethnic disparities in the stage of prostate cancer diagnosis is an important phenomenon clinically because the survival of men is dependent on the stage of the disease (Hoffman et al., 2001). Prostate cancer mortality rate has been shown to be

higher in AAM then in EAM; however, the racial disparity disappears after adjusting for the stage of the disease between the groups as stated by Hoffman et al. (2001). The SEER report has shown that AAM survival rate is poorer across all stages of diseases (Hoffman et al., 2001). The SEER data was not altered for socioeconomic or demographic factors (Hoffman et al., 2001). AAM, who subsequently represented in a lower socioeconomic level, have been noted as having less access to healthcare and preventive services compared to EAM; in retrospect this factor can delay diagnosis and lead to advanced disease (Hoffman et al., 2001).

Stage of Disease

The failure to explain differences in the stage by looking at income, employment, educational levels, and insurance suggests that socioeconomic factors may not represent access to healthcare equities between AAM and EAM(Hoffman et al., 2001). Researchers may want to obtain data from a source that shows the above-mentioned factors as they relate with men with prostate cancer. Lack of association between cancer stages and these factors may better explain the advanced stage of prostate cancer disease in AAM (Hoffman et al., 2001). Since there are no prevention strategies for prostate cancer to reduce racial disparity in the stage and survival from the disease, this may lead to offering AAM an aggressive screening program (Hoffman et al., 2001). Ultimately, any efforts to decrease prostate cancer mortality and incidence in AAM will have to address all factors associated with racial disparity and clinical stage of the disease along with diagnosis (Hoffman et al., 2001).

Numerous reports show that AAM are present with a higher grade and stage tumors, along with serum PSA levels being higher, are less likely to receive definitive or curative treatment than Caucasians. The prognosis for AAM is worse when compared to CM (Heyns, 2008). Studies have also documented that AAM are present with a more advanced disease and the treatment for this disease is palliative rather than curative (Heyns, 2008). It may be suggested that race is an ill-defined concept or a socio-political deception instead of a biological or genetic entity, causing the use of self-identification to establish the race of a study population (Heyns, 2008).

Incidence of prostate cancer may vary as much as 90 fold between different populations with the highest rate being present among AAM and the lowest rate exist and Chinese men (Heyns, 2008). Epidemiology studies reported, since the late 1930s the incidence and mortality rates have been consistently increasing in AAM compared to EAM(Heyns, 2008). The rates that were reported vary from 126.4 to 275.3/100,00 per year in AAM while during the same time the rates in EAM were 74.5 to 172.9/100,000 (Heyns, 2008). The mortality rates during the same time were 46 to 71.1/100,000 per year among AAM compared to 22 to 33.8/100,000 between EAM(Heyns, 2008). With this magnitude it shows that the mortality rate can be reported as 10 to 120% higher among AAM compared to EAM(Heyns, 2008). With the increase in incidence rate Heyns (2008) suggests that there is a correlation which exists between increases in diagnosis which is in alignment with the increase in incidence. Hoffman et al. (2001) suggested that since there are no prevention strategies for prostate cancer, reducing the disparities in stage and survival may necessitate providing AAM with aggressive screening. As the rationale for

his statement, Hoffman (2001) mentioned that since recent data suggests that declining incidence rates of advanced stage prostate cancer, along with an increase in clinically localized prostate cancer in men overall, may imply it has a connection with PSA testing.

Studies have reported that prostate cancer increases with age, whereas the peak age depends on the life expectancy of the population (Heyns, 2008). AAM life expectancy is considerably lower than EAM as reported by several studies (Heyns, 2008). Reports show that there are no reliable age-adjusted mortality rates available for many countries (Heyns, 2008) suggesting that data could be skewed when comparing populations for significant studies. The calculation for reliable incidence and mortality rates depend on accurate facts especially as it relates to diagnosis and reporting of all cases, along with complete population statistics (Heyns, 2008). Multiple studies have indicated that socioeconomic factors decrease the awareness and limited access for utilization of healthcare which will contribute to the poor outcome in AAM even after adjusting for differences in disease characteristics for pretreatment of the disease (Heyns, 2008). While scientific evidence is lacking, the incidence of prostate cancer among AAM and the mortality rate is due to the higher stage at presentation or lower curative treatment rather than biological tumor aggressiveness (Heyns, 2008).

Zeliadt and others have suggested that since 1992, in the United States prostate cancer mortality has been on the decline by more than 20% (Zeliadt, Potosky, Etzioni, Ramsey, & Penson, 2004). At present it is unclear as to the reason for the decline, however it has been stated that several changes did occur in the diagnosis and management of prostate cancer disease (Zeliadt et al., 2004). A study was put together

with the use of primary and adjuvant androgen deprivation therapy (ADT) with the use of a population base treatment (Zeliadt et al., 2004).

The purpose of this study was to determine if aggressive therapy has increased in EM over time as compared to the decrease in AAM within the same time (Zeliadt et al., 2004). The study did account for age, socioeconomic status, grade, and coal morbidity (Zeliadt et al., 2004). It was noted that AAM were 26% less likely to receive any kind of aggressive therapy (Zeliadt et al., 2004). Racial differences are increasing when it comes to aggressive and conservative therapies (Zeliadt et al., 2004). Understanding the impact of any treatment pattern can be very critical to the outcome on patient survival and cost of the treatment (Zeliadt et al., 2004).The data for this study was collected from the SEER Medicare database. This database contain Medicare treatment claims history on patients with nonmetastatic prostate cancer at age 65 or older (Zeliadt et al., 2004).

Diagnosis

Brawley (1997) has placed an emphasis on how prostate cancer is a devastating sickness that affects the death of many AAM. His research was designed to focus on the need for preventing prostate cancer deaths at the rapid pace in which it has been reported. Brawley's study discussed the use of PSA testing for screening, and discussed the potential harms of the test (Brawley, Ankerst, & Thompson, 2009). He stated that because AAM have been taught for multiple years to fear all cancers and if one is to find the best way to cope with cancer, it would be to detect it early and aggressively treat the disease (Brawley et al., 2009).

Brawley's study suggested that over diagnosis put the emphasis on screening as a mechanism to save lives (Brawley et al., 2009). It was suggested that over diagnosis will increase a proportion of men surviving the disease for 5 and 10 years (Brawley, 2012b). From this article, it seems that over- diagnosis and screening are simultaneously used when it comes to prostate cancer prevention. Brawley stated that if screening will diagnose some men earlier, they may live longer after the cancer was diagnosed, however they do not live longer than other men who had the similar diagnosis but were not detected with a screening procedure (Brawley, 2012b). The literature suggests that over-diagnosis was an issue well before screening was popular (Brawley, 2012b). The literature on screening shows that there is a difference among the number of men who are tested at an event compared to the screening done within the relationship between physician and his or her patient (Brawley, 2012b).

Prostate cancer screening has been done at multiple sites, for example churches, fraternities, television events, fairs, and community centers. They have been occupied by politicians, athletes, and celebrities, which help generate the attendance for men to be screened for prostate cancer. Brawley speaks on how the potential harms of screening is never mentioned at such events, however he states that the emphasis is to save lives by having such screening events advertised (Brawley, 2012b). The American Cancer Society at one time put an accent on prostate cancer screening being done annually on men of certain ages; it was also stated that this will address men to make an informed decision when it comes to prostate cancer (Wender et al., 2013).

Underwood et al. (2005) reported that prostate carcinoma among AAM is the most prevalent noncutaneous malignancies in the United States. The projection of prostate cancer death related to this malignancy was stated to be around 28,900 men in the United States in which 30% would be newly diagnosed prostate cancer in AAM (Underwood et al., 2005). The study acknowledged that in comparison to European Men (EM), AAM have been diagnosed with a higher grade and advanced stage of prostate carcinoma and AAM are less likely to receive any definitive therapy (Underwood et al., 2005). Schapira suggested that there was a significant difference when it came to utilizing special treatment modalities as related to EM compared to AAM (Schapira, McAuliffe, & Nattinger, 1995). The basis for determining the difference was data collected from the Surveillance, Epidemiology, and End Results (SEER) (Schapira et al., 1995). Other investigators have reported similar results as Schapira; however those studies produced strong evidence that it was related to racial differences.

Underwood et al. (2005) reported that an effort was promoted to increase prostate cancer education, screening and early detection for AAM in the1990s. Even though this promotion was started, the study showed that there was a strong racial difference displayed in treatment for prostate carcinoma with little information published to substantiate if Hispanic men are included (Underwood et al., 2005). The objective of Underwood's study was to describe the trends that existed between racial and ethnic backgrounds (Underwood et al., 2005). The study also exhibited different treatment modalities for localized/regional prostate cancer between EAM, and AAM. There was a difference in the type of treatment that was administered to each group (Underwood et

al., 2005). This led to the basis for the racial difference within the groups as reported by the researchers. Some examples of the different modalities were androgen-deprivation therapy, expectant management, radical prostatectomy, external beam radiation therapy brachytherapy, and combination therapy. Literature suggested that for AAM at the stage of the disease the only option was radical prostatectomy, which decreased after time (Underwood et al., 2005). It was also stated that androgen-deprivation therapy was not available for public use as presented in the national seer data set, which skewed the data collection for this study (Underwood et al., 2005). The author stated that of all the men that had radical prostatectomy and external beam radiation, AAM were 64% less likely to receive the treatment as their counterparts (Harlan et al., 2001). Harlan reported that multiple studies have found racial differences exist in the receipt of major therapeutic procedures after adjustments are made for economic status, socioeconomic status, and insurance, along with the severity of prostate cancer disease (Harlan et al., 2001).

Understanding that there is a lack of scientific data for the best treatment modality for localized prostate cancer, making a consensus decision can be difficult for AAM and their physicians (Underwood et al., 2005). Because of the patient variables such as socioeconomic status, treatment outcomes, and lack of trust in the healthcare system and the physician variables such as clinical bias, and lack of clinician agreement towards the information which is essential for decision making, there are hindrances for AAM when it comes to deciding on the best treatment for localized/regional prostate cancer treatment (Underwood et al., 2005). With this being said, it is important for researchers to understand how these cofounders may have a bearing on the treatment which is received

by AAM for localized/regional prostate cancer (Harlan, Brawley, Pommerenke, Wali, & Kramer, 1995).

Knowledge and Education

Racial and ethnic dissimilarities toward treatment outcome are not understood in totality and more studies are needed to find the common solution for all populations (Underwood et al., 2005). AAM having mistrust in the healthcare system is well documented which leads to AAM being less likely to trust their physicians than EAM (Corbie-Smith, Thomas, & St George, 2002). AAM have the belief that they were being used as guinea pigs and exposed to unnecessary risk without giving consent to their physicians (Underwood et al., 2005). There is not enough information on racial differences when it comes to mistrust, however speculation could be that AAM having mistrust can lead to refusal for more invasive procedures.

As previously stated by multiple authors, men diagnosed with prostate cancer in the United States have been documented every 3 minutes, also every 17 minutes a man dies from the disease (Mohler, 2007).The literature noted that the worldwide incidence of prostate cancer is increasing annually, and AAM have a higher incidence and a much larger mortality rate than EAM (Mohler, 2007). In fact it was stated that AAM have the highest mortality rate of prostate cancer in the world (Mohler, 2007). Data has shown that invasive prostate cancer is much higher in AAM than EAM at a rate of 1.9 times greater in the age bracket less than 65 years, however it is 1.6 times greater in AAM older than 65 years (Mohler, 2007).

Mohler suggested that what is presented above does not indicate a difference in racial development of prostate cancer (Mohler, 2007). However it was indicated that clinical prostate cancer progresses more rapidly in AAM than European men, also once prostate cancer appears clinically it becomes more lethal in AAM (Mohler, 2007). The study showed that reasons for the disproportionate rate of mortality as related to prostate cancer in AAM can be placed in 3 categories:

1. Racial differences with AAM and the health care system
2. Biological differences between races
3. Biological differences in the prostate tissue between AAM and EM (Mohler, 2007).

If one is to carefully understand the contribution of these areas, he or she must examine, understand, promote public resources for research, and intervention to eliminate racial disparity in prostate cancer mortality (Jemal et al., 2008).

AAM present with incurable prostate cancer more frequently than EM, the SEER data base reported that 29% of AAM have metastatic prostate cancer compared to European men at 19% (Mohler, 2007). Consequently, racial differences and the regularity of metastatic prostate cancer may come from racial differences due to healthcare based on socioeconomic status and participation in early detection programs (Demark-Wahnefried et al., 1995). The literature suggests that lack of early detection behavior among AAM can be a factor in the outcome disparity generated among AAM as they are more than likely not receptive towards prostate cancer screening (Myers et al., 1999). It was stated that the benefit of PSA in early detection can be a benefit to AAM at an earlier

age than 65 mainly because it could decrease the mortality rate (Gilligan, Wang, Levin, Kantoff, & Avorn, 2004). Some of the factors that point to why AAM are not receptive to early detection programs are unclear, however it was mentioned that realization of personal risk, financial limitations, and literacy level are the factors presented as the reason this phenomena takes place. Another factor that was presented was that AAM and their families lived in rural areas and the death rate was higher in the rural areas when prostate cancer was detected (Mohler, 2007).

Race may have a role in patient and physician interaction when it comes to the healthcare system (Robinson, Ashley, & Haynes, 1996). Socioeconomic status was mentioned as one of the reasons AAM would not participate in clinical trials (Mueller, Ortega, Parker, Patil, & Askenazi, 1999). When looking back on research, it was determined that the data was flawed when the factor was emphasized as socioeconomic variables along with poverty (Nelson, 2002). Even if these factors are corrected AAM still remain in the minority to receive curative treatment for prostate cancer in comparison to EAM (Hughes-Halbert et al., 2007). The decision making for prostate cancer treatment may be obstructed due to racial differences between AAM and their physicians. African Americans having a strong belief in their community, church, religion, and the traditional source for healing may also have an impact on the relationship between patient and physician. (Johnson et al., 2004). Research has indicated that AAM have no problem participating in prostate cancer early detection for care when the information given to them is culturally sensitive, clear, and the relationship between them and their physician are respected (Germino et al., 1998). Some of the viable factors

that can play a part in AAM having a better relationship with their physician are trust, competence, and a positive motive for the treatment. African Americans may utilize culture with several factors such as family, religious community, and homemade remedies before they accept professional help, this has a barren on the communication between AAM and their physicians.

Disparities concerns relating to race have a great impact and divergent pathway to healthcare matters (Williams & Jackson, 2005). In most residential communities there is an influx of African Americans; the inequities in the neighborhoods include environments, socioeconomic circumstances, and most importantly medical care which are the factors needed to maintain racial disparities in health (Johnson et al., 2004). The abundance amount of African Americans dying in the United States is significantly higher than 30 years ago; a study suggests that 100,000 African Americans die every year and would not die if the death rates were comparable (Odedina et al., 2009). Trying to understand the racial differences in health is a monumental task to overcome. As stated previously, some of the factors that have a major role in treatment are socioeconomic status, education, income, and health practices. with the focus on education, research suggests that AAM who have not completed high school have the highest death rate when compared to their counterparts with the same education level (Williams & Jackson, 2005). The death rate of AAM with a limited amount of college learning is still 11 times that of their peers with the same education (Hughes-Halbert et al., 2007).

Other factors that point to social differences are stress, segregation, and poor residential environments all of which have an impact on income as well as health and are

stated in the literature as efforts needed to identify points of intervention in the healthcare arena (Fiscella, Franks, Gold, & Clancy, 2000). Racial segregation in residential areas are one of the initial causes for racial imbalances in the United States (Harlan et al., 1995). There is evidence that supports changing the health policy so that societal domains can be recognized as on one accord with all society and not have any influence on the healthcare for African Americans (Williams & Jackson, 2005).

Many researchers have expressed how physical, cultural, and social factors influence health risk and behaviors when it relates to prostate cancer and AAM. However, not many researchers have explored how the environmental contents affect AAM prostate cancer treatment or early detection methods (Griffith et al., 2007). A study conducted by Griffith et al. (2007) used focus groups from rural southern communities consisting of AAM and their counterparts. This study talked about how sociopolitical context can shape a man's screening and treatment behaviors when it comes to prostate cancer (Griffith et al., 2007). What the study pointed out was that these proximal and distal health related factors could affect a man's prostate cancer knowledge, the perceived risk, and readiness to pursue care and trust in the health care system (Griffith et al., 2007).

Several quantitative studies have examined factors that are related to AAM decision making regarding treatment (Courtenay, 2000). What these studies have not done was to look into the health care systems or community level factors that will influence the decision making process for AAM as it relates to prostate cancer screening and treatment (Griffith et al., 2007). Some of the critical areas for research are in the

social, cultural, economic, and political arena which will shape one's health system or community health outcomes, yet these factors are frequently ignored (Griffith et al., 2007). Griffith et al.'s research was trying to focus on the structural approach for examining the environmental factors that have influence on screening and treatment outcomes in a community. However, the researchers did not want to focus on the characteristics of individuals with certain behavior patterns.

Even though, the primary mechanisms are not well defined, age, race, ethnicity, and culture are some of the factors which are used to measure prostate cancer in AAM. It has been stated that prostate cancer occur more in men over age 50; AAM have been diagnosed with prostate cancer at an earlier age and at an advanced stage of the disease (Germino et al., 1998). AAM tend to be diagnosed with advanced stage disease and the rate of survival within five years is lower than European men, making their rates the lowest in the world (Griffith et al., 2007). Many reasons exist for the unfavorable outcome for AAM and prostate cancer. Some examples are differences in biology, stage of disease, lack of health care access, cultural factors, masculinity, trust in the health care providers and many more (Courtenay, 2000). While many physicians state that having routine examinations are a protective measure, there has been major disagreements in routine prostate cancer screening especially when it comes to PSA testing (Brawley, 2012b). The major question is what we really know about early detection mechanism related to prostate cancer. Many professional associations and organizations have stated that evidence is insufficient to suggest routine screening or even to not suggest routine screening (Griffith et al., 2007).

Ultimately, the lack of consensus regarding prostate cancer screening creates ambivalence and consternation among health professionals and makes it difficult for conscientious men to make decisions about screening (Griffith et al., 2007). Griffith et al. (2007) reported that rural AAM have been the most under-studied group of all in the United States. Effects from racial oppression along with poor resources in rural communities, can contribute in the disadvantage for AAM with prostate cancer (Griffith et al., 2007). These disadvantages are linked to the disparities in the risk and health for AAM with prostate cancer in rural communities (Griffith et al., 2007). It has been documented that rural communities have poor health infrastructures, which lead to the population to have a difficult time accessing resources and opportunities to better their health care (Griffith et al., 2007). Griffith pointed out that people who reside in rural communities are more likely to be older and have poorer health care which makes them prone to be less healthier than people who live in urban areas (Griffith et al., 2007).

The health related incidents in past history has caused AAM to feel that they are misdiagnosed, receive unequal health treatments, and subjected to unethical research, has led to skepticism, mistrust of the health service, and paranoia of having a health cultural differences (Griffith et al., 2007). A major factor related to the differential rates for unhealthy behavior in AAM is gender socialization which leads to the attitude about harming their masculinity (Courtenay, 2000). This gender socialization promotes the paranoia in AAM and causes them to be less likely to follow recommended guidelines or seek health care as well as information regarding prostate cancer (Griffith et al., 2007). If AAM live in rural areas, they may have poorer health status and no health insurance, as

well as higher rates of chronic illness, such as, heart disease, diabetes, and cancer (Griffith et al., 2007).

With all the factors being mentioned that are related to prostate cancer decision-making, one of the less mentioned is the social environment. In the African American community racism is the social environmental feature. Racism will affect all resources and will directly and indirectly affect the health outcome of African Americans (Johnson et al., 2004). AAM are the most stigmatized or stereotyped individuals in the United States, along with being exposed to a wide range of social environmental factors which ultimately affect their health in an adverse manner (Griffith et al., 2007). Reviewing the health inequity is always compromised for AAM if it impairs an aspect of life from them such as a sexual relationship or jobs (Griffith et al., 2007). On the other hand a high priority is placed on being a provider, father, and spouse, which will lead to seeking better health care (Courtenay, 2000). Looking at the lifespan of AAM, some stress related items that will contribute to AAM having poor health behaviors and high mortality rates with prostate cancer are, gender socialization, economics, social marginalization (Griffith et al., 2007).

The lack of knowledge has been cited as a reason for AAM not seeking screening for early detection of prostate cancer (Bennett et al., 1998). Communication also plays an important role in AAM decision making for prostate cancer treatment, and it was stated that physicians do not communicate well when discussing prostate cancer concerns to AAM (Gilligan et al., 2004). Individuals trying to understand screening and treatment behaviors without looking into the larger picture for health care and social context will

show this not to be beneficial for AAM. Even though research is continuing on AAM with their experience with prostate cancer, there is important limitations in the research along with gaps in knowledge that researchers must address in the future (Griffith et al., 2007).

Boehm described a study promoting education and screening programs to increase the knowledge and self-efficacy in AAM with prostate cancer (Boehm et al., 1995). This research was a qualitative study done in churches predominately occupied by African Americans (Boehm et al., 1995). The framework that the author used was social cognitive theory for the purpose to model the desired behavior between patients or clients (Boehm et al., 1995). The results of this study indicated that individuals must possess the knowledge and skills to be self-regulated for change in behavior (Boehm et al., 1995). Boehm wanted to evaluate how effective an educational and screening program would benefit AAM, and would they participate in one as long as their church provided it (Boehm et al., 1995). Health education programs traditionally have not been designed to support the specific needs of men that are associated with ethnic or racial minorities (Price, Desmond, Wallace, Smith, & Stewart, 1988). Although Price et al. (1988) study was a start it surely indicated that more research is needed on generating knowledge of prostate cancer for AAM as it relates to treatment and screening behavior changes.

Smith, Dehaven, Grundig, and Wilson (1997) developed a community based study that showed the factors affecting the knowledge of AAM and prostate cancer. It was shown that AAM did not have adequate knowledge as EM when asked about prostate cancer screening and treatments (Smith et al., 1997). AAM are getting the

message about prostate screening. However, educational efforts need to be enhanced in order to reach the less affluent or as mentioned the less educated in order to change behavior (Hoffman et al., 2001). The study suggests that demographic, socioeconomic, and education are factors that affect the level of knowledge that AAM have when it is related to prostate cancer (Smith et al., 1997). Smith et al.'s study indicated that 19% of the sample scored high on the questions related to prostate cancer, and AAM did not have adequate knowledge (Smith et al., 1997). This study also indicated that physicians need to play an important role in educating AAM about prostate cancer during examination and subsequent follow-up examinations (Smith et al., 1997).

Barriers

Socioeconomic status (SES) has been associated with cancer mortality regardless if the data is collected from individuals or different communities (Singh, Williams, Siahpush, & Mulhollen, 2012). Some of the data has shown to be different for different areas within the United States (Singh et al., 2012). Singh et al.'s research was set up to analyze socioeconomic status between rural and urban communities (Singh et al., 2012). This study examined racial patterns and health disparities between the least and most advantaged social groups, while looking at the population in rural versus urban communities (Singh et al., 2012). The research determined that there was a need for social and medical interventions (Singh et al., 2012). Although numerous studies have generated information between area based SES disparities, there is a major variation in United States cancer mortality rates corresponding to levels between rural and urban (Singh et al., 2012). However, not many studies have examined the impact of deprivation

and urbanization explaining if there is a difference in the mortality rates from prostate cancer (Singh et al., 2012).

Minorities and socioeconomically disadvantaged inhabitants' medical care in the United States has been reduced (Underwood et al., 2004). Singh et al.'s study indicated that in 2009 18% of African Americans less than age 65 did not have health insurance, compared to 13% Caucasians (Singh et al., 2012). Minorities with a low SES were less likely to delay needed medical care than Caucasians (Williams & Jackson, 2005). African Americans with SES disadvantages in the United States were more likely to live in neighborhoods that were undesirable, and environmental characteristics, ultimately putting them at risk of poor health care and health conditions (Singh et al., 2012). It was reported that in 2007 26% of African Americans lived in unsafe neighborhoods, and 27% were habituating in areas with litter and garbage on the streets (Singh et al., 2012).

Singh's study had some limitations, because some of the documentation was not SES disparities in the mortality rates for cancer. They used county level variations, which opened the door for ecological fallacy, because the study analyzed their functions on two different populations that were based on ecologic variables (Singh et al., 2012). In addition, most SES studies are done on an individual level while this was done on a geographical area level; the data may be smaller than that of individual (Singh et al., 2012). Singh wanted to display a relationship with social disparities and how it could contribute to the overall health inequalities that exist in the United States.

Summary and Conclusions

Prostate cancer is a significant public health concern in the United States, and

with an improved prognosis if it is discovered at an early stage, it is crucial that the healthcare providers for AAM detect any abnormality to decide what treatment option may be necessary for future survival. The literature review for this study showed a wide variety of cofounders which may explain why prostate cancer is elevated among AAM. The information was based on data collected from men of all ethnicities in the United States. At present, the exact causes of prostate cancer are still a major research topic, never the less; age, race, life style, hereditary, and nutrition have all been identified in the literature as factors which have an influence on prostate cancer. My study may fill the gap that has been missing in the literature, and may extend the knowledge among AAM in the discipline.

Various research studies indicate the prospective barriers for the increased number of AAM diagnosed with prostate cancer being contributed to the lack of knowledge and understanding about the risk factors. AAM have expressively higher mortality rates than any other ethnic group as stated by the Centers for Disease Control and Prevention (CDC) (Jemal et al., 2011). The conceptual framework for this research will focus on the use of the HBM, this model assisted in identifying the factors which may influence prostate cancer and individuals' health related knowledge. This research will not only look at the knowledge and comprehension in regards to prostate cancer with in the AAM communities, the main focus will be a connection with rural versus urban communities, looking at those men who have a higher risk of being diagnosed with prostate cancer and comparing the data between the male populations in each community. In chapter 3, I will discuss the details of the setting, sample size, methods, and limitations

of the research. I will explain the measures that will be employed to protect the rights of human subjects used in this study. The procedures and study instruments necessary for data collection will be discussed, and the statistical data analysis used for analyzing this study will be summarized.

Chapter 3: Research Methods

Introduction

Prostate cancer has been specified as the most diagnosed cancer in AAM in the United States (Jemal et al., 2005). Geographic dissimilarities in prostate cancer mortality rates as well as incidence in AAM have been detected in the United States for a number of years (Jemal et al., 2005). Literature has not reported on the reason for the dissimilarities, especially in rural versus urban communities, as they relate to prostate cancer diagnosis among AAM and CM. Most information reported in the literature regarding rural versus urban comparisons relates to treatment parameters for prostate cancer and not diagnosis.

Perhaps more men are being diagnosed with prostate cancer worldwide; the trend may be for knowledge and prevention to come to the forefront. Unlike other cancers, prostate cancer typically progresses at a slower rate and has fewer symptoms in the early stage of the disease. Literature has reported that the incidence of prostate cancer is increasing in both high-risk and low-risk populations (Brawley, 2012a). Figure 2 illustrates the pathway to detecting prostate cancer in the United States.

Diagnosis

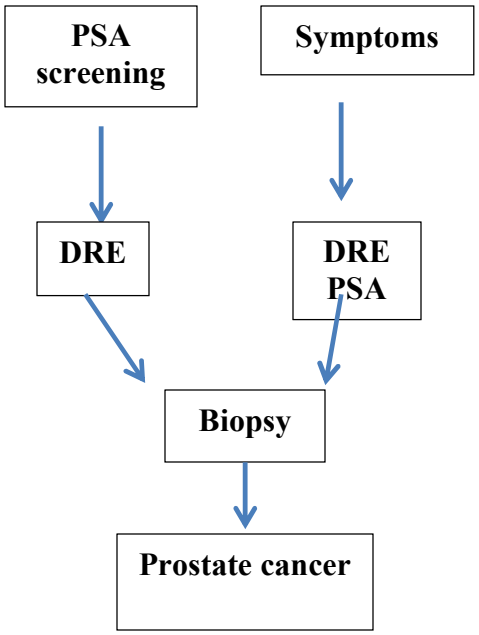

Figure 2. Illustration of different steps in diagnosis. From "The North Carolina–Louisiana Prostate Cancer Project (PCaP): Methods and Design of a Multidisciplinary Population-Based Cohort Study of Racial Differences in Prostate Cancer Outcomes," by J. C. Schroeder et al., 2006, *Prostate*, *66*(11), 1162–1176. doi:10.1002/pros.20449

Prostate cancer diagnosis varies between countries and communities. Prostate cancer diagnosis in people under age 50 has been reported on a limited basis. Research indicates that 85% of men diagnosed with prostate cancer are 65 years of age or older (Harlan et al., 1995). Multiple factors may account for the wide differences in the reporting of prostate cancer to many cancer registries. Prostate cancer disease does not occur equally among men of different ethnic backgrounds or within the same community (Whittemore et al., 1995). Although there is a difference in mortality rates between AAM and EAM between the ages of 40 and 65 years, advantages and disadvantages within the United States are immense; there are important differences between the two diverse communities.

This study used data collected from the SEER database, as well as from the North Carolina-Louisiana Prostate Cancer Project (PCaP). The purpose was to evaluate differences in rural versus urban communities and AAM versus EAM within these communities. The data that were collected from these registries were population-based data, which are routinely collected for research studies. The use of both databases was intended to answer the research questions that were derived for the basis of executing this project. This chapter focuses on the design of my research, the methodology, the population that the study encompassed, and the sample size determined for this research.

Research Design and Rationale

A quantitative retrospective non-experimental research design was used to collect data to substantiate the research questions and hypotheses. The design was a secondary analysis of data collected by cancer registries from SEER databases. Most of the data for this study came from a case-only study design that was conducted in specific counties and states based on SEER database criteria throughout the United States. This is an example of a population-based sample of AAM and EAM who visited these sites for prostate cancer treatment.

The data in this study were secondary data concerning AAM and EAM, which were analyzed for the purpose of evaluating differences in the diagnosis of prostate cancer between the populations. Data for this study were obtained from the North Carolina-Louisiana Prostate Cancer Project for use in a multidisciplinary population-based study design addressing differences in race and the aggressiveness of prostate

cancer through an evaluation of social and individual characteristics, as well as the level of the tumor upon diagnosis (Moore et al., 2012).

The majority of the analyses done by PCaP evaluated the risk factors that are associated with the aggressive nature of prostate cancer in AAM (Schroeder et al., 2006). The analyses were classified according to the clinical grade, stage of disease, and PSA at diagnosis.

The SEER data were analyzed from AAM and CM in different counties and states throughout the United States for purposes of evaluating a large sample of men diagnosed with prostate cancer. The data did demonstrate differences with regard to socioeconomic status, healthcare, and several other risk factors mentioned throughout this study between AAM and men of other ethnic backgrounds.

This research design involved assessing the relationship that exists between AAM and EAM concerning prostate cancer diagnosis and knowledge. With this design, the intent of this study was to describe the characteristics of AAM compared to EAM in relation to behavior associated with prostate cancer diagnosis and to test the research hypothesis based on numerical data. This design was used to describe the different variables that exist between AAM and EAM in prostate cancer diagnosis and to explore the relationship between the variables, which were ethnicity, age, socioeconomic status, income, advanced stage of disease, and insurance.

Methodology

AAM, by all standards, experience excess mortality associated with prostate cancer when they are compared to EAM(Brawley, 2012a). Ironically, healthcare patterns

have shown that AAM are less likely to undergo prostate cancer screening tests than their counterparts in other ethnic groups. One theory as to why AAM will not use prostate cancer screening tests is related to their socioeconomic status, knowledge, and beliefs and attitudes concerning prostate cancer prevention.

This study was designed to examine data from the SEER database to determine whether there is a relationship between the demographic locations and health-related beliefs of AAM. A prostate cancer consortium consisting of investigators from North Carolina and Louisiana conducts PCaP. These investigators come from major institutions such as the University of North Carolina, Louisiana State University, Duke University, Roswell Park Cancer Institute, Boston University, and many more. The SEER program of the National Cancer Institute is designed to provide information on cancer statistics. The SEER program is a population-based registry that covers the U.S. population over several geographic regions and is the largest publicly available data set for all types of cancers (Mohler, 2012). This study used this information with the goal of reducing the burden of cancer among populations in the United States subdivided between rural and urban areas.

The data collected from SEER were used to address the research questions as they pertained to AAM and EAM living in rural and urban communities. This study analyzed data over a period of 5 years to confirm why AAM, at the time of diagnosis of prostate cancer, had advanced-stage disease. The data were used to formulate charts and graphs to distinguish between AAM and EAM in their respective communities.

Population

The target population used for this research study of prostate cancer disparities is AAM located in a metropolitan or urban area and rural area that have been diagnosed with prostate cancer. This population was selected based on the data that suggest AAM has the highest incidence of prostate cancer than any other ethnic male background. The sample collected from the SEER database for this research was composed of AAM and CM with the age greater than 40.

Calculating secondary data makes this study statistically manageable because the data has been determined. After analyzing the data, the outcomes lead to the finding of which group of AAM between the rural and metropolitan areas, have the lower incidence rate. Several factors as to why AAM are diagnosed with prostate cancer have been explored; cultural barriers have to be addressed within the African American community to fight the stereotype of ignorance as a factor. Better understanding that early detection leads to a better outcome for this disease should be addressed among AAM.

Sampling and Sampling Procedures

Data that was reported by the Centers for Disease and Prevention (2013) suggested that the age-based statistics concerning AAM and the diagnosis of prostate cancer by age suggest that 6 out of every 100 men will be diagnosed with prostate cancer by age 60 within the next 10 years. At the age of 70, there will be 7 out of every 100 diagnosed. Centers for Disease and Prevention (2013) also reported that 20.1% of AAM would die from prostate cancer by age 65. This data is suggesting that AAM should begin being screened for prostate cancer at the age of 45 for early detection.

The study analyzed AAM between the ages of 40 and 70 within both community groups. This study also analyzed the total population of individuals reported to the SEER database with prostate cancer between the ages of 40 and 70 years. The sample size was based on the total population listed in the SEER database (age 40-70 years) related to prostate cancer diagnosis in rural versus urban communities. The number was chosen based on data received from medical records from the health facilities in the locations along with data that has been reported to the Centers for Disease Control and Prevention (CDC). Data was also collected from SEER databases. However, looking at the bases for my study community population is what leads to determining the sample size for the study. Therefore, indicating a way to increase the sample size to maximize the data for a near perfect analysis.

Procedures for Recruitment, Participation, and Data Collection

Utilizing cancer registries as a resource for collecting data for public health related research is a valuable asset. Cancer registries play a vital role in all research that is cancer related. Population-based cancer registries are setup to provide information that is essential for priorities related to public health along with monitoring programs that are essential to cancer.

Every state in the U.S. has policies that mandate cancer reporting and the authorities set regulations that will govern the cancer registries. The data that will be used in this study will come from the SEER databases, which collects cancer data for virtually all states in the United States. By utilizing, the databases collecting data for rural and

urban communities will give this study a controllable mechanism for gathering and comparing the data.

The data collected was transferred from a coding sheet into a Statistical Package for the Social Sciences (SPSS) version 21.0 and Statistics Data Analysis version 13.1 for Mac data files. Examining the plausible ranges for responses to the different variables by frequency distributions, scatterplots, descriptive and outliner using SPSS will provide the data methods for checking and cleaning. The data, which was collected for my study, focused on the PSA levels in men with advanced stage prostate cancer in AAM and EAM. A second-data set also focused on the advanced stage of prostate cancer that was diagnosed in AAM and EAM in both rural and urban communities over a 5-year span. The third set of data focused on the marital status, education and screening knowledge of AAM compared to EAM in both communities over the same time span.

Statistical Analysis

Descriptive statistics was used to analyze and develop data collected for demographic and prostate cancer diagnosis associated with the characteristics and the primary study variables accompanying my study. There are several independent variables in this study which consist of income, marital status, education, environment, health belief, DRE level, relationship with healthcare provider, and knowledge of prostate cancer. The dependent variables in the study consist of age, gender, PSA level, demographic location, grade and stage of diagnosis. Income will be determined by their annual salary. Marital status will be if the men are married or single. Education is measured by highest degree attained from elementary school up to and including graduate

level. Age is measured by years and months. Demographic location is measured from the cities, states, and counties they reside in.

RQ1: Is there a significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in rural areas in the United States between 2008 and 2013?

Ho1: There is no significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period (2008-2013).

Ha1: There is a significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period (2008-2013).

Descriptive statistics was obtained on all variables. All data was collected using the SEER database registry. Age, location, grade of disease, stage, ethnicity, and cancer type was measured using a nominal scale coded via SPSS 21.0 statistical package and STATA 13.1. Chi square test was conducted to display the variables that are significant to prostate cancer diagnosis related in this study. The baseline was determined by calculating the means, standard deviation, and frequency of distribution. The SEER database is set to collect stage at disease, age at disease, cancer type, gender, and race. The same parameters will be set for research questions 2 which are,

RQ2: Is there a significant difference in the proportion of AAM and CM living in urban areas in the United States annually diagnosed with prostate cancer between 2008 and 2013?

Ho2: There is no significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period (2008-2013).

Ha2: There is a significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period (2008-2013).

RQ3: Was there a significant change in the proportion of men annually diagnosed with advanced stage prostate cancer in rural versus urban areas in the United States between 2008 and 2013?

Ho3: The proportion of men annually diagnosed with advanced stage disease in a rural community versus an urban community did not change during the 5-year period (2008-2013).

Ha3: The proportion of men annually diagnosed with advanced stage disease in a rural community versus an urban community changed significantly during the 5-year period (2008-2013).

Descriptive statistics was obtained on all variables. All data was collected using the SEER database registry. Age, location, grade of disease, stage, ethnicity, and cancer type was measured using a nominal scale coded via SPSS 21.0 statistical package and STATA 13.1. Chi square tests were conducted to display the variables that are significant to prostate cancer diagnosis related in this study. I used a p value of < 0.05 to show the significant of prostate cancer diagnosis. The baseline was determined by calculating the means, standard deviation, and frequency of distribution. The SEER database is set to

collect stage at disease, age at disease, cancer type, gender, PSA and DRE levels and race.

RQ4: Did PSA levels of men annually diagnosed with advanced stage prostate cancer significantly changes in rural versus urban areas in the United States between 2008 and 2013?

Ho4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community did not change during the 5-year period (2008-2013).

Ha4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community changed significantly during the 5-year period (2008-2013).

The statistical analysis was performed using the SPSS 21.0 statistical package. The patients chosen characteristics was described using summary statistics. P-values for comparing AAM and EAM characteristics between prostate cancers was calculated using chi square test to display the variables that are significant to prostate cancer diagnosis related to this study. I utilized a p value of < 0.05 to show the significant of prostate cancer diagnosis. The baseline was determined by calculating the means, standard deviation, and frequency of distribution. The SEER database is set to collect stage at disease, age at disease, cancer type, gender, PSA level, DRE level, and race. A two - sample t-test was used to compare age for all data collected. A Kaplan-Meier proportional hazard model will be used to compare overall survival between each male group associated with my research.

Threats to Validity

When diagnosis is a part of the decisions made by physicians and patients, different randomized trials have to be taken into account (Cooperberg et al., 2004). Relatively the amount of patients that are reported to the databases are under graded or under staged before surgery (Cooperberg et al., 2004). Relevance will depend on external validity in regards to the results being applied to a definable group of men in a certain clinical venue situated within a certain practice, example Urology. Most of the governmental agencies, pharmaceutical agencies, and medical journals tend to omit external validity which allows for the physicians to make judgments when diagnosing patients (Cooperberg et al., 2004). Some literature suggests that reporting of the determinants from external validity in systematic reviews are found to be inadequate (Skinner & Schwartz, 2009).

Interpretation of evidence reported to the databases can also have an external validity of the studies the data was reported. The limitations that are within the evidence base studies will not always permit a clear interpretation of the different barriers associated with the cancer trials. A major variable for a physician in explaining the survival differences between AAM and EAM is the stage of the prostate cancer at diagnosis (Price, Colvin, & Smith, 1993). Studies have found that perceptions have a role in cancer risk reduction early detection behaviors along with diagnosis (Underwood, 1992).

Internal validity can be threatened by the bias collection of data from the cancer registries and how it was reported. Some studies suggested that the reliability of survey

data that may have been collected and used in studies may pose a threat to the internal validity (Price et al., 1993). Outcome data may be speculative because of selection bias making it difficult to interpret. Therefore making selection bias a threat to internal validity for this study as well as others.

Ethical Procedures

The collection of this data was subject to Institutional Review Board (IRB) approval. This approval has to be recognized because the data was collected from cancer registries. The desire is that the secondary data has been approved from the collecting sources leaving for little doubt that it is justified for research use. All rights will be protected using the appropriate measures such as signed documentation letting individuals know that the information may be used in future research studies. The purpose of this is an attempt to insure that The Health Insurance Portability and Accountability Act (HIPAA) were not violated. The data collected for this study was designed not to identify any candidate and is based on different cofounders, which are not identifiable for any group.

No surveys or direct patient contact was used to obtain data. It was assumed that since the data was coming from secondary source the consents and other legal documents have been completed for the data to be published in the SEER database. Guidance on this provision will be sought from the IRB and the cancer registries used for this study. The IRB will provide an ethical framework from which the ethical review process for this study will operate. Although the most of the data archives which service the research community deal absolutely with the storage and provision of data collected for

quantitative research, the same facilities also will store, deposit and reuse data which was collected for qualitative research. Such data then can be used in the analysis for secondary data as used in my study. This data will be stored in a database created by me for a period of ten years.

Summary

Numerous explanations have been intended to account for the disparities at the time of diagnosis. Some of the disparities mentioned are demographic characteristics; socioeconomic status and race are just a few that can limit screening in AAM and cause for the delay in diagnosis. Furthermore, attempting to explain the difference in disparities in the stage during diagnosis between AAM and EAM is difficult because there are no studies reported as of yet that assembled a large enough cohort to collect individual-level data to substantiate the information needed.

Efforts to limit prostate cancer in AAM as related to mortality will have to be addressing the disparity concerns at the clinical stage at diagnosis. Future studies will have to take place in order to explain such disparities as the socioeconomic factors, use of healthcare systems, distance to travel to healthcare facilities along with health beliefs.

Prostate cancer is the leading cancer diagnosed in AAM in the United States. AAM have been reported in the literature to have the highest incidence rate of prostate cancer in the world. AAM suffers from a higher disproportionately burden of the disease than any ethnic group in the United States. Removing race from the equation as an independent disparity, with all the other disparities mentioned, we would still have to answer the question what is the reason for worse pathological findings in AAM when it

comes to prostate cancer. The leading forces that emerge on how culture can influence attitudes, beliefs, and decision-making are attributed to lack of knowledge, communication, social support, quality care, and race.

Prostate cancer in AAM has a realistic chance of early diagnosis in all areas of all states as long as education is delivered to all ethnicities. Many counties do not have the means to treat prostate cancer in rural areas and with the population being as high in North Carolina with African Americans travel, socioeconomics, and poor health care coverage play an important role in the outcome for proper treatment of the disease. AAM need to have an understanding of the outcome of prostate cancer if not diagnosed early or treated.

This study was designed to examine data from PCaP database along with the SEER database to show if there is a relationship among the demographic locations and health -related beliefs of AAM. Chapter 4 will discuss the results gathered from the collection of data retrieved from the SEER database. This chapter will give a detailed outline showing how the data was put together to obtain the necessary results to substantiate my hypothesis and answering the research questions that was presented.

Chapter 4: Results

Introduction

This chapter encompasses the findings from testing the hypotheses that were generated from the research questions of this study. A quantitative retrospective non - experimental research design was used to collect data to substantiate the research questions and hypotheses. This design was a secondary analysis of data collected by cancer registries from SEER databases. The purpose was to show the differences between AAM and EAM in rural versus urban communities based on prostate cancer diagnosis. The methodology described in Chapter 3 was used to test the research questions and hypotheses listed.

RQ1: Is there a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States between 2008 and 2013?

Ho1: There is no significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period (2008-2013).

Ha1: There is a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period (2008-2013).

RQ2: Is there a significant difference in the proportion of AAM and the proportion of EAM living in urban areas in the United States annually diagnosed with prostate cancer between 2008 and 2013?

Ho2: There is no significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period (2008-2013).

Ha2: There is a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period (2008-2013).

RQ3: Was there a significant change in the proportion of men annually diagnosed with advanced-stage prostate cancer in rural versus urban areas in the United States between 2008 and 2013?

Ho3: The proportion of men annually diagnosed with advanced-stage disease in a rural community versus an urban community did not change during the 5-year period (2008-2013).

Ha3: The proportion of men annually diagnosed with advanced-stage disease in a rural community versus an urban community changed significantly during the 5-year period (2008-2013).

RQ4: Did PSA levels of men annually diagnosed with advanced-stage prostate cancer significantly change in rural versus urban areas in the United States between 2008 and 2013?

Ho4: The PSA levels of men annually diagnosed with advanced-stage prostate cancer in a rural community versus an urban community did not change during the 5-year period (2008-2013).

Ha4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community changed significantly during the 5-year period (2008-2013).

This chapter consists of four sections: introduction, data collection, results, and summary. A series of statistical analyses were performed to investigate and test the hypotheses that were generated from the research questions. Results are presented according to the statistical tests performed. STATA and SPSS statistical software were used to analyze all data collected. A summary provides the results revealed in this chapter.

Data Collection

Data were obtained from the SEER database cancer registry. In order to obtain data from SEER, one must register and abide by the rules and regulations for using the data. I obtained permission to use SEER data for this study in June 2014. The data use agreement for the 1973-2011 SEER Research Data File was signed and approved (Appendix A). In order to extrapolate the data, I used Statistics Data Analysis (version 13.1), which is the software required by SEER to analyze data from the SEER database in order to separate and align the data based on the variables selected.

This study used secondary data, which were reviewed and approved for the cancer registry associated with SEER. The variables chosen for data collection were age, race, marital status, risk, demographics, PSA, and Gleason score. Each variable was coded using the Rural Urban Continuum codes for use with SEER*Stat.

In explaining how the original data were determined, I wrote each code into the software, specifically assigning the task that I wanted the data collected for use in this study. For example, using the continuum code for the county of Allen, Louisiana, is 22003, but in the software it is represented by stating replaces metro if StCtyRec==22003 to determine if it is rural or urban demographics. The purpose was to show how the software has to be coded in order to generate data. This was done after rural-urban continuum codes for 2003 and 2013 were defined in the software. After codes were written and labeled, I put them into a do file, which the software recognized, and I ran the file, collecting the data and putting the data into a Malgen folder designated for prostate cancer data. The do files are a storage component of the software for placement of codes to be generated when *run* is selected. The codes were specifically designed to collect prostate cancer data and generate the analysis for the data collected. The datasets contained information on the variables of age, race, demographics, marital status, PSA, and Gleason score to determine stage of disease and risk of disease, along with diagnosis. After the data were generated, I had to analyze the data within the software to assure that this data was exactly what I was looking to accomplish.

Upon all data being collected, I analyzed the data using STAT (version 13.1) and SPSS (version 21). The data were put into the statistical programs to generate tables and graphs to be used for this study. I analyzed using chi-square test, 95% confidential interval, and *p* value to show significance along with analysis of variance. I also ran the program for odds ratio to determine the ratio for each variable within rural versus urban communities.

Results

Table 1 through Table 5 show the total population in the United States as a whole, without separating the population between rural and urban communities. These data give the frequency and percentages of men diagnosed with prostate cancer and are determined by age and race in Table 1. The findings were analyzed using statistical analysis with chi-square test and *p* value. The data showed that AAM have significantly higher diagnosis rates of prostate cancer than EAM($p < 0.0001$).

Table 1

Frequency of Men Diagnosed With Prostate Cancer Based on Age and Race

Race	< 50 yr.	50-59 yr.	60-69 yr.	70-79 yr.	> 80 yr.
AAM	2851 (6%)	13387 (29%)	18659 (41%)	9343 (20%)	1624 (4%)
EAM	6595 (3%)	51507 (21%)	98141 (41%)	66098 (28%)	16291 (7%)
Total	9446	64894	116800	75441	17915

Note. Chi-square = 3.8e+03. *p* value = < 0.0001.

Table 2 describes the total population of U.S. men diagnosed with prostate cancer by marital status and race. This information shows that unmarried AAM have a higher percentage of diagnosis with prostate cancer in comparison to unmarried EAM ($p < 0.0001$). For EAM who are married, the percentage is higher than that of AAM. This shows that lifestyle does have an effect on AAM versus EAM in relation to prostate cancer diagnosis.

Table 2

Frequency of Men Diagnosed With Prostate Cancer Based on Married or Not Married and by Race

Race	Not married	Married	Total
AAM	19781 (43%)	26084 (57%)	45865 (100%)
EAM	64670 (27%)	173971 (73%)	238941 (100%)
Total	84451	200055	284506

Note. Chi-square = 4.73e+03. *p* value = < 0.0001.

Table 3 shows the PSA levels between AAM and CM based on total population throughout the United States. PSA levels are displayed in values of less than 1 up to and including greater than 20. AAM have a significant difference in PSA levels when compared to CM ($p<0.0001$).

Table 3

Frequency of Men Diagnosed With Prostate Cancer Based on PSA Levels

Race	PSA <1	PSA >1	PSA >2	PSA >4	PSA >10	PSA >20
AAM	681 (1%)	991 (2%)	4515 (10%)	28328 62%)	8156 (18%)	3194 (7%)
EAM	4772 (2%)	6943 (3%)	29397 (12%)	153441 (63%)	33393 (15%)	10695 (5%)
Total	5453	7934	33912	181769	41549	13889

Note. Chi-square = 102e+03. *p* value = < 0.0001.

Table 4 represents the stage of disease that AAM and EAM have in the United States. The percentages confirm that AAM are diagnosed with advance stage disease at a higher rate than EAM($p<0.0001$). The Gleason score is defined as follows, if the score is 6 or less it is considered to be low grade or well differentiated. The Gleason score 7 is defined as moderately differentiated or intermediate grade. Gleason score of 8 to 10 is considered to be poorly differentiated or high grade. This table indicated that AAM on a whole have a higher grade and percentage than their counterparts.

Table 4

Frequency of Men With Advanced Stage of Disease Based on Gleason Score

Race	Gleason 5 <	Gleason 6	Gleason 7	Gleason 8-10
AAM	664 (1%)	20285 (44%)	19293 (42%)	5623 (12%)
EAM	3182 (1%)	112304 (47%)	93405 (39%)	29750 (12%)
Total	3846	132589	112698	35373

Note. Chi-square = 154.3135. *p* value = < 0.0001.

Table 5 will discuss the risk of disease related to race and the levels of risk. This covers the male population between AAM and EAM. In looking at the risk here I do not see any difference between AAM and EAM in the United States. The percentages are close and statistically there is a difference.

Table 5

Percentages of AAM and EAM for Different Levels Based on the Risk of Acquiring Prostate Cancer in the United States

Race	Low	Intermediate	High
AAM	13717 (30%)	21306 (46%)	10842 (24%)
EAM	75534 (32%)	110564 (46%)	52543 (22%)
Total	89251	131870	63385

Note. Chi-square = 82.8356. *p* value = < 0.0001.

The data presented designates the baseline for this study. In the previous section I did not separate rural from urban. Rural and urban are now presented to justify and answer my research questions. Table 6 represents an analysis performed based on age and demographics. I looked at rural AAM and EAM together by age less than 50 years with 20,000 or less in population. N = 431 (2%) compared to urban population within the same age group, N = 8813 (3%) with the population being 20,000 or greater. The age between 50-59 years for rural population N= 3795 (19%) compared to urban where N=59446 (23%). The next age group continued with 60–69 years with rural N = 8366 (42%), compared to urban at same age N = 105365 (41%). At age 70–79 years rural population N = 6036 (30%) compared to urban population N = 67534 (26%). The final age observed both groups of men at 80 or greater in years. The rural analysis was N = 1443 (7%) compared to urban N = 16026 (6%). Looking at this data there did seem to be and difference statistically with percentage, and age. I did take into consideration that the rural population will be less than the urban population, however in comparison the statistics barred these finding based on the size of the population.

Table 6

Frequency of Rural Versus Urban Population Based on Age

Rural/Urban	< 50 yr.	50–59 yr.	60–69 yr.	70–79 yr.	> 80 yr.
Urban > 20k	8813 (3%)	59446 (23%)	105365 (41%)	67534 (26%)	16026 (6%)
Rural < 20k	431 (2%)	3795 (19%)	8366 (42%)	6036 (30%)	1443 (7%)
Total	9244	63241	113731	73570	17469

Note. Chi-square = 367.3265. *p* value = < 0.0001.

I continued to compare rural versus urban based on marriage, PSA, Gleason score, and risk. The data showed significant different if the men were married versus not being married. The total number of men married in rural community was N = 14665 (73%) versus the urban community N = 180631 (70%). This was compared to not married category rural N = 5406 (27%), and urban N = 76563 (30%). Table 7 will display the finding presented for this variable.

Table 7

Results of Married Versus Not Married Men With Prostate Cancer in Rural Versus Urban Communities

Race	Not married	Married	Total
AAM	19781 (43%)	26084 (57%)	45865 (100%)
EAM	64670 (27%)	173971 (73%)	238941 (100%)
Total	84451	200055	284506

Note. Chi-square = 4.73e +03. *p* value = < 0.001.

Following in sequence I proceeded to analyze PSA in rural and urban communities for comparison. The data suggested that there was statistically no difference within the communities. Which is consistent with earlier findings when I did PSA in the United States and did not compare to the different communities? Table 8 demonstrates the findings and the percentages along with the P value and Chi–square results.

Table 8

PSA Analysis From Men Diagnosed With Prostate Cancer in the United States

Race	PSA < 1	PSA > 1	PSA > 2	PSA > 4	PSA > 10	PSA > 20
AAM	681 (1%)	991 (2%)	4515 (10%)	28328 (62%)	8156 (18%)	3194 (7%)
EAM	4772 (2%)	6943 (3%)	29397 (12%)	153441 (63%)	33393 (15%)	10695 (5%)
Total	5453	7934	33912	181769	41549	13889

Note. Chi-square = 1.2e +03. *p* value = < 0.0001.

Table 9 will display the advanced stage of disease between urban and rural communities based on the definition of urban and rural. This data suggest that there is a slight difference in advance stage disease between urban and rural with rural having the highest percentage. The lower Gleason scores show that there is no difference whether it is rural or urban, this can be explained based on the number of individuals reported at the time. The population of the urban community is larger than that of rural. The difference will be shown when race is involved based on data collected.

Table 9

Gleason Score of Rural Versus Urban Communities for Men Diagnosed With Prostate Cancer

Rural/Urban	Gleason 5 <	Gleason 6	Gleason 7	Gleason 8-10
Urban >20K	3304 (1%)	120320 (47%)	101881 (40%)	31689 (12%)
Rural < 20K	447 (2%)	8782 (44%)	8087 (40%)	2755 (14%)
Total	3751	129102	109968	34444

Note. Chi-square = 190.6405. *p* value = < 0.0001.

Risk of disease between rural and urban data suggest that rural communities' population risk is greater than urban population. The results from the data suggest, the higher the risk the greater chance that the rural population of men will be diagnosed with prostate cancer. Table 10 will display data and confirm the findings, which were stated throughout this dissertation. Risk of disease was based on low, intermediate, and high ratios.

Table 10

Risk of Disease Between Rural Versus Urban Communities With Population Being 20k and Greater for Urban and 20k and Less for Rural

Rural/Urban	Low	Intermediate	High
Urban > 20K	81441 (32%)	119059 (46%)	56694 (22%)
Rural < 20K	5520 (28%)	9477 (47%)	5074 (25%)
Total	86961	128536	61769

Note. Chi-square = 193.8793. *p* value = < 0.0001.

Testing the Research Questions and Hypotheses

The research questions guided this study on the complexity of prostate cancer diagnosis in AAM. Pending the statistical analysis the null hypotheses was presumed to be proven true. The research questions used to guide this study are being addressed in this chapter. Descriptive data associated with the variables coming from the SCT model, race, age, demographics, and marital status were incorporated in this study to determine prostate cancer behaviors between AAM and EAM in rural and urban communities. Another set of variables, PSA, Gleason Score, and demographics were incorporated to address the severity of prostate cancer in AAM versus EAM leaving in rural versus urban communities. The results of the data analyzed are shown below with an explanation of the data researched. The statistics performed here are from SPSS using chi-square results along with p-value and percentage.

RQ1: Is there a significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in rural areas in the United States during a five-year period?

Ho1: There is no significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period.

Ha1: There is a significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in rural areas in the United States over a 5-year period.

Results of the chi-square test of independence for race and demographics returned significant results with P Value = <0.05 with differences in risk and age of AAM and EAM annually diagnosed with prostate cancer. Table 11 demonstrates the data collected with the comparison by age and race utilizing SPSS statistics for standard deviation and mean. Table 12 shows the relationship of significance by chi-square results as it relates to risk in both AAM and EAM leaving in rural versus urban communities. Table 13 list the relationship of significance by chi-square and logistic regression results, over a period of five years in an urban development, based on race, age and marital status. Based upon the data collected and presented in the tables for Research Question 1, the null hypothesis was rejected in lieu of the alternative hypothesis which suggests there is a significant difference between the populations.

Table 11

Age-Related Comparison of Men Diagnosed With Prostate Cancer Based on Race in Rural Versus Urban Communities

Race	Obs.	Mean	Std. dev.	Min	Max
AAM	45864	63.11876	8.966572	32	98
EAM	238632	65.98336	8.921155	23	106

This table demonstrates that AAM are diagnosed with advance stage disease at a younger age that EAM demonstrating that by the mean age between the groups. This supports my null hypotheses for research question 3 and the rest of my findings.

Table 12

Risk of AAM Compared to EAM Living in Rural Communities Diagnosed With Advanced-Stage Prostate Cancer in the United States

Race	Low	Intermediate	High
AAM	13156 (30%)	20350 (47%)	10220 (23%)
EAM	70575 (32%)	102043 (46%)	48091 (22%)
Total	83731	122393	58311

Note. Chi-square = 83.3699. *p* value = < 0.0001.

Table 13

Logistic Regression Results of AAM and EAM in a Rural Community Over a 5-Year Period in the United States

Risk	Odds ratio	Std. err	Z	P > |Z|	95% con	Interval
Race	1.195584	.0149599	14.2	0.000	1.16662	1.225267
Age < 50	.7841884	.0226188	-8.43	0.000	.7410862	.8297975
Age 50-59	.8588257	.0109672		0.000	.8375971	.8805924
Age 60-69	1.35079	.0152409	26.65	0.000	1.321246	1.380994
Age > 80	2.850909	.0488717	61.11	0.000	2.756714	2.948324
Yr. diag. 2005	1.014481	.0189019	0.77	0.440	.9781027	1.052213
Yr. diag. 2006	.9933613	.0180541	0.37	0.714	.9585988	1.029384
Yr. diag. 2007	.872721	.0158623	-7.49	0.000	.8421786	.904371
Yr. diag. 2008	.8920351	.0164345	-6.20	0.000	.8603987	.9248348
Yr. diag. 2009	.8613282	.0159871	-8.04	0.000	.8305572	.8932392
Yr. diag. 2010	.8819796	.0164733	-6.72	0.000	.8502763	.914865
Yr. diag. 2011	.8483067	.015989	-8.73	0.000	.8175406	.8802305
Married	.9383218	.0095058	-6.28	0.000	.9198745	.9571391
Rural	1.177914	.0202005	9.55	0.000	1.138979	1.218179

Note. Number of ods. = 277255. LR Chi-square = 5520.79. Prob. > Chi2 0.

RQ2: Is there a significant difference in the proportion of AAM and EAM living in urban areas in the United States annually diagnosed with prostate cancer during a five-year period?

Ho2: There is no significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period.

Ha2: There is a significant difference between the proportion of AAM and EAM annually diagnosed with prostate cancer in urban areas in the United States in a 5-year period.

The finding of the chi-square test for independence comparing AAM and EAM annually diagnosed with prostate cancer in the United States over a five-year period living in urban areas showed statistically results (P Value =<0.05) with differences between race and demographics. Table 14 list the relationship of significance by chi-square and logistic regression results, over a period of five years in an urban development, based on race, age and marital status. Based upon the data collected and presented in the tables for Research Question 2, the null hypothesis was rejected in lieu of the alternative hypothesis which suggests there is a significant difference between the populations.

Table 14

Logistic Regression Results of AAM and EAM in an Urban Community over a 5-Year Period in the United States

Risk	Odds/Ratio	Std. err	Z	P > |Z|	95% con	Interval
Race	1.189103	.0153118	13.45	0.000	1.159468	1.219496
Age < 50	.7844002	.0226254	-8.42	0.000	.7412855	.8300226
Age 50-59	.858854	.0109677	-11.92	0.000	.8376245	.8806215
Age 60-69	1.350809	.0152413	26.65	0.000	1.321265	1.381014
Age > 80	2.850468	.0488651	61.10	0.000	2.756285	2.947869
Yr. diag. 2005	1.014548	.0189033	0.78	0.438	.9781662	1.052282
Yr. diag. 2006	.9933032	.0180532	-0.37	0.712	.9585424	1.029325
Yr. Diag. 2007	.8727535	.0158631	-7.49	0.000	.8422097	.904405
Yr. diag. 2008	.8920568	.016435	-6.20	0.000	.8604194	.9248575
Yr. diag. 2009	.8613973	.0159885	-8.04	0.000	.8306236	.8933112
Yr. diag. 2010	.8820471	.0164747	-6.72	0.000	.8503411	.9149352
Yr. diag. 2011	.8483218	.0159893	-8.73	0.000	.8175551	.8802464
Married	.9384848	.0095081	-6.27	0.000	.9200331	.9573065
Urban	1.16468	.0212917	8.34	0.000	1.123688	1.207168

Note. Number of ods. = 277255. LR chi-square = 5524.05. Prob. > Chi2 0.

RQ3: Was there a significant change in the proportion of men annually diagnosed with advanced stage prostate cancer in rural versus urban areas in the United States during a five-year period?

Ho3: The proportion of men annually diagnosed with advanced stage disease in a rural community versus an urban community did not change during the 5-year period.

Ha3: The proportion of men annually diagnosed with advanced stage disease in a rural community versus an urban community changed significantly during the 5-year period.

The chi-square test results of independence comparing AAM and EAM annually diagnosed with advanced stage disease in rural versus urban community showed statistically significant results (P Value =<0.05) with stage of disease based on Gleason Score. Additional findings showed significant difference in the logistics regression results the 95% CI was (1.1 – 1.3). These results are explained in Table 15 and 16. Based upon the data collected and presented in the tables for Research Question 3, the null hypothesis was rejected in lieu of the alternative hypothesis which suggests there is a significant difference between the populations.

Table 15

Advanced-Stage Disease of Men Diagnosed With Prostate Cancer Over 5-Year Period Based on Race, Age, and Gleason Score

Race	Gleason 5 <	Gleason 6	Gleason 7	Gleason 8-10
AAM	600 (1%)	19434 (44%)	18371 (42%)	5321 (12%)
EAM	2799 (1%)	104373 (47%)	86240 (39%)	27297 (12%)
Total	3399	123807	104611	32618

Note. Chi-square = 147.0613. *p* value = < 0.0001.

Table 16

Logistic Regression Results of AAM and EAM Over a 5-Year Period in the United States

Risk	Odds/Ratio	Std. err	Z	P > |Z|	95% con	Interval
Race	1.216631	0.053902	4.43	0	1.115442	1.326999
Age < 50	0.8837661	0.0902663	-1.21	0.226	0.7234309	1.079637
Age 50-59	0.850692	0.0352071	-3.91	0	0.784412	0.9225725
Age 60-69	1.365693	0.0465331	9.15	0	1.277469	1.460011
Age > 80	3.268155	0.1687957	22.93	0	2.953515	30616313
Yr. diag. 2005	0.9947706	0.0571956	-0.09	0.927	0.8887549	1.113432
Yr. diag. 2006	0.9575623	0.0533845	-0.78	0.437	0.8584445	1.068124
Yr. diag. 2007	0.7785422	0.0437576	-4.45	0	0.6973338	0.8692077
Yr. diag. 2008	0.8316075	0.0474698	-3.23	0.001	0.7435842	0.9300507
Yr. Diag. 2009	0.7960569	0.0462707	-3.92	0	0.710343	0.8921134
Yr. diag. 2010	0.823038	0.0477311	-3.36	0.001	0.7346078	0.9221133
Yr. diag. 2011	0.8962405	0.0516204	-1.9	0.057	0.8005681	1.003346
Married	0.9375667	0.0296691	-2.04	0.042	0.881183	0.9975583

Note. Number of ods. = 27312. LR chi-square = 724.71. Prob > Chi2 0.

RQ4: Did PSA levels of men annually diagnosed with advanced stage prostate cancer significantly changes in rural versus urban areas in the United States during a five year period?

Ho4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community did not change during the 5-year period.

Ha4: The PSA levels of men annually diagnosed with advanced stage prostate cancer in a rural community versus an urban community changed significantly during the 5-year period.

The finding of the chi-square test for independence comparing AAM and CM annually diagnosed with prostate cancer in the United States over a five-year period living in urban versus rural areas, PSA levels showed statistically results (P Value = < 0.05) with differences between race and demographics and Gleason Score. Table 17 list the relationship of significance by chi-square test results, over a period of five years in an urban development, and a rural development based on race, PSA, and demographics. Based upon the data collected and presented for Research Question 4, the null hypothesis was rejected in lieu of the alternative hypothesis which suggests there is a significant difference between the populations.

Table 17

PSA Analysis for Men Diagnosed With Prostate Cancer, Rural Versus Urban Communities

Race	PSA < 1	PSA > 1	PSA > 2	PSA > 4	PSA > 10	PSA > 20
AAM	652 (1%)	953 (2%)	4369 (10%)	27084 (62%)	7697 (18%)	2971 (7%)
EAM	4455 (2%)	6529 (3%)	27757 (13%)	142017 (64%)	30333 (14%)	9585 (4%)
Total	5140	7482	32126	169101	38030	12556

Note. Chi-square = 1.2e+03. *p* value = < 0.0001.

Summary

Research questions and hypotheses statements were analyzed in chapter four. The variables used in this study were used to perform descriptive statistical analyses. The dependent variables consisted of race, demographics, advance stage of disease and PSA levels. Information regarding the study research questions and hypothesis pertaining to the statistical analysis was presented in this chapter and all assumptions regarding the study were met.

Statistical analysis was performed using chi-square test and logistic regression as related to the variables of study. The chi-square tests were a priori and demonstrated a statistical significance for the entire variables mentioned above. The logistic regression analysis was investigative by nature; nevertheless, the results showed a statistical significance for all variables either dependent or independent. The logistic regression models the relationship between a dependent variable and one or more independent

variables. In this study race was a dependent variable and marital status and age were independent. Each test for the various research questions indicated a significant difference was presented and the null hypotheses were each rejected in lieu of the alternative hypotheses.

Chapter 5 will provide a more detailed explanation and interpretation of the results also will give recommendations for future studies and a plan for action. Chapter 5 will discuss social change to improve the health of AAM in the United States and may provide interest in continuing one to want better understanding as to why prostate cancer has a higher incidence in AAM.

Chapter 5: Discussion

Introduction

This chapter presents a discussion of the findings discovered in Chapter 4 and the study's implications for social change, as well as limitations of the study and recommendations for action and studies to be conducted in the future. Prostate cancer endures as the most commonly diagnosed cancer in men in the United States. AAM are more at risk of receiving a prostate cancer diagnosis at an advanced stage than U.S. men of other ethnic groups. Understanding prostate cancer signs and symptoms and having awareness of risk factors related to prostate cancer may allow AAM the opportunity to decide whether screening or any other modality is beneficial for them.

The purpose of this study was to assess demographic variables, race, PSA, and advanced stage of disease in AAM versus EAM and rural versus urban communities in the United States over a period of time. The reason for the study was the high incidence of prostate cancer in AAM. The majority of past research in this area has focused on treatment. This study concentrated on diagnosis of prostate cancer in AAM in rural areas versus urban areas. This study used chi-square test and logistic regression to analyze the data.

This study, even though it was focused on diagnoses, opens the door for future research on prostate cancer in AAM and its relationship with metastatic disease. Evaluating and statistically analyzing the data led to questions relating to primary tumor and metastatic disease. I looked at the relationship of metastatic disease and AAM in rural versus urban communities, because some data pointed to EAM in rural areas as

having a higher percentage of advanced-stage disease than AAM in urban areas. Future research on prostate cancer diagnosis is necessary to clean up these phenomena generated by this study in the public health arena.

Interpretation of Findings

Examining my research questions, I listed each one separately and explained the findings as related to Chapter 4. Research Question 1 was the following: Is there a significant difference between the proportion of AAM and the proportion of EAM annually diagnosed with prostate cancer in rural areas in the United States during a 5-year period? The results showed that there is a statistically significant difference ($p < 0.005$) between AAM and EAM in rural areas within the United States. The chi-square test was used to generate the results to address this question. An additional step was taken to consider marriage and to determine whether there was a significant difference here. The results did show a significant difference ($P < 0.005$), however, this was not part of the research question; I assumed that the data would play an important role in future studies.

AAM in rural areas are particularly at risk of late-stage cancer diagnosis. It is also documented that rural dwellers have less access to and are less likely to use early cancer detection programs (Goovaerts & Xiao, 2011). This statement is supported by the data that were collected for this study. Even though numerous studies have highlighted the need for prostate cancer screening among AAM, no studies have addressed the concerns and attitudes of rural AAM about prostate cancer diagnosis and cancer screening programs (Oliver, 2007).

Research Question 2 was the following: Is there a significant difference in the proportion of AAM and the proportion of EAM living in urban areas in the United States annually diagnosed with prostate cancer during a 5-year period? The results showed that there is a statistically significant difference (p val < 0.005) between AAM and EAM in urban areas within the United States. The chi-square test was used to generate the results to address this question. Table 14 lists the relationship of significance by chi-square and logistic regression results over a period of 5years in an urban development, based on race, age, and marital status. Age group showed statistical significance (p val < 0.005) using the logistic regression table and chi-square results.

It has been reported that changes in the prevalence of risk factors in the AAM population will impact what has been reported and the real incidence of the disease (Heyns, 2008). Depending on exposure and the effects on the stage of the prostate cancer's natural history, some of these changes in exposure will cause changes in incidence, whereas others may take some time to become evident in AAM (Brawley, 2012b). It should be mentioned that for grades of prostate cancer, AAM have a higher rate than EAM in the United States, and the disparity is very pronounced for undifferentiated prostate tumors.

Research Question 3: was there a significant change in the proportion of men annually diagnosed with advanced-stage prostate cancer in rural versus urban areas in the United States during a 5-year period? The chi-square test results of independence comparing AAM and EAM annually diagnosed with advanced-stage disease in rural versus urban communities showed statistically significant results (p val < 0.05) with stage

of disease based on Gleason score. Additional findings showed significant difference in the logistic regression results; the 95% CI was (1.1 – 1.3).

The difference in the extent of prostate cancer diagnosis between AAM and EAM may suggest a rural versus urban disparity for populations within these regions. The study acknowledged that in comparison to EAM, AAM have been diagnosed with a higher grade and more advanced stage of prostate cancer in both rural and urban communities. The data was verified in Tables 13, 14, and 15 which represent the logistic regression and chi-square results for significant difference.

Clinically advanced stage prostate cancer was detected more repeatedly in AAM than in any other ethnic group (Brawley, 2012b). Clinical, socioeconomic, and pathologic factors have been known to account for 15% of the increased risk in AAM (Oliver, 2007). Being diagnosed with advanced-stage prostate cancer is a major health problem for AAM living in a low-income environment. This causes opportunities to vary for early detection, leading to an explanation for why AAM were twice as likely to be presented with advanced-stage prostate cancer.

Research Question 4 was as follows: Did PSA levels of men annually diagnosed with advanced-stage prostate cancer significantly change in rural versus urban areas in the United States during a 5-year period? In the findings of the chi-square test for independence comparing AAM and EAM annually diagnosed with prostate cancer in the United States over a 5-year period living in urban versus areas, PSA levels showed statistically significant results (p val <0.05) with differences between race and demographics and Gleason score. Significant differences within the age group and racial

group showed AAM having a lower mean for age, and their PSA levels were reported as significantly higher.

Although marital status was not a variable of concern, I did use some of the results to determine whether there was a statistically significant difference in relationship to PSA levels in AAM and EAM who were married and not married. Results showed at statistically significance (p val<0.005) by virtue of the chi-square test. This was demonstrated in Tables 7 and 8.

Chi-square test and logistic regression were performed to test the four research questions and hypotheses and examine the variables over the 5-year period in this study. The test measured percentage, frequency, p value, and 95% CI of disease among different demographic areas and populations based on race and age. The chi-square test was considered a priority in the study. Data showed that all the variables of study had statistical significance. Overall, the results of the study showed that there was a statistical difference in rural versus urban populations between AAM and EAM diagnosed with prostate cancer over a 5-year period.

PSA is at present the most reliable marker for prostate cancer with a higher predictive value. This antigen was introduced into practice in 1986 for use in prostate cancer screening (Heyns, 2008). PSA is more useful in deciding if an individual needs a biopsy that in determining stage of disease. Some studies have shown higher PSA values in AAM than EAM, however, some of these same studies have pointed to other factors such as large tumors, undetected metastasis, and more aggressive tumor biology in AAM as the reason for advanced-stage disease (Brawley, 2012b).

A finding that was not expected from the data was EAM in rural populations had a statistical significance when compared to AAM in urban populations. I was not looking for this in this study, however when I compared the results this stood out. More research is needed in order to confirm this hypothesis. Preliminary data points to EAM in rural areas have higher frequency of being diagnosed with prostate cancer when compared to AAM in urban areas.

Limitations of Study

One limitation of the study is that the sample size coming from the SEER database was not equal for urban demographics and rural demographics. This is understood because the population in an urban setting is larger than that of rural. Preferably a yearly census data may give greater insight into the true population of rural areas.

The strength of the study was that the data was collected the same way without any adjustments having to be done by the researcher. However, with this being said recall bias maybe a limiting factor because of the patients not having entire information and understanding of their disease. SEER has standards as to how data is collected and used; this made this study more reliable for the findings that are presented. A larger number of men in rural communities would have provided a greater insight and outcome on the differences in the study compared to urban men, assuming that PSA levels and advance stage of disease may give information on the increase in frequency of prostate cancer in AAM in the study.

Implications for Social Change

Could there be a difference in socioeconomic status, lack of education, and lack of insurance and less access to quality healthcare? Many might think so, however, this study looked at the complexity of why AAM were diagnosed with advance stage disease more than CM. Those question asked above would be considered if this study was based on treatment. AAM diagnosed with high Gleason Scores show that the stage of the disease is severe. Giving them the tools to curtail the high incidence for the disease is extremely necessary. This study utilized the Social Cognitive Theory (SCT) to focus on AAM, and their behavior with prostate cancer diagnosis, in rural versus urban communities. SCT assume that individuals will make a reasonable decision whether one should take preventive action (Myers, 2005). A part of the SCT represents a form of various life domains, such as family, health, demographic location, employment, and health care providers.

The implications for social change are to reduce prostate cancer health disparities among AAM in the United States. This can be done through knowledge, education, and healthcare providers. These results will improve health outcomes and reduce the burden of cancer in AAM and their families. Continuous research and designing future studies to determine the other cofounders that play a role in the increased incidence rate may determine future health outcomes and establish programs that would improve the health of AAM as it relates to prostate cancer. This in itself may lead to cultural behavior changes within the AAM population.

This study will introduce social change in AAM by entertaining focus groups to spread the word to rural and urban communities on the importance to bring prostate cancer discussions as the focal point relating to men receiving information their diagnosis of prostate cancer in both populations as a suggestion. Examples of these focus groups and interventions are reported further in this discussion. AAM have been told of the need for early screening for treatment purposes; however this study will increase the knowledge in AAM for diagnosis as well as their living environment. Pointing out to AAM that diagnosis is a primary concern with prostate cancer disease suggests that AAM focus on the need to change behavior when they are diagnosed.

Several SCT interventions have been tested in the past and are proven to be successful. The interventions that will be beneficial for this study are psychosocial interventions, faith based interventions, and group based interventions. Psychosocial interventions will provide self-efficacy for AAM to reduce the stress from not meeting the educational knowledge of understanding the nature of the disease and will help to improve on their quality of life. This type of intervention will provide supportive and expressive group therapy for AAM will have effective measures in relaxation training, emotional support and assist in an avenue for AAM to express their fears and anxieties, along with behavioral and cognitive coping strategies.

Given that behavioral choices remain debatably the influential determinant for population's health outcomes, AAM individual behaviors remain a key weapon in eliminating prostate cancer health disparities. This study aids in changing the behavior of

AAM by pointing out the necessary guidelines needed to become knowledgeable and ask the right questions when AAM are diagnosed with advanced stage prostate cancer.

Behavioral interventions will influence observance to prostate cancer early detection within the AAM population. Individual background and cognitive along with psychosocial characteristics may affect AAM behavior. Future research should look into the impact that cognitive and psychological correlates with decision making and behavior along the gamut of prostate cancer care in AAM. Socioeconomic status and education should be reviewed for the role they play in quality of healthcare.

Group based intervention programs are structured to manage interventions on improving quality of life trough cognitive behavioral management skills. AAM along with EAM in rural communities will benefit from this program based on the time it takes to travel to health care providers explaining why the high rate of advance disease is seen among this population of men, and the data in this study showed that the rural communities' percentage of advanced stage disease was higher. Changing the behavioral concept for AAM is very important for the success rate of the disease and decreasing the stage of disease along with mortality rate.

Social support will enhance health related quality of life in AAM diagnosed with prostate cancer by improving their cognitively ability to manage their prostate cancer proficiency. Many faith based organizations have lay leaders who educate AAM that were diagnosed with prostate cancer who tend to serve as role models for AAM, because they themselves have been dealing with the same disease. These interventions are in

place for several communities and can be implemented in this study based on data that was presented in this study.

Recommendations

The results of this study can be of value to AAM, healthcare professionals, family members, and friends of AAM. This study focused on prostate cancer diagnosis among AAM and EAM living in rural and urban communities. The outcome from the study cause for the researcher to recommend that AAM seek early detection programs and entertain the idea of joining group based intervention programs to gain knowledge on the disease. Which will provide additional education and enhance the knowledge regarding prostate cancer to all men involved in the study? Another recommendation is for all men to join a focus group in order to discuss each ones diagnosis which will enhance their learning about the disease. Another recommendation is to seek information from psychosocial intervention programs which will enhance their quality of life and improve their self-efficacy. Having a SCT model to affect a physical transition in AAM will be very helpful for improving quality of life in these patients. AAM should be able to make an informed decision with their health care providers, only after being informed with information about the uncertainties, risk and potential benefits. Having this ammunition will give AAM the tools necessary to share with family and friends, so that early detection will lead to less frequency of advanced stage prostate cancer in the population. This practice will ensure that AAM will be given an opportunity to learn about the disease and become aware of the severity that is associated with prostate cancer diagnosis. With this knowledge comes health benefits and understanding which will

provide quality of life and may increase AAM life expectancy as related to prostate cancer.

Family discussions should take place on a regular basis in order for AAM to understand the history which has been present in their background. Attending multidisciplinary panels is another recommendation which can set guidelines for AAM to follow during their battle with prostate cancer. AAM need to learn more about evidence review, consisting of randomized trials, population data, and modeled data which will lead to evidence interpretation consisting of public health perspectives and individual perspectives to go along with policy. This is the knowledge which is lacking that this study will incorporate in the mindset of AAM who seek to conquer the prostate cancer dilemma.

Conclusion

Prostate cancer remains an important health concern for all men, however with a major emphasis on AAM. This topic will always be controversial in the public health realm of study. Recognizing and understanding the risks factors associated with the development of prostate cancer, along with the outcome of delayed initial screenings, and the diagnosis highlight the importance of this study. The African-American ethnic background presents a greater risk of disease with advanced stages, which implies a poorer prognosis for AAM. This could reflect the later stages of the diagnosis and consequently poorer prognostic features of the disease in AAM, or it could reflect a biological difference in the disease.

This study demonstrated the relationship between AAM and EAM living in rural and urban communities diagnosed with prostate cancer. The purpose was to examine if there was a statistical significance between AAM, EAM, demographics and stage of disease. This study showed that there was a statistical significance base on chi-square results and p-value. This study was not able to determine the specific reason as to why these differences occur, however the changes were significant enough to know that there was a difference based on the comparison of the variables used in the study.

Discovering prevalence among rural and urban populations of this study was important in order to observe the frequency for prostate cancer in AAM and EAM living in the communities. The logistic regression model showed measures for prevalence over time, this justified the PSA results along with advanced stage of disease in both AAM and EAM. Chi-square test aided in justifying the significance in the PSA levels and advance stage of disease using Gleason score in AAM and EAM living in rural and urban populations.

Future studies are needed to address some of the results that I encountered from this study. Researchers need to look at the association from metastatic disease in correlation with advance stage prostate cancer in AAM compared to EAM and demographics. This research should be based on information gathered from a qualitative methodology, seeking more information from rural populations. Another area of concern is this study showed a significant difference in EAM living in rural areas and AAM living in urban areas. This need to be evaluated more in order to see if there is indeed more data that support the rural populations have the increase percentage for prostate cancer

diagnosis and to determine why this phenomena takes place. I would suggest a qualitative case control study be conducted to generate more data from the rural population that will support any future study finding on the comparison in AAM and EAM in this population.

It is extremely essential for public health to continue monitoring evaluating the health outcomes for AAM populations who are at risk of being diagnosed with prostate cancer no matter where the demographics are. Informed decisions may empower AAM, and allow them to make a conscious decision on their health behavior. Enhancing ones knowledge will provide the tools that are necessary for correcting any misunderstandings, or misgivings that AAM may have encountered in earlier medical conversations with professionals or healthcare providers.

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Appendix A: Signed SEER Agreement

Note: This form is primarily applicable to following situations:

1) **you want to access the SEER 1973-2011 Research Data with a named SEER*Stat account;**
2) **a representative of the SEER Program is handing you a SEER 1973-2011 Research Data DVD;**
3) **you are accessing the SEER 1973-2011 Research Data from a shared location such as a LAN.**

SURVEILLANCE, EPIDEMIOLOGY, AND END RESULTS PROGRAM

Data-Use Agreement for the 1973-2011 SEER Research Data File

It is of utmost importance to protect the identities of cancer patients. Every effort has been made to exclude identifying information on individual patients from the computer files. Certain demographic information — such as sex, race, etc. — has been included for research purposes. All research results must be presented or published in a manner that ensures that no individual can be identified. In addition, there must be no attempt either to identify individuals from any computer file or to link with a computer file containing patient identifiers.

In order for the Surveillance, Epidemiology, and End Results Program to provide access to its Research Data File to you, it is necessary that you agree to the following provisions.

1) I will not use—or permit others to use—the data in any way other than for statistical reporting and analysis for research purposes. I must notify the SEER Program if I discover that there has been any other use of the data.

2) I will not present or publish data in which an individual patient can be identified. I will not publish any information on an individual patient, including any information generated on an individual case by the case listing session of SEER*Stat. In addition, I will avoid publication of statistics for very small groups.

3) I will not attempt either to link—or permit others to link—the data with individually identified records in another database.

4) I will not attempt to learn the identity of any patient whose cancer data is contained in the supplied file(s).

5) If I inadvertently discover the identity of any patient, then
   a) I will make no use of this knowledge,
   b) I will notify the SEER Program of the incident, and
   c) I will inform no one else of the discovered identity.

6) I will not either release—or permit others to release—the data—in full or in part—to any person except with the written approval of the SEER Program. In particular, all members of a research team who have access to the data must sign this data-use agreement.

7) I will use appropriate safeguards to prevent use or disclosure of the information other than as provided for by this data-use agreement. If accessing the data from a centralized location on a time sharing computer system or LAN with SEER*Stat or another statistical package, I will not share my logon name or password with any other individuals. I will also not allow any other individuals to use my computer account after I have logged on with my logon name and password.

8) For all software provided by the SEER Program, I will not copy it, distribute it, reverse engineer it, profit from its sale or use, or incorporate it in any other software system.

9) I will cite the source of information in all publications. The appropriate citation is associated with the data file used. (Please see either Suggested Citations on the SEER*Stat Help menu or the Readme.txt associated with the ASCII text version of the SEER data.)

My signature indicates that I agree to comply with the above stated provisions. **I understand that this form is not for the purpose of requesting delivery of a DVD by mail.**

First Name: Adam Last Name: Sumlin

Organization: Roswell Park Cancer Institute/ Walden University

Phone: 716-462-7332 E-mail: adamsumlin@hotmail.com

Signature: Adam B Sumlin Date: 06/11/2014

Please print, sign, and date the agreement. Send the form to The SEER Program:

- **By fax to 301-680-9571**
- **Or, e-mail a scanned form to seertrack@imsweb.com**

Curriculum Vitae

Adam B. Sumlin
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Personal Data:

Date of Birth: June 15, 1954
Place of Birth: Buffalo NY
Marital Status: Married

Education:

Walden University Online September 2009 to Present PhD, Public Health

University of Phoenix Online MBA December 2008

Fisk University Nashville Tenn. 37203. Bachelor
Of Science in Biology/Chemistry Awarded May 1976.

Publications:

1. Talbot, H.W., Sumlin, A.B., Naylor, E.W. and Guthrie, R. A. Neonatal screening test for argininosuccinic acid lyase deficiency and other urea cycle disorders. Pediatrics, 1980

2. Pandey, R.K., Shiau, F-Y, Medforth, C.J., Sumlin, A.B., Dougherty, T.J., Smith, K.M. Synthesis and structure activity relationships of porphyrin dimers and trimers with ether linkages. Photochem and Photobio 1990

3. Henderson, B.W., Bellnier, D.A., Farrell, G., Owczarczak, B., Sumlin, A.B., Dougherty, T.J. New sensitizers, do they target tumor cells or vasculature? Photochem and Photobio 1990

4. Henderson, B.W. Sumlin, A.B., Owczarczak, B., Dougherty, T.J. Photodynamic tumor destruction with Bacteriochlorophyll-a as a Sensitizer. Photochem and Photobio.1991

5. Ravindra K. Pandey, Fuu-Yau Shiau, Isabelle Meunier, S.Ramaprasad, Adam B. Sumlin, Thomas J. Dougherty, and Kevin M. Smith. Improved Photosensitizers for photodynamic therapy. Photochem and Photobio. 1992

6. Thomas J. Dougherty, Ravi K. Pandey, Adam B. Sumlin, Joseph R. Missert, David A. Bellnier, and YAU-Kwan HAPotential new PHOTOSENSITIZERS for photodynamic Therapy. Photochem and Photobio. 1991

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11. Ravindra K. Pandey, William R. Potter, Isabelle Meunier Adam B. Sumlin and Kevin M. Smith. Evaluation on new Benzoporphyrin derivatives with enhanced PDT efficacy. Accepted May 1995 Photochem and Photobio.

Professional Affiliations**:**

The International Photodynamic Association

Research Experience**:**

11-26-86 to 08/30/2014 Roswell Park Cancer Institute Elm and Carlton Buffalo NY, 14263. Position: Clinical and Assistant Cancer Research Scientist under the Auspices of Dr. Thomas Dougherty.

Duties: Data entry manager for patient records and treatment with Photodynamic Therapy. Clinical Treatments for PDT. Drug analysis and development of different photosensitizers. Analysis of Photosensitizers using High Pressure Liquid

Chromatography. Study of different Hematoporphyrin drugs for the treatment of different tumors. . Instruct all new affiliates in PDT. Supervise technicians and students and help plan their research. Operate and repair lasers for research and clinical use.

4-15-85 TO 11-25-86 Roswell Park Cancer Institute Elm and Carlton Buffalo NY, 14263. Position: Research Scientist under the Auspices of Dr.Theresa Gessner.

Duties: Generation of Metabolites from Adriamycin and Daunorubicin P388 Cells, Generation of different Prostaglandins using High Pressure Liquid Chromatography and Macrophages. Harvesting of cells from C57 mice, which are treated with Adriamycin, and Daunorubicin Resistant cells. Prepare Microsomes from mice to study the effects of Benzopyrene and Glucuronidase Metabolites. Tissue culture and cell banking. Prepare and harvest Macrophages. Order all supplies for the Lab.

9-83 to 1-30-85 Roswell Park Cancer Institute
Elm and Carlton Buffalo NY, 14263. Position: Research Scientist under the Auspices of Dr. Edward Johnson.

Duties: Purification of Proteins and Enzymes, Gel Electrophoresis, Column Chromatography, Electron Microscopic Analysis, Preparation of Hybridomas, isolation of different antigens from Breast and Ovarian Carcinomas. Supervise new employees based on research topic.

11-82 TO 9-83 Roswell Park Cancer Institute
Elm and Carlton Buffalo NY, 14263. Position: Research Scientist under the Auspices of Dr. Mong Heng Tan.

Duties: Maintenance of Tissue culture and the Nude mice colony for breeding and experimental purposes. Injection of mice with tumors for growth and experimental purposes for the use with Monoclonal Antibodies. Research on Pancreatic tumors. Use of microtome for the cutting of selective tissues for Histology purposes.

7-81 TO 11-82 Roswell Park Cancer Institute
Elm and Carlton Buffalo NY, 14263. Position: Research Scientist under the Auspices of Dr. K.C. Chadha.

Duties: Prepare and Purify Interferon, maintenance of tissue culture stocks, preparation of media, various assays, including hemagglutination, Finter's dye uptake method for Biological activities, protein determination of sample by Biorad Micro and Macro protein assay, running of Gel Electrophoresis and column chromatography, setting up of complement fixation procedures, use of radioactive assays using radioactive materials Tritiated Thymidine and Carbon 14.

11-79 to 7-81 State University of New York at Buffalo 3435 Main St. Buffalo, NY 14214. Position: Research Assistant under the Auspices of Dr. Robert Guthrie.

Duties: Research on Inborn Metabolic Diseases, development of new screening tests for Organic Acid Urea Cycle Disorders of Microbial Genetics. Maintenance of Bacillus Subtilis and E.coli Strains.

12-77 to 11-79 Associate Biomedic System 872 Main St. Buffalo, NY 14202. Position: Manager of Reagents.

Duties: Maintenance and preparation of tissue culture media. Growing and harvesting Human cell lines. Supervise 5 employees in the production lab. Compile a weekly production schedule. Research on different chemical arrangements for the production of different media. Prepare the work schedule for the department of quality and control and supervise the department. Subsequently became Vice President of special projects for the purpose of creating and formulating new products to be marketed by the company. Taught cell culture and general sciences for interested students and trained for future careers in science.

Computer Skills:

Hardware: IBM-PC Apple Macintosh,

Software: WordPerfect, WordStar, Sigma Plot, Database III Plus, Reflex, PC Tools, Windows, Norton Utilities, Turbo Tax, Image mate Slide Write Plus, Microsoft Word, Microsoft Excel, Microsoft Access, Windows 95,Prodigy, Quattro Pro, Ventura publisher and Lotus 123. Windows XP, Windows Power Point.