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Digital Object Identifier: <https://doi.org/10.13023/ETD.2018.005>

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DEVELOPING A PREDICTIVE MODEL FOR PROSTATE CANCER SCREENING
INTENT

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
in the College of Nursing
at the University of Kentucky

By
Quentin E. Moore

Lexington, Kentucky

Director: Dr. Jennifer Hatcher, Professor of Nursing,
Director of Diversity and Inclusivity

Lexington, Kentucky

2017

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ABSTRACT OF DISSERTATION

DEVELOPING A PREDICTIVE MODEL FOR PROSTATE CANCER SCREENING INTENT

African Americans bear a disproportionately high burden of cancer incidence and mortality in this country. The purpose of this dissertation was to investigate factors associated with African-American men, who are incarcerated, making informed health decisions about participation in prostate cancer screening, as well as exploring factors that reduce modifiable risk factors for cancer. The United States incarcerates more people per capita than any country in the world and African American men are overrepresented in the U.S. prison system.

This dissertation is composed of three manuscripts. The first paper reviews the current literature about the factors that influence African-American males in making informed decisions about whether to participate in prostate cancer screening. The second paper uses existing data from a sample of 129 incarcerated African American men to examine the value of an intervention aimed at reducing modifiable risks for cardiovascular disease – and by extension, cancer – in inmates. The third paper explores predictors of intent to screen (or not) for prostate cancer in incarcerated African-American males, as well as those factors that influence informed decision-making in this population.

These papers provide an overview of factors that influence incarcerated African-American men's health decisions (health literacy, having a relative with previous diagnosis). These findings can be used to guide future research that addresses African-American male decision-making about personal health outcomes.

KEYWORDS: Prostate cancer screening, informed decision making, African-American men, incarceration, screening intent

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December 12, 2017

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DEVELOPING A PREDICTIVE MODEL FOR PROSTATE CANCER SCREENING
INTENT

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DEDICATION

I dedicate this dissertation to my wife (Angie) and our children (Quentin II and Faith). Thank you for the love, understanding, caring, and support throughout this journey.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank GOD. Your blessings are beyond explanation and YOU have given me the power to believe in myself and pursue my dreams. I could never have done this without the faith I have in YOU, the ALMIGHTY.

I would like to acknowledge several individuals who have helped me in some many ways throughout this journey of obtaining my Doctor of Philosophy degree. I would like to thank my wife Angie (My biggest cheerleader). Your support means everything to me. Thanks for pushing me when I didn't want to do anything. Thanks for listening when I needed to just talk, and thanks for your continued support throughout our lives together. Thanks for all of your sacrifices. Love You!!! To our children, Quentin II and Faith (Supporting Cast). With GOD's guidance, you can do whatever you set out to do regardless of your situation in life or the task ahead. Always keep GOD FIRST in your lives and He will take care of the rest.

To my dissertation committee: Dr. Jennifer Hatcher (my Committee Chair), Dr. Terry Lennie, Dr. Gia Mudd, and Dr. Mark Dignan. Each of you have contributed your expertise and support throughout this entire journey. Word can't express the appreciation I have for each of you. THANK YOU.

Mom, who would have thought that a boy from a single parent home and started out in the East End projects of Lexington, Kentucky would be able to obtain such an accomplishment? YOU DID!!!! Throughout my life, you have been an inspiration not only through words but in your actions for me and my three siblings (Sharon, Sharona, and LaRoy). I thank you for all of the sacrifices you made on our behalf. Most of all, I

thank you for introducing your children to GOD and giving us a love that was as humanly close as possible to love that He displayed to us by giving his only Son. I Love You.

To Ms. Mary Jones: Thanks for all you have done for me and my family. You are the world's greatest mother-in-law and I Love You. Your acceptance and support throughout these 20 years has been a blessing beyond words.

I want to thank my church family at Consolidated Baptist Church. Your prayers and well wishes mean the world to me. A special thanks to Dr. Vanessa Jackson who was instrumental in guiding me early on in this process. Ms. Chris. You will never know how your continued support held me up during those days that I needed support. YOU ARE AWESOME!!! To the brothers of Omega Psi Phi Fraternity Inc. Keep holding up the cardinal principles: Manhood, Scholarship, Perseverance, and Uplift (F.I.E.T.T.S). I would like to thank Shawn White for providing his editing expertise to this dissertation project. You made things FLOW a lot smoother. To Dr. Gayle Scroggs. Your coaching helped me to manage my time and projects. Thanks for putting things in perspective and providing your expertise and support. To my Eastern Kentucky University family: Your support has meant so much. The encouragement and support received from the administration as well as my colleagues is UNBELIEVEABLE. Go Colonels!

Last but not least, I would like to thank the Federal Bureau of Prisons and the men who participated in my study for their cooperation and assistance in this dissertation. If not for your assistance (Especially Jody Klein-Saffran), this would not have been possible.

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CHAPTER ONE: INTRODUCTION

Background

Prostate cancer is the second most common cancer in American men and the third leading cause of cancer death in the country (American Cancer Society, 2017). It is estimated that one in seven men will be diagnosed with this disease within his lifetime, and of the 161,360 new cases that are expected to develop in 2017, more than 26,000 men are expected to die from the disease (American Cancer Society, 2017; National Cancer Institute, 2017).

Although prostate cancer occurs across all dimensions of society, its distribution along racial lines is unequal and inequitable. According to the American Society of Clinical Oncology (2017), African-American men experience a disproportionate risk of developing prostate cancer compared to their non-Hispanic Caucasian counterparts—nearly 74% higher. In addition to the higher (Prostate Cancer Foundations, 2017) incidence rates, African-American men are also 2.4 times more likely to die from prostate cancer compared to Caucasians. The reasons for this disparity are complex and multifactorial, requiring ongoing investigation by researchers and practitioners.

Across the United States as a whole, Caucasians and African Americans respectively comprise 61.3% and 13.3% of the population (U.S Census Bureau, 2016); however, Caucasians constitute 58.7% of the inmate population in federal prisons, while African-Americans constitute 37.7% (Federal Bureau of Prisons, 2017). This inequity is even more apparent at the state level, where African-Americans and Caucasian respectively represent, on average, 38% and 35% of inmates; in 11 states, the former number is as high as 50% (Williams, 2016). Overall, African Americans are five times

more likely to be incarcerated than Caucasians (Williams, 2016). Given that the United States has the largest prison population in the world (2,145,100 prisoners), as well as the largest number of people incarcerated per capita (665 per 100,000) (World Prison Brief, 2017), there is a meaningful portion of the African American community that will end up in prison.

Given the demographics of the prison population and the health disparities for those overrepresented populations who are incarcerated, it would be valuable to understand how inmates make health-related decisions and how prisons can facilitate better health outcomes among prisoners. However, the prison population remains largely underrepresented in research studies. Indeed, most articles about incarcerated individuals focus largely on mental health; there is notably less research on medical decision-making, and virtually no studies to date regarding prostate cancer screening or screening intention among inmates. To compound matters, research shows that inmates are getting older (age 50 and older) upon incarceration and receiving longer sentences, which means prisons will inevitably be confronted with more chronic health issues (Sterns, Lax, Sed, Keohane, & Sterns, 2008; Williams, 2007; Williams, Stern, Mellow, Safer, & Greifinger, 2012). Such research is increasingly needed given the aging of this population and the associated healthcare costs.

Ninety-five percent of incarcerated individuals eventually return to their communities (Bureau of Justice Statistics, 2017); thus, their health issues will ultimately have an impact on general healthcare costs and community well-being. As such, prison health services can provide a critical link to post-release care and possibly decrease the burden of disease in the communities that absorb these individuals. One way for prisons

to influence the well-being of communities to which previously incarcerated persons will reintegrate is offering preventative care (including screening, diagnosis, and treatment of acute and/or chronic illnesses while incarcerated) to vulnerable individuals who might not otherwise seek health care.

Given that men constitute 93% of U.S. inmates (Federal Bureau of Prisons, 2017), the dissertation contends that understanding the factors that influence prostate cancer screening is a first step in prisons being able to help encourage healthy habits and informed decisions in inmates. This type of service would be particularly valuable to the prison system as well as the communities that inmates will return to, upon their release from prison. To this end, this dissertation contains three manuscripts—a literature review, a secondary analysis, and a survey study—that combined provide insight into how U.S. prisons can promote better outcomes for male inmates, and particularly African Americans, regarding cancer screening and informed decision making.

It is worth noting that scholars and practitioners have not arrived at unanimous guidelines with regard to prostate cancer screening recommendations. As will be discussed in more detail in Chapter Two, there is an ongoing controversy about the efficacy of the prostate specific antigen (PSA) method of screening: Notably, there is a lack of randomized studies that provide evidence regular annual screening with the PSA effectively decreases the mortality rates of the disease. Due to this ambiguity, some organizations, such as the U.S. Preventive Services Task Force (USPSTF), have begun advocating the use of informed decision making: This process involves a provider discussing the risks and benefits of screening with a patient and allowing him to decide the course of action. Several major organizations (e.g., the American Urological

Association, American Cancer Society, and Prostate Cancer Coalition) support this approach, especially for men between the ages of 50-69 and those in high-risk categories, such as African-American men and men with a family history of prostate cancer. However, there is currently limited knowledge about the factors that influence African-American men—and particularly those who are incarcerated—to engage in informed decision-making with regard to prostate cancer screening. This dissertation addresses this gap.

Theoretical Framework

Informed decision-making relies on the individual's knowledge or awareness of a situation or procedure and ability to convert that knowledge into action. In doing so, the person has to consider potential outcomes of his choices and his/her personal values. In order to identify the factors that underlie this behavior, this dissertation is guided by Theory of Planned Behavior (Figure 1). The Theory of Planned Behavior (TPB) is an explanatory theory used describe a problem, explain the reason for the problem, and provide guidance on finding solutions. The TPB has been applied to multiple health-related behaviors, such as smoking, safe sex, suicide intent and, for the purposes of this study, the outcome behavior is to get participants to have a discussion about prostate cancer screening with a provider and to make an individualized decision about whether or not screening is right for them.

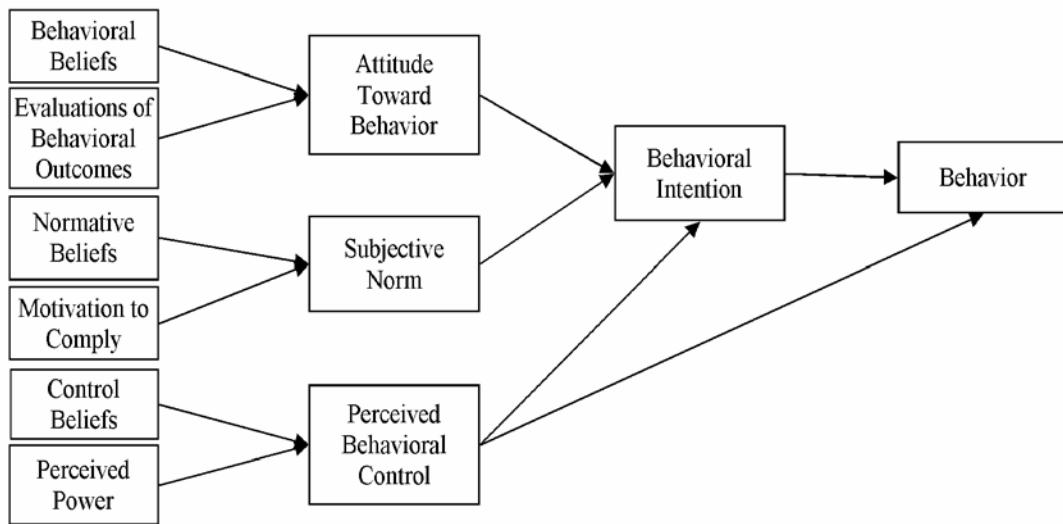


Figure 1.1. The Theory of Planned Behavior.

The TPB is an extension of the theory of reasoned action (TRA) (Ajzen, 1991).

The intent of the TPB is to explain those behaviors that a person has the ability to exert control over. According to the TPB, behavior is based on intentions: An individual's intentions to participate in a given behavior are based on his/her attitude toward the behavior, subjective norms surrounding the behavior, and the perceived difficulty (easy/difficult) of performing the given behavior (perceived behavioral control). All of the variables, except the behavior, are considered psychological (internal to the individual).

Attitude toward a behavior is the person's evaluation of the behavior. Two components are assumed to work together to influence attitude: behavioral beliefs and outcome evaluations. **Subjective norm**, meanwhile, is the person's estimate of the social pressure to perform the given behavior. This process is assumed to depend on two, interrelated components: normative beliefs and motivation to comply. **Perceived**

behavioral control is the extent to which the person feels he/she can perform the behavior, and also features two aspects: control beliefs and perceived control. Researchers can measure each variable (attitude, subjective norm, perceived behavioral control, and intention) directly by asking participants about specific behavioral beliefs and outcome evaluations.

Overview of Dissertation Chapters

This dissertation adds to the knowledge base about how African-American men make informed decisions about their health. This work includes a segment of the population that has been underrepresented in research: the incarcerated African-American male. The specific aims for this dissertation, which align with the three chapters, were to:

1. Critically examine current literature regarding factors that influence African American males to engage in the informed decision-making process as it pertains to prostate cancer screening activities.
2. Examine whether an intervention targeted at decreasing modifiable risk factors for cardiovascular disease in incarcerated African-American male inmates also decreases risk factors for cancer.
3. Test a model of predictors for intention to screen for prostate cancer in incarcerated African-American males.

Chapter Two reviews the current literature about the factors that influence African-American males in making informed decisions about whether to participate in prostate cancer screening. This review included a total of 22 studies that investigated subjective norms, trust, and knowledge. The findings of this literature review highlight

the importance of these factors in helping African-American males make an informed decision about prostate cancer screening which can potentially decrease the risk of developing this disease.

Chapter Three is a secondary analysis conducted on a subset of data from a previous study (from 2009-2011), that looked at the impact of an intervention to decrease cardiovascular risk factors in male inmates in Kentucky state prisons. This secondary analysis examined whether an intervention aimed at decreasing modifiable risk factors for cardiovascular disease also decreased risk factors for cancer (namely prostate cancer) in African-American male inmates. With these lifestyle modifications, the risk of developing prostate cancer may decrease. This study was focused on three modifiable risk factors (obesity, physical activity, and diet) that were related to both cardiovascular disease and certain types of cancer.

Chapter Four presents the results of a study that explored the predictors of African-American male inmates' intent to screen for prostate cancer. The study included the variables of the Theory of Planned Behavior to predict intention to screen for prostate cancer. The Newest Vital Sign (literacy tool) was also used as a potential predictor of intent in hierarchical regressions to explain additional variance that was not covered by the original model. . Screening may lead to early detection of prostate cancer, therefore decreasing the risk of the individual dying from this disease.

These three studies, collectively, give a global view of prostate cancer risk reduction as they highlight factors that influence the decision making process in African-American men.

Chapter Five summarizes the findings of the prior chapters and draws conclusions about their theoretical and practical implications. The chapter also discusses the limitations of the dissertation and offers recommendations for future research.

CHAPTER TWO: LITERATURE REVIEW

Introduction

Prostate cancer is the third leading cause of cancer death in men and the second-most common type of cancer found among men in the United States (American Cancer Society, 2017). Approximately one in seven men will be diagnosed with prostate cancer in his lifetime, and about 16% of those diagnosed in 2017 will die from this disease (American Cancer Society, 2017).

African Americans have the highest mortality and morbidity rates of prostate cancer in the world (American Cancer Society, 2017; Centers for Disease Control and Prevention, 2016). Relative to their Caucasian counterparts, African-American men demonstrate a nearly 60% higher incidence rate: 130.4 versus 214.5 cases per 100,000, respectively (National Cancer Institute, 2015). Mortality rates are also alarmingly high among African-American males: approximately 46.3 deaths per 100,000, compared to 19.8 deaths per 100,000 among Caucasian males (National Cancer Institute, 2015). African-American males are approximately 1.5 times more likely to develop prostate cancer and more than two times as likely to die from this disease relative to a Caucasian male. Even though the incidence and mortality rates for prostate cancer have continued to fall over time, the ratio between these two populations remains the same (American Cancer Society, 2017).

Moreover, African-American men have a lower five-year survival rate: 96.5% compared to 99.9% among Caucasians (National Cancer Institute, 2015). These statistics encompass scenarios where the cancer is detected in the early stages and found in local or

regional areas of the prostate. However, in cases where the cancer has spread to distant areas of the body, the five year survival rate drops to about 29% (The American Society of Clinical Oncology, 2017). This statistic is especially concerning in light of the fact that African-American men are generally diagnosed with prostate cancer in much later stages than Caucasian men (Espey et al., 2007). The intuitive response to this disparity would be for providers to recommend cancer screening for all men at earlier points. However, this solution is muddled by an ongoing controversy regarding the value of screening itself.

The Prostate Specific Antigen (PSA) and the Digital Rectal Exam (DRE) are the two most commonly used tests to identify prostate cancer (American Urological Association, 2016; UCSF, 2017). The PSA is more effective at detecting tumor cells in the early stages, but it is not specific to prostate cancer, which calls into question its ability to positively differentiate between a cancerous or non-cancerous tumor (American Urological Association, 2007; Gwede & McDermott, 2006). As such, the PSA suffers from a high number of false-positives, ranging from 67% to 93% (Canadian Task Force on Preventive Health Care, 2009). Nonetheless, a higher PSA value is the most common means of diagnosing prostate cancer in the United States (American Urological Association, 2007).

The Digital Rectal Exam is the other test conducted during a prostate exam. During this procedure, the provider inserts his gloved finger into the rectum, assessing the back part of the prostate gland for abnormalities in shape, size, consistency and the presence of any lumps. Research has shown the DRE to be significantly less effective than the PSA in detecting prostate cancer (Cui, Kovell, & Terlecki, 2016). That said, it has been useful in finding cancer in men with normal PSA levels, as many prostate

cancers often originate on the back of the prostate gland (American Cancer Society, 2017). As a result, the American Urological Association (2016) only recommends the use of DRE as a secondary screening method when a patient has an elevated PSA.

Currently, many professional organizations (e.g., the American Urological Association; Prostate Cancer Coalition; American College of Radiology; American Cancer Society, etc.) endorse informed decision-making for prostate cancer screening. An informed decision is a decision about a procedure made by a patient which is based on choices. In order for that patient to be able to make an informed decision he/she must have the ability to reason, understand, and communicate his/her thoughts about what is to take place. Informed decision-making allows the patient to decide, based on critical information, whether or not he will be screened for prostate cancer. This involves the patient receiving information, discussing the benefits and disadvantages of prostate cancer screening with his provider and reaching an individual decision about whether or not to participate in the screening process. The American Cancer Society (2017) recommends having this discussion with average-risk men at age 50; with high-risk men (African American men and those with a family history of the disease) at age 45, and with very high-risk men (those with multiple relatives with the disease at an early age) at age 40.

Given the stunning disparity in prostate cancer morbidity and mortality suffered by African American men and the strong recommendation that screening decisions be made in concert with health care providers, the purpose of this review is to critically examine current literature addressing factors that influence African American males to

engage in the informed decision-making process as it pertains to prostate cancer screening activities.

Methods

A literature search was conducted using four electronic databases: PsycINFO (journal articles in psychology), MEDLINE (journal articles in medicine), CINAHL (journal articles in nursing), and Psychology and Behavioral Science Collection (journal articles in psychology). The search included articles from 2006 to 2016 identified by one or more of the following search terms: “prostate cancer screening”, “African American”, “knowledge”, “informed decision making”, “black”, “male”, “knowledge”. The search terms were derived from a combination of the above terms using the “and/or” connector in the search. First, the abstracts and titles were screened for relevance to the topic. Next, full text articles were selected based on the following inclusion criteria: (a) studies published in English between 2006 and 2016, (b) studies that reported factors that influenced African-American men to engage in the informed decision making process, and (c) studies that were peer reviewed. Studies that were reported as an abstract, dissertation, or were review papers were excluded for the review.

The literature search process is displayed in Figure 1. The initial electronic database search resulted in 47 articles being identified for review. A review of the titles and abstracts was conducted based on the inclusion criteria. Also, reference lists of each article were reviewed to identify other relevant research studies pertaining to the subject.

All duplicate articles were removed from consideration leaving 28 full-text article to be screened for eligibility. A total of 22 articles met inclusion criteria.

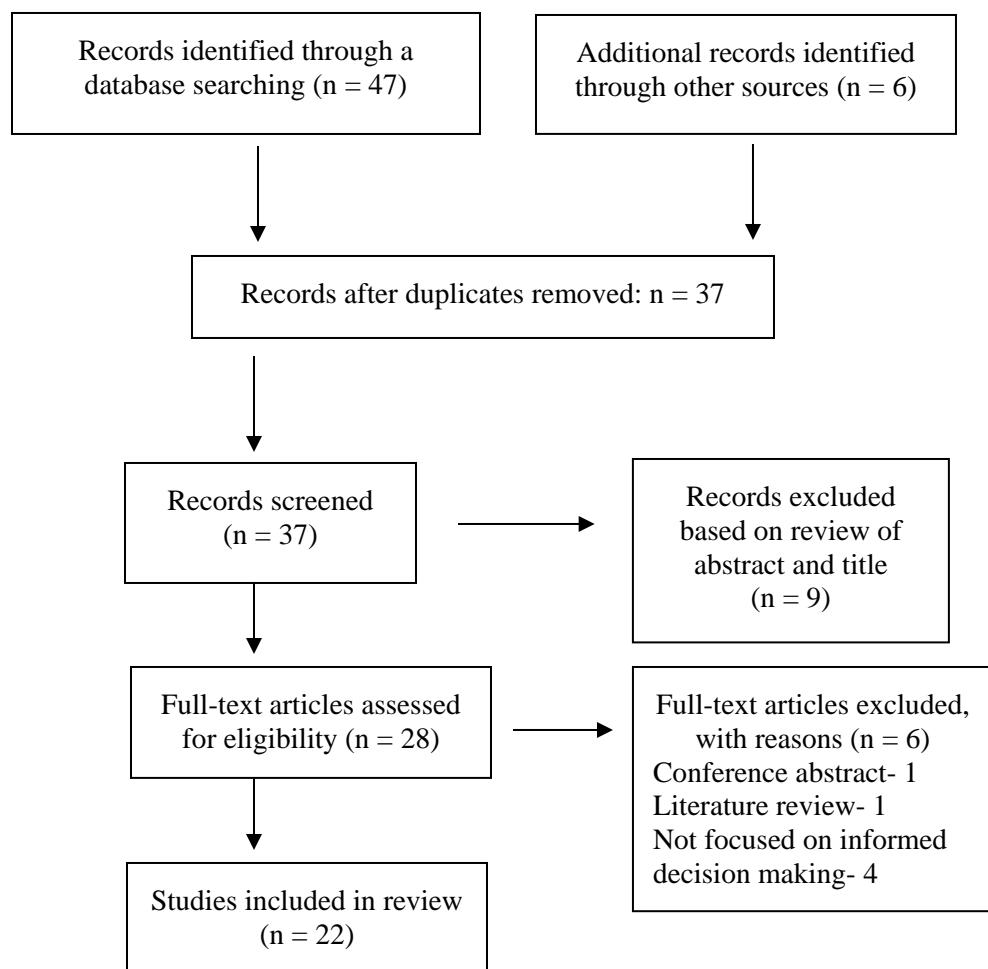


Figure 2.1. Summary of Literature Search and Review Process

Data Extraction and Analysis

All studies meeting inclusion criteria were critically analyzed and reviewed. A data extraction table was used to facilitate review of the characteristics of each study. Characteristics which were reviewed include: authors, subject characteristics, research design, sampling methods, study locations, and findings. Data were extracted, analyzed, and organized into major themes.

Results

The purpose of this review of current literature was to examine the factors that influence African-American men to engage in the informed decision-making process as it pertains to prostate cancer screening activities. For this review of literature, 22 articles were selected based on inclusion criteria. After the articles were reviewed common themes in the literature were identified in the literature. Those themes were: trust, subjective norms, cultural sensitivity, and knowledge. Each article was reviewed and evaluated according to those themes and their contribution to the literature regarding informed decision-making process. A summary of the articles can be seen in Table 2.1 below.

Table 2.1. Summary of prostate cancer related studies that include African American men and informed decision making process

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Sandiford 2016	Purpose was to describe the development and implementation of a prostate cancer screening intervention and risk assessment tool	Quantitative Pre/post education knowledge questionnaires	50 AA from two churches in different suburban Southern California cities Age 30-75	<ul style="list-style-type: none"> • Knowledge increased 8% • increased intent to participate in shared decision-making • Increase awareness of personal risk and benefits of prostate cancer screening with providers
Frencher 2015	What is the effectiveness of using decision support instruments to assist AA men in making a pros. Ca. screening decision	Quantitative Cross sectional Pre/post test with a 3 month f/u 2 DVD's (1 culturally tailored and the other was for the gen. audience)dist. Throughout black barbershops	120 AA men in the LA area Age 40 and up 50 Barbershops	<ul style="list-style-type: none"> • Increased intention to screen • Degree of certainty increased from 49.2% to 58.3% following the administration of the cultural decision support instrument • Majority of participants planned to discuss prostate cancer screening with primary provider

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Halbert 2015	Utilization of PSA testing among AA men based on factors that are important components of making informed decisions	Quantitative Telephone interviews	132 AA participants from Philadelphia Pennsylvania Age 50-75	<ul style="list-style-type: none"> • 64% didn't know recommended age to • 28% recognized be at high risk or higher risk for developing prostate cancer • Communication with Health care provider about screening was significantly associated with PSA testing • increased education and income were significantly associated with having a PSA
Holt 2015	Which is the most effective way to implement a church-based informed decision making intervention (individually or mixed gender)	Quantitative pencil survey	283 AA participants Age 41-69 with an average age of 55.4	<ul style="list-style-type: none"> • Intervention highly rated by men in both groups • Within workshops, study group differences favored the health department group in some instances • men and the man only group showed increased trust in workshops over time

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Owens 2015	Are computer based IDM interventions appropriate for AA men What is the AA man's process for screening What are AA men's att. Toward access to interactive communication technology	Qualitative Participation in 1 of 6 90 min. focus groups and completion of 1-45 item descriptive survey	39 AA men from the southeastern United States recruited from several faith based organizations Age 37-66	<ul style="list-style-type: none"> Initially, few participated in IDM with provider Few knew were informed about the risk factors and uncertainties of screening Most were opened to computer based interventions if they were easy and the avatars were culturally appropriate
Jackson 2014	What are older and younger/middle aged AA men's knowledge and attitudes about prostate cancer How do they make health and cancer related decisions	Mixed methods Pre/post test surveys (75 items) in a qualitative interview	28 AA men from the southeastern state Recruited from community centers, churches, and a cancer center	<ul style="list-style-type: none"> Young/middle aged men were more knowledgeable about screening Older men invited to participate in clinical trials thought it was risky and didn't plan to participate Increased knowledge when comparing pre-and posttest Older men reported talking to their doctor about advantages, disadvantages of screening Older men were more likely to have reported making a shared decision about screening with their provider

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Sultan 2014	How does a computer based community mediated IDM intervention affect AA men's knowledge, screening decisional conflict, and screening decisional self-efficacy	Quantitative Cross sectional study Pre/post test to measure knowledge, screening decisional conflict, and screening decisional self efficacy	152 AA men Age 40-70	<ul style="list-style-type: none"> Increased knowledge Sig. increase in decisional self efficacy Sig. reduction in decisional conflict Increased IDM was related to increased Education, being married, having financial resources, and younger age
Patel 2013	What is the impact of an educational intervention on Pros. Ca screening behavior and knowledge	Quantitative Cross sectional study Structured interviews: Pre intervention and another 3 months post intervention	104 AA men from Davidson County / Nashville who had not screened for pros. Ca. with a PSA and/or DRE in past year Age 45 and up	<ul style="list-style-type: none"> For those who had screened before, knowledge increase and barriers decreases (Post) No sig. predictors of decisional conflict. Screening status not sig. predictor of decisional conflict in Prostate cancer screening

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Luque 2011	What are the effects on Barbershop communications on pros. ca screening using barber health advisors	Quantitative Cross sectional Structured survey 51 question Educational intervention	40 AA men from the Tampa area; 40 and older; 8 Barbers in 4 barber shops trained as advisors	<ul style="list-style-type: none"> • Sig. increase in barbershop client's self-reported knowledge of pros. ca. likelihood of discussing with MD • More than half discussed pros. ca with barber in following month • Increased knowledge, decreased perceived risk and barriers, increase decisional self efficacy • two out of four decision efficacy items displayed statistically significant increase. They were: 1) sufficient information about prostate cancer, and 2) confidence in making an informed decision about getting screening for prostate cancer
Wray 2011	Development of a screening outreach strategy that struck a balance between the imperatives informed decision-making goals pragmatics of community setting	Quantitative Pre/post surveys	63 AA men from the St. Louis area Age 40 and up	
Jones 2010	How do African-American men decide whether or not to participate in screening? What role do their family and friends play in this process?	Qualitative This is an explanation of a portion of a larger study.	17 AA men from rural Virginia Age 40 and up	<ul style="list-style-type: none"> • Participants' family and friends were shown to be important in the decision-making process in this group when deciding whether or not to participate in prostate cancer screening

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Allen 2009	What are the effects of a computer tailored intervention to promote informed decision-making prostate cancer screening among African-American men	1 group pre/post test quasi-experimental design 20 to 30 minute self-administered questionnaire	108 AA men from the greater Boston area Age 40 and older Recruited from churches, barbershops, worksites, and community settings	<ul style="list-style-type: none"> • % Of those making screening decision increased from 43% pre-test to 47% post test • Significant improvement noted on knowledge test scores (from 54% to 72%), decision efficacy (87% to 89%, and decisional conflict (decreased from 21% to 13%) • participants were more likely to want to have a part in making this decision post intervention
Holt 2009	What is the most effective approach with African-American men making the decision to screen or not to screen for prostate cancer (spiritual based or non-spiritual based)	Quantitative Randomized controlled trial Pre/post test surveys	49 AA men Age 45 and older Recruited from two Baptist churches	<ul style="list-style-type: none"> • Scores for the subscales for knowledge increase in the spiritual group when comparing pre-and posttest • scores for screening self-efficacy increased significantly from pre-to posttest the non-spiritual group • self-efficacy for informed decision-making increased significantly in the spiritual group when comparing pre-and posttest

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Jones 2009	How do African-American men decide to screen or not screened for prostate cancer	Qualitative semi structured one-on-one interviews	17 AA men from central Virginia Age 40-71 Recruited from barbershops, churches, community health centers, and radio	<u>3 themes emerged:</u> 1) Manhattan information about prostate cancer, 2) family and friends played an important role in the decision-making process, and 3) a trusting relationship with their providers was needed limited education about prostate cancer was obvious
Weinrich 2008	What is the knowledge of prostate cancer screening based on exposure to 1 of 2 decision aids related to pros. ca. screening	Post intervention Quasi-experimental Random assignment to 2 groups	230 low income men (76% AA, 24 % Caucasian) from four urban neighborhoods in a Midwestern state Age 40-70 AA and 50-70 Caucasian	<ul style="list-style-type: none"> • Group which had the enhanced decision aid administered to them showed an increase in post test knowledge • Stat. sig was only noted in men who reported having previous DRE

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Williams 2008	Investigates the preferences among AA men who are members of the Prince Hall Masons	Quantitative 2 interviews: Initial and a 1 month f/u telephone interview Used Degner Shared Decision scale and Decisional conflict scale	286 AA participants Washington DC area Age 40-70 All men were members of the Prince Hall Masons	<ul style="list-style-type: none"> • 57% Preferred Shared decision making, 36% preferred making decision themselves, 7% deferred to MD • Older men more likely to prefer SDM (65%) • Increased age and education = SDM • SDM preferred by over 50% of participants
Allen 2007	1) What are the perceptions of AA about prostate cancer screening 2) What strategies and interventions to promote informed decision making are acceptable to AA men	Qualitative 4 focus groups with each group containing 7 to 10 participants	37 AA men from the greater Boston area Age 35-70	<ul style="list-style-type: none"> • Men who were not prostate cancer survivors had insufficient information about prostate cancer risk among AA men and the controversy surrounding screening • Recommended interventions be embedded in community settings men's overall health • barriers such as decreased access, mistrust, poor provider relationships, and perceived threats to male sexuality were identified as possible barriers to prostate cancer screening

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Sanchez 2007	What components are involved with pros. ca. screening informed decisions in AA men What factors influence screening decisions in this population	Qualitative 6 focus group sessions with each group having 3-7 participants	31 AA men from the Seattle/King county area Age 40-70	<ul style="list-style-type: none"> • There is a need for culturally sensitive decision aids in prostate cancer screening activities • Themes emerged <ul style="list-style-type: none"> - Knowledge of prostate cancer and clinical services - Prostate cancer as threat to manhood - Possible misconception b/t being screened for pros. ca and colon ca - Participants not well informed - Mistrust - Need for cultural Sensitive decision aids • Healthcare providers must play a role in the participant's decision to screen for prostate cancer • 3 major factors were found: lack of knowledge, fear of cancer, confusion between prostate cancer screening for prostate cancer diagnostic testing
Ford 2006	What are the factors associated with perceptions of prostate cancer screening among African-American men age 55 and older	Qualitative Two focus groups exploring knowledge, attitudes, and beliefs about prostate cancer screening	21 AA men Age 55 - 87	

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/ Sample	Findings
Plowden 2006	What are the social factors that the decision to participate in prostate cancer screening among urban AA men	Qualitative semi structured interviews using probes developed by the research team	36 AA man from an urban northeastern city Age 40-79	<ul style="list-style-type: none"> • Significant others were a strong determinant in participation and screening • knowledge of screening options was a key determinant in the decision to screen for prostate cancer • the way information was presented was a determinant • knowledge, significant others, and presentation were found to be critical factors in the man make an informed decision about screening
Taylor 2006	What is the effect of the intervention on knowledge, decisional conflict satisfaction with screening decision and self-reported screening	Randomized trial Randomly assigned to video- or print-based arm or a waitlist intervention materials mailed to participants' homes at baseline, one month, and 12 months post intervention	238 AA men from the Washington DC area Age 40-70	<ul style="list-style-type: none"> • Significant increase in knowledge and significant decrease in decisional conflict about screening in the book and video portion of interventions • Self-reported screening rates increased b/w baseline and 1 year • Individuals who reported previously screening for prostate cancer were more likely to have a PSA conducted at 1-year mark

Table 2.1 (continued)

Author/Date	Topic/Focus/Question	Method	Context/Setting/Sample	Findings
Weinrich 2006	Do screening rates for DRE and PSA of higher risk AA men differ from the general population	Cohort study Quatitative Compared data sets from 3 diff. studies AAHPC and NHIS (1998 & 2000)	134 AA men with a family hx of 4 or more relatives who have been dx'd with prostate Ca. Age 40-69	<ul style="list-style-type: none"> • Of the unaffected AA men in the AAHPC, a low % had ever had a DRE (35%), and PSA (45%) which was lower than the rates of the AA men in the NHIS study • AA men from the NHIS study had 45% who reported having a DRE and 65% reporting receiving a PSA. However rates decreased with age.

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AA- African American; LA- Los Angeles; PSA- prostate specific antigen; IDM- informed decision making; DRE- digital rectal exam; SDM- shared decision making; NHIS- National Health Interview Survey; AAHPC- African American Hereditary Prostate Cancer study

Characteristics of Selected Studies

Articles selected for inclusion in this review were published between 2006 and 2016. All study characteristics are outlined in Table 2.1. Study designs include fourteen quantitative, seven qualitative, and one mixed method design.

Sample sizes and sampling methods varied across the studies. Convenience sampling was used most often with 59 % (n = 13) of the studies using this method. Three studies (14 %) used random assignment as a sampling method while four studies (18 %) did not mention their sampling method. All study participants were African Americans who were 30 years of age and older. Marital status was reported in fifteen (68%) of the studies. Education status was included in 73% (n=16) of the studies. Employment status was included in 9 out of 22 (41%) studies. Family history of prostate cancer was a variable in 6 (27%) of the studies whereas personal history of the disease was only included in 3 (14%) of the studies. However, researchers reported individual screening status in 27% (n=6) of the studies. Four themes were identified as influencing the African-American male to engage in the informed decision making process: trust in the medical establishment, Subjective norms, cultural sensitivity, and knowledge.

Trust in the Medical Establishment

Trust was identified as a facilitator to informed-decision making by several investigators (Allen et. al., 2007; Holt, 2015; Jones et al, 2009; Sanchez et al., 2007). Lack of trust ("Tuskegee Study," 2017) and negative experiences during encounters with medical professionals (Guerra, Jacobs, Holmes, & Shea, 2007), were clearly barriers for African American's when deciding to participate in the informed decision making

process. As is the case historically in the African-American community, trust played an important role in whether or not an individual utilized preventive health services (Musa, Schulz, Harris, Silverman, & Thomas, 2009). In this review of the literature, patients identified a trusting relationship with a provider to be a facilitator of better learning, thus empowering the patient to be able to participate in the decision making process as an informed patient and allowing him to make an individualized informed decision regarding his health care (Jones, Steeves, & Williams, 2010; Jones et al., 2007).

As a result of providers' discriminatory practices and patients' negative experiences, African-Americans generally exhibit less trust toward the healthcare system than Caucasian patients (Boulware, Cooper, Lloyd, LaVeist, & Powe, 2003; Doescher, Saver, Franks, & Fiscella, 2000; Halbert, Armstrong, Gandy, & Shaker, 2006; Wasserman, Flannery, & Clair, 2007). When it comes to seeking information about health, African-American men are more likely to seek informal advice from people they trust, such as family members, friends, community centers, and churches (Jones, Steeves, & Williams, 2009).

Unfortunately, the provider's failure to discuss such important issues as prostate cancer screening and colorectal screening with African-American patients engenders a less trusting patient-provider relationship (Crump, Mayberry, Taylor, Barefield, & Thomas, 2000; Ford, Vernon, Havstad, Thomas, & Davis, 2006; Halbert et al., 2015; Jones et al., 2009; Mandelson et al., 2000). Importantly, several articles underscored that trust between the patient and healthcare provider is a crucial determinant of patients' healthcare decisions (Jones, Steeves, & Williams, 2010; Jones et al., 2007).

Subjective Norms and Their Role in Informed Decision-Making

Subjective norms—that is, people's perceptions about how important others (e.g., parents, spouses, and authority figures.) think they should behave—play an important role in individuals' decision-making process. The same applies to healthcare decisions. African-American individuals are influenced, positively or negatively, by individuals who hold positions of power, authority, respect, or kinship relative to themselves (Jones, Steeves, & Williams, 2010; Plowden, 2006; Sultan et al., 2014). Results from several of the reviewed studies highlighted the importance of family/significant others and provider involvement in healthcare decisions (Allen et al., 2007; Ford et al., 2006; Halbert et al., 2015; Jones et al., 2009; Jones et al., 2010; Plowden, 2006; Williams et al., 2008). This means that both the opinions of family members or significant others and the recommendations of providers play an important role in whether African American men participate in informed decision making regarding prostate cancer screening.

Plowden (2006) investigated the social factors that affect urban African-American men's decision to participate in prostate cancer screening activities. Using semi-structured interviews, the author collected data from 36 African-American men, age 40 to 79, who resided in an urban northeastern city. Several factors that affect a man's decision making about prostate cancer screening were identified: the influence of significant others, knowledge of the screening options for prostate cancer, and how information about screening is presented. Similarly, Jones et al. (2009) stated that African-American men's decision to participate in screening activities was heavily affected by the opinions of family and friends. In a follow-up study, Jones et al. (2010) found that African-

American men consider it very important to have family and friends participate in the decision-making process with regard to prostate cancer screening.

Taking a quantitative approach, Halbert et al. (2015) noted several important factors that paralleled those above: namely, communication between the patient and provider, patients' knowledge of prostate cancer, and screening recommendations, and patient demographics. Their study which included 132 African-American men between the ages of 50-75 from the Philadelphia, Pennsylvania area showed that most of the men possessed little knowledge about prostate cancer and prostate cancer screening. Indeed, only 36% knew the recommended age for discussing prostate cancer screening with their providers, and only 28% recognized themselves as being at high risk for developing prostate cancer. The researchers also discussed how individuals' communication with their healthcare provider about screening was significantly associated with filling their knowledge gap and helping them make an informed decision.

Cultural Sensitivity

Several researchers highlighted that cultural sensitivity plays a key role in building trust and understanding between African American men and their providers. Men who participated in these studies emphasized the importance of integrating tools that either resembled them (African American avatars) or that they could relate to (DVDs with African American actors) culturally, along with embedding the interventions in community settings that deal with men's overall health (Allen et al., 2007; Frencher et al., 2016; Owens et al., 2015; Plowden, 2006; Sanchez, Bowen, Hart, & Spigner, 2007; Weinrich et al., 2008). One of the methods used to address cultural sensitivity in this population, with some success, is through the use of decision aids focusing on educating

African-American men about their health and the decisions they make regarding their overall health. In the prostate cancer literature reviewed, decision aids have been shown to increase patients' knowledge levels about prostate cancer and screening activities (Sandiford & D'Errico, 2016; Taylor et al., 2006; Weinrich et al., 2008). This increase in knowledge has resulted in many individuals becoming willing to discuss prostate cancer screening with their primary care provider, thus allowing them to make an informed decision about whether or not to have the screening performed (Frencher et al., 2016).

Knowledge and Decisional Conflict

The literature in this domain tends to focus on the areas of knowledge, decisional conflict, and screening decisions. Several researchers noted that very few of their male participants possessed knowledge about the risks of prostate cancer or the uncertainties of screening (Allen et al., 2007; Ford et al., 2006; Owens et al., 2015). African-American men tend to underestimate their risk for developing prostate cancer, which constitutes a common theme in the literature (Bloom, Stewart, Oakley-Girvans, Banks, & Chang, 2006; Odedina, Campbell, Larose-Pierre, Scrivens, & Hill, 2008). This lack of knowledge is a barrier which compromises the individual's ability to clearly think through the decision making process when considering health decisions. According to Joseph (2006), many of those who didn't participate in prostate cancer screening activities admit that they would be more inclined to act if their provider had educated them about screenings. Knowledge is obviously foundational to many health decisions, and thus its absence represents a clear problem for informed decision-making. The literature demonstrates that increases in knowledge lead to fewer barriers and less decisional conflict (Patel et al., 2013; Wray, Vijaykumar, Jupka, Zellin, & Shahid, 2011).

However, knowledge does not always predict a man's willingness to participate in shared or informed decision making. For instance, Jackson, Owens, Friedman, and Hebert (2014) found that young/middle-aged men possessed more knowledge about prostate cancer than their older counterparts. At the same time, even with less knowledge about the disease and screening, older men were more likely to discuss the advantages and disadvantages of prostate cancer screening with their provider, and ultimately make an informed decision about participating.

Decisional conflict is defined as uncertainty about course of action to be taken when choice among competing actions involves risk, loss, or challenge to personal life values. Many patients who are not educated about a procedure in which they have to make a health decision may experience these feelings as they attempt to make the right decision for themselves all while having limited or no knowledge of the procedure being offered by the medical professional. Several authors in this review identify the contradictory relationship between knowledge and decisional conflict regarding the decision making process (Allen, 2009; Sultan, 2014; Taylor, 2006).

In a study designed to promote informed decision-making regarding prostate cancer screening among African-American men, Allen (2009) found knowledge and decisional conflict to have an inverse relationship. The results showed as knowledge significantly increased, decisional conflict significantly decreased in participants. In this study, pre-test and the post-test findings show the percentage of men making informed decisions about prostate cancer screening increasing from 43% to 47% ($p=0.39$); knowledge scores increasing from 57% to 72% ($p<0.001$) and decisional conflict decreasing from 21% to 13% ($p<0.001$). Sultan et al. (2014) achieved similar findings in

a study about informed decision making. However, even though decisional conflict decreased with a noted increase in knowledge, the degree of the increase in decisional conflict was affected by other variables such as: higher education, marital status, available financial resources, and the participant's age (being younger).

In a comparable study, Owens et al. (2015) aimed to investigate whether computer-based interventions are an appropriate method for exploring prostate cancer knowledge, screening decisions, and the attitude of African-American men. For this qualitative study, the authors recruited 39 men, aged 37-66, from several faith-based organizations in the southeastern United States. The men were required to participate in one of six 90-minute focus groups, as well as complete a computer-based descriptive survey comprising 45 items that addressed the three aforementioned areas. The focus groups revealed that few of the men had participated in informed decision-making with their provider. Likewise, few men were informed about the risks, controversy, and uncertainty surrounding prostate cancer screening. Despite their lack of knowledge, most of the men were open to participating in a computer-based intervention that would educate them about prostate cancer screening and thereby allow them to make an informed decision about their screening choices. They also expressed the need for the program to be easily understood and feature avatars that were culturally appropriate.

Discussion

This literature review describes the current literature regarding factors that influence African-American men to engage in the informed decision making process regarding prostate cancer screening. Despite the disparate mortality and morbidity

experienced by this vulnerable group, the literature provides a paucity of research specific to African-American men and the factors which influence them to engage or not to engage in the decision making process as it pertains to prostate cancer screening. The review included 22 articles published from 2006 and 2016. Through rigorous evaluation of these articles the author identified common themes in the literature. Factors that were found to influence African-American men to engage in the informed decision-making process included: trust, subjective norms, cultural sensitivity, and knowledge.

The medical establishment has struggled to build trust with the African American community for decades. Trust plays a major role in the decision making process. Distrust of the medical establishment, due to past injustices against the African-American community, has strained the relationship between these two groups. As a result of what African-American patients view as the providers' discriminatory practices and the patients' negative experiences, African-Americans generally exhibit less trust toward the healthcare system than Caucasian patients (Boulware, Cooper, Lloyd, LaVeist, & Powe, 2003; Doescher, Saver, Franks, & Fiscella, 2000; Halbert, Armstrong, Gandy, & Shaker, 2006; Wasserman, Flannery, & Clair, 2007). Numerous studies have emphasized the importance of a trusting relationship between the patient and provider (Allen, 2009; Jones et al., 2009; Sanchez, Bowen, Hart, & Spigner, 2007) when making health decisions. Lack of trust was cited as a barrier to informed decision making by Allen (2009). This was supported by Jones et. al. (2009) where it was found that a trusting relationship with a provider fostered informed decision-making regarding prostate cancer screening. Providers must take note of the role that trust plays in strengthening the patient/provider

relationship. This may include spending more time with the patient during a visit and taking the time to educate them prior to having them make health decisions.

Understanding the culture of the patient allows the provider to look into the patient's world providing a better understanding of the patient. Providers must be willing to take the time to learn about and respect the different cultures of their patient population. This will allow for the patient to have a better experience during visits, giving them a sense of worth. In this review patients emphasized how the use of culturally sensitive materials decreased the stress of engaging in an informed decision to participate in prostate cancer screening.

The current literature review showed evidence that knowledge of the situation must be present in order to engage in the process of making an informed-decision about prostate cancer screening. According to the research, the relationship between knowledge and decisional conflict presents in an inverse manner. When knowledge is up, decisional conflict is down allowing the patient to make an informed decision about participation in screening activities.

Literature demonstrates that subjective norms play an important role in the African-American community also. The interactions between individuals and those who are important to them have been instrumental in the decision making process to include health decision. African-American men depend on family, friends, and people in positions of power (whom they trust) for guidance in making informed health decisions. The health care provider is in a unique position as he/she holds a position of authority. In this review, we found that subjective norms coupled with trust, cultural sensitivity, and knowledge provided the foundation for the patient/provider relationship, thus fostering an

environment where the patient is able to engage in the informed decision making process having less decisional conflict.

Conclusion

African-American males have the highest incidence and mortality rates of prostate cancer in the world, yet there are no guidelines in place for this population regarding prostate cancer screening, highlighting the need for informed and joint decision making.

The body of literature reviewed has contributed greatly to our understanding of the factors which influence whether or not an African-American male engages in the informed-decision making process regarding to prostate cancer screening. The peer-reviewed journal articles not only outline African-American men's beliefs about prostate cancer, but also identifies the factors that influence the decision making process with which he makes an informed decision about his health care. Not only did the review illuminate several important factors that drive decision-making, such as trust, subjective norms, cultural sensitivity, and knowledge, it also showed how these factors work for the good of the patient when used in conjunction with each other. Overall, the literature shows how several different factors can affect the decision making process of the African-American male. These factors are foundational to African-American men's ability to make an informed decision about their health. Furthermore, it is clear that healthcare opportunities should be presented within the community context into the African American community, where these men have easier access to care and feel less vulnerable.

Further research is needed to fill the gap in knowledge and how it affects the African-American man's ability to engage in the process of making an informed health decision regarding participation in prostate cancer screening activities.

CHAPTER THREE: IMPACT OF AN INTERVENTION TARGETED TO DECREASE MODIFIABLE RISK FACTORS FOR CARDIOVASCULAR DISEASE ON MODIFIABLE RISK FACTORS FOR CANCER IN AFRICAN AMERICAN INMATES

Introduction

Cancer, which comprises more than 100 related diseases (American Cancer Society, 2017; National Cancer Institute, 2017), is a major public health problem throughout the world. Researchers have shown that one in two men and one in three women will develop some form of cancer in their lifetime (Cancer Treatment Centers of America, 2015). The American Cancer Society (2017) predicted that approximately 1.7 million new cases of cancer will be diagnosed in the U.S. this year (excluding basal cell, or squamous cell cancers which are not required to be reported to cancer registries) and over 600,000 Americans will die from cancer-related causes.

These incidence of cancers are not equally distributed across groups. According to the National Cancer Institute (2017), African Americans bear a disproportionately high burden of cancer incidence and mortality—504.1 and 238.8 per 100,000, respectively, compared to 477.5 and 190.7 for Caucasians, the next-most at-risk group. The death rate from all cancers combined is 25% higher for the African-Americans than for Caucasians (National Cancer Institute, 2017). In fact, African Americans have the highest death rate and shortest survival of any racial and ethnic group in the US for most cancers (American Cancer Society, 2017)

Modifiable Risk Factors for Cancer

Life-style interventions that may reduce the risk of developing prostate cancer include maintaining a healthy weight and diet, regular exercise, and avoiding tobacco products (American Cancer Society, 2017; National Cancer Institute, 2017). According to the American Heart Association (2017), modifiable risk factors for cardiovascular disease include: high cholesterol, blood pressure, physical inactivity, obesity/overweight (waist circumference and BMI), diabetes mellitus, stress, alcohol consumption, tobacco use, and unhealthy diet and nutrition. Fortunately, modifiable risk factors for cardiovascular disease and cancer have significant overlap.

According to Danaei, Hoorn, Lopez, Murray, and Ezzati (2005), nine modifiable risk factors account for the development of more than one third of the world's cancers. These factors include: smoking, alcohol consumption, overweight/obesity, physical inactivity, unhealthy diet consumption, unsafe sex, urban air pollution, indoor smoke from household fuels, and contaminated injections in healthcare settings. Research shows that individuals can significantly reduce their cancer burden by making behavioral changes that lower these risk factors (Centers for Disease Control and Prevention, 2015; Curry, Byers, & Hewitt, 2003).

Obesity

Obesity has been shown to account for approximately 20% of all cancer cases (Wolin, Carson, & Colditz, 2010) as well as approximately 20% of all cancer deaths in women and 14% of all cancer deaths in men (Karnik & Kanekar, 2012; Pergola & Silvestris, 2013). The World Cancer Research Fund and American Institute for Cancer

Research identified obesity as the single most important factor in reducing cancer risk (Csizmadi et al., 2014).

The apparent link between obesity and cancer is related to excess body fat leading to excessive hormone secretion, particularly estrogen and insulin that can stimulate cancer growth (American Cancer Society, 2017). Cancers related to obesity include colorectal, prostate, ovarian, kidney, pancreatic, endometrial, esophageal, and breast cancer (postmenopausal) (Azvolinsky, 2014; Bianchini, Kaaks, & Vainio, 2002; Friedenreich, 2001; Frossard, Lescuyer, & Pastor, 2009; Navina et al., 2011; Pan, Johnson, Ugnat, Shi, & Mao, 2004).

Researchers have shown visceral fat (deep abdominal fat that wraps around the inner organs) to be a significant risk factor for the development of colorectal cancer (Guiu et al., 2010). Bjorge, Engeland, Tverdal, and Smith (2008) showed that excess weight in teenagers was associated with double the mortality risk of colon cancer in adulthood. Likewise, Lam et al. (2013) found that a BMI of 30 kg/m^2 or greater at age 18 was associated with increased lung cancer risk. However, women who participated in the Metabolic Syndrome and Cancer Project with an elevated BMI had an increased risk of developing pancreatic cancer (Johansen et al., 2010). Increased BMI has also been associated with lower survival rates in patients diagnosed with pancreatic and breast cancers (Genkinger et al., 2011; ww5.komen.org, 2017). Also relevant to the present study is the established link between obesity and many cardiovascular diseases and type 2 diabetes, which are considered risk factors for several types of cancer (Akil & Ahmad, 2011; www.aha.org, 2017; www.daibetes.org, 2017).

Physical Activity

Physical activity provides lifelong health benefits including longer life-span, improved quality of life, increased energy, and stress reduction. In the context of the present study, physical activity can also decrease body fat, thereby inhibiting the development of chronic diseases and cancers, as well as decreasing cancer recurrence rates (Holmes, Chen, Feskanich, Kroenke, & Colditz, 2005; Irwin et al., 2008; President's Council on Fitness, Sports, & Nutrition, 2015; Spence, Heesch, & Brown, 2010; Tardon et al., 2005; Leitzmann et al., 2009) in women, specifically, breast, gastric, colon, and endometrial cancers (Boyle, Keegel, Bull, Heyworth, & Fritschi, 2012; Moore, Gierach, Schatzkin, & Matthews, 2010; Singh & Singh, 2013). However, this information is not always widely known to the public. Bernat et al. (2015) investigated the associations among dispositional cancer worry, perceived risk, physical activity and breast cancer in a population of college females. The participants showed a lack of knowledge about their breast cancer risks and the role that physical activity plays in the prevention of this disease. However, cancer worry did significantly predict their inclination to follow the physical activity recommendations.

The length of time one participates in physical activity plays a role in cancer development. In their study of endometrial cancer, Dieli-Conwright et al. (2013) found that women were at a higher risk for developing the cancer when they engaged in short-term (rather than long-term) recreational physical activity. Lam et al. (2013) reported similar findings while investigating risks for lung cancer—specifically, that individuals who sat for more than three hours a day had a higher risk for developing the disease.

In addition to duration of activity, intensity also plays an important role in risk reduction. Dieli-Conwright et al. (2013) found that women who are more active and whose workouts are more intensive have a decreased risk of developing endometrial cancer. In corroboration, the National Cancer Institute (2015) states that premenopausal women who participate in four or more hours of moderate to high intensity physical activity per week and are of normal weight have a reduced risk of developing breast cancer.

Diet

Dietary habits have been associated with increased cancer risks for decades (ACS, 2016). According to www.choosemyplate.gov, approximately half of American adults have one or more chronic conditions that can be traced back to poor diet habits. This includes increased risk for certain types of cancer through the consumption of processed and fried foods, red meat, alcohol, and generally large food portions (Aune et al., 2013; Inoue-Choi, Sinha, Gierach, & Ward, 2016). These types of foods have been linked to obesity, which is the single most important risk factor in many cases (Bao et al., 2013; Bidoli et al., 2012; Harris, Srihari, & Go, 2011; Li, Go, & Sarkar, 2015). In contrast, some researchers have shown that eating foods high in dietary fiber such as fruits, vegetables, whole grains, and nuts can have many preventive properties regarding cancer (Park, Brinton, Subar, Hollenbeck, & Schatzkin, 2009).

Because these poor diet habits do not provide all the nutrients needed to lower cancer risks, some individuals have turned to dietary supplementation. While dietary supplements may correct some limitations in a person's diet, they have not conclusively been shown to prevent cancer (Csizmadi et al., 2014). Further, there are inconsistent

findings about the role of individual nutrients in increasing or decreasing cancer risks (Hori, Butler, & McLoughlin, 2011; Masko, Allott, & Freedland, 2013). However, the evidence is more consistent for adhering to specific diet, such as a Mediterranean-like diet, can have positive effects on the incidence and mortality rates of certain types of cancer (Sofi, Abbate, Gensini, & Casini, 2010; Verberne, Bach-Faig, Buckland, & Serra-Majem, 2010). Relatedly, Csizmadi et al. (2014) noted that individuals with higher physical activity levels and who are not overweight are more likely to consume a diet containing cancer-preventing micronutrients.

In summary, lifestyle modifications that decrease risk factors for CVD can also decrease risk factors for cancer. Consequently, we examined the modifiable risk factors of obesity, physical activity, and diet, which are shared by both cancer and cardiovascular disease. Specifically, BMI and waist circumference were chosen as a proxy for obesity, time required to reach 85% maximum heart rate or fatigue was used as a proxy for physical activity, and blood lipids as a proxy for diet. This study was unique in that there have been no similar studies performed on the inmate population.

The purpose of this secondary analysis was to examine whether an intervention targeted to decrease modifiable risk factors for cardiovascular disease decreased those that are co-risk factors for cancer in African-American male inmates. The specific aim was to compare total cholesterol, HDL, triglycerides, LDL, time required to reach 85% maximum heart rate or fatigue, waist circumference, and BMI across the four study time points.

Method

Design

A secondary analysis of data collected between September 2009 and September 2011 in a multiple, staggered baseline, intervention study in 4 male Kentucky prisons. This multiple baseline design was the best alternative to a randomized, controlled trial, which is impossible in a prison environment because all participants are required to receive the intervention.

The objective of the primary study was to improve cardiovascular health of inmates by implementing a state wide cardiovascular risk factor reduction program in prisons. The purpose of the primary study was to test the effects of a behavioral cardiovascular reduction intervention on health outcomes. The intervention was a 12 week cardiovascular health education/ behavior change and physical training program.

Sample and Setting

Participants recruited from 4 Kentucky's state-operated, male prisons were at least 18 years old with a parole date set for 7 months or more beyond the date of study entry; under no restrictions related to past behavior issues; able to speak English; and completed at least the 8th grade. Among the 560 inmates who were enrolled in the parent study, 129 were African American and were included in this secondary analysis.

Procedure

Data were collected at 4 time points. Time 1: baseline 1, Time 2: preintervention, Time 3: post intervention, and Time 4: post-intervention 3 month. The intervention was a 3 month life-style cardiovascular health education/behavior change program that included an aerobic physical training program. The intervention was delivered by trained health

educators and trained exercise professionals from the community. The multiple risk factors targeted included BMI, waist circumference, exercise fitness, total cholesterol, triglycerides, high density lipoprotein (HDL), and low density lipoprotein (LDL).

Measurement of Variables

Obesity

For this study, waist circumference and body mass index were measured by trained research assistants as a proxy for obesity as both are used to estimate disease risk related to excess body fat (www.cdc.gov, 2017). Waist circumference was measured in centimeters at the end of exhalation by placing an anthropometric measuring tape in a horizontal line at the level of the iliac crest. Increased waist circumference (40 inches or greater) has been found to be associated with such chronic diseases as type 2 diabetes, cardiovascular disease , and certain types of cancer (www.diabetes.ca, 2017). Body mass index (BMI) was defined as weight in kg divided by height in m². The National Institutes of Health (2017) defines BMI categories as: underweight ($\leq 18.2 \text{ kg/m}^2$), normal weight (18.5 to 24.9 kg/m²), overweight (25.0 to 29.9 kg/m²), or obese ($\geq 30.0 \text{ kg/m}^2$). Height and weight were measured with inmates' shoes off and in light clothing using a professional grade stadiometer and digital body weight scale, respectively.

Physical Activity

Physical activity level was defined as time required to reach 85% maximum heart rate or fatigue. A sub-maximal model of testing was used as it allows for the population to be at different levels of fitness. This test was based on the individual reaching 85% of his age-predicted maximum heart rate or stopping test due to fatigue. Sub maximal testing was conducted on a motor driven treadmill in stages with the speed and grade of

the treadmill increased every 3 minutes. Testing was performed by a cardiologist and physical therapists who were trained to do ECG stress testing using the Bruce protocol according to the American Heart Association's recommended guidelines assuring safety and accuracy of the test. The test was stopped and the time when the inmate reached volitional fatigue or the heart rate reached 85% of the age-predicted maximum heart rate was recorded.

Diet

Total cholesterol, HDL, LDL, and triglycerides were used as a proxy for diet. Trained research assistants used the Cholestech LDX to measure blood lipids from a finger stick sample. The machines were calibrated before each data collection session.

Data Analysis

Demographics and study outcomes were summarized using means and standard deviations or frequency distributions. Two-sample t-tests and chi-square tests of association were used to assess group differences in demographics and outcomes between those who completed the study and those who dropped out. The comparisons of outcomes over time were accomplished using mixed modeling; this type of analysis, which was done using the MIXED procedure in SAS, allows for the inclusion of all participants with at least one assessment, assuming that the missing values due to dropout are missing at random. Given no differences in baseline values of outcomes between completers and dropouts, this assumption is reasonable. As a check these findings based on the full sample, a sensitivity analysis including only those who completed all assessments was

also done via mixed modeling. All analyses were conducted using version 9.3 of the Statistical Analysis System (SAS); an alpha level of .05 was used for inferential tests.

Results

A total of 129 African American male inmates participated in the study, of which 33% completed all assessments. The comparison between completers and dropouts indicated no difference between these subgroups on marital or education. The average age of the participants was 35 years ($SD = \pm 9.11$) and 82% had at least a high school education. However, completers and dropouts differed on health status. While 77% of those in the completer group considered themselves to be in good health or better, 81% of the dropout group assessed their own health positively ($U = .455$, $p= .649$). Table 3.1 summarizes demographic characteristics of the study sample.

Table 3.2 summarizes the comparison of completers and dropouts on the baseline values for the study outcomes. With regard to total cholesterol, high-density lipoprotein, triglycerides, low-density lipoprotein, time to 85% maximum heart rate or fatigue, no significant difference was noted between dropouts and completers. However, in both waist circumference and body mass index a significant difference between dropouts and completers was noticed.

Repeated Measures Models

Table 3.3 summarizes the changes of all variables over the four time points. Differences between these time points were tested by repeated measures mixed effects models. There were no differences in total cholesterol between the four time points ($F(3,128) = 2.45$; $p=0.067$). High density cholesterol was also shown not to have a significant difference between the four time points ($F(3, 126) = 1.95$; $p=0.13$). Repeated

measures mixed effects models also showed no difference over the four time points in triglycerides ($F(3,127) = 0.52$; $p=0.67$). Low density lipoproteins were different across the four time points ($F(3,115) = 0.31$; $p=0.82$). Across the four time points, time to 85% maximum heart rate or fatigue was not found to be significant ($F(3,127) = 1.17$; $p=0.33$). In contrast, there was a significant change in waist circumference and BMI over the four time points.

Post-hoc testing was done for the two outcomes that were found to have significantly changed over time, namely waist circumference ($F(3,128) = 14.10$; $p= <0.001$) and BMI ($F(3,128) = 8.14$; $p <0.001$). Table 3 also presents the results of the differences of the least squares means with respect to waist circumference and BMI. Waist circumference measurements taken at post intervention were found to significantly differ from all remaining time points, while the comparison between baseline 1 and the preintervention measurements was also found to achieve statistical significance. Similar to BMI, in reviewing the means associated with these data, mean waist circumference was found to be significantly lower at post intervention relative to the three remaining time points. Additionally, with regard to the comparison conducted between baseline 1 and the preintervention, waist circumference was found to be significantly smaller at preintervention compared with baseline1. Also, three significant effects were found on the basis of these analyses. Specifically, mean BMI was found to significantly differ between post intervention and all three remaining measurements. A review of the average values indicated that BMI was significantly smaller at post intervention, at the completion of the study, relative to all other time points. Overall, these results suggest that with respect to BMI as well as waist circumference, the intervention served to significantly reduce both

measurements during the course of the study however, the impact of the intervention was not long-lasting.

Discussion

African-Americans bear a disproportionately high burden of incidence and mortality rates for cancer and cardiovascular disease (www.heart.org; www.cancer.org). In the United States, African-Americans have the highest death rate and shortest survival rate of any racial and ethnic group for most cancers (www.cancer.org). It is estimated that more than 50% of cancer deaths in the United States are preventable (AACR.org, 2014). Many of these preventable issues stem from modifiable risk factors, which can be reduced or eliminated through behavioral changes. This is especially pertinent in prisons, where inmates are often at a higher risk for developing cancer and other diseases due to their lack of access to and utilization of healthcare facilities and resources prior to incarceration. On this basis, the present study analyzed an intervention intended to reduce the modifiable risk factors for cardiovascular disease, and by extension, cancers that are linked to the same modifiable risk factors. The results of this study confirm that the intervention significantly reduced waist circumference and BMI during the course of the study. However, at post intervention, BMI and waist circumference showed a significant increase relative to post intervention (the conclusion of the intervention). This indicates the impact of the intervention had a modest effect that was not sustained. The decrease in BMI and waist circumference at post intervention is consistent with literature discussing the effect of physical activity and diet and their ability to decrease obesity (Foster-Schubert et. al., 2011; Lauby-Secretan et. al., 2016). The increase in BMI and waist

circumference at the post intervention 3 month time point suggests participants did not continue to adhere to the behavior. After the intervention was completed participation in the intervention activities was a personal decision by each individual during the 3 month post-intervention period. In many cases it would be expected for both variables to increase during the 3 month period after the intervention. The fact that BMI and waist circumference increased between the post intervention and the post intervention 3 month time points suggests that the participants did not become leaner, but instead returned to their pre-intervention status. Thus, the intervention seemed to have an effect, but not one that was sustained.

In this study, multiple blood cholesterol components were used as a proxy for diet (total cholesterol, high density lipoproteins, low density lipoproteins, and triglycerides). According to the Dietary Guidelines Advisory Committee (2015), approximately 75% of serum cholesterol is produced by the liver and is determined by genetics, whereas the remaining 20-25% is related to dietary intake. This dietary component is substantial enough that prior research has associated a healthy diet with lower cholesterol levels and overall improved health (www.heart.org; www.mayoclinic.org). However, the present study did not find any meaningful relationship between cholesterol and the intervention. One possible reason could be the state prison's restrictive diet and limited amount of healthy choices. The United States federal prison system has tried to address this issue by enacting a uniform menu that substitutes all fried foods for healthier options. This can potentially reduce the risk of both chronic health conditions and cancer. However, the state prisons sampled in this

study have yet to undertake such an initiative. Another possible reason could be the small number of African-American inmates who completed the study.

Interestingly, we found that the time required to reach 85% maximum heart rate or fatigue showed no significant improvement overtime in this sample of incarcerated African-American inmates. This could be attributed to a number of causes. First, there is an open question about whether the actual intervention to improve physical fitness was effective. If many of the participants were already physically fit prior to the intervention, which would produce a ceiling effect. Second, participants may have simply not meaningfully participated in the intervention. . Nonetheless, the intervention did show some health effects during its implementation. As we look to the future, researchers should investigate ways to improve these health effects and/or sustain the benefits of the intervention as this population can potentially benefit from such interventions.

Limitations

There are some limitations that should be taken into account when interpreting the present results. First, the use of a convenience sample—in this case, a small number of incarcerated African-American participants in Kentucky. Also, inmates have limited access to dietary choices, and thus it is difficult to establish the true impact of on the success of the intervention. Finally, retention was a challenge for this study and underscores the difficulty in promoting longer-term interventions in an inmate population.

Conclusion

Modifiable risk factors for cancer and cardiovascular disease are similar in many ways. These risk factors have been shown to decrease one's chances of developing such chronic diseases as diabetes, cardiovascular disease, and certain types of cancers. However, there is little research that has evaluated the impact of interventions on inmates' modifiable risk factors for cancer. The present study sought to address this gap with a secondary analysis of one intervention applied to several state prisons. The study found significant changes during the intervention, but these changes were not sustained by participants. As a result, it is not clear whether the intervention itself was ineffective or some extraneous factors limited its efficacy. Researchers repeatedly showed the triad of physical inactivity, obesity, and consumption of an unhealthy diet to be risk factors for the developing many cancers. It may be possible that such an intervention could be successful if researchers, e.g., were able to more closely monitor inmates' engagement with the intervention. This study shows that the potential for an intervention that improves cardiovascular risks can potentially also decrease cancer risks. Potential avenues for future research could include: 1) interventions that use the team approach by teaming inmates up, 2) having participants to set weekly personal goals which are measured at each time point, 3) using a workout diary as well as a food diary as these will grant more insight into inmates' activities throughout the intervention. This may also increase the sustainability of the programs beyond the timeframe of the intervention. Clinicians and researchers should be aware of this population's increased risk for various diseases and continue to explore possible behavioral interventions that can decrease modifiable risk factors.

Table 3.1. Sample Demographic Characteristics (n=129)

Variable	Entire Sample N (%) or mean (SD)	Not Complete Study N (%) or mean (SD)	Completed Study N (%) or mean (SD)	χ^2 , t-test or Mann-Whitney	p
Marital Status				$\chi^2(4) = 4.40$.355
<i>Single</i>	94 (72.9%)	65 (76.5%)	29 (85.9%)		
<i>Married</i>	16 (12.4%)	10 (11.8%)	6 (13.6%)		
<i>Divorced/ Separated</i>	15 (11.6%)	10 (11.8%)	5 (11.4%)		
<i>Widowed</i>	1 (0.8%)	0 (0.0%)	1 (2.3%)		
<i>Cohabitate</i>	1 (0.8%)	0 (0.0%)	1 (2.3%)		
Education				$\chi^2(6) = 5.19$.520
<i>Less than high school graduate</i>	24 (18.6%)	15 (17.6%)	9 (20.5%)		
<i>High school graduate</i>	47 (36.4%)	30 (35.3%)	17 (38.6%)		
<i>Business school</i>	1 (0.8%)	1 (1.2%)	0 (0.00%)		
<i>Some college</i>	42 (32.6%)	31 (36.5%)	11 (25.0%)		
<i>Associate degree</i>	13 (10.1%)	6 (7.1%)	7 (15.9%)		
<i>Bachelor's degree</i>	1 (0.8%)	1 (1.2%)	0 (0.00%)		
<i>Professional degree</i>	1 (0.8%)	1 (1.2%)	0 (0.00%)		

Table 3.1 (continued)

Variable	Entire Sample N (%) or mean (SD)	Not Complete Study N (%) or mean (SD)	Completed Study N (%) or mean (SD)	χ^2 , t-test or Mann-Whitney	p
Health Status				$U = -.455$.649
<i>Excellent</i>	17 (13.2%)	10 (11.8%)	7 (15.9%)		
<i>Very good</i>	38 (29.5%)	28 (32.9%)	10 (22.7%)		
<i>Good</i>	48 (37.2%)	31 (36.5%)	17 (38.6%)		
<i>Fair</i>	24 (18.6%)	15 (17.6%)	9 (20.5%)		
<i>Poor</i>	2 (1.6%)	1 (1.2%)	1 (2.3%)		
Age	35.2 (± 9.11)	33.85 (± 8.57)	37.98 (± 9.59)	$t(127) = -2.49$.014

Table 3.2. Comparison of baseline risk factors between completers, non-completers

Variable	Dropout (n=85) Mean (SD)	Completers (n=44)Mean (SD)	p-value
Total Cholesterol	161.40 (36.75)	167.00 (37.32)	0.07
High-density Lipoprotein	40.56 (13.30)	37.77 (13.84)	0.13
Triglyceride	126.50 (103.10)	137.20 (94.85)	0.67
Low-density Lipoprotein	101.90 (29.68)	102.10 (33.38)	0.82
Time to 85% max HR(Seconds)	511.80 (118.70)	533.20 (125.80)	0.33
Waist Circumference	36.17 (6.26)	36.24 (4.55)	< 0.0001
Body Mass Index	29.16 (5.81)	28.38 (4.42)	< 0.0001

Max = maximum; HR= Heart rate

Table 3.3. Changes over time in Completers (n= 44)

Variable	Baseline 1 Mean (SD)	Pre-Intervention Mean (SD)	Post Intervention Mean (SD)	Post Intervention 3 months Mean (SD)	Type III Test of Fixed Effect F (p)
Total cholesterol	163.33 (36.89)	161.11 (37.90)	158.61 (34.94)	163.11 (41.95)	2.45 (0.07)
High density lipoprotein	39.59 (13.50)	37.64 (12.78)	37.45 (12.57)	38.49 (13.40)	1.95 (0.12)
Triglycerides	130.20 (100.08)	123.77 (86.03)	121.93 (90.83)	120.39 (101.49)	0.52 (0.67)
Low density lipoprotein	101.99 (30.98)	102.66 (33.31)	101.04 (30.13)	102.59 (35.04)	0.31 (0.81)
Time to 85% max HR (Seconds)	518.98 (121.03)	539.19 (132.74)	546.94 (121.04)	532.76 (146.88)	1.17 (0.33)
Waist Circumference	36.19 (5.71)	35.85 (5.38)	35.15 (3.94)	35.97 (4.75)	14.1 (<.001) ^a
Body Mass Index	28.90 (5.37)	28.81 (5.33)	28.10 (4.20)	28.57 (4.44)	8.14 (<.001) ^b

Max = maximum; HR= Heart rate

^a In pairwise comparisons, there was a significant reduction in waist circumference from baseline 1 to preintervention ($p=.02$), from preintervention to post intervention ($<.001$), but a significant increase from postintervention to postintervention 3 months ($p<.001$).

^b In pairwise comparisons, there was a significant reduction in body mass index from preintervention to post intervention ($<.001$), but a significant increase from postintervention to postintervention 3 months ($p<.001$).

CHAPTER FOUR: DEVELOPING A PREDICTIVE MODEL FOR PROSTATE CANCER SCREENING INTENT

Introduction

Prostate cancer is the third leading cause of cancer death in American men and the second-most common type of cancer found among men in the United States (American Cancer Society, 2017). In 2017, there will be an estimated 161,360 new cases of prostate cancer diagnosed in the United States and an estimated 26,730 deaths from the disease (National Cancer Institute, 2017). These incidence and mortality rates reflect a decade of consistent improvement. However, certain men remain at increased risk for developing prostate cancer, such as African American men who have a 1.5 times greater chance of developing the disease as compared to Caucasians, and are twice as likely to die from it once diagnosed (American Cancer Society, 2017).

Although African American men have been identified as high risk, certain segments of the community remain largely underrepresented in research studies regarding this topic, including men who are incarcerated. In the U.S., African Americans are incarcerated at disproportionately higher rates than Caucasians. According to the Population Reference Bureau (2016) in 2010 black men were incarcerated at a rate of 3,074 per 100,000 residents; Latinos were incarcerated at 1,258 per 100,000, and white men were incarcerated at 459 per 100,000. Despite the demographic makeup of the inmate population and the fact that African American males experience a higher risk of prostate cancer mortality, there are no studies that examine factors that influence prostate cancer screening activity in inmates. Examination of these factors may possibly help

identify those inmates at higher risk for developing prostate cancer as well as helping detect cancer earlier leading to a better outcome for the individual.

Background and Significance

While no studies investigating inmate decision making about prostate cancer screening have been conducted in the inmate population, studies that examine factors that influence men's decision to participate in prostate cancer screening or not have been conducted in the general public (Ferrante, Shaw, & Scott, 2011; Hall et al., 2011; Parker et al., 2006). African American men are less likely than Caucasian men to screen for prostate cancer and when prostate cancer screening is conducted and cancer is discovered, it is more often in the advanced stages in the African American male population (DeVere et al., 1998; Thompson et al., 2001). African American men's lack of consistent screening patterns, differences in knowledge regarding prostate cancer, and differences in socioeconomic status are possible factors which contribute to this disparity (Denmark-Wahnefried et al., 1995; Shavers & Brown, 2002; Gilligan, Wang, Levin, Kantoff, & Avorn, 2004). Another factor that may contribute to this behavior is the individual's health literacy level as studies have shown low health literacy levels to be connected with poor health outcomes (U.S Department of Health & Human Services, 2010).

This will be the first study to explore prostate cancer screening intent, beliefs regarding screening, and health literacy in men who are incarcerated in the federal prison system. This population presents unique challenges that may make them more likely to experience cancer health disparities. The inmate population is largely made up of

minorities, has less education than the general population, has a lower income (prior to incarceration), and may experience multiple chronic illnesses prior to incarceration (Loeb & Abudagga, 2006). Research also shows inmates physiologically age to be much faster than the general population (Aday, 2003). Medical evidence supports this statement as inmates begin to present with medical problems (around the age of 50) that typically present in the general population at a more advanced age (Chammah, 2015). Possible reasons for this advanced aging include: past drug and alcohol abuse, high-stress lifestyles and improper medical care (Aging Inmate Committee, 2011). Studies have also shown this population likely to have poor health and little access to healthcare on the outside as well as presenting with multiple chronic health issues to include heart disease, respiratory disease, and cancer (Aday, 2003). Taking a proactive approach can potentially lead to the prevention and/or early detection of prostate cancer, thus improving the inmates quality of life as well as decreasing future healthcare costs when inmates return to their communities.

The purpose of this study was to explore predictors of intent to screen for prostate cancer in incarcerated African American males. The theoretical framework for this study was the theory of planned behavior. The research question is: What is the influence of Attitude, Subjective Norms, and Perceived Behavioral Control of incarcerated African American males on their intent to screen for prostate cancer.

Specific Aims:

- 1) To describe the knowledge, attitudes, behaviors and behavioral intentions of study participants regarding prostate cancer screening; and to determine how these factors may be related to demographics.

- 2) To assess the extent to which the variables of the Theory of Planned Behavior explain an inmate's intention to be screened for prostate cancer.
- 3) To determine the amount of additional variance in intent to screen explained by health literacy after accounting for the variables in the theory of planned behavior.

Definition of Terms

For the purpose of this study, the following terms are defined as follows:

Inmate: An individual confined in long-term facilities run by the state or federal government or private agencies. They are typically felons who have received a sentence of incarceration of 1 year or more.

Social Pressure- Pressure from one's peers to behave in a manner similar or acceptable to them.

Prostate cancer screening- Testing which is conducted to detect prostate cancer, such as the prostate-specific antigen test (PSA) and the digital rectal examination (DRE).

Prostate-specific antigen (PSA)- A blood test used to measure a protein made by the prostate gland. This protein is often elevated in men with prostate cancer, but may be increased in some conditions which are noncancerous.

Attitude- The degree to which a behavior is positively or negatively valued by the individual.

Behavioral Beliefs- Beliefs that underlie a person's attitude toward the behavior.

Outcome Evaluation- An individual's beliefs about the consequence of a behavior.

Subjective Norm- Perceived social pressure to adhere to or decline performance of a given behavior.

Normative Beliefs- Beliefs concerned with the likelihood that significant others, such as family members, and friends approve or disapprove of a certain behavior.

Motivation to Comply- A person's general tendency to accept the directives of a given reference group or individual.

Perceived Behavioral Control- An individual's perceived ease or difficulty of performing the particular behavior.

Control Beliefs- Beliefs about the presence of factors that may facilitate or impede performance of the behavior.

Perceived Power- Beliefs about the power of situational and internal factors to inhibit or facilitate the performing of the behavior

Intent- An indication of an individual's readiness to screen.

Indirect measures- Questions formulated to measure predictor variables of the TPB indirectly by asking the study participants about specific behavioral beliefs and outcome evaluations.

Direct measures- Questions formulated to measure predictor variables of the TPB directly by asking the study participants about their overall attitude toward a behavior.

Health literacy- The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed in order to make appropriate health decisions.

Theoretical Framework

The Theory of Planned Behavior (TPB) is an extension of the theory of reasoned action (TRA) (Ajzen, 1991). The intent of this theory is to explain those behaviors that

an individual has the ability to exert his/her control over. According to the TPB, behavior is based on intentions and an individual's intentions to participate in a given behavior are based on his/her attitude toward the behavior, subjective norms surrounding the behavior, and individual's perceived difficulty (easy/difficult) of performing the given behavior (Perceived behavioral control). All of the variables, except for behavior, are considered psychological (internal).

Attitude toward a behavior is the person's evaluation of the behavior. Two components are assumed to work together to influence attitude. These components are behavioral beliefs and outcome evaluations. Subjective norm is the person's estimate of the social pressure to perform the given behavior. It is assumed that two components work together to make up subjective norms. The two components are normative beliefs and motivation to comply. Perceived behavioral control is the extent to which the person feels he/she can perform the behavior. It has two aspects as well. These are control beliefs and perceived control. Each variable (Attitude, Subjective Norm, Perceived Behavioral Control, and Intention) may also be measured directly by asking participants about specific behavioral beliefs and outcome evaluations.

The Theory of Planned Behavior has been used successfully in predicting health behaviors. Areas in which the TPB have been used include the following: smoking, safe sex behaviors, testicular self-examinations, condom use, prostate cancer screening, suicide intent and multiple other healthy/unhealthy behaviors. In this study, the TPB will be used to investigate factors that influence an African-American inmate to engage in informed decision-making with regard to prostate cancer screening.

Methods

A cross-sectional design was used to examine the relationship between inmate beliefs and behavioral intentions.

Setting

This research study was conducted in 2016 at the Federal Medical Center federal prison (FMC), located in Lexington, Kentucky. This facility houses approximately 1800 male inmates and has a racially diverse population. Of the 1800 inmates housed at FMC Lexington, 808 (46%) are African American and 186 (23%) of these are age 45 and older.

Procedure

This study was conducted at the Federal Medical Center which is a Federal Prison located in Lexington, Kentucky. IRB approval was received from the University of Kentucky Institutional Review Board (IRB) and the Federal Bureau of Prisons Office of Research and Evaluation (BRRB) prior to the study being conducted. First, a list of all African American inmates who were 45 years old and older was populated using the prison's SENTRY Inmate Management System. SENTRY is a real-time system which collects and stores vital inmate information (ex: age, race, physical description etc.)(Thompson, 2012). Next, a recruitment flyer was posted to those inmates who were identified in Sentry e-mail bulletin board which is an area that is open to the entire inmate population for viewing. In addition to the posting on the e-mail bulletin board, flyers were posted in several common areas including: 1) Inmate's housing units, 2) Education department, 3) Food Service, 4) Recreation, 5) Central Clinic, and 6) Religious Services department at FMC Lexington. Inmates who were interested in participating in the study

were directed to submit an Inmate Request to a Staff Member Form (Cop-Out) (paper or electronic) to the principal investigator. The PI was a member of the healthcare team at the prison. After receiving a Cop-Out, the principal investigator populated a list of individuals interested in participating in the study. These inmates were placed on the Call –Out list (Inmate appointments) at a later date where they were instructed to report to education department at a given time. The study was then explained to them and informed consent form was reviewed (read aloud to the group) and signed if the individual was still interested in participating in the study. The inmates who signed the informed consent were then given a questionnaire by the primary investigator in a classroom setting or in a one to one setting in a private office if the participant chose to do so. The entire consent and questionnaire were read to the participants and the average time to complete the questionnaire was approximately 30 minutes. This paper questionnaire was then secured in a locked cabinet in a secured room in the college of nursing at the University of Kentucky.

Sample

A convenience sample of 76 male inmates was recruited for this study. Inclusion criteria was: 1) 45 years old or older, 2) Incarcerated in the federal prison system, 3) Able to read and understand the English language, 4) Have no prior history of prostate cancer. According to the American Cancer Society (ACS) (2017), a discussion about prostate cancer screening benefits and potential limitations should take place at age 50 or greater for those men who have an average risk of developing the disease and a life expectancy of at least 10 years. For men who are at high risk for developing prostate cancer, such as African American men and men who have had a first degree relative (father, brother, or

son) diagnosed with prostate cancer at an early age (younger than age 65), the discussion should take place at the age of 45. Lastly, for those men with an even higher risk (more than one first degree relative who had prostate cancer at an early age), the ACS recommends the discussion take place at the age of 40 (American Cancer Society, 2017). Based on the combination of these recommendations we include men starting at age 45.

Measures

Theory of Planned Behavior Survey (Modified)

We used a modified version of the previously validated Theory of Planned Behavior Survey (TPBPS) to measure the constructs of the Theory of Planned Behavior (Appendix 1). This instrument was developed by Gregory (2007), a student at the University of Iowa. The instrument contains a total of 61 items for assessing intention to participate in prostate cancer screening. This instrument was developed according to the Theory of Planned Behavior and was tested on a sample of 452 Caucasian men from Iowa who had no prior history of prostate cancer. The TPBPS contains items that measure the constructs of behavioral intention (Attitude, Subjective Norms, and Perceived Behavioral Control). These constructs can be measured directly and indirectly. “Direct and indirect approaches to testing the TPB make different assumptions about the fundamental cognitive structures”(Francis 2004), which provides support for convergent validity. Elicitation interviews, with a sample of the population were used to create the content of the survey tool. Content validity was established during the pilot testing of the instrument. After pilot testing was completed, changes to the instrument were made to increase comprehension and readability. This instrument contains 9 items regarding patient screening history (ex : Have you ever had a PSA test?), 29 Likert scale items on

patient's beliefs and thoughts about prostate cancer screening (ex: I want to be screened for prostate cancer next year. ; How much does your wife's opinion influence your decision to participate in prostate cancer screening?) and 11 demographic questions about marital status, education, etc. The questions regarding patient beliefs and thoughts are rated on a 7 point Likert scale ranging from 1 to 7 with 1 being less likely to perform the behavior and 7 being more likely to perform the behavior. Convergent validity was demonstrated by Spearman's correlation between the direct and indirect summary scores. Summary scores for attitude ($r = 0.62$, $p < 0.0001$, $n = 360$), and subjective norm ($r = 0.82$, $p < 0.0001$, $n = 86$) were very strongly correlated. The summary score for perceived behavioral control was modestly correlated ($r = 0.26$, $p < 0.0001$, $n = 356$). These findings suggest that the summary scores are measuring the same concept. Construct validity was also supported through the use of a structural equation modeling of the relationship between operational measures and theoretical constructs. In this equation all the t values were statistically significant providing further evidence that the measures are measuring the constructs they are supposed to measure. The minimum fit function Chi-square was statistically significant ($\chi^2 = 125.4$; $p < 0.05$) demonstrating good instrument reliability. The normed fit index (NFI) was 0.97 which suggests an acceptable model fit. The goodness-of-fit was 0.94. The survey used for this study is listed in the appendix. The questions for the survey are arranged according to the variable each addresses in the Theory of Planned Behavior.

Attitude (Behavioral Beliefs and Outcomes Evaluations)

Items for this part of the instrument were designed to address the two components of behavioral beliefs of the population being studied. The components consist of

behavioral beliefs and outcome evaluations. Behavioral beliefs are the belief about consequences of the behavior. The participants were asked to rate how much they agree with statements regarding having prostate cancer screening in the next year resulting in potential outcomes. There are four questions about behavioral beliefs (Questions 20, 21, 22, and 23). An example item is: *1) Receiving cancer PSA test in the next year will help detect cancer early if I have prostate cancer.* Behavioral beliefs are measured using a 7 point Likert scale. Items with a potentially favorable outcome are scored so that agreement is positive: (i.e., 1 = *Strongly Disagree*, 2 = *Quite Disagree*, 3 = *Slightly Disagree*, 4 = *Neither Agree nor Disagree*, 5 = *Slightly Agree*, 6 = *Quite Agree*, 7 = *Strongly Agree*). Potential negative outcomes are reverse scored (i.e., 7 = *Strongly Disagree*, 6 = *Quite Disagree*, 5 = *Slightly Disagree*, 4 = *Neither Agree nor Disagree*, 3 = *Slightly Agree*, 2 = *Quite Agree*, 1 = *Strongly Agree*). Outcome evaluations are when a value is placed on an outcome as well as positive or negative judgements about features of the behavior. Both categories were scored on Likert scale as noted above. There are four questions addressing outcome evaluations (Questions 24, 25, 26, and 27). An example of an outcome evaluation question is: *2) Detecting prostate cancer early is very important to me.* The total score is formed by adding the all items with the higher scores indicating greater intention to be screened.

Subjective Norm (Normative Beliefs and Motivation to Comply)

Subjective norms are predicted by normative beliefs and motivation to comply. Items measuring subjective norms assess the target population's beliefs pertaining to normative beliefs and motivation to comply with prostate cancer screening. Normative beliefs are beliefs about whether or not someone who is important to the individual

approves or disapproves of a behavior. There are five questions on normative beliefs (Questions 30, 31, 32, 33, and 34). An example item is: *1) My wife thinks I should get screened for prostate cancer* Beliefs were measured on a 7 point Likert scale: (i.e., 1 = *Strongly Disagree*, 2 = *Quite Disagree*, 3 = *Slightly Disagree*, 4 = *Neither Agree nor Disagree*, 5 = *Slightly Agree*, 6 = *Quite Agree*, 7 = *Strongly Agree*). Motivation to comply is defined as motivation to do what referents think and individual should do. There are five items related to motivation to comply which are scored in a Likert type scale from 1 = *Not At All* to 7 = *Very Much* (Questions 35, 36, 37, 38, and 39). An example item is as follows: *2) How much does your wife's or partner's opinion influence your decision to get a PSA screening test?* The total score is formed by adding the all items with the higher scores indicating greater intention to be screened.

Perceive Behavioral Control (Control Beliefs and Perceived Power)

Perceived behavioral control is made up of two components: control beliefs and perceived power. Control beliefs are beliefs held by an individual about the presence of factors that may facilitate or impede the performance of a given behavior. There are four control belief items that are rated on a Likert scale from 1 = *Difficulty* to 7 = *Easy* (Questions 40, 41, 42, and 43). These items measure specific factors that may facilitate or impede the performance of a given behavior. An example is: *1) Will information about PSA screening make getting a PSA test? (Easy/Difficulty).* Perceived power refer to beliefs about the power of factors (situation and internal) to impede or facilitate the performance of the behavior. Four perceived power items are scored on a Likert scale ranging from 1 = *Unlikely* to 7 = *Likely* (Questions 44, 45, 46, and 47). The total score is

formed by adding the all items with the higher scores indicating greater intention to be screened.

Direct Measures and Scoring

Attitude

Three items assess men's attitudes about the prostate cancer screening in the next year were rated on a Likert scale ranging from 1 = *Useless*, to 4 = *Neither Useless nor Useful*, to 7 = *Useful* (Questions 48, 49, 50). The question in all three items was the same with a different possible outcome (Useless/Useful, Worrisome/Reassuring, and Unnecessary/Important). An example item is: *1) In your opinion, having a PSA test to screen for prostate cancer in the next year will be?* The total score is formed by adding the all items with the higher scores indicating greater intention to be screened.

Subjective Norm

Two items measured the man's perceived social influence on getting screened for prostate cancer in next year using a Likert scale ranging from 1 = *Strongly Disagree*, 2 = *Quite Disagree*, 3 = *Slightly Disagree*, 4 = *Neither Agree nor Disagree*, 5 = *Slightly Agree*, 6 = *Quite Agree*, 7 = *Strongly Agree*) (Questions 28 and 29). An example item is: *1) The people who are important to me think I should get a PSA test to screen for prostate cancer in the next year. 2) The people who are important to me expect me to get a PSA test to screen for prostate cancer in the next year.* The total score is formed by adding the all items with the higher scores indicating greater intention to be screened.

Perceived Behavioral Control

Perceived control over receiving a prostate cancer screening in the next year was assessed using two items (Questions 16 and 51). The first item was scored on a Likert



scale ranging from 1 = *Strongly Disagree*, to 7 = *Strongly Agree*. Example items are: 1) *If I want to, I can get a PSA test to screen for prostate cancer in the next year.* The second item was scored on a Likert scale ranging from 1 = *No Control* to 7 = *Complete Control*. 2) *How much control do you have over getting a PSA test to screen for prostate cancer in the next year.* The total score is formed by adding the all items with the higher scores indicating greater intention to be screened.

Intention

Two items assessing an inmate's intentions to be screened for prostate cancer in the next year are scored on a Likert scale ranging from 1 = *Strongly Disagree*, 2 = *Quite Disagree*, 3 = *Slightly Disagree*, 4 = *Neither Agree nor Disagree*, 5 = *Slightly Agree*, 6 = *Quite Agree*, 7 = *Strongly Agree*). (Questions 13 and 14). An example item is: 1) *I want to receive a PSA test to be screened for prostate cancer in the next year.* 2) *I plan to receive a PSA test to screen for prostate cancer in the next year.* The total score is formed by adding the all items with the higher scores indicating greater intention to be screened.

Summary Scores

Scores for the scales are summed and averaged with a higher number indicating a more favorable outcome.

Health Literacy

The Newest Vital Sign (NSV) is designed to measure an individual's health literacy (Pfizer, 2016). Studies have shown individuals with limited health literacy to have less knowledge of their health problems, poorer health status, and to have more hospitalizations (Davis TC 2001, Gazmararian, Williams et al. 2003). The instrument is usually administered by a nurse or other trained clinical staff member. Administration of

the instrument consists of the administrator verbally asking 6 questions which pertain to a nutrition label. The participant refers to the nutrition label to answer the questions. All questions are asked in sequence (even if prior questions are answered incorrectly). Scoring for NVS ranges from 0-6 (1 point for each correct answer). Scoring for the NVS is: 0-1 indicates a high likelihood of limited literacy, 2-3 indicates possibility of limited literacy, and 4-6 almost always indicates adequate literacy. Administration of the instrument takes approximately 3 minutes and it is available in two languages (English (NVS-E) and Spanish (NVS-S)). For this study the English version was used. Reliability for the NVS-E was good. In prior studies, the internal consistency of the instrument demonstrated a Cronbach alpha of 0.76. Criterion validity was demonstrated as well ($r=0.59$, $P<.001$) (Weiss et al., 2005).

Data Analysis

The data were analyzed using the Statistical Packages for Social Sciences (SPSS) version 22. Independent variables included demographic and personal factors (age, marital status, education, family history of prostate cancer, and health literacy) as well as constructs of the Theory of Planned Behavior (Attitude, Social Norms, and Perceived Behavioral Control). The dependent (outcome) variable was the inmate's intention to be screened for prostate cancer.

Descriptive statistics, including means and standard deviations or frequency distributions, were used to summarize study variables. Two-sample t-tests and Pearson's product moment correlation were used to assess relationships between demographic and study variables and among study variables. Multiple linear regression assessed the

potential predictors of intention to be screened for prostate cancer. Variance inflation factors were calculated to determine whether multicollinearity was influencing regression parameters. Hierarchical multiple regression analyses were utilized to assess if scores on the health literacy questionnaire explained a significant amount of variance in intention to obtain a prostate examination above those variables that were found to be significant in the two forward regression analyses outlined above.

Results

Sample

Seventy-six men agreed to participate in the study initially. However, only 67 participants completed the entire survey and were thus included in the analysis. All participants were African-American men whose ages ranged from 45 to 70 years, with a mean age of 52 years. The majority (65.0%; n=50) were single or divorced; only 16 participants (20.8%) reporting being married. Meanwhile, 88% (n=67) of the men reported an education level of high school graduate or higher. Most of the men (83.5%) viewed themselves as being in good health or better. The sample characteristics are presented in Table 4.1.

Associations between Demographics and Study Variables

The relationship between knowledge and intention was assessed using a Pearson's Correlation. Knowledge showed a very weak negative relationship to no relationship ($r = -.085$, $P=0.483$, $N=70$) with intention to screen for prostate cancer.

There was a significant difference in intention to be tested for prostate cancer based on whether the participant had a relative diagnosed with prostate cancer ($t=2.5$,

$p=.014$). Those who had a relative with this disease had higher scores than those who did not [$M=6.7$ ($SD=0.8$) and $M=5.8$ ($SD=1.9$), respectively].

An analysis of demographic variables and their relationship with intent to obtain a prostate screening revealed that marital status was not related to intent, $F(3,62) = 6.97, p = .058$. A t-test revealed that subjects who knew an individual diagnosed with prostate cancer ($M = 6.20$, $SD = 1.46$) did not differ from subjects who did not know someone diagnosed with prostate cancer ($M = 5.75$, $SD = 2.09$), $t(59) = .998, p = .322$. The age of the subjects, $r(74) = .075, p = .538$ and education of subjects, $r(69) = -.109, p = .374$ were not related to intention to obtain a prostate examination. The subjects' self-assessment of their health was not related to their intention to obtain a screening for prostate cancer, $r(67) = -.056, p = .647$.

Forward Stepwise Regressions were utilized to assess the relationship of the direct and indirect measures to the subjects' intention to obtain a prostate examination. An alpha of .05 was used to determine if a variable should enter the model. The assumptions underlying the regression analyses were tested and will be included below. The intercorrelations of the direct and indirect measures of planned behavior, health literacy and intention are presented in Table 4.2. The regression analysis for the direct measures will then be presented first, followed by the regression analysis for the indirect measures.

The measures of Direct Attitude, Direct Perceived Behavioral Control and Direct Subjective Norm were considered for entry into the Forward Regression Analysis to determine which of these variables significantly predicted the subjects' intention to obtain a prostate examination. The results, including the standardized and unstandardized

coefficients and t-tests, are presented in Table 4.3. Direct Attitude entered into the regression on the first step, $t(65) = 6.40, p < .001$, adj. $R^2 = .377$. The variables not included in the analysis at step one are also included in Table 4.3. Both Direct Perceived Behavioral Control, $t(64) = 1.34, p = .186$, and Direct Subjective Norm, $t(64) = 1.03, p = .307$, did not explain a significant amount of variance beyond Direct Attitude, and therefore did not enter into the regression analysis.

The assessment of the assumptions that underlie regression analysis utilized a number of procedures. The linearity assumption, which was assessed by inspecting partial regression plots and a plot of studentized residuals against the predicted values, indicated that Direct Attitude, Direct Perceived Behavioral Control and Direct Subjective Norm had a linear relationship with Intention. The Durbin-Watson statistic of 2.11 indicated that there was an independence of residuals. The homoscedasticity assumption, as assessed by a visual inspection of a plot of studentized residuals versus predicted values, indicated that this assumption was not violated. Multicollinearity was not an issue as all measures of tolerance were .75 and above. An assessment of outliers was conducted by an inspection of subjects' absolute standardized residuals. While two subjects had a residual above three, no leverage values were above .5 and no Cook's distances were above one, indicating that these subjects did not have a significant impact on the regression analysis. In addition, an examination of these two subjects' data revealed no data entry errors. Therefore, both subjects were retained in the analyses. The assumption of normality was met, as assessed by an inspection of a frequency distribution of the residuals.

The measures of Indirect Behavioral Beliefs, Indirect Outcome Evaluation, Indirect Normative Beliefs, Indirect Motivation to Comply, Indirect Control Beliefs and Indirect Perceived Power were considered for entry into the Forward Regression Analysis to determine which of these variables significantly predicted the subjects' intention to obtain a prostate examination. The results, including the standardized and unstandardized coefficients and t-tests, for variables included in the analysis are presented in Table 4.4. Indirect Normative Beliefs entered into the regression on the first step, $t(65) = 5.82, p < .001$, adj. $R^2 = .332$. Indirect Outcome Evaluation enter the analysis at step two, $t(64) = 2.74, p = .008$, adj. $R^2 = .393$. Indirect Behavioral Beliefs, $t(63) = 1.63, p = .107$, Indirect Motivation to Comply, $t(63) = -1.25, p = .214$, Indirect Control Beliefs, $t(63) = -1.17, p = .248$ and Indirect Perceived Power, $t(63) = .095, p = .925$, did not explain a significant amount of variance beyond Indirect Normative Beliefs and Indirect Outcome Evaluation, and therefore did not enter into the regression analysis.

As with the direct measures, the assessment of the assumptions that underlie regression analysis utilized a number of procedures. The linearity assumption, which was assessed by inspecting partial regression plots and a plot of studentized residuals against the predicted values, indicated that Indirect Behavioral Beliefs, Indirect Outcome Evaluation, Indirect Normative Beliefs, Indirect Motivation to Comply, Indirect Control Beliefs and Indirect Perceived Power had a linear relationship with Intention. The Durbin-Watson statistic of 1.93 indicated that there was an independence of residuals. The homoscedasticity assumption, as assessed by a visual inspection of a plot of studentized residuals versus predicted values, indicated that this assumption was not violated. Multicollinearity was not an issue as all measures of tolerance were .44 and

above. An assessment of outliers was conducted by an inspection of subjects' absolute standardized residuals. None of the subjects had a standardized residual above three, no leverage values were above .5 and no Cook's distances were above one, indicating that none of the subjects would be considered outliers. The assumption of normality was met, as assessed by an inspection of a frequency distribution of the regression residuals.

A series of hierarchical multiple regression analyses were utilized to assess if scores on the health literacy questionnaire explained a significant amount of variance in intention to obtain a prostate examination above those variables that were found to be significant in the two forward regression analyses outlined above. Two hierarchical analyses were conducted, the first assessing if health literacy scores explained variance beyond and above Direct Attitude scores and the second assessing if health literacy scores explained variance beyond Indirect Normative Beliefs and Indirect Outcome Evaluation scores.

The results of the former analysis revealed that health literacy scores explained a significant amount of variance in intention to obtain a prostate examination, $t(65) = 2.67$, $p = .008$, R^2 change = .062, beyond Direct Attitude. The regression coefficients are presented in table 4.5. The results of the former analysis revealed that health literacy scores explained a significant amount of variance in intention to obtain a prostate examine beyond Indirect Outcome Evaluation and Indirect Normative Beliefs, $t(64) = 2.47$, $p = .016$, R^2 change = .052. The regression coefficients are presented in Table 4.6. An assessment of the assumptions that underlie the regression analyses revealed that none of the assumptions were violated. These findings may point to health literacy as a potential variable of consideration when examining health beliefs and intention.

Discussion

The purpose of this study was to explore predictors of intent to screen (or not) for prostate cancer in incarcerated African American males. This research provided informative information about factors that influence the decision making process of African American male who is incarcerated in the federal prison system. It revealed information, never before investigated, about the decision making process as it pertains to his intent to screen for prostate cancer. It also provided a better understanding of how the participant's perception of the behavior, his perceived control of performing the given behavior, and the importance of those who were important to him and how they influenced that decision. The study was underpinned by the Theory of Planned Behavior.

Specific Aim 1 was to describe the knowledge, attitudes, behaviors, and behavioral intentions of the participants regarding prostate cancer screening. The findings suggest that the priorities of African American men who are incarcerated in the federal prison system may be slightly different from what is found in the literature regarding those who are not incarcerated. Variables such as marital status, age, and education were found to have no relationship with intention. This does not support the literature which shows these variables to have influence on individual's intention to screen for prostate cancer (Jackson, Owens, Friedman, & Hebert, 2014; Plowden, 2006; Williams et. al., 2008). This may be due to the individual's current situation of being incarcerated. Self-assessment of health was also noted as not having a connection with one's intention to screen for prostate cancer. However, it is worth noting that the individuals who had family members diagnosed with prostate cancer in the past had a higher intention score than did those individuals who did not. This is consistent with current literature as in some

cases where men tend to over-estimate their chances of developing prostate cancer when a family member has been diagnosed with the disease (Bancroft et.al., 2015).

A significant amount of variance in the intention to obtain a prostate examination was explained with the addition of the health literacy scores to the model. This lends to the thought of health literacy playing an important role in a person understanding information provided and being able to make an informed decision as to his intention to participate or not in prostate cancer screening. This is supported in the literature as it has been shown that limited health literacy can be a marker for vulnerability and a risk factor for poor health outcomes (Altin, & Stock, 2016; Brabers, Rademakers, Groenewegen, van Dijk, & de Jong, 2017).

Overall, this research provides an avenue for understanding the incarcerated African-American male inmate and giving researchers a glimpse of what influences this population to engage in the informed decision making process regarding prostate cancer screening. It is evident that health literacy plays an important role in this process. Improving the health literacy of this population allows the inmate to have a better understanding of what is going on with his health care and assists him make an informed-decision about his health care.

Limitations

There are some implicit limitations when researching a prison population. Given their current circumstances (incarceration), their answers may be impacted due to the fear of repercussions from the prison administration. Thus, the study's findings cannot be generalized beyond the sample population who completed the entire study.

Conclusions

The African-American inmate population represents several immediate and future challenges for the US prison system. Inmates are more often being convicted in their later years and receiving longer sentences. As a result, prisons are increasingly responsible for providing their health care, which will only become more expensive with time.

Counteracting this issue begins with understanding how providers can better predict health-related behaviors and foster proactive health attitudes in this population. With this information, providers may be able to empower inmates to make more informed decisions, which may lead to lower overall healthcare costs combined with the potential for saving inmate lives.

Improving informed decision-making begins with cultivating African-American men's health literacy. Providers both inside and outside of prisons may raise awareness about prostate cancer screening through various methods (e.g., in-clinic discussions, written flyers, postings in common areas, etc.). Providers should also take the time, when possible, to understand the patient's knowledge level using open-ended questions. By demonstrating empathy and attentiveness, providers can potentially decrease a patient's decisional conflict and empower him to make an informed decision. Future research should focus on the degree to which increased knowledge produces improvements in health literacy in African-American men's decision-making process regarding prostate cancer screening. By increasing knowledge, health literacy will be improved allowing the African-American inmate to make an informed decision regarding his health. Researchers should also focus on the impact of health literacy, relative to other factors, on African-American men's decision-making. Likewise, it would also be valuable to better

understand the factors that inspire African-American inmates to engage in the decision making process as well as those factors that motivate them to achieve greater health literacy (e.g., subjective norms, attitude toward a behavior, perceived control, education, age, etc.).

Table 4.1. Sample Demographic Characteristics (n=76)

Variable	N (%) or mean (SD)
Marital Status	
<i>Married</i>	16 (20.8%)
<i>Never married</i>	25 (32.5%)
<i>Divorced</i>	25 (32.5%)
<i>Widowed</i>	2 (2.6%)
<i>Separated</i>	1 (1.3%)
<i>Unmarried couple</i>	7 (9.1%)
Education	
<i>Grade 1-8</i>	3 (3.9%)
<i>Grade 9-11</i>	6 (7.8%)
<i>Grade 12 or GED</i>	38 (49.4%)
<i>College 1-3 years</i>	24 (31.2%)
<i>College 4 or more years</i>	5 (6.5%)
Health Status	
<i>Excellent</i>	9 (11.7%)
<i>Very good</i>	20 (26.0%)
<i>Good</i>	27 (35.1%)
<i>Fair</i>	16 (20.8%)
<i>Poor</i>	4 (5.2%)
Age	52.34 (\pm 7.04)

Table 4.2. Intercorrelations between the Direct, Indirect, and Intention Measures

	Health Literacy	Direct Perceived Behavioral Control	Direct Attitude	Direct Subject Norm	Intention	Indirect Behavioral Beliefs	Indirect Outcome Evaluation	Indirect Normative Beliefs	Indirect Motivation to Comply	Indirect Control Beliefs	Indirect Perceived Power
Direct Perceived Behavioral Control		-.110 .370									
Direct Attitude		-.05 .681	.150 .226								
Direct Subject Norm		-.170 .162	.402 .001	.507 <.001							
Intention		.221 .066	.221 .071	.606 <.001	.394 .001						
Indirect Behavioral Beliefs		.019 .878	.339 .005	.460 <.001	.398 .001	.480 <.001					
Indirect Outcome Evaluation		-.053 .669	.274 .027	.339 .005	.009 .944	.310 .011	.333 .006				
Indirect Normative Beliefs		-.005 .969	.575 <.001	.496 <.001	.763 <.001	.584 <.001	.463 <.001	.082 .511			
Indirect Motivation to Comply		-.057 .643	.315 .010	.414 <.001	.664 <.001	.373 .002	.428 <.001	.103 .406	.740 <.001		
Indirect Control Beliefs		-.010 .934	.430 <.001	.181 .137	.328 .006	.181 .136	.203 .095	.182 .141	.413 <.001	.343	
Indirect Perceived Power		.274 .041	.536 <.001	.392 .001	.387 .001	.370 .02	.285 .018	.213 .083	.531 <.001	.435 <.001	.432

Table 4.3. Multiple regression summary table for forward regression analysis utilizing direct measures as independent variables

Variable(s) in the Equation	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
	B	Std. Error	Beta	t	p	VIF
Direct Attitude	1.120	.175	.622	6.396	.000	1.000
Variable(s) in the Equation						
Direct Perceived Behavioral Control			.130	1.34	.186	1.023
Direct Subjective Norm			.116	1.03	.307	1.35

Table 4.4. Multiple regression summary table for forward regression analysis utilizing indirect measures as independent variables

Variable(s) in the Equation	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
	B	Std. Error	Beta	t	p	VIF
Indirect Normative Beliefs	.724	.124	.585	5.82	<.001	1.000
Indirect Outcome Evaluation	.653	.239	.264	2.74	.008	1.007
Variable(s) in the Equation						
Indirect Behavioral Beliefs			.186	1.63	.107	1.45
Indirect Motivation to Comply			-.180	-1.25	.214	2.27
Indirect Control Beliefs			-.124	-1.17	.248	.123
Indirect Perceived Power			.011	.095	.925	1.46

Table 4.5. Multiple regression summary table for hierarchical regression analysis assessing additional contribution of health literacy beyond and above Direct Attitude in predicting Intention to Obtain a Prostate Cancer Examination.

Variable(s) in the Equation	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
	B	Std. Error	Beta	t	p	VIF
Direct Attitude	1.10	.177	.606	6.24	<.001	1.000
Health Literacy Scores	.255	.095	.249	.267	.008	1.003

Table 4.6. Multiple regression summary table for hierarchical regression analysis assessing additional contribution of health literacy in predicting Intention to Obtain a Prostate Cancer Examination beyond and above Normative Beliefs and Indirect Outcome Evaluation Direct Attitude

Variable(s) in the Equation	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
	B	Std. Error	Beta	t	p	VIF
Indirect Outcome Evaluation	.653	.239	.264	2.74	.008	1.007
Indirect Normative Beliefs	.697	.119	.564	5.86	<.001	1.007
Health Literacy Scores	.236	.096	.228	2.47	.016	1.003

CHAPTER FIVE: DISCUSSION

The primary goal of this dissertation was to understand how U.S. prisons can promote better outcomes for male inmates, and particularly African-Americans, regarding cancer screening and development. The primary purpose was to investigate factors that influence African-American male inmates to engage in the informed decision making process. To this end, the dissertation presented three papers: a literature review about the purpose and utility of informed decision-making in terms of prostate cancer (Chapter Two); a secondary analysis of a prison intervention intended to improve inmates' cardiovascular health and thereby reduce cancer risk (Chapter Three); and a survey study of African-American male inmates and the factors that incline them or not to pursue screening for prostate cancer (Chapter Four). Again, these three studies, collectively, give a global view of prostate cancer risk reduction by potentially decreasing the risk of death through informed decision making (Chapter Two), lifestyle modifications which may decrease the overall risk of developing prostate cancer (Chapter Three), and screening intention leading to possible early detection of prostate cancer and potentially decreasing the risk of death (Chapter Four).

The literature review in Chapter Two summarized the factors that either influenced or predicted an African-American male's intention to engage in informed decision-making regarding prostate cancer screening. Informed decision making involves a patient learning about the benefits and risks of a procedure, weighing the available options against their personal values, and making the best decision for themselves. The research results indicate that trust is an important factor in African-American men's

engagement in this decision-making process, as it can improve such things as compliance, and patient involvement in care. Subjective norms also play a vital role in African-Americans' health decisions: Men are especially likely to consult with family members or close friends prior to seeking professional help (Allen et al., 2007; Halbert et al., 2015; Jones et al., 2010), and more likely than female patients to delegate health decisions to a physician or loved one instead of taking a more active role (Levinson, Kao, Kuby, & Thisted, 2005). Consequently, the literature highlights the importance of providers demonstrating sensitivity toward a patient's culture and building a strong interpersonal relationship. In this way, providers can establish trust, help imbue patients with a sense of worth, and incline patients to be more receptive toward knowledge that helps them make informed decisions. The review revealed a need for research that focuses on African-American men and ways for providers to facilitate trust and knowledge building with this community, particularly in terms of prostate cancer screening. This is especially needed for incarcerated African-American men, who are underrepresented in the literature.

As one effort to address this deficiency, Chapter Three assessed the value of an intervention aimed at reducing modifiable risks for cardiovascular disease – and by extension, cancer – in inmates. The final analysis focused on 44 African-American inmates and three specific variables: obesity (proxy: waist circumference and BMI), physical activity (Proxy: amount of time needed to reach 85% maximum heart rate or fatigue), and diet (proxy: total cholesterol, HDL, LDL, and triglycerides) over 4 time points. While prior studies suggest that all three variables are interrelated (Reichmann, 2009; World Health Organization, 2016), this study hypothesized that the intervention

would lead to reductions in both waist circumference and BMI. However, nearly all the findings ran counter to expectations: Waist circumference showed a significant decrease between baseline 1 to preintervention and preintervention to post intervention. However, the waist circumference significantly increased between the postintervention and the postintervention 3 months time points. Meanwhile, the BMI showed a significant decreased between the preintervention to post intervention time points, but then increased between the postintervention and the postintervention 3 month time points. Granted, because BMI cannot differentiate between lean mass and fat accumulation, this latter finding may be explained by an increase in either of those two factors between post intervention and the post intervention 3 month time points. Nonetheless, research has clearly shown the cumulative effect of physical activity and dietary changes in decreasing obesity. Thus, the findings illuminate the need for more research on proper health interventions among inmates, particularly in regard to cancer risk factors.

Designing better inventions might depend on first understanding the factors that incline inmates to make a decision to participate in cancer screening. To this end, Chapter Four applied the Theory of Planned Behavior to assess the variables that underlie African-American male inmates' intent to screen for prostate cancer. The study focused on 76 African-American males who were incarcerated in the U.S. federal prison system. Surprisingly, the demographic variables assessed (marital status, age, and education) showed no relationship with the patients' intention to screen for prostate cancer, which contrasts with previous studies suggesting that such variables can be influential. However, this study did reveal that direct attitude (one's overall attitude), indirect normative beliefs (Perception of what others who are important to the participant

believed), and indirect outcome evaluation (The perception of others who are important to the participant's views of the possible outcome) had a significant relationship with the inmates' intention to screen for prostate cancer. Additionally, the inmates' health literacy (assessed via a relevant questionnaire) explained a significant amount of the variance in intention to screen.

In sum, the dissertation indicates that informed decision-making is an important tool for reducing the risk of prostate cancer, and may be especially valuable among the vulnerable community of African-American male inmates. These individuals may feel disenfranchised by their position in society and separated from the broader social environment that they would rely on for health decisions. Thus, medical professionals and prison administrators may be able to fill a gap here by empowering inmates to make their own informed health decisions. By improving their health literacy and proactivity, these inmates would be better equipped to care for themselves both inside and outside of prison. Engaging in this kind of preventative care can help prisons keep healthcare costs down, and thereby lower taxpayer burden, while improving the self-sufficiency of local communities.

Recommendations for Future Research

The findings and limitations of the aforementioned studies can lead to valuable additional research. For instance, Chapter Four showed that several sociodemographic factors had no relationship with actual behavioral change in African-American inmates, but factors such as a subjective norms, cultural sensitivity, and health literacy may indirectly guide people toward or away from making an informed decision. Future

researchers should ascertain whether demographic factors are truly inconsequential in this case, and if so, why? Furthermore, given the substantial number of barriers experienced by African-American men to prostate cancer screening, it would be useful to know which factors (e.g., trust, subjective norms, etc.) are the most relevant to African-American men who are incarcerated. Also, the current study suggests that health literacy is an important variable in the intention to screen for prostate cancer.

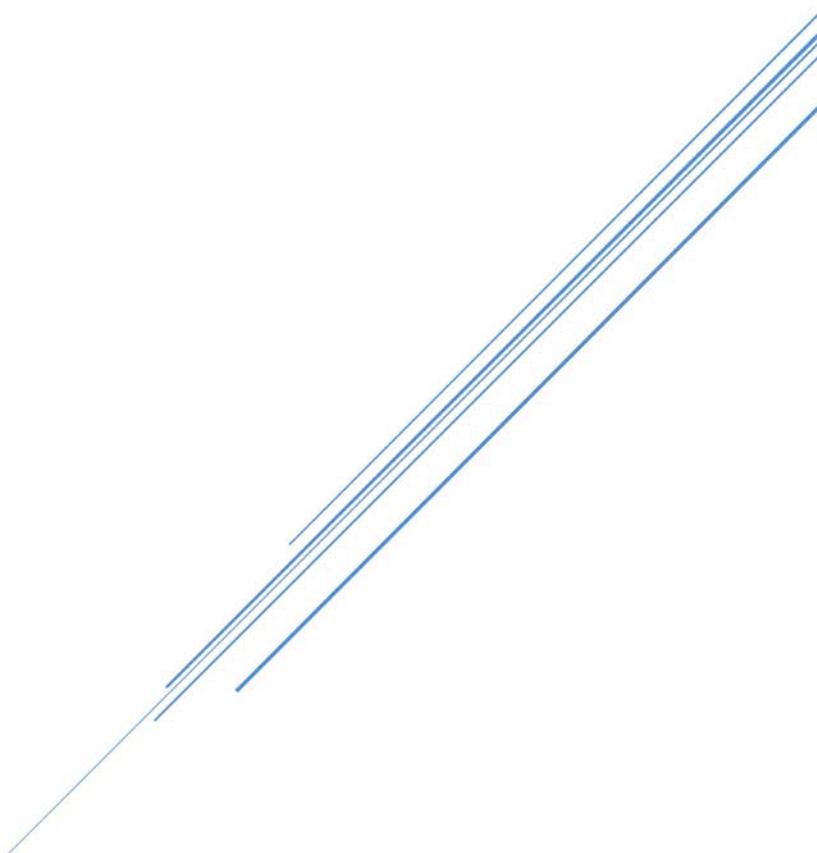
By exploring what motivates inmates to take a more active role in their health care, scholars can develop more effective interventions and encourage more informed decisions about cancer screening. One way in which this may be done is through the implementation of qualitative studies. Through the use of focus groups and interviews, the researcher may get a better understanding of the problem through firsthand experience. However, the richness of the data collected may be effected as some prisons will not allow electronic recording devices to be introduced into the prison setting. These future research recommendations may have the effect of promoting cost-savings for prisons (by preventing health issues rather than merely responding to them) while fostering better health outcomes after inmates leave prison.

APPENDIX

Theory of Planned Behavior Questionnaire

PLEASE DO NOT PLACE YOUR NAME OR ANY OTHER INFORMATION THAT MAY IDENTIFY YOU AS A PARTICIPANT ON OR IN THIS BOOKLET

MODIFIED THEORY OF PLANNED BEHAVIOR QUESTIONNAIRE



PLEASE DO NOT PLACE YOUR NAME OR ANY OTHER INFORMATION THAT MAY IDENTIFY YOU AS A PARTICIPANT ON OR IN THIS BOOKLET

PLEASE DO NOT PLACE YOUR NAME OR ANY OTHER INFORMATION THAT MAY IDENTIFY YOU AS A PARTICIPANT ON OR IN THIS BOOKLET

INSTRUCTIONS

1. This booklet asks for your thoughts about the prostate specific antigen (PSA) test. Please read each question carefully and respond accordingly. Our answers will remain confidential.
2. For some questions you are asked to fill in the blank.
3. For other questions please indicate your beliefs by filling in the ONE CIRCLE on the 1 to 7 scale to indicate the strength of your belief.
4. THERE ARE NO WRONG ANSWERS. Please tell us what you think.
5. Each question will be read to you by Mr. Moore.
6. PLEASE DO NOT PLACE YOUR NAME OR ANY OTHER INFORMATION THAT MAY IDENTIFY YOU AS A PARTICIPANT ON OR IN THIS BOOKLET.

Thank you for your participation

PLEASE DO NOT PLACE YOUR NAME OR ANY OTHER INFORMATION THAT MAY IDENTIFY YOU AS A PARTICIPANT ON OR IN THIS BOOKLET

SECTION 1: PSA SCREENING HISTORY

1) A prostate specific antigen test, also called a PSA test is a blood test used to check men for prostate cancer. Have you ever heard of the PSA or prostate-specific antigen? ***** If NO, skip to question # 52

- Yes (1)
- No (2)
- Don't Know (3)

If No Is Selected, Then Skip To End of Survey

2) Have you ever had a PSA test? ***** If NO, skip to question # 6

- Yes (1)
- No (2)
- Don't Know (3)

If No Is Selected, Then Skip to question # 6

3) IF YES, how long has it been since you had your last PSA test?

- Within the past year (1)
- Within the past 2 years (2)
- Within the past 3 years (3)
- Within the past 5 years (4)
- 5 or more years ago (5)
- Don't know (6)

4) What was the MAIN reason you had this last PSA test?

- Part of routine physical exam screening test (1)
- Because of a specific problem (2)
- Follow-up test for an earlier exam (3)
- Other (Please specify) _____ (4)
- Don't Know (5)

5) Did a health provider recommend the last PSA test you received?

- Yes (1)
- No (2)
- Don't Know (3)
- Not Applicable (4)

6) Has a health provider EVER recommended that you have a PSA test to screen for prostate cancer?

- Yes (1)
- No (2)
- Don't Know (3)

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- 7) Has a health provider EVER recommended that you NOT have a PSA test to screen for prostate cancer?
- Yes (1)
 - No (2)
 - Don't Know (3)
- 8) Has a health provider EVER discussed the advantages and disadvantages of the PSA test with you? ***** (If No, skip to 10)
- Yes (1)
 - No (2)
 - Don't Know (3)
- 9) If YES, did you feel the health provider told you enough about the PSA test?
- Yes (1)
 - No (2)
 - Don't Know (3)
- 10) Has a health provider or other healthcare professional EVER provided you with other sources of information about the PSA test (e.g. pamphlet, website address, video)?
- Yes (1)
 - No (2)
 - Don't Know (3)
- 11) Did you know there is disagreement among health professionals concerning use of the PSA test?
- Yes (1)
 - No (2)
 - Don't Know (3)
- 12) Have you ever been told by a health professional that you had prostate cancer? ***** If YES, skip to question # 52
- Yes (1)
 - No (2)
 - Don't Know (3)

If Yes Is Selected, Then Skip To End of Survey

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SECTION 2: YOUR BELIEFS AND THOUGHTS ABOUT PSA SCREENING

I. Most questions in this section (questions 13-19) ask about IF YOU WERE TO RECEIVE A PSA TEST TO SCREEN FOR PROSTATE CANCER IN THE NEXT YEAR.

13) I want to receive a PSA test to screen for prostate cancer in the next year.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

14) I plan to receive a PSA test to screen for prostate cancer in the next year.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

15) IF YOU DO NOT PLAN to have a PSA test to screen for prostate cancer in the next year, do you plan to receive the test at any time in the future?

- Yes (1)
- No (2)
- Don't Know (3)
- Not Applicable (4)

16) If I want to, I can get a PSA test to screen for prostate cancer in the next year.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

17) I believe that most health providers recommend that men my age get PSA tests regularly.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

18) I believe that most prostate cancer can be treated and cured if caught early enough.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

19) I believe that men who are diagnosed with prostate cancer can still live a normal life.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

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Questions 20-23 ask your beliefs about the PSA test

20) Receiving a PSA test in the next year will help detect cancer early if I have prostate cancer.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

21) Receiving a PSA test in the next year will give me peace of mind.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

22) Receiving a PSA test in the next year will let me know my PSA value status.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

23) Receiving a PSA test in the next year may be a false result.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

Questions 24-27 ask how important these issues are to you

24) Detecting prostate cancer early is very important to me.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

25) Peace of mind regarding prostate cancer is very important to me.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

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26) Knowing my PSA value status is very important to me.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

27) The issue of potentially false results is very important to me.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

Questions 28-29 ask what those important to you think and expect you to do about having a PSA test in the next year.

28) The people who are important to me think I should get a PSA test to screen for prostate cancer in the next year.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

29) The people who are important to me expect me to get a PSA test to screen for prostate cancer in the next year.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

Questions 30-34 ask what you think specific people want you to do.

30) My wife/partner other thinks I should get a PSA test.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

31) Family/friends who currently have cancer or died of cancer want or would want me to get a PSA test.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

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32) My family thinks I should get a PSA test.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

33) My friends think I should get a PSA test.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

34) My regular health provider (DR., NP, PA) thinks I should get a PSA test.

	1	2	3	4	5	6	7	
Disagree	<input type="radio"/>	Agree						

Questions 35-39 ask how important specific people's opinions are to your decision to get a PSA screening tests in the next year.

35) How much does your wife's or partner's opinion influence your decision to get a PSA screening test?

	1	2	3	4	5	6	7	
Not At All	<input type="radio"/>	Very Much						

36) How much do the opinions of family/friends influence your decision to get a PSA screening test?

	1	2	3	4	5	6	7	
Not At All	<input type="radio"/>	Very Much						

37) How much does your family's opinion influence your decision to get a PSA screening test?

	1	2	3	4	5	6	7	
Not At All	<input type="radio"/>	Very Much						

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38) How much do the opinions of your friends influence your decision to get a PSA screening test?

	1	2	3	4	5	6	7	
Not At All	<input type="radio"/>	Very Much						

39) How much does your regular health provider's (DR., NP, PA) opinion influence your decision to get a PSA screening test?

	1	2	3	4	5	6	7	
Not At All	<input type="radio"/>	Very Much						

Questions 40-43 ask how much certain things make getting a PSA test difficult or easy for you.

40) Will information about PSA screening make getting a PSA test?

	1	2	3	4	5	6	7	
Difficult	<input type="radio"/>	Easy						

41) Do other health problems make getting a PSA test?

	1	2	3	4	5	6	7	
Difficult	<input type="radio"/>	Easy						

42) Will including a PSA test in a regular physical exam make getting a PSA test?

	1	2	3	4	5	6	7	
Difficult	<input type="radio"/>	Easy						

43) Does your health provider (DR., NP, PA) make getting a PSA test?

	1	2	3	4	5	6	7	
Difficult	<input type="radio"/>	Easy						

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Questions 44-47 ask how much those things influence your decision to get a PSA test.

44) How likely is information to influence your decision to get a PSA test?

	1	2	3	4	5	6	7	
Unlikely	<input type="radio"/>	Likely						

45) How likely are other health problems to influence your decision to get a PSA test?

	1	2	3	4	5	6	7	
Unlikely	<input type="radio"/>	Likely						

46) How likely is including the PSA test in a routine physical exam to influence your decision to get a PSA test?

	1	2	3	4	5	6	7	
Unlikely	<input type="radio"/>	Likely						

47) How likely is your health provider to influence your decision to get a PSA test?

	1	2	3	4	5	6	7	
Unlikely	<input type="radio"/>	Likely						

Questions 48-50 ask your opinion about having a PSA test.

48) In your opinion, having a PSA test to screen for prostate cancer in the next year will be?

	1	2	3	4	5	6	7	
Unnecessary	<input type="radio"/>	Important						

49) In your opinion, having a PSA test to screen for prostate cancer in the next year will be?

	1	2	3	4	5	6	7	
Worrisome	<input type="radio"/>	Reassuring						

50) In your opinion, having a PSA test to screen for prostate cancer in the next year will be?

	1	2	3	4	5	6	7	
Useless	<input type="radio"/>	Useful						

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Question 51 asks your opinion on how much control you have over getting a PSA test

51) How much control do you have over getting a PSA test to screen for prostate cancer in the next year?

	1	2	3	4	5	6	7	
No Control	<input type="radio"/>	Complete Control						

SECTION 3: FACTS ABOUT YOU

52) How old are you? _____

53) Are you:

- Married (1)
- Never Married (2)
- Divorced (3)
- Widowed (4)
- Separated (5)
- Unmarried Couple (6)

54) What is the highest level of education you have completed?

- Never attended school (1)
- Grade 1 through 8 (Elementary) (2)
- Grade 9 through 11 (Some high school) (3)
- Grade 12 or GED (High school graduate) (4)
- College 1 to 3 years (Some college or technical school) (5)
- College 4 years or more (College graduate) (6)

55) In general, would you say your health is:

- Excellent (1)
- Very Good (2)
- Good (3)
- Fair (4)
- Poor (5)

56) Do you have a close relative (i.e., father, brother, or son) that has been diagnosed with prostate cancer?

- Yes (1)
- No (2)
- Don't Know (3)

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57) If YES, How many close relatives have been diagnosed with prostate cancer?

- 1 Relative (1)
- 2 Relatives (2)
- 3 Relatives (3)
- 4 Relatives (4)
- 5 Relatives (5)

58) Do you know anyone that has been diagnosed with prostate cancer?

- Yes (1)
- No (2)
- Don't know (3)

59) Which one of these groups would you say *best* describes your race?

- White
- Black or African American
- Native American or Alaskan Native
- Asian or Pacific Islander
- Other (Please Specify) _____

60) Are you Hispanic or Latino?

- Yes
- No

THANK YOU FOR YOUR TIME AND PARTICIPATION

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VITA

Quentin E. Moore

Education

Dates	Institution/Location	Degree/Field of Study
December 1995	Eastern Kentucky University, College of Health Science, Richmond, KY	ADN, Nursing
December 1998	Eastern Kentucky University, College of Health Science, Richmond, KY	BSN, Nursing
May 2003	Eastern Kentucky University, College of Health Science, Richmond, KY	MSN, Nursing
Aug. 2006 – present	University of Kentucky College of Nursing, Lexington, KY	PhD Candidate, Nursing

Professional Experience

Dates	Institution and Location	Position
March 1996 – October 1997	Veterans Administration Hospital, Lexington, KY	Staff Nurse
October 1997- April 2003	Federal Medical Center, Lexington, KY	Staff Nurse
April 2003-January 2017	Federal Medical Center, Lexington, KY	Family Nurse Practitioner
January 2017- Present	Eastern Kentucky University, Richmond, Ky	Assistant Professor

Awards and Honors

January 1998	Winners Circle Award	Federal Bureau of Prisons
December 1998	Clinical Excellence Award	Eastern Kentucky University
September 1999	YMCA Adult Achiever Award	Lexington YMCA
September 2007	Letter of Appreciation for recruitment activities at local universities, colleges, and job fairs	U.S. Public Health Service

	in and around the Fayette county area	
November 2008	Kentucky Colonel Award	Kentucky State Land Grant Program
October 2009	Letter of Commendation for assisting the maximum security Prison, USP McCreary, prepare for program review	Federal Bureau of Prisons
April 2010	Chief Professional Officer's Award for Clinical Excellence	Federal Bureau of Prisons
June 2010	Letter of Appreciation for speaking to at risk fifth grade boys about life choices	William Wells Brown Elementary School
August 2011	Letter of Appreciation for giving a presentation to BSN students on public health nursing	Eastern Kentucky University
April 2012	Chief Professional Officer's Award for Clinical Excellence	Federal Bureau of Prisons
September 2014	Letter of Commendation for going above and beyond the call of duty in preparation for program review	Federal Bureau of Prisons
November 2015	Col. Charles Young Leadership Award	Omega Psi Phi Fraternity Inc.
January 2016	PAL Mentor of the Year	Lexington Police Activity League