

USE OF THE THEORY OF PLANNED BEHAVIOR TO ASSESS PROSTATE
CANCER SCREENING INTENT AMONG AFRICAN AMERICAN MEN

By

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This work is dedicated to my beloved husband, Murle, provider of endless support and encouragement. I would also like to dedicate this work to my mother, Joan, and my father, Frenchie. My Dad did not live to see my accomplishment, but he has been with me throughout this entire process. Finally, I would like to dedicate this work to my sweet kitty, Sam, who has provided me with soothing purrs and comic relief over the past five years.

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CHAPTER I

INTRODUCTION

Problem Statement

Compared with Caucasian men, African American men have a 60 percent higher incidence rate of prostate cancer, and their mortality rate from prostate cancer is nearly double that of Caucasian men (American Cancer Society, 2007). Despite these troubling statistics, research has shown that African American men are less likely than Caucasian men to undergo prostate cancer screening tests. To try to understand the reasons for the difference, there has been growing interest in the role of sociocultural constructs in cancer prevention and control. However, there has not been much research using theoretical frameworks to explain the prostate cancer screening behaviors of African American men.

Purpose of the Study

An examination of health seeking practices based on the beliefs and perceptions of subpopulations is particularly relevant in health disparities research. Health care utilization patterns have raised questions of how health professionals can integrate an understanding of social norms and ideologies into an analysis of men's use of health services (Addis & Mahalik, 2003). The purpose of this study was to adapt the Theory of Planned Behavior (TPB) (Ajzen, 1985, 1987) to provide a framework for elucidating

sociocultural factors associated with prostate cancer screening intent among African American men.

According to the TPB (Ajzen, 1985, 1987), individual behavior is motivated by behavioral intentions. Additionally, behavioral intentions are a function of an individual's attitude toward the behavior, the influence of the individual's social environment, and the individual's perceived control over resources and skills necessary to perform a behavior (Belgrave & Allison, 2006). As a general rule, the strength of a person's intention to perform a particular behavior is determined by the favorability level of the attitude and the level of perceived control towards the behavior.

The TPB (Ajzen, 1985, 1987) provided a framework for testing the relationship between behavioral beliefs, normative beliefs, control beliefs, and the intent to participate in prostate cancer screening tests. The TPB suggests that behavioral, normative, and control beliefs influence the attitude-behavior relationship (Ajzen & Driver, 1992). Thus, the assertion was made that the beliefs of African American men towards prostate cancer and prostate cancer screening influenced their attitudes towards the intent to participate in prostate cancer screening. Intent, as a precursor to the behavior, was considered a proximal measure of prostate cancer screening. Based on this theory, the study proposed that prostate screening intent among African American men was guided by the following: 1) beliefs about the consequences of prostate cancer screening; 2) beliefs about how other people, who may be in some way important to the individual, would like them to behave with respect to prostate cancer screening; and 3) the power of both situation and internal factors to inhibit or facilitate participating in prostate cancer screening tests.

Constructs of the TPB were operationalized to examine the role of social and cultural determinants of prostate cancer screening behaviors among African American men. Behavioral beliefs were operationalized by measuring *fatalistic views* of prostate cancer, prostate cancer screening *fears/apprehension*, and the *perceived benefits* of prostate cancer screening. Normative beliefs were operationalized by measuring the *influence of relevant others* on prostate cancer screening behaviors. Instead of assessing the construct of perceived behavioral control, situational barriers were measured. The selection of barriers for this study was based on their prevalence in the prostate cancer screening literature. The situational barriers assessed in this study included concerns about *cost, time commitment, embarrassment, and pain* associated with prostate cancer screening. The construct of knowledge was added to the TPB model to assess the relationship between understanding prostate cancer and associated beliefs about prostate cancer and prostate cancer screening. Knowledge was operationalized by measuring *knowledge of prostate cancer and prostate cancer screening*. Intent was operationalized by measuring the *intention to participate in prostate cancer screening within a six month period*. Demographic characteristics and past screening behaviors were also assessed as possible modifying factors in prostate cancer practices. It is expected that data obtained from this study may further explicate the role of social and cultural determinants in cancer prevention and control behaviors of African American men.

Research Questions

The research questions for this study are:

1. What are the relationships of prostate cancer and prostate cancer screening, attitudes, subjective norms, situational barriers, and knowledge with prostate cancer screening intent?
2. What are the relationships of demographic variables, prostate cancer screening history, family history of prostate cancer, and perceived risk of prostate cancer, with prostate cancer screening intent?

Significance of the Study

Health Disparities

The National Center for Health Statistics (2008) acknowledged that over the past 50 years, the health of both African Americans and Caucasians has improved in the United States. Despite notable gains in overall life expectancy, African American men continue to bear the burden of disease and excess mortality in the United States. The Institute of Medicine (2002) reported that the estimated life expectancy for Caucasian men is 74 years and for African American men is 66 years. This disparity in life expectancy is consistent with the disproportionate excess in cancer incidence and mortality experienced by African American men compared with Caucasian men (National Center for Health Statistics, 2008).

No one factor has been attributed to the disproportionate burden of disease and premature mortality among African American men. Conversely, a complex interaction

among multiple social and economic factors is believed to affect the health status of populations. Associations between poverty, race, insurance status, access to quality health care, environmental injustices, and institutional racism have been well documented (Carter-Pokras & Baquet, 2002; Qureshi et al., 2000; Williams et al., 2008). Nonetheless, studies have found that socioeconomic status (SES), insurance coverage, and/or access to care do not fully explain the excess mortality and reduced survival rates among African American compared with Caucasians (Baquet & Commiskey, 2000; Lannin et al., 1998; Mustard & Etches, 2003; Newman et al., 2002; Ward et al., 2004).

Apart from social and economic factors, personal factors have also been linked to the health outcomes of diverse racial and ethnic groups (Institute of Medicine, 2003). The personal level, as a source of health disparities, cannot be disregarded since behavioral choice is arguably the most influential determinant of population health (McGinnis et al., 2002). For example, once African American men receive prostate cancer screening recommendations from a health care provider, the decision to screen or not to screen rests on them. The question then becomes what factors drive personal choice and how are they associated with broader social and contextual factors, such as cultural influences.

Prostate Cancer Disparities

There has been an overall decline in prostate cancer morbidity among men in the United States. On the other hand, the general decline in prostate cancer deaths has been negligible among African American men when compared with Caucasian men (Ries et al., 2004). Racial and ethnic differences in prostate cancer outcomes have generated growing interest in the underlying biological and social factors believed to contribute to

these disparities. These predisposing factors include race, genetics, age, and lifestyle. According to the American Cancer Society (2006), all men are presumed at risk for prostate cancer; however, race has remained a consistent risk factor in predicting the likelihood for developing the disease. Prostate cancer incidence is nearly 60 percent more common among African American men than Caucasian men (American Cancer Society). More notably, the National Cancer Institute (2007) reported the mortality rate for African American men as being twice that of Caucasian men in the United States. This disparity has, in part, been attributed to African American men being diagnosed with prostate cancer in its latter stages, which suggests delays in screening for this group.

Delays in prostate cancer screening among African American men are consistent with their underutilization of primary health care services. African American men often forgo preventative services, opting instead to delay treatments, or to avoid care altogether (Cheatham et al., 2008). A number of studies have shown that African American men are less likely to undergo prostate-specific antigen (PSA) screening (Demark-Wahnefried et al., 1995a; C. B. Steele et al., 2000) when compared with Caucasian men. Etzioni et al. (2002) examined trends in PSA use and associated cancer detection among African American and Caucasian Medicare recipients from 1991 to 1998. Results suggested that annual testing rates in 1998 were 20 percent higher for Caucasians than for African Americans, with the exception of men over 80 years of age. These delays in prostate cancer screening may be the result of specific barriers to health seeking behaviors faced by African American men.

The challenge in addressing prostate cancer-related disparities has been the absence of modifiable risk factors and the ongoing debate surrounding screening efficacy

(Allen et al., 2007). Despite the prostate cancer screening controversy, most medical organizations encourage men to discuss screening options with their health care providers (American College of Physicians, 1997). While the literature on informed decision making for cancer screening has grown, few studies have focused on understanding sociocultural factors that affect African American men's perceptions of prostate cancer (Abbott et al., 1998; Forrester-Anderson, 2005; Myers et al., 2005a; Sellers & Ross, 2003).

One theory in the underutilization of prostate cancer screening tests by African American men is based on the sociocultural barriers to health care they experience. The effect of culture on attitudes and behaviors related to health is well known and has been acknowledged for many years (Reeder & Berkanovic, 1973; Suchman, 1965). The sociocultural perspective takes the view that behaviors are not only shaped by prior learning experiences, but also by the social or cultural context of the behavior.

Sociocultural Constructs and Health

Briggance and Burke (2002) stated that "the progression of the United States towards multiculturalism will have profound and permanent effects on our healthcare delivery system" (p. 62). Cultural groups exhibit diverse health care utilization patterns, perceptions of disease and illness, as well as differences in interactions with mainstream health professionals and organizations (Harwood, 1981). Gentry (1987) referred to studies that were conducted for the Public Health Service (PHS) Task Force on Women's Health. One key area identified in the studies as having an effect on morbidity and mortality was cultural and social values and attitudes.

Addressing racial and ethnic health disparities in an increasingly multicultural landscape requires the examination of sociocultural determinants of health and health related outcomes (Brach & Fraser, 2000; Lewis-Fernández & Diaz, 2002). Sociocultural factors are thought to contribute to health disparities that currently exist among certain groups. A sociocultural perspective takes into account both social and cultural constructs and the interrelationships between them (Deshpande et al., 2009). According to an Institute of Medicine (2006) report, examining cultural constructs and social variables in the context of culture is needed to understand why some groups choose to adopt or not adopt recommended behaviors. This includes cancer screening as well as other cancer control behaviors.

In a mediational framework, correlating sociocultural variables to cancer outcomes suggests that sociocultural constructs of significance to cancer disparities are those that affect beliefs, attitudes, and behaviors related to prevention and screening (Meyerowitz et al., 1998). However, the association between sociocultural distinctiveness and patterns of disease risk, health behaviors, and delayed diagnosis has not been fully documented or well understood (Consedine & Skamai, 2009). While the body of literature centering on the health seeking patterns of African American men is growing, more research is needed on the sociocultural determinants of cancer control behaviors.

The Theory of Planned Behavior (Ajzen, 1985, 1987) postulates that intention mediates between behavior and behavioral beliefs, normative beliefs, and perceived control beliefs. To date, there has been a paucity of studies utilizing the Theory of Planned Behavior to investigate beliefs centering on prostate cancer and prostate cancer

screening among African American men. The use of this theoretical framework is important for understanding sociocultural processes that guide intent among African American men to undergo prostate cancer screening tests. Examining social and cultural influences on health-related behaviors may have profound implications for explaining and predicting the prostate cancer screening delays among African American men. Once these factors are better understood, health care professionals can begin to implement strategies that may reduce the disparity in morbidity and mortality between African American and Caucasian men.

CHAPTER II

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

There has been a dearth of research examining the relationship between sociocultural factors and prostate cancer screening intent among African American men. An exploration of sociocultural variables associated with prostate cancer screening practices of African men will be the focus of the literature review. These sociocultural factors, such as socioeconomic status (SES), beliefs, and perceived personal risk of prostate cancer, are believed to shape prostate cancer screening behaviors. Constructs from the Theory of Planned Behavior will provide a framework for examining variables of interest for this study. These variables include cancer fatalism, fear/apprehension of screening, perceived benefits of screening, social influence, barriers to screening, and prostate cancer screening intent.

Prostate Cancer

Prostate cancer is the most commonly diagnosed cancer among men and second only to lung cancer in the number of cancer deaths (U.S. Cancer Statistics Working Group, 2009). The American Cancer Society (2009) estimated that 192,280 new cases of prostate cancer will be diagnosed in 2009 and 27,360 men will die of prostate cancer. For reasons that remain unclear, African American men have the highest rate of incidence for prostate cancer in the world (Edwards et al., 2002; Jemal et al., 2005). Moreover, the prostate cancer mortality rate for African American men is twice that of Caucasian men

in the United States. Statistics indicate that from 2002-2006 the age adjusted prostate cancer death rate was 23.6 per 100,000 among Caucasian men compared with 53.6 per 100,000 among African American men (U.S. Cancer Statistics Working Group, 2009). African American men have been diagnosed over Caucasian men at a rate of 3:1 with advanced stage prostate cancer (Woods et al., 2006). Stage at diagnosis has been posited as a key factor contributing to the disparity in prostate cancer mortality that currently exists between African American and Caucasian men.

Generally, there has been a downward trend in mortality rates associated with prostate cancer; however, this trend has been negligible among African American men (Edwards et al., 2002; Jemal et al., 2005). Although prostate cancer screening remains controversial, it is currently the only method recognized to control prostate cancer disease through early detection.

There is evidence that prostate specific antigen (PSA) screening can detect early stage prostate cancer (Agency for Healthcare Research, 2002), and it is recommended that men at high risk, based on race and family history, should begin early detection with PSA blood test and digital rectal exam (DRE) at 45 years of age (American Cancer Society, 2004). Additionally, the American Urological Association (2001) recommended that African American men with multiple first degree relatives diagnosed with prostate cancer begin testing at 40 years of age. Despite these recommended guidelines, there is evidence that African American are less likely to participate in prostate cancer screening services as a method of early detection. Poor adherence to screening guidelines raises the question of whether or not there are patterns in knowledge and beliefs toward prostate cancer screening within subculture of African American men.

Prostate Cancer Screening

The excessive mortality rates from prostate cancer experienced by African American men continue to be a major public health concern. One theory related to the disparity in deaths from prostate cancer among African American men is based on their lower prostate cancer screening rates. Very few African American men participate in annual prostate cancer screening (Odedina et al., 2008). Furthermore, the probability of African American men with a family history of prostate cancer being tested for prostate cancer is less than the probability of African American men without a family history (Weinrich, 2006).

A number of surveys have indicated that African American men are less likely to undergo prostate-specific antigen (PSA) screening (Demark-Wahnefried et al., 1995a; C. B. Steele et al., 2000) when compared with Caucasian men. Etzioni et al. (2002) examined trends in PSA use and associated cancer detection among African American and Caucasian Medicare recipients from 1991 to 1998. Results indicated that annual testing rates in 1998 were 20 percent higher for Caucasians than for African Americans, with the exception of men over 80 years of age. This pattern of prostate cancer testing suggests a link between screening behavior and increased mortality rates experienced by African American men.

Sociocultural Constructs in Prostate Cancer Prevention and Control

Sociocultural factors have been theorized to influence cancer prevention and control beliefs and behaviors. These factors have been viewed as barriers in the disparities literature and are believed to contribute, notably, to differences in cancer

screening access and utilization patterns among populations. Social structural factors include racism and the disproportionately lower SES of African American men restricting their access to health knowledge, their opportunities for cancer screening, and their access to adequate health care. Cultural factors include attitudes and beliefs about prostate cancer and prostate cancer screening. For example, studies suggest African Americans are more likely to embrace fatalistic beliefs (Mayo et al., 2001; B.D. Powe & Johnson, 1995). Fatalism refers to the belief that events are beyond an individual's control (B.D. Powe, 1995). Studies have found that less educated groups are more likely to adopt fatalistic views concerning cancer (Niederdeppe, & Gurmankin, 2007; Powe, 1996). Thus, to adequately explain the lower rates of prostate cancer screening among African American men requires an examination of the complex interaction between social structure and cultural factors.

Recognizing the role that sociocultural environments play in determining health-related behaviors is vitally important in eliminating health disparities. Furthermore, an understanding of the relationship between sociocultural constructs and cancer-related screening is important to the development of relevant and effective cancer prevention and control interventions (Deshpande et al., 2009). Sociocultural factors associated with disease risk, symptom recognition, and delayed diagnosis in relation to prostate cancer screening patterns among African American men offers a viable framework for addressing health-related disparities.

Social Determinants of Prostate Cancer Screening Practices

Researchers have identified several social factors that vary according to population subgroups and are believed to affect population health. These social factors, which include SES and insurance coverage, are believed to underlie delays in prostate cancer screening experienced by African American men. Low socioeconomic position has been linked to poorer prostate cancer outcomes, but not to the higher incidence of prostate cancer among African American men (Gilligan et al., 2004). Studies using data from the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute (NCI) have found disparities in stage at diagnosis by income or poverty level (Singh et al., 2003), occupation or profession (Schwartz et al., 2003), and insurance coverage (McDavid et al., 2003; Roetzheim et al., 1999).

The issue of socioeconomic disparities in health-related behaviors is complex. The results of existing studies do not consistently support or dispel one specific contributory factor to prostate cancer screening behavior. For example, Gilligan et al. (2004) analyzed all associations among PSA testing frequency, race, age, socioeconomic status, and co-morbidities. The data found PSA screening to be inversely associated with African American race after controlling for SES and co-morbid confounders. More specifically, African American men were 50 percent less likely to undergo routine PSA testing than Caucasian men.

Conversely, Fowke (2005) investigated racial differences in prostate cancer screening using a sampling frame of predominantly low-income men, between 40 to 79 years of age for their study. Eighty four percent of the men in this study were African American. The results of this study demonstrated that racial differences in screening

prevalence varied with age. Of men older than 65 years of age, Caucasians were significantly more likely to report a PSA test over the past 12 months when compared to African Americans; however, when socioeconomic status was controlled for, these disparities were reduced. More significantly, among participants younger than 65 years of age, Caucasians were roughly equal to African Americans in not receiving a PSA test over the past 12 months, with little change after adjusting for SES.

Winterich et al. (2009) examined the roles of education, race, and screening status in men's beliefs and knowledge about prostate cancer. The aim of this research was to examine how educational attainment, race, and screening status alone influenced men's knowledge of prostate cancer and screening. They surmised that limited knowledge of prostate cancer and prostate cancer screening contributed to the racial disparity in prostate cancer deaths. In-depth interviews were conducted with 65 African American and Caucasian men from diverse educational backgrounds. Their study concluded that education, not race, was associated with prostate cancer and prostate cancer screening knowledge (Winterich et al., 2009).

Summary

A social disparity in health can be characterized as the unequal distribution of health across some social space (Messer, 2008). A social gradient with respect to low SES and poor health outcomes has been consistently documented in the United States (Adler et al., 1994; Marmot et al., 1991). However, the direct mechanism by which SES affects health and health-related outcomes, specifically cancer-related mortality, is not clear. It is generally assumed that higher SES is a precursor to improved health care

access. However, several questions can be posed in relation to links between health and SES. First, what aspects of SES, such as income and education, really matter? Second, what is the direction of causation? For instance, does lower SES contribute to poorer health, or does poorer health contribute to poorer SES? Third, are there specific gradients of SES that contribute to gaps in adherence to recommended cancer screening guidelines? Although existing studies reveal variations in SES and prostate cancer screening practices of African American men, the SES and health link has not been fully explained.

Cultural Determinants of Prostate Cancer Screening

In addition to the SES gradient in health, there also seems to be a cultural gradient, with culture moderating the relationship between SES and health (Steffen, 2006). According to Berry et al. (2002), culture-behavior relationships are reciprocal in that individual human beings produce culture, and individual behavior is influenced by culture. The concept of culture in its broadest sense is cultivated through a person's learned, accumulated experiences, which are socially transmitted (Hofstede, 1997). Culture in the context of health behavior has been defined as unique shared values, beliefs, and practices that are directly associated with a health-related behavior (Pasick et al., 1994). It has been postulated that cultural influences guiding health-seeking behaviors is determined, in part, by social systems. Therefore, the decision of whether or not to participate in prostate cancer screening would be influenced by the potential participant's culture.

Knowledge, Attitudes, and Beliefs

Medical sociologists have theorized that cultural background can explain beliefs, expectations, and perceptions about the usefulness of intervention or treatment regimens (Agho & Lewis, 2001). Despite the relatively low prostate cancer screening rates among African American men, little is known about the screening beliefs, expectations, and perceptions of this sub-group. Researchers have suggested that barriers to screening may be deeply embedded in the attitudes, customs, experiences, and practices of African American men (Forrester-Anderson, 2005). The interplay among these barriers contributes to the complexity in understanding screening delays exhibited by this group.

Critical Analysis of Relevant Literature

Qualitative Studies

Several factors are believed to act as barriers to cancer screening among African Americans and other minority groups. These factors include lack of knowledge that underlie health and cultural beliefs, and unhelpful attitudes of health professionals (Thomas et al., 2005). Psychosocial correlates of cancer screening participation consist of beliefs and perceptions surrounding risks and susceptibility (Hoffman & Gilliland, 1992; McDavid et al., 2000; Ronald E. Myers et al., 1999). Additionally, African American men have expressed uncertainty regarding accuracy of the tests, and whether or not their physicians recommend the tests (Merrill, 2001; C. B. Steele et al., 2000). A number of qualitative studies have been conducted to explore perceptions surrounding prostate cancer and prostate cancer screening (Agho & Lewis, 2001; Blocker et al., 2006;

Forrester-Anderson, 2005; Fowke et al., 2005; McDougall *et al.*, 2004; McFall et al., 2006; Richardson et al., 2004; Sally P. Weinrich, 2006; Sally P. Weinrich et al., 2004; Woods et al., 2004).

McFall et al. (2006) explored beliefs about prostate cancer risks, screening, and shared decision-making among African American, Caucasian, and Hispanic men and women. The participants were recruited from primary care settings and included 33 African Americans, 35 Hispanics, and 22 non-Hispanic Whites. Of the 90 participants, 53% were male. The emergent themes concerning prostate cancer risk included heredity, age, and race, and other lifestyle influences as risk factors of prostate cancer. While Hispanic and Caucasian men did not recognize race as a risk factor, African American men were acutely aware of their increased risk of prostate cancer. Furthermore, African American men recognized the racial disparity in prostate cancer incidence and mortality. Interestingly, not only did African Americans express a collective risk of prostate cancer, they also suggested a collective approach to improving screening rates in their community (McFall).

In a similar study, Forrester-Anderson (2005) used focus group methodology to explore prostate cancer and screening knowledge, perceptions, attitudes, and behaviors. However, unlike McFall et al. (2006), this study targeted only African American men who were 40 years of age and older. Several themes emerged from 12 focus groups concerning barriers to screening. These themes included limited knowledge about the disease, lack of access to screening services, embarrassment, and fear of a positive diagnosis and related sexual dysfunction. Participants reported that many men did not participate in prostate cancer screening because of the cost associated with testing and the

lack of health insurance coverage. Additionally, participants who had not been screened for prostate cancer were more likely to report that they had no knowledge about the PSA or the DRE (Forrester-Anderson, 2005).

Clarke-Tasker and Wade (2002) were interested in exploring prostate cancer and screening perceptions of African American men. Unlike similar research, the investigators applied the Health Belief Model as a framework to examine knowledge, attitudes, and perceptions of prostate cancer and early detection methods among African American men. The results from this study were consistent with related studies. For example, although the participants felt there was value in early detection, they expressed fear over possible changes in their sex life if they were diagnosed with prostate cancer. Additionally, they considered a DRE to be embarrassing and uncomfortable (Clarke-Tasker & Wade, 2002).

Blocker et al. (2006) also used focus groups to assess prostate cancer attitudes and behaviors to inform culturally relevant interventions aimed at improving screening behaviors of African American men. As with the Clark-Tasker and Wade (2002) study, this research was framed around constructs from the Health Belief Model (Becker, 1974) to identify important beliefs, barriers, and motivators associated with prostate cancer screening behavior. One important theme that emerged from the groups was the positive influence of spouses/partners on promoting cancer screening. Additional findings were consistent with those of comparable studies reporting major barriers and challenges to screening (Clarke-Tasker & Wade, 2002; Forrester-Anderson, 2005; McFall et al., 2006). These barriers and challenges included distrust of the medical community and negative attitudes towards specific screening tests (Blocker, 2006).

Woods, Montgomery, and Herring (2004) used a qualitative methodology to elucidate attitudes, beliefs, and practices of African American men regarding prostate cancer prevention behaviors. They found that lack of knowledge creates fear, which, in turn, increases the likelihood that an individual will not access information on prevention. Additionally, visits to the doctor were viewed as necessary only in the presence of pain or symptoms (Woods, Montgomery, & Herring, (2004). Therefore, preventive health services were not perceived as essential.

In contrast to other studies, Richardson et al. (2004) used a different approach to assess knowledge and beliefs of prostate cancer among cohort of low SES African American men. The focus group discussions not only centered on prostate cancer knowledge, but also on the myths and misinformation thought to serve as barriers to prostate health decisions and behaviors. The participants identified both sociocultural and psychological barriers to prostate cancer screening that included lack of adequate knowledge about prostate health and cancer, fear, denial, and apathy. The endorsement of these barriers was attributed to poor participation or no participation in prostate cancer screening services. Furthermore, the socioeconomic disadvantage was believed to heighten the knowledge and attitudinal barriers to the early detection of prostate cancer (Richardson et al., 2004).

There were common themes identified across each of the qualitative studies regarding perceived barriers to prostate cancer screening. For example, principal themes throughout most of the studies were feelings of embarrassment, anxiety, fear of the procedure, and distrust of the medical community (Clarke-Tasker & Wade, 2002; Forrester-Anderson, 2005; McFall et al., 2006; Richardson et al., 2004; Woods et al.,

2004). The lack of knowledge about prostate cancer and prostate cancer screening was perceived as affecting other barriers to care (Forrester-Anderson, 2005; Richardson et al., 2004; Woods, Montgomery, & Herring, (2004). Despite the reported barriers, participants believed having regular exams could be effective in the early detection of prostate cancer and they were not against having the procedure done (Clarke-Tasker & Wade, 2002). These themes are relevant when examining the role of sociocultural constructs in prostate cancer prevention and control behaviors and their impact on the screening behaviors of African American men.

Summary. These qualitative studies attempted to clarify the relationship between knowledge beliefs and beliefs related to prostate cancer screening behaviors. This methodology allowed participants to discuss factors that influence participation in prostate cancer screening services. Notwithstanding some of the reported differences, salient themes emerged from the data. For instance, the analyses presented an expressed willingness to participate in prostate cancer screening despite their associated fear, embarrassment, and limited knowledge. Thus, the ability to engage African American men in the health care system or more specifically in prostate cancer screening may occur within a larger sociocultural context. This larger sociocultural context would include sub-populations of age, lifestyle, perceived risk, and socioeconomic status.

Quantitative Studies

The impact of factors associated with low SES in conjunction with higher prostate cancer incidence and mortality rates based on race represents a significant health care challenge. Several researchers have explored knowledge and beliefs regarding prostate and prostate cancer screening. However, studies conflict on whether race or

socioeconomic status affects knowledge and beliefs of prostate cancer and prostate cancer screening. It is yet to be determined whether cancer-related disparities represent the effects of race and socioeconomic status or whether these disparities represent a combined action of the two.

McDougall et al. (2004) reported on the outcomes of a health fair that specifically targeted African American men for the measurement of perceived barriers to prostate cancer screening. Data analyses were conducted with education as a grouping variable. Generally, the barrier that ranked the highest among men in the sample was “Too many things going on in their lives.” Conversely, those men without a college degree ranked “Nobody in the family had prostate cancer” significantly higher than those with a college degree. This study suggests that social and personal factors associated with perceived barriers to prostate cancer screening may be influenced by educational level.

Weinrich et al. (2004) measured knowledge of prostate cancer among low-income men. Seventy four percent of the participants were African American. The study found that *married men*, *low-income men*, and *Caucasian men* had significantly lower total knowledge scores than *unmarried*, *higher income*, and *African American men*. This study differed from previous research in which African American men had less knowledge than Caucasian men (Abbott et al., 1998; Barber et al., 1998; S.P. Weinrich et al., 1998).

Chan et al. (2003) also assessed knowledge on the subject of the prostate-specific antigen (PSA) screening among African Americans and Caucasians. Men attending outpatient clinics were surveyed for their knowledge about and experience with screening. The findings of this study found that both groups learned about screening

through sources other than their physicians; however, unlike the Weinrich (2004) study, African American men were less knowledgeable than Caucasian men about PSA testing. Furthermore, African American men heard about prostate screening primarily through radio or television, whereas Caucasian men typically learned about screening from reading the newspaper.

In another study, Denmark-Wahnefried (1995b) conducted a survey to determine prostate cancer related knowledge, beliefs, and prior screening behaviors of African American and Caucasian men. The study found differences in prostate cancer related beliefs knowledge and beliefs between African American and Caucasian men in perception of the disease and its treatment, and knowledge of risk factors associated with race. For example, approximately half of the African American men viewed prostate cancer as a death sentence. Similar to the Chan et al. (2003) study, Caucasian men were more likely to list the newspaper as their primary source of screening resources, as opposed to African Americans who reported television.

Talcott et al. (2007) identified factors associated with the increased rate of prostate cancer deaths among African American men when compared to Caucasian men. These researchers took the unique approach of interviewing both African American and Caucasian men in North Carolina who were all within six months of being diagnosed with prostate cancer. Findings suggested that despite lesser education, African American men acknowledged their greater risk of prostate cancer and reported more personal failures that delayed diagnosis that included fear and fatalism. As with similar studies prostate cancer screening was viewed as important to health and cancer-related outcomes.

Despite this belief, there were perceived obstacles that resulted in delayed cancer screening.

Summary. The importance of drawing comparisons between cognitive, cultural, and socioeconomic variables, with respect to the health-related behaviors of African American men, has been noted in several studies. For example, Neighbors and Jackson (1984) identified distinct patterns of illness behavior in the African American community in relation to differential use of informal networks and professional help. In addition, gender, age, income, and problem type were extensively linked to different patterns of health and illness behavior. Jernigan et al. (2001) found that African American men were less likely to initiate tests for prostate cancer on their own and relied on those females in their network to encourage them to take action once they verbalized specific symptoms and concerns. Based on these precedents, further exploration into social norms (Jacobson, 1986) as well as group effects are considered necessary to better explain their impact on the health and illness behavior of African American men.

Theoretical Frameworks Used to Explain Prostate Cancer Screening Behaviors

The use of theory, grounded in social psychology, is an important organizing framework in understanding cognitive and behavioral responses to health-related issues. Assessing a set of commonly held beliefs by a defined group of people enables researchers to predict individual behavior or personality traits. This is based on the assumption that transmission of shared cultural elements, such as beliefs and value systems, across generations has greater influence than the effect of individual activity on cultural practices.

Cognitive-Behavioral Theories and Prostate Cancer Screening Perceptions and Beliefs

Despite the burden of disease and premature mortality experienced by African American men, there have been only modest attempts to explain their health-related behaviors, with respect to prostate cancer, using cognitive-behavioral theories. These frameworks have included the Health Belief Model (Myers, 1999; Plowden, 1999) and the Preventive Health Model (Myers et al., 2000b; Myers et al., 1996).

Preventive Health Model. The Preventive Health Model (PHM) (Myers et al., 2000b; Myers et al., 1996) integrates major constructs from preventive health behavior theories and self-regulation theory. Preventive health behavior theories posit that people are highly rational in decision making about health behavior insofar as people consider the likelihood that certain health-related events will or will not occur as well as personal values related to occurrence of the event (Cameron & Leventhal, 2003). The self-regulation theory assumes that individuals form cognitive and affective representations of health-related problems and that these representations have an effect on whether or not people choose to engage in specified health behaviors (Janz & Becker, 1984). The PHM theorizes that background, psychologic representation, social support and influence, and program factors are associated with both intention to engage in a preventive health behavior and taking preventive action (Myers et al., 1996).

Myers et al. (1996) applied the PHM (Myers et al.) to assess the receptivity of African American men in Philadelphia to annual prostate cancer screening with the aim of predicting their intent of participating in prostate cancer screening tests. This study found that over two thirds of the participants intended to undergo annual prostate cancer screening. In addition, most men tended to view prostate cancer screening as reasonable

and effective for the prevention and early diagnosis of prostate cancer. Despite their findings, the authors remained skeptical that African American men were unconditionally receptive to prostate cancer screening, stating that relatively few men in the study perceived their personal risk for prostate cancer as being high. Furthermore, other factors contributing to prostate cancer screening were expressed through concerns over the abnormal screening results, screening related discomfort and embarrassment, and financial cost.

In another study, Myers et al. (2000b) applied the PHM (Myers et al., 1996) to examine the background characteristics, social influence factors, and program factors thought to be associated with African American males and genetic testing for prostate cancer. The purpose of this study was to identify factors associated with the intent of African American men participate in tests to determine their genetic risk of prostate cancer. Unlike the Meyers et al. (1996) study, they found that past screening, perceived susceptibility, and beliefs related to early detection may influence receptivity to testing for prostate cancer risk.

Studies using the PHM (Myers et al., 2000b; Myers et al., 1996) as a framework for examining prostate cancer screening behaviors of African American men found that cognitive and socio-demographic factors were the most significant predictors of the intent to take preventive action and actual preventive behavior. Contrastingly, affective factors such as social support and influence did not predict cancer screening use among this population.

Researchers have theorized that conditions where an individual is encouraged to consider the benefits and risks of cancer screening, affective factors may become

significant in elucidating behavior. Trafimow et al., (1998) found that for many behaviors, affect made a larger contribution than cognition in predicting behavioral intentions. This is based on the principles that although people are aware of screening for cancer and believe these tests are beneficial; however, they still do not participate in cancer screening. Ajzen and Fishbein (2005) underscored the importance of affect, but in addition emphasized the use of attitude measures that include both instrumental and affective behavioral components, such as cancer-specific anxiety or apprehension regarding the actual screening procedures.

Health Belief Model. In the exploration of cognitive influences on health behaviors, the Health Belief Model (Rosenstock, 1974) has been viewed as the preeminent, empirically based theory (Damrosch, 1991; Myers et al., 1999; Plowden, 1999). Consequently, the HBM is considered to be a useful framework for understanding and predicting health-related practices of African American men, particularly in the area of prostate cancer screening (Myers et al.; Plowden). There have, however, been criticisms of the HBM based on its limited ability to address such psychosocial concerns as attitudes and beliefs about illness, economic and cultural factors, and the role of the social network in illness or disease (Damrosch, 1991).

The central premise of the HBM (Rosenstock, 1974) is that understanding an individual's motivation to engage or not engage in certain health-related behaviors will help determine the individual's pattern of preventive health practices Bloom et al. (2006a) applied the HBM (Rosenstock) to understand why people accept preventive health services and why they do or do not adhere to health regimens. With respect to prostate cancer, they theorized that men with a family history of prostate cancer would

perceive themselves as more vulnerable, so that the benefits would outweigh the barriers and they would be likely to have received a recent test. Consequently, the findings of this study did not support the hypothesis that family history was associated with increased perceived risk, nor did they report more cancer worries. Several studies measuring the external prompts that motivate African American men to seek health care have shown similar findings. These studies demonstrated that African men with positive family histories of prostate cancer report surprisingly low rates of prostate cancer screening (Weinrich, 2006).

Summary. Research has identified a number of behavioral-cognitive factors thought to influence prostate cancer screening practices among African American men. However, it remains unclear as to whether or not the correlates of SES plays a significant role in screening patterns, or to what extent they interact with behavioral and cognitive processes. A general limitation of the HBM (Rosenstock, 1974) and PHM (Myers et al., 2000b; Myers et al., 1996) is that they do not take into account cultural, environmental or economic factors that may influence health behaviors. In other words, these models focus on internal processes and mechanisms, and essentially discount the premise that these processes may be occurring within the socio-cultural context of family, neighborhood, and community.

Limitations of Previous Research

The importance of understanding cultural influences on health-related attitudes, beliefs, and practices has been underscored in the disparities literature. Even so, there has been a paucity of published accounts, based on empirical data, explaining the role of

culture on health related outcomes of African American men (Hughes-Halbert et al., 2007). Additionally, research using theoretically driven approaches used to explain and predict the role of culture in shaping health-related behaviors of racial and ethnic minorities, particularly African American men, has been limited.

The central tenet of culture and its relationship to health is that culture provides a social context, and affects the pervasiveness of specific behaviors (Maxwell, 2002). Lifestyles and behaviors associated with health disparities are frequently characterized by some combination of socioeconomic disadvantage and intercultural distinctions that often occur in tandem (Page, 2005). Researchers have often acknowledged that the environment in which one lives contributes to health (Borrell et al., 2004; Morello-Frosch & Jesdale, 2006). For example, sharing a social environment often determines an individual's access to goods and services, the built environment, social norms, and other factors relevant to health (Cubbin et al., 2000). Social construction has been expressed through categories such as social class, gender, religion, and social relationships (Dein, 2006). Therefore, to understand cultural phenomena in relation to health, a conceptual shift must account for social and economic conditions that affect social construction.

Disparities research calls for a transformative approach that accounts for the link between socio-political processes and health. Additionally, better interpretation of culture and the way in which it interfaces with social and economic environments is also needed for understanding diverse health-related practices. The relationship among socioeconomic variables and health-related behaviors has been widely observed. However, the examination of culture as an explanatory variable for socioeconomic gradients in the health-related behaviors of African American men have rarely been

incorporated into research models (Dressler et al., 1998). Thus, even though culture is thought to influence health-related behaviors, the complex interactions between the social and economic environment and culture remain unclear.

The examination of intracultural cognitive, behavioral, or attitudinal diversity is thought to be essential for elucidating cross-cultural differences (Realo & Allik, 2002), thereby providing vital insights into subgroups based on factors such as race, gender, and SES. Consequently, an alternative approach to framing future research is needed for examining the way in which culture operates through beliefs thought to influence the health behaviors of sub-groups. An unconventional approach to operationalizing culture requires a methodology that redefines the basic concepts and common variants of a selected theory. This altered perspective may provide empirically testable predictions or explanations of cultural determinants associated with the health practices of African American men.

Scientific evidence suggests that sociocultural determinants of health do not operate in isolation. Rather, they act together in complex relationships between the individual and the basic structuring of society (Bejakel & Goldblatt, 2006). Cultural groups exhibit diverse healthcare utilization patterns, perceptions of disease and illness, as well as differences in interactions with mainstream health professionals and organizations (Harwood, 1981). Cultural explanatory frameworks specify three key determinants of health screening behaviors: 1) socioeconomic factors; 2) the impact of cultural beliefs; and 3) the influence of community social networks on screening behaviors (Rajaram & Rashidi, 1998). Unfortunately, the literature reveals little that explains and predicts the health behaviors of African American men. This lack of

cultural knowledge can be attributed to a focus on African American men as a race rather than as an ethnic group with unique cultural traits (Thomas, 2001).

Theoretical Framework

Theory of Planned Behavior and Prostate Cancer Screening

This research uses the Theory of Planned Behavior (TPB) (Ajzen, 1991b) to examine prostate cancer screening intentions among African American men. The Theory of Planned Behavior is an expectancy-value theory. Expectancy value theories assume that human behavior is rationally guided by logical thought processes (Henderson et al., 1979). The concepts included in the TPB are behavioral, normative, and control beliefs.

Consistent with the TPB (see Figure 1), a person's behavior is determined by their attitude towards the outcome of that behavior and by the opinions of the person's social environment. Attitude toward the behavior is the overall evaluation of behavior based on a person's beliefs about the consequences of the behavior. Subjective norms reflect a person's own estimate of the social pressure to perform or not perform the target behavior. These norms are assumed to have interactive components of beliefs about how other people would like them to behave. Perceived control represents the extent to which a person feels able to enact the behavior. Control beliefs are determined by the power of both situational and internal factors that inhibit or facilitate carrying out the behavior.

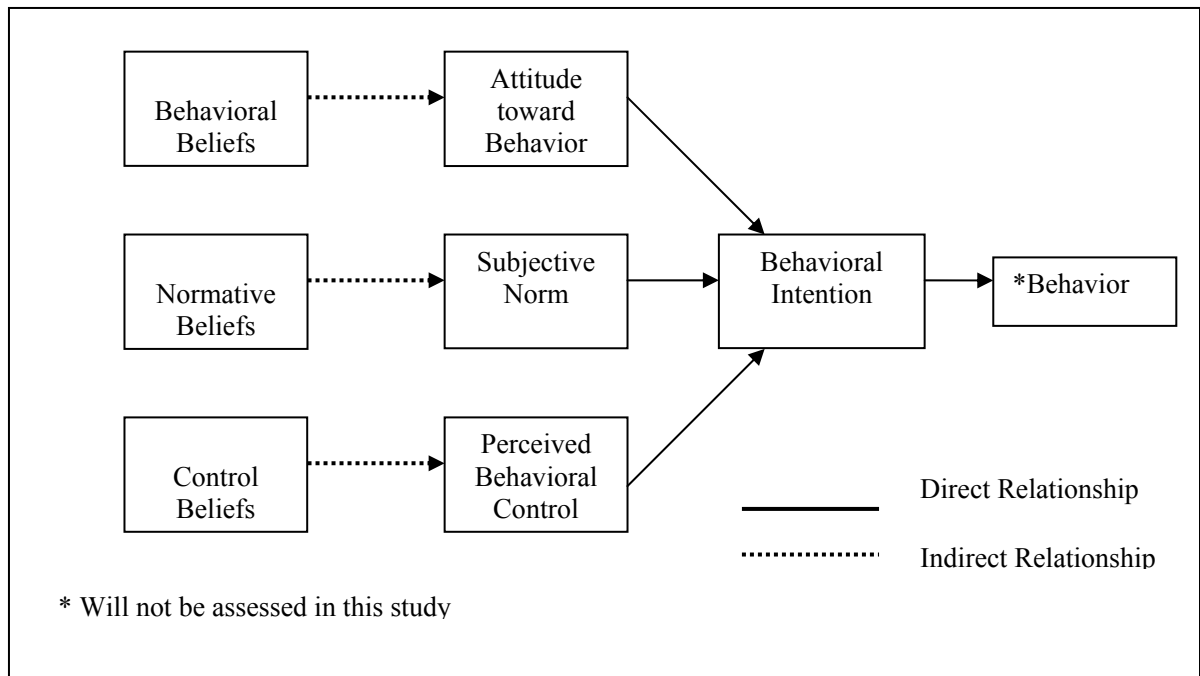


Figure 1: Theory of Planned Behavior (Ajzen, 1991b)

Theory of Planned Behavior and Related Literature

Although the validity of the TPB has been well established in the literature, there has been limited application of this theory in the study of African American men. This paucity of related literature limits the ability to offer a comparative summary of previous research on application of the TPB.

According to Rahim, Golembiewski, and Mackenzie (2005) there are two significant assumptions of the TPB, which are “human beings are rational and make systematic use of information available to them; and people consider the implications of their actions before they decide to engage or not engage in certain behaviors (p. 211).”

The TPB asserts that the best predictor of behaviors is the strength of the intention (Ajzen, 1987). The intention to engage in a specified action is presumed to be a precursor to behavior. Armitage and Conner (2001) conducted a quantitative integration

and review of that research from a database of 185 independent studies published up to the end of 1997. This study indicated that the TPB accounted for 27% and 39% of the variance in behavior and intention, respectively. Additionally, when behavior measures were self-reports, the TPB accounted for 11% more of the variance in behavior than when behavior measures were objective or observed.

Steele and Porche (Steele et al., 2000, 2005) examined the TPB to predict mammography intention among rural women in Southeastern Louisiana. The investigators theorized that mammography behavior is an observable or documented response mediated by actual behavioral control and intention. On the other hand, intention was mediated by a woman's attitude towards mammography, how much a woman feels socially pressured to obtain a mammography, and her perceptions of being able to obtain a mammography. The findings of this study suggest that perceived behavioral control explained the majority of the variance and, therefore, was the strongest predictor of mammography intention.

Based on the TPB (Ajzen & Fishbein, 1980), intent to seek prostate cancer screening is a function of three determinants: attitude, subjective norms, and perceived behavioral control. Therefore, the prostate cancer screening practices of African American men could be explained and predicted by whether or not an individual is favorable to obtaining prostate cancer screening tests, whether or not the individual feels socially pressured to obtain or not obtain prostate screening tests, and whether or not the individual feels in control of obtaining prostate cancer screening tests.

There have been relatively few published accounts of research that explain the underlying beliefs of African American men related to prostate cancer screening

behaviors. Moreover, the correlates of these fundamental beliefs and socioeconomic factors among African American men have not been fully explicated in the research literature. The application of the TPB and related measures will not only contribute to understanding the complex concept of culture, but also will serve to explain and predict health-related practices and behaviors by quantifying specific cultural variables. For the purpose of this study, *culture* will be characterized as a complex set of relationships, responses, and interpretations that must be understood, not as a body of discrete traits, but as an integrated system of shared values, beliefs, and norms generated within specific socioeconomic and environmental contexts.

The TPB (Ajzen, 1991; Ajzen & Fishbein, 1980) postulates three conceptually independent determinants of intention. First, the attitude of African American men toward prostate cancer screening explains the degree to which they have a positive or negative valuation of prostate cancer screening. Second, subjective norm refers to the perceived social pressure experienced by African American men to participate or not participate in prostate cancer screening. Third, the antecedent of intention is the degree of perceived behavioral control, or the degree of ease or difficulty in prostate cancer screening participation experienced by African American. In addition, perceived behavioral control is assumed to reflect past experience as well as anticipated barriers and obstacles to prostate cancer screening.

The theoretical constructs of the TPB, explained by salient beliefs, predict a person's intention to perform a behavior. As shown in Figure 2, this study proposed to identify numerous beliefs salient to PSA screening and hypothesize that each of the

Theory of Planned Behavior theoretical constructs will contribute significantly to explaining men's intentions to receive PSA screening.

Definition of Terms

Behavioral Beliefs & Attitude towards Behavior

Behavioral beliefs: An individual's belief about prostate cancer and prostate cancer screening (e.g., the belief that prostate cancer screening is uncomfortable)

Attitude toward behavior: An individual's positive or negative evaluation of self-performance of prostate cancer screening

Variables

- Fatalistic beliefs concerning prostate cancer
- Fear/Apprehension towards prostate cancer screening
- Perceived benefits of prostate cancer

Normative Beliefs and Subjective Norms

Normative beliefs: An individual's perception of prostate cancer screening, which is influenced by the judgment of significant others (e.g., parents, spouse, friends, physician)

Subjective norms: An individual's perception of social pressures or other relevant beliefs that he or she should not participate in prostate cancer screening

Variables

Social Influence of:

- Physician
- Family members

Control beliefs and perceived behavioral control

Perceived behavioral control: An individual's perceived ease or difficulty in performing a particular behavior

Control beliefs: Beliefs of African American men about the presence of factors that may facilitate or impede prostate cancer screening intention

Variables

- Situational barriers
 - Concerns of screening cost
 - Concerns of finding the time to screen
 - Concerns of embarrassment associated with screening
 - Concerns of discomfort associated with screening

Intention

Behavioral intention: An indication of an individual's readiness to perform a given behavior

Prostate Cancer Screening Intention of African American men

Variable

- Intent to participate in prostate cancer tests within a six month period

Knowledge of Prostate Cancer

Variables

- Limitations
- Symptoms
- Risk factors
- Side effects from treatment
- Screening age guidelines

Socioeconomic status (SES)

Variables

- Income
- Employment status
- Years of education

Background factors

Variables

- Age
- Marital status
- Prostate cancer screening history
- Family history of prostate cancer
- Beliefs concerning personal risk of prostate cancer

Research Questions

The research questions posed for this study are:

1. What are the relationships of prostate cancer and prostate cancer screening, attitudes, subjective norms, situational barriers, and knowledge with prostate cancer screening intent?
2. What are the relationships of demographic variables, prostate cancer screening history, family history of prostate cancer, and perceived risk of prostate cancer, with prostate cancer screening intent?

CONSTRUCT	OPERATIONAL DEFINITION	DATA SOURCE	ITEMS
Prostate Cancer Knowledge	Twelve items assessed knowledge about prostate cancer and prostate cancer screening using a “true”, “false”, and “don’t know” scale. Variables include: <ul style="list-style-type: none"> • Limitations • Symptoms • Risk factors • Side effects from treatment • Screening age guidelines 	(Sally P. Weinrich et al., 2004)	12
Attitude Toward Prostate Cancer Screening	Attitude toward prostate cancer was the degree to which prostate cancer screening was positively or negatively valued. Attitudes and beliefs about prostate cancer were assessed on a scale of strongly agree/sort of disagree/sort of agree/strongly agree. Variables included: <ul style="list-style-type: none"> • Fatalism • Fear/apprehension • Perceived benefits 	(R. Myers et al., 2005a)	13
Subjective Norms and Prostate Cancer Screening	Subjective norm represented perceived social pressure to adhere to prostate cancer screening. Participants were read statements concerning the expectations of referent other and wanting to do what these important others believed they should do about prostate cancer screening. Items were measured on a scale of strongly agree/sort of disagree/sort of agree/strongly agree. The variable included: <ul style="list-style-type: none"> • Social influence 	(R. Myers et al., 2005a)	4
Situational Barriers to Prostate Cancer Screening	Situational barriers were factors perceived to impede or facilitate the decision to participate in prostate cancer screening. These factors were presented as a list representing barriers to prostate cancer screening. Barriers were measured on a scale of whether the participant agreed/disagreed with each item. Variables included: <ul style="list-style-type: none"> • Concerns about cost of screening • Concerns about finding the time to screen • Concerns about screening discomfort • Concerns about embarrassment of screening 	(R. Myers et al., 2005a)	4
Prostate Cancer Screening Intent	Intent was an indication of a person’s readiness to participate in prostate cancer screening tests within a six month period. Intent consisted of a four point scale ranging from strongly agree to strongly disagree.	(R. Myers et al., 2005a)	3
Contributory Factors	Contributory factors are those that may or may not influence the intention to participation in prostate cancer screening tests. <ul style="list-style-type: none"> • Prostate cancer screening history • Family h/o prostate cancer • Perceived risk of prostate cancer • SES 	(R. Myers et al., 2005a)	8

Figure 2: Constructs and Operational Definitions

CHAPTER III

METHODOLOGY

African American men account for an excess in mortality associated with prostate cancer when compared with Caucasian men. Conversely, health care utilization patterns have indicated that African American men are less likely than Caucasian men to undergo prostate cancer screening tests. One theory in the underutilization of prostate cancer screening tests by African American men is based on their sociocultural values, beliefs, and attitudes concerning cancer prevention.

The purpose of this study was to examine the relationships among demographic factors, health-related beliefs, and health seeking intentions of African American men to participate in prostate cancer screening. The Theory of Planned Behavior (TPB) (Ajzen, 1991a) was adapted to frame the examination of sociocultural variables and the intent of African American men to participate in prostate cancer screening (see Figure 3). This chapter provides detailed descriptions of the methods and procedures that were used in this study.

Research Design

According to the TPB (Ajzen, 1985), human action is guided by three considerations: (1) the person's attitudes toward the behavior, (2) the subjective norms he or she believes significant others have concerning the behavior, and (3) his or her perception of whether the behavior can be performed (i.e., perceived behavioral control).

As a general rule, the strength of a person's intention to perform a particular behavior is based on the favorability level of the attitude and the level of perceived control towards the behavior. A correlational, cross-sectional design was used to examine the strength of the relationship between sociocultural variables related to attitudes, subjective norms, perceived behavioral control, knowledge, and the intent to participate in prostate cancer screening among African American men.

Description of Research Setting

The African American church occupies an essential place in the lives of African Americans and is increasingly recognized by researchers as a venue for access to targeted populations (Chatters, 2000; Chatters et al., 1998). Data were collected from three predominantly African American church sites in Nashville, Tennessee. These sites were proposed for data collection to facilitate access to the target population based on race and age. Additionally, the faith community offered socioeconomic diversity that helped establish some degree of generalizability outside the study setting.

Sample and Sampling Plan

The sample for this study was composed of African American men 40 to 70 years of age residing in Nashville, Tennessee. The Centers for Disease Control and Prevention (2003) offered the following age-based statistics regarding African American men and prostate cancer diagnosis: by age 45, one in 1,111; by age 50, one in 204; by age 55, one in 66; by age 60, one in 26; by age 65, one in 13; by age 70, one in 7. According to the American Cancer Society, African American men should begin receiving prostate cancer

screening testing at 45 years of age (American Cancer Society, 2006) However, because African American men are notably over affected by prostate cancer, current guidelines recommend that this population receive initial screenings as early as 40 years of age.

Nature and Size of Sample

The sample for this study was composed of African American men living in Nashville, Tennessee. A minimal sample size of 80 subjects was determined using guidelines from Cohen (1988) through an analysis of power for multiple regression at the .78 level of power with $p \leq .05$, and assuming a mean correlation coefficient of $r = .4$ to detect a 16% shared variance between the six predictor variables of the Theory of Planned Behavior model: *behavioral beliefs, normative beliefs, control beliefs, attitudes, subjective norm, and perceived behavioral control*, and one predictor variable of *prostate cancer knowledge*. Eighty seven men were recruited for the study and 18 were eliminated because they did not meet eligibility criteria for the study. There were no refusals from the remaining 69 men in the sample and the total sample size for this study consisted of 69 African American men. Therefore, this study did not achieve the statistical power that was hoped for; however, this issue is addressed in the discussion section.

Criteria for Sample Selection

Convenience sampling was used to recruit African American men from three church sites in Nashville, Tennessee. Criteria for sample selection included African American men between 40 and 70 years of age. Exclusion criteria included men with a history of having a prostate biopsy or prostate ultrasound and/or having a diagnosis of prostate cancer or benign prostatic hypertrophy (BPH).

Methods for Subject Recruitment

The investigator contacted pastors of three predominantly African American churches in Nashville Tennessee. Initial contact was made in person as well as in writing to provide information about the nature of the study. The same information given in person was also provided in writing. This information included the focus of the study, the target population, the time commitment, issues surrounding confidentiality, and the data collection process. Signed letters of support were obtained from pastors from each of the churches once permission was granted to use the sites for participant recruitment. These churches included Olivet Baptist Church, Mount Paran Primitive Baptist Church, and St. James Missionary Baptist Church.

Once church commitment was established, pastors were asked to schedule a date(s) for on-site recruitment. Fliers were then posted at each of the church sites announcing the dates and times of study recruitment. As a strategy to enhance the recruitment process, pastors were asked to make an announcement about the study during the church service and/or men's meeting. The pastors' announcements were delivered from a script prepared by the principal investigator. The script provided the focus of the study, the pre-selected dates and times that interviews would be conducted at each of the church sites, and contact information for the principal investigator.

Recruits who expressed interest in volunteering for the study were given two options for participation. The first option was that they could be screened for study eligibility and interviewed on site if they met eligibility criteria. The second option was that they could be screened for study eligibility on site, and contacted later by phone for an interview if they met eligibility criteria.

Human Subjects Protection

Approval for the study was granted by the Vanderbilt University Institutional Review Board (IRB) (Appendix A). The rights of participants were protected using several methods. First, the participants were fully informed about the purpose of the study. Second, the participants were informed that involvement in the study was voluntary and that they had the option of withdrawing from the study at any time. Third, participants were provided with an explanation of measures taken to ensure confidentiality of the survey data. The study involved obtaining a limited data set that excluded direct identifiers of the participants.

Data Collection Methods

Procedures

Prior to beginning the data collection process formal sessions were held with a paid research assistant for the purpose of ensuring standardization of procedures and integrity of the data. Specific practices included the review of scripts for recruitment, screening forms, seeking consent, maintaining confidentiality, and survey administration. The principal investigator (PI) and research assistant were together at each of the research sites for recruitment and data collection.

Due to variations in literacy levels, surveys were administered through structured interviews by the PI and research assistant. Data were collected through either face-to-face interview at each of the church sites or by telephone. Participants were provided with an explanation of the study's aims, the interview process, and the approximate

length of time it would take to complete the interview. Participants were also given an opportunity to ask questions about the study prior to being interviewed. Prior to being interviewed, each prospective participant was screened using a standardized screening form (Appendix B) to determine their eligibility for the study. Interviews ranged from 15 to 25 minutes. Seventy percent of the interviews were conducted by telephone and the remaining 30% of interviews were conducted through face-to-face interviews.

Instruments

The following section provides a detailed description of instruments used for this study. The description includes an explanation of the instruments and their content, as well their use in previous research. Additionally, information regarding the reliability of scales used to measure each of the variables for this study is described.

Prostate Cancer and Prostate Cancer Screening Attitudes. The Thomas Jefferson University Prostate Cancer Screening Survey (Myers et al., 2005b) (Appendix C) has been used in two studies to assess factors associated with screening frequency among African American men (Myers et al., 2005a; Myers et al., 2000a). In accordance with the Preventive Health Model (Myers & Wolf, 1990), the survey draws on earlier health behavior models (i.e., Health Belief Model, Theory of Reasoned Action, Social Cognitive Theory). The survey included a number of items on personal attitudes and beliefs about prostate cancer and screening, and each item was measured on a four-point Likert-type scale. In the first study (Myers et al., 2000a) cognitive and psychological representations related to prostate cancer screening were measured using the Thomas Jefferson University Prostate Cancer Screening Survey (Myers et al., 2000a). The following scales were formed: 1) salience and coherence of prostate cancer screening (four items,

Cronbach's $\alpha=0.85$); 2) personal susceptibility to prostate cancer (two items, Cronbach's $\alpha=0.74$); and 3) concern about exam related pain and anxiety (two items, Cronbach's $\alpha=0.75$).

In the first study (Myers et al., 2000a), cognitive and psychological representations related to prostate cancer screening were measured using the Thomas Jefferson University Prostate Cancer Screening Survey (Myers et al., 2000a). The following scales were formed: 1) the salience and coherence of prostate cancer screening (four items, Cronbach's $\alpha=0.85$); 2) personal susceptibility to prostate cancer (two items, Cronbach's $\alpha=0.74$); and 3) concern about exam related pain and anxiety (two items, Cronbach's $\alpha=0.75$) (Meyers et al.).

In the second study (Myers et al., 2005a), four subscales were defined by authors of the original instrument that included: 1) "perceived salience and coherence of screening (8 items, Cronbach's $\alpha=0.80$); 2) worries and concerns about prostate cancer and screening-related risks (eight items, Cronbach's $\alpha=0.63$); 3) perceived susceptibility to prostate cancer (three items, Cronbach's $\alpha=0.66$); and 4) intention to have prostate cancer screening within a six month period (4 items, Cronbach's $\alpha=0.88$). Additional single items were used to measure participant belief in the curability of prostate cancer, perceived ease of arranging to have prostate cancer screening (self-efficacy), and social support and social influence related to prostate cancer screening (Meyers et al.).

For this study, three subscales were used to assess the extent that intent to participate in prostate cancer screening tests within six months was influenced by personal attitudes and beliefs. Using the Thomas Jefferson University Prostate Cancer Screening Survey (Myers et al., 2005b) Attitudes and Beliefs Scale, items were selected

that assessed fatalistic beliefs concerning prostate cancer (3 items), fear/apprehension towards prostate cancer screening (5 items) and perceived benefits of prostate cancer screening (5 items). For example, items related to “fatalism” included: “*If I am meant to get prostate cancer I will get it no matter what I do*”; and “*If I have prostate cancer I would just as soon not know about it*.” Items related to “fear/apprehension” included: “*I am bothered by the possibility that prostate cancer screening might be physically uncomfortable*”; and “*I am afraid that if I have a prostate screening test, the results will show that I have prostate cancer.*” Items related to perceived benefits included: “*I think the benefits of prostate cancer screening outweigh any difficulty I might have in going through the tests*”; and “*I believe that prostate screening is an effective way of to find prostate cancer early.*” Each of the item response possibilities was a 4-point Likert (i.e., 1=*strongly disagree*, 2=*sort of disagree*, 3=*sort of agree*, 4=*strongly agree*). Item scores were averaged to derive the three subscale scores.

The internal consistency of each of these subscale scores in this study were as follows: 1) fatalistic beliefs concerning prostate cancer (Cronbach’s $\alpha=0.76$); 2) fear/apprehension towards prostate cancer screening (Cronbach’s $\alpha=0.67$); and 3) perceived benefits of prostate cancer screening (Cronbach’s $\alpha=0.78$). Higher scores on the *fatalism* and *fear/apprehension* measures correlated with negatively valued beliefs towards prostate cancer screening intention. A higher score on the *perceived benefits* measure correlated with a positively valued belief towards screening intention.

Social Influence and Prostate Cancer Screening Intent. In this study, subjective norms assessed the extent that intent to participate in prostate cancer screening within six months was influenced by the perceived social pressure of a physician and/or family

member. For example, questions included “*I want to do what members of my family immediate family think I should do about prostate cancer screening*”, and “*Members of my family are likely to think I should go through prostate screening.*” Four items were selected from the Thomas Jefferson University Prostate Cancer Screening Survey (Myers et al., 2005b) “Attitudes and Beliefs Scale” to measure social influence. Each item had a 4-point Likert response (i.e., 1=*strongly disagree*, 2=*sort of disagree*, 3=*sort of agree*, 4=*strongly agree*). Item scores were averaged to obtain a normative beliefs score (Cronbach’s α for this sample = 0.70). A higher score on this measure indicated greater perceived social influence regarding prostate cancer screening intent.

Situational Barriers to Prostate Cancer Screening. In this study, four items were selected from the Thomas Jefferson University Prostate Cancer Screening Survey (Myers et al., 2005b) “Decisional Scale” to assess situational barriers to prostate cancer screening. It was not used as a 'scale' in this research; rather it was considered to be a checklist of the possible barriers to screening. Situational barriers were assessed as factors that may impede intent to participate in prostate cancer screening within six months, such as cost and time. For example, participants were asked questions related to concerns about prostate cancer tests, such as “*I am concerned about the cost of having an exam*” and “*I am concerned about finding the time to have an exam.*” Response options included 0 'No', 1 'Yes.' A response of "Don't Know" was treated as a 'No'. A higher score on this measure indicated a greater number of barriers to screening or less perceived behavioral control.

Intent to participate in prostate cancer screening. The intent scale assessed the intention participate in prostate cancer screening. Using the Thomas Jefferson University

Prostate Cancer Screening Survey (Myers et al., 2005b) Attitudes and Beliefs scale items were selected to assess intent (3 items) to participate in prostate cancer screening testing within 6 months. Each item had a 4-point Likert response (i.e., 1=*strongly disagree*, 2=*sort of disagree*, 3=*sort of agree*, 4=*strongly agree*). Item scores were averaged to arrive at an Intent score (3 items, study data Cronbach's α 0.95). A higher intent score indicated greater intent to participate in prostate cancer screening within six months.

Contributory Factors to Prostate Cancer Screening Intent. Additional items were included in this study to assess perceived risks of developing prostate cancer. These items included: 1) Are African American men more likely to develop prostate cancer?; and 2) Does a family history of prostate cancer increase an individual's risk of developing prostate cancer? Each item had a 4-point Likert response (i.e., 1=*strongly disagree*, 2=*sort of disagree*, 3=*sort of agree*, 4=*strongly agree*). Two items measured screening history, which were whether or not the participant received a 1) PSA test and a 2) digital rectal examination (DRE) in the past 12 months. Each item had a 3-point response (i.e., 1=yes, 2=no, -1=don't know). "Don't know" responses for PSA were treated as a 'No' response. The premise behind this re-categorization was that a "no" response was equivalent to participants who did not know whether or not they received a PSA test, and were not informed or given the results of the test.

Knowledge of prostate cancer. The Knowledge of Prostate Cancer Screening Questionnaire (Weinrich et al., 2004) (Appendix D) measures the level of prostate cancer and prostate cancer screening knowledge. The 12 item questionnaire has been used in previous studies to assess knowledge of prostate cancer and prostate cancer screening among low-income men. Items on the knowledge scale measure prostate cancer

screening limitations, prostate cancer screening symptoms, prostate cancer risk factors, and prostate cancer guidelines. Each item required a *true*, *false*, or *don't know* response, such as “younger men are more likely to get prostate cancer,” and “a man can have prostate cancer and have no symptoms.” Content validity was established with five cancer health professionals who provided suggestions for the questionnaire. The questionnaire was revised and administered 12 additional times to 56 men. The reliability using factor analysis was 0.61. Construct validity was based on factor analysis and factor loading of 0.35 or greater. The 12 items clustered on one factor indicating a unidimensional scale. The internal consistency of the knowledge scores using a Cronbach's α was 0.77 (Weinrich et al.).

The Knowledge about Prostate Cancer Screening Questionnaire (Weinrich et al., 2004) was used for this study to assess prostate cancer and prostate cancer screening knowledge of African American men. Items included: “*A man can have prostate cancer and have no problems or symptoms*”; “*Most 80 year old men do not need a prostate cancer screening*”; and “*prostate cancer may grow slowly in some men.*” Knowledge values were recoded to modify the values so that *yes* responses were coded as correct and *no/don't know* responses were coded as incorrect. Item scores represented a total knowledge score between zero and 12 ($\alpha=0.69$). The knowledge scale was scored according to whether or not the participant answered the question correctly and the total number of correct responses was calculated.

Demographic Information. A demographic form was used to collect age, education, employment status, income, and marital status. These data were used to

describe the sample included in the final report. These questions used a forced choice categorical response to obtain consistent information from all of the participants.

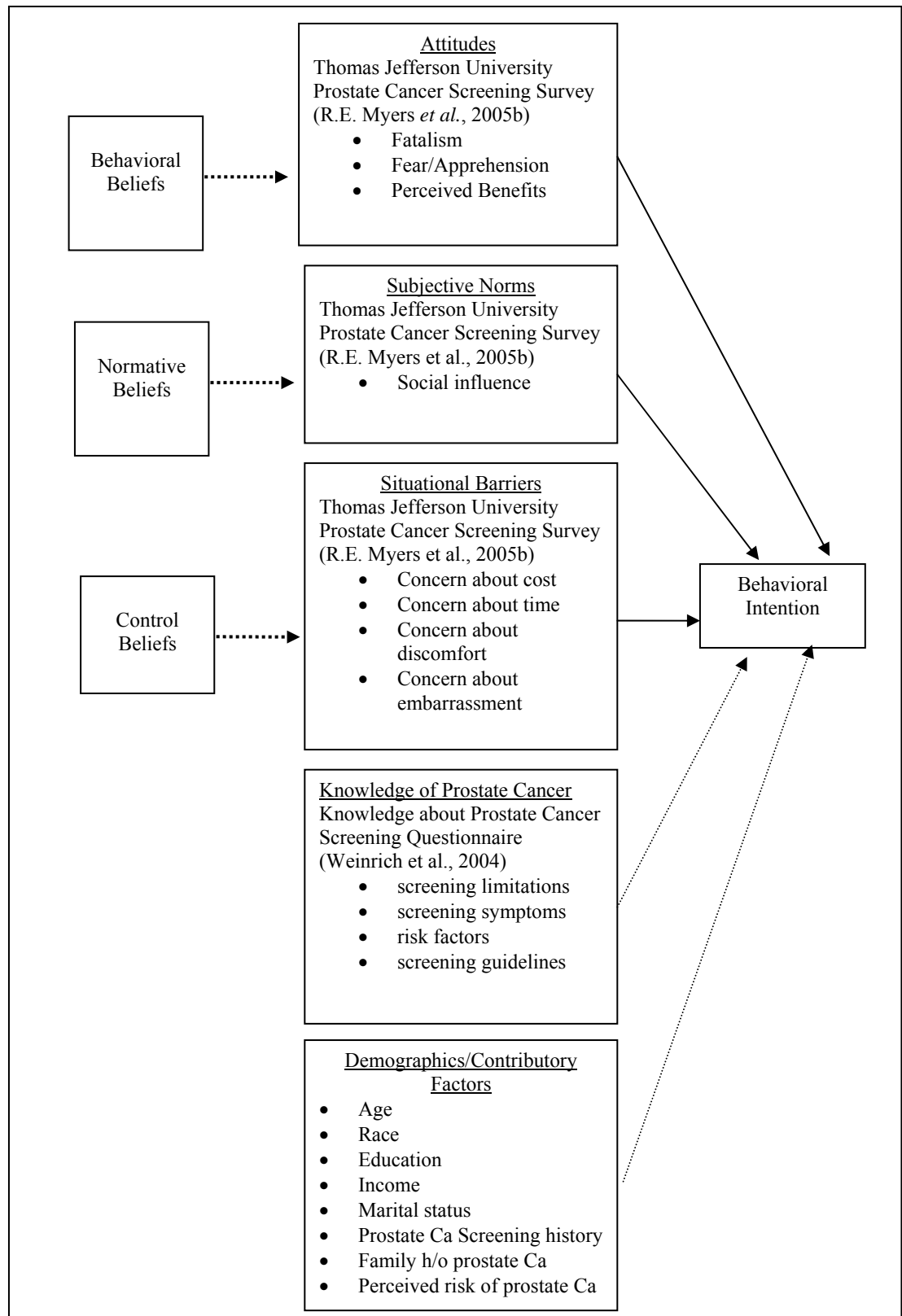


Figure 3: Modified Theory of Planned Behavior

Data analysis

Data collected from subject were transferred from a standard coding sheet into a Statistical Package for the Social Sciences (SPSS), version 12.0 for Windows data file, along with the subject's unique identification number. Data checking and cleaning methods included examining the plausible ranges for responses to each of the individual variables via frequency distributions, evaluation of each missing data value for possible oversight upon entry, normality, scatterplots, frequencies, descriptives, and outliers using SPSS. Missing data were addressed through listwise deletion. This method of handling missing data consisted of excluding cases from any calculations involving variables that had missing data (Munro, 2001). The advantage to this method is that the process produced true correlation matrices. There were no cases excluded from analysis due to missing data.

Descriptive statistics were calculated to create a profile of study participants for demographic and prostate cancer screening-related characteristics, as well as to summarize the key study variables. Total subscale scores were created for the prostate cancer fatalism, prostate cancer fear/apprehension, perceived benefits of screening, social influence associated with prostate screening, and screening intent. The Fisher test of skewness was used to assess whether or not the continuous data are normally distributed and no problems of skewed distributions were found. Thus, means and standard deviations were used for summarizing continuous variables (e.g. age, screening intent), and counts and proportions were used to summarize the categorical variables (e.g. marital status, educational level). Prior to conducting correlation and multiple regression analyses, statistical assumptions underlying those methods were assessed (specifically

normality as noted above, linearity and multicollinearity). No violations of these assumptions were found. Residuals were evaluated post-regression for detection of possible heteroscedasticity of the regression fit. No problems were seen in the residual. Decisions for the statistical significance of the findings were made using an alpha level of 0.05.

Statistical methods

1. What are the relationships of prostate cancer and prostate cancer screening attitudes, subjective norms, situational barriers, and knowledge, with prostate cancer screening intent?

Initially, univariate associations of each of the independent variables (prostate cancer fatalism, fear/apprehension of prostate cancer screening, perceived benefits of screening, social influence and screening, and prostate cancer and screening knowledge) with intention to participate in prostate screening testing were assessed using Pearson Product Moment correlations. Pearson correlations were also used to assess the degree of inter-correlation among the independent variables prior to including them in the subsequent multivariate analysis. Finally, multiple linear regression was used to determine the overall contribution of all the independent variables to the self-report of intent to screen, as well as the unique contributory information of each variable

2. What are the relationships of demographic variables, prostate cancer screening history, family history of prostate cancer, and perceived risk of prostate cancer, with prostate cancer screening intent?

Possible associations of each of the demographic, screening and family history variables, as well as perceived risk of prostate cancer with screening intent were

conducted using bivariate tests. The Kruskal-Wallis test was used to compare family history of prostate cancer, education level, marital status, and income level with prostate cancer screening intent. When necessary, Mann Whitney tests using a Bonferroni–corrected alpha value were used for post-hoc tests of a statistically significant Kruskal-Wallis finding. An Independent T tests was also used in the analysis of previous prostate cancer screening history (DRE in the past 12 months, and PSA in the past 12 months) and prostate cancer screening intent. Finally, Spearman Rank correlations were used to assess the strength of the association between the family and ethnic risk beliefs and intent to screen.

CHAPTER IV

RESULTS

This chapter provides descriptive data of relationships among variables from the modified Theory of Planned Behavior model. Descriptive data related to the sample are presented first, followed by the relationships among prostate cancer and prostate cancer screening knowledge, attitudes, subjective norms, and situational barriers, and prostate cancer screening intent.

Description of the Sample

The sample of this study consisted of 69 African American men. Frequencies and percentages were used to describe demographic characteristics (Table 1) of study participants. The average age of the sample in this study was 54.1 years ($SD = 7.6$, min = 40, max = 70).

Socioeconomic status was assessed by income and education levels. Education was measured using three levels with over one-half of the men (55%) not educated beyond high school. Annual household income was measured using five categories. Thirty five percent of the sample had incomes \geq \$50,000/year. Thirty one percent of the study participants had incomes between \$25,021 and \$49,999/year. Lowest income men (34%) had incomes \leq \$25,020/year.

Marital status was measured in six categories. Approximately half of the men in the sample (48%) were either married or living as married. The remaining participants were widowed (7%), divorced (12%), separated (10%), or never married (23%).

Study participants were asked about their prior screening history. Screening history was assessed for both prostate specific antigen blood test (PSA) and digital rectal examination (DRE). As indicated in Table 1, approximately half of the sample (51%) received a DRE in the past 12 months, while only 31 percent reported with certainty to receiving a PSA blood test.

Table 1: Demographic and Prostate Cancer-Related Characteristics of the Sample

Demographic Variables	n (%)
Education	
High School	38 (55.1)
College	24 (34.8)
Post College	7 (10.1)
Marital Status	
Married	27 (39.1)
Widowed	5 (7.2)
Divorced	8 (1.6)
Separated	7 (10.1)
Never married	16 (23.2)
Living as married	6 (8.7)
Annual Income	
\$4,800 or less	1 (1.5)
\$4,801 to \$9,600	4 (5.9)
\$9,601 to \$25,020	18 (26.5)
\$25,021 to \$49,999	21 (30.9)
\$50,000 or more	24 (35.3)
Prostate Ca Screening History (past 12 months)	
DRE	
Yes	35 (50.7)
No	34 (49.3)
PSA	
Yes	27 (39.1)
No	30 (43.5)
Don't know	12 (17.4)
Family H/O Prostate Cancer	
Father	
Yes	7 (10.4)
No	41 (61.2)
Don't know	19 (28.4)
Brother(s)	
Yes	0 (0)
No	44 (65.7)
Don't know	14 (20.9)
No Brothers	9 (13.4)

Family history of prostate cancer was restricted to fathers and brothers who had received a diagnosis of prostate cancer. Over half of men participating in the study reported no history of a father (61%) or a brother (66%) diagnosed with prostate cancer.

Total Attitude and Belief Scores

Scale scores were computed for prostate cancer and prostate cancer screening attitudes and beliefs (Table 2). Intent, Fatalism, Fear/Apprehension, Perceived Benefits, and Social Influence scale scores ranged from 1 to 4. These variables were computed as an average of scale items only when more than half of the items had no missing values. Prostate screening Intent Score was 3.01 (*SD* .62), which reflected strong intention to screen for prostate cancer among this sample.

The Attitude construct was operationalized through measures of prostate cancer and prostate cancer screening fatalism, fear/apprehension, and perceived benefits. The Fatalism mean score was 1.36 (*SD* .67), which indicated that this sample held relatively weak fatalistic beliefs related to prostate cancer and prostate cancer screening. The Fear/Apprehension mean score was 1.77 (*SD* .55), which indicated a low degree of fear/apprehension associated with prostate cancer and prostate cancer screening among this sample. The Perceived Benefits of Screening mean score was 3.58 (*SD* .43), which represented strong beliefs in the benefits of screening among this sample.

The Subjective Norm construct was operationalized through the measure of social influence. The social influence mean score was 3.17 (*SD* .62), which represented the level of influence family members and physicians had on prostate cancer screening among this sample.

Prostate Cancer Screening Barriers Score

Prostate cancer barriers were operationalized through the measure of situational barriers associated with screening. Individual barriers were interval data in which participants were asked to respond “yes” or “no” for each of the items. The total Situational Barriers score was created by summing the individual perceived barriers. The possible range of values for the Situational Barriers score was 0 to 4. The percentages for each of the individual situational barriers are presented in Table 2. The most frequently reported barrier was cost (52%) associated with prostate cancer screening. This was followed by perceived discomfort (45%) related to screening and finding the time (32%) to schedule prostate cancer screening tests. The least reported barrier was embarrassment associated with prostate cancer screening tests (9%).

Prostate Cancer Knowledge Score

Prostate cancer knowledge was operationalized through the Knowledge of Prostate Cancer scale. The 12 items on the scale were scored according to whether or not study participants answered each correctly. Total Knowledge score (Table 2) could range from 0 to 12. The Knowledge of Prostate Screening had a mean of 6.71 (*SD* 2.55). On average, men from this sample answered approximately 60% of the questions correctly. Questions concerning screening age guidelines, symptoms, and side effects from treatments were responded to incorrectly by over half the sample in this study. For example, 64% of the participants responded incorrectly to the “true” “false” or “don’t know” statement that back pain was a symptom of prostate cancer. Eighty five percent of the participants responded incorrectly to the “true” “false” or “don’t know” statement that

you can have cancer and have a normal PSA blood test. Seventy eight percent responded incorrectly to the “true” “false” or “don’t know” statement that 80-year-old men do not need to be tested for prostate cancer.

Table 2: Distributions of Prostate Cancer Screening Knowledge and Beliefs

Study Variables	Mean (SD)	Min-Max
Attitude*		
Fatalism	1.36 (.67)	1-4
Fear/Apprehension	1.77 (.55)	1-3
Perceived benefits of screening	3.58 (.43)	3-4
Subjective Norms*		
Social influence	3.17 (.62)	2-4
Barriers		
Situational barriers to screening	1.38 (1.08)	0-4
Item Barriers	% Responded “Yes”	
Cost	52	
Discomfort	45	
Embarrassment	9	
Finding the time	32	
Prostate Cancer Knowledge*		
Knowledge of prostate cancer and prostate cancer screening	6.71 (2.55)	1-12
Intent*		
Intention to discuss/participate in prostate cancer screening within 6 mos.	3.01 (.62)	1-4

*Possible ranges of “Attitude”, Subjective Norms”, “Behavioral Control” and “Intent variables were 1 to 4. Possible range of “Knowledge” variable was 1 to 12.

Research Question 1

1. What are the relationships of prostate cancer and prostate cancer screening, attitudes, subjective norms, and situational barriers, and knowledge with prostate cancer screening intent?

Correlation/Regression Analysis

Multivariate Analysis of All the Independent Variables

Attitudes. Table 3 provides a summary of univariate and multivariate associations of prostate cancer attitudes with the reported intention to be screened. The independent variables of attitudes included fatalistic perceptions of prostate cancer, fears associated with prostate cancer screening and screening outcomes, and the perceived benefits of prostate cancer screening. Of the three independent variables, perceived benefits had a statistically significant correlation ($r = .285, p = .018$) with prostate cancer screening intent. This association with intent to screen remained after controlling for the associations of fatalism and fear in the multivariate analyses ($p = .043$).

Table 3: Associations of Prostate Cancer Attitudes with Prostate Cancer Screening Intent

Attitude	<u>Univariate</u>		<u>Multivariate</u>	
	<i>r</i>	<i>p-value</i>	<i>beta</i>	<i>p-value</i>
Fatalism	-.193	.111	-.092	.547
Fear	.049	.688	.204	.121
Perceived Benefits	.285	.018	.307	.043

Subjective Norms. A single measure of social influence was used to assess the construct of subject norms in this study. Social influence was found to be statistically significant associated with intent to screen ($r = .337, p = .005$). That is, if a participant reported a higher score on the measure of social influence, that person also tended to report a higher value on the measure of prostate cancer screening intent.

Situational Barriers. Table 4 represents a summary of univariate and multivariate associations of prostate cancer screening barriers with the reported intention to be screened. The situational barriers assessed in this study were cost, time, embarrassment, and discomfort related to prostate cancer screening. Of those variables, only cost had a statistically significant correlation ($r = -.278, p = .021$) with prostate cancer screening intent. In the multivariate analyses of the association of situational barriers with intent to screen, after controlling for the associations of the other three barriers, the statistically significant association of cost with prostate cancer screening intent remained ($p = .014$)

Table 4: Associations of Prostate Cancer Screening Barriers with Prostate Cancer Screening Intent

Situational Barriers	<i>r</i>	<i>p</i>-value	<i>beta</i>	<i>p</i>-value
Concern about cost	-.278	.021	-.307	.014
Concern about discomfort	.112	.357	.140	.300
Concern about finding time	.083	.498	.067	.595
Concern about embarrassment	.096	.435	.004	.976

Knowledge. Prostate cancer knowledge was not statistically significantly associated with prostate cancer screening intent ($r = .132, p = .279$).

Overall multivariate analysis

A setwise regression model was used to assess the multivariate relationship of the key study independent variables with the dependent variable of prostate cancer screening intent. That is, the measures comprising each construct were entered as a set in the last step of a hierarchical model to assess the unique explanatory value or association of the measures as a set with the reported likelihood of intent to go for a prostate screening test. The findings from that analysis are summarized in Table 5. The multiple correlation of all nine independent variables with intent to screen was not statistically significant (Multiple $R = .475, p = .067$). Overall, the full regression model explained approximately 23% of the variance in screening behavior in this sample. However, the adjusted R^2 was .108 indicating that there was a considerable amount of overfitting of the model likely in this sample and that only approximately 11% of shared variability between the nine independent variables and intent to screen could be expected in a replication study. In this full model, while not statistically significant, the strongest unique contributor to the

intent to screen value was the extent of social influence reported by the participant ($beta=.255, p=.085$).

Table 5: Adjusted Associations of Prostate Cancer and Prostate Cancer Screening Knowledge and Belief Total Scores with Prostate Cancer Screening Intent

Construct	<i>beta</i>	<i>p-value</i>	<i>R</i> ² Change	<i>p-value</i>
Attitudes			.022	.642
Fatalism	-.153	.344		
Fear	.092	.575		
Perceived Benefits	.077	.672		
Subjective Norms			.040	.085
Social Influence	.255	.085		
Situational Barriers			.045	.496
Concern about Cost	-.177	.186		
Concern about Discomfort	.192	.203		
Concern about Finding Time	.062	.630		
Concern about Embarrassment	-.105	.436		
Knowledge			.016	.279
	-.136	.279		

* Multiple $R = .475, R^2 = .226, \text{Adjusted } R^2 = .108, p = .067$

Intercorrelations of Independent Variables

In order to understand possible changes in the apparent finding among the univariate associations presented above and the multivariate model presented below, intercorrelations among all of the key study independent variables were assessed. Table 6 presents the intercorrelations among prostate cancer and prostate cancer screening knowledge and belief variables. The findings of this study indicated statistically

significant negative correlations between prostate cancer fatalism and perceived benefits of screening ($r = -.607, p = .000$), social influence ($r = -.439, p = .000$), and prostate cancer knowledge ($r = -.295, p = .014$). There were also statistically significant positive correlations between fatalism and fear/apprehension ($r = .415, p = .000$), concern about screening cost ($r = .239, p = .048$), and concerns about screening discomfort ($r = .334, p = .005$).

Intercorrelations also found a statistically significant negative correlation between fear/apprehension and perceived benefits of screening ($r = -.381, p = .001$). Statistically significant positive correlations were found between perceived benefits of screening and concerns about screening discomfort ($r = .562, p = .000$), concerns about finding the time to screen ($r = .349, p = .003$), and concerns about embarrassment associated with screening ($r = .314, p = .009$). Additionally, there were statistically significant positive relationships between concerns about screening discomfort, concerns about finding the time to screen ($r = .320, p = .007$) and concerns about embarrassment associated with screening ($r = .342, p = .004$).

There was a statistically significant negative correlation between perceived benefits of screening and concerns about the cost of screening ($r = -.404, p = .001$). Additionally, there was a statistically significant positive correlation between perceived benefits of screening and social influence ($r = .591, p = .000$). Conversely, a statistically significant negative correlation was found between social influence and concerns about cost ($r = -.271, p = .024$).

Table 6: Covariance/Correlation Matrix of Prostate Cancer and Prostate Cancer Screening Knowledge and Belief Measures
(N = 69)

		1	2	3	4	5	6	7	8
1. Total Fatalism Belief Score	Pearson Correlation Sig. (2 tailed)								
2. Total Fear/Apprehension Score	Pearson Correlation Sig. (2 tailed)	.415 .000							
3. Total Perceived Benefits Score	Pearson Correlation Sig. (2 tailed)	-.607 .000	-.381 .001						
4. Total Social Influence Score	Pearson Correlation Sig. (2 tailed)	-.439 .000	-.233 .054	.591 .000					
5. Concern about Cost	Pearson Correlation Sig. (2 tailed)	.239 .048	.060 .624	-.404 .001	-.271 .024				
6. Concern about Discomfort	Pearson Correlation Sig. (2 tailed)	.334 .005	.562 .000	-.169 .166	-.150 .220	.165 .176			
7. Concern about Finding Time	Pearson Correlation Sig. (2 tailed)	.178 .142	.349 .003	-.021 .864	-.034 .784	.095 .439	.320 .007		
8. Concern about Embarrassment	Pearson Correlation Sig. (2 tailed)	-.063 .607	.314 .009	.185 .129	.209 .085	-.116 .341	.342 .004	.120 .326	
9. Total Knowledge Score	Pearson Correlation Sig. (2 tailed)	-.295 .014	-.170 .163	.135 .267	.033 .786	.143 .243	-.115 .346	.041 .735	-.005 .966

Question 2

2. What are the relationships of demographic variables, prostate cancer screening history, family history of prostate cancer, and perceived risk of prostate cancer, with prostate cancer screening intent?

First of all, there was not statistically significant association of age with intent to screen ($n = 68$, $r = -.087$, $p = .482$). Table 7 summarizes the intent to discuss/participate in prostate cancer screening tests with the other demographic variables. There were no statistically significant differences in the reported intent to screen depending on a report of a father with history of prostate cancer, education level, marital status, or income level. A statistically significant difference was found between the level of intent and responses to the question of whether the respondent had *Brother(s) with History of Prostate Cancer* ($p = .033$). Any two pairwise comparisons of the responses were not sufficiently different, however, to meet the criteria for a statistically significant post-hoc (each test $p > .017$).

Table 7: Distributions for Background/History Variables and Intent

Variable	n	Mean	SD	Median	Min, Max	p-value
Father with h/o prostate CA						.084
Yes	7	3.52	1.12	4.00	1-4	
No	41	3.14	.99	3.33	1-4	
DK	19	2.72	1.02	3.00	1-4	
Brother with h/o prostate CA						.033
No	44	3.26	1.03	4.00	1-4	
DK	14	2.60	1.12	2.50	1-4	
No Brothers	9	2.81	.47	3.00	2-3	
Education						.191
High School	38	2.93	.995	3.00	1-4	
College	24	3.01	1.15	3.50	1-4	
Post College	7	3.52	.997	4.00	1-4	
Marital Status						.953
Married/Living as Married	33	2.90	1.17	3.33	1-4	
Widowed	5	3.20	.84	3.00	1-4	
Separated/Divorced	15	3.02	1.22	4.00	1-4	
Never Married	16	3.17	.68	3.00	1-4	
Income						.230
< or = to \$9,600/yr	5	3.33	.85	3.67	2-4	
\$9,601 to \$25,020/yr	18	3.00	.63	3.00	2-4	
\$25,021 to \$49,999/yr	21	2.57	1.33	2.33	1-4	
> or = to \$50,000/yr	24	3.29	.99	3.63	1-4	

* Possible range of the 'Intent' variable was 1 to 4

Table 8 summarizes the intent to screen scores for prostate cancer and the history of prostate cancer screening tests. The findings indicate there was no statistically significant difference between prostate cancer screening intent for men who have had a DRE in the past 12 months and men who have not had a DRE in the past 12 months ($T(67) = 1.40; p=0.288$). Furthermore, there was no statistically significant difference between prostate cancer screening intent for men who have had a PSA blood test in the past 12 months and men who have not had or did not know if they had a PSA blood test in the past 12 months ($T(67) = .683; p = 0.497$)

Table 8: Comparison of Prostate Cancer Screening Mean Scores on Intent

Variable	n	Mean	SD	p-value
DRE in the past 12 months				.288
Yes	35	2.88	1.172	
No	34	3.15	.911	
PSA in past 12 months				.497
Yes	27	2.90	1.233	
No/DK	42	3.08	.928	

*Possible range of the ‘Intent’ variable was 1 to 4

Finally, as shown in Table 9, there was no statistically significant association between race as a risk factor for prostate cancer and prostate cancer screening intent ($r = .145, p = .235$). Conversely, there was a statistically significant association between the belief that family history of prostate cancer increases an individual’s risk for developing prostate cancer and prostate cancer screening intent ($r = .273, p = .023$). However, inclusion of that belief in the overall model of the associations of the key study variables with screening intent did not result in any statistically significant improvement in the association ($beta = .069, p = .596$). That is, after controlling for the key study variables associations with intent to screen, the association of belief about family risk with intent was no longer statistically significant.

Table 9: Comparison of Perceived Risk of Prostate Cancer and Intent

Variable	n (%)	p-value
African American men more likely to develop prostate cancer		.235
Strongly Disagree	5 (7.2)	
Sort of Disagree	5 (7.2)	
Sort of Agree	14 (20.3)	
Strongly Agree	45 (65.2)	
Family h/o prostate cancer increases risk		.023
Strongly Disagree	5 (7.2)	
Sort of Disagree	6 (8.7)	
Sort of Agree	36 (52.2)	
Strongly Agree	22 (31.9)	

The discussion section will center not only on the significant findings, but also on the interpretation of inconsistencies in the findings of this study when compared to similar studies. Views will focus on the relevance of this study in decisions related to the assessment sociocultural constructs in nursing practice as well as suggestions for future research.

CHAPTER V

DISCUSSION

This study examined the relationships between prostate cancer and prostate cancer screening knowledge, attitudes, subjective norms, and situational barriers, and prostate cancer screening intent among African American men in Nashville, Tennessee. Additionally, other contributing factors and their relationship to prostate cancer screening intent were examined. This chapter begins with a summary of the overall key findings. The findings are then compared with previous studies that have used sociocultural constructs in the examination of prostate cancer screening practices of African American men. These comparisons are followed by explanations for any inconsistent findings as well as the limitations of this study. Finally, implications for nursing and theory development as well as recommendations for future research are presented.

Summary of Key Findings

The present study used an adapted model that included constructs of the Theory of Planned Behavior (Ajzen, 1991a) as well as prostate cancer knowledge to understand those possible associations with the prostate cancer screening intent of African American men. In addition, group differences of demographics, prostate cancer screening history, family history of prostate cancer, and perceived risk of prostate cancer, on prostate cancer screening intent were examined. Overall, the constructs of attitude, subjective norms, situational barriers, and prostate cancer knowledge did not demonstrate a statistically significant (Multiple $R=.475$, $R^2=.226$, Adjusted $R^2=.108$, $p = .067$) association with

prostate cancer screening intentions. However, social influence was the strongest unique contributor to prostate cancer screening intent. Nevertheless, this multiple R of .475 is a relatively strong effect size. If the same effect sizes had resulted from a larger sample of 80 men, the overall and unique association of social influence would have been statistically significant. Despite limitations of sample size, the study did have several key findings with respect to prostate cancer-related beliefs and prostate cancer screening intent and correlations among key variables.

Attitudes

Fatalism. Fatalistic attitudes associated with prostate cancer screening intent were examined in this study. Fatalism was the perception that a positive cancer diagnosis was controlled by external forces and beyond the power of humans to influence its course. Consequently, endorsing this belief might discourage individuals from engaging in prostate cancer screening behaviors. The distribution of prostate cancer beliefs for this study suggests that participants held relatively weak fatalistic attitudes toward prostate cancer and prostate cancer screening. These findings, however, were not consistent with qualitative studies where cancer fatalism, as a barrier to prostate cancer screening, has been a predominant theme (Forrester-Anderson, 2005; McFall, 2006; Ross et al., 2007). Although cancer fatalism has emerged as a finding from qualitative research, it does not provide an interpretive framework based on the interrelationships between fatalistic beliefs and other factors that influence cancer health-seeking behaviors of African American men.

Knowledge as a key correlate of fatalism was also examined in this study. This study found a significant negative correlation between prostate cancer knowledge and

fatalism. This finding is consistent with previous research on associations between prostate cancer knowledge and fatalistic beliefs. For instance, Powe et al. (2009) examined the relationship between prostate cancer and colorectal cancer knowledge, and fatalism among African Americans and Hispanics. In their study, fatalism was operationalized through fear, predetermination, pessimism, and inevitability of death from cancer. Knowledge of prostate cancer was operationalized through an understanding of risk factors, signs, symptoms, and screening recommendations. Although the Powe et al., did not focus exclusively on prostate cancer, the study did find significant negative correlations between prostate cancer knowledge and cancer fatalism. Therefore, it would be logical to think that the more an individual knows about prostate cancer and prostate cancer screening, the greater their intentions would be to engage in prostate cancer screening testing.

Studies suggest that the concept of fatalism is important in understanding the prostate cancer screening practices of African American men. However, the limited examination of cancer fatalism and screening practices based on race makes it unclear whether or not differences exist among African American men when compared to other racial and ethnic groups. Additionally, there has been an inconsistent use of frameworks to systematically explain a cultural ideology associated with cancer fatalism and screening behaviors among African American men.

This study used the TPB to elicit the attitude of fatalism and its association with prostate cancer screening intent among African American men. However, in a review of cancer fatalism studies, Powe et al., (2003) found that most of the research did not have an explicit theoretical framework, and had varied definitions of fatalism. Regardless of

this incongruity, the broad view that death from cancer is inevitable has been a common attitude across cultural groups, including Asians, African Americans, and Hispanics (Liang et al., 2004; Nelson et al., 2002; Salazar & Walsh, 2006).

In addition to the conceptual inconsistencies, there has also been variation in the way in which fatalism has been measured. For instance, Meyers et al. (2000) used one question to assess fatalism and prostate cancer beliefs among African American men. For this study, a subscale was used to assess fatalistic beliefs. Although several studies have addressed the phenomenon of fatalism and cancer screening, their comparative value with respect to findings, is limited due to differences in the measures.

Fear/Apprehension. The relationship of the attitude of fear/apprehension with prostate cancer screening intent was examined in this study. Similar to fatalism, the association between prostate cancer screening fear/apprehension and prostate cancer screening intent was not statistically significant. Conversely, when Woods et al. (2006) examined self-reported barriers to prostate cancer screening, the majority of respondents in their study reported fear-related barriers to obtaining prostate cancer screening. These fear related barriers included fear of cancer problems, fear of cancer treatment fear of sexual dysfunctions, and fear of cancer diagnosis. Fear associated with prostate cancer was also a significant finding in Spain et al. (2008) study. Their findings suggest that African American men were likely to avoid getting their prostate checked for fear of a positive cancer diagnosis.

In offering some explanation of fear/apprehension, one should consider the target of fear/apprehension associated with prostate cancer and prostate cancer screening. For instance, this study primarily assessed fears associated with the screening examination as

opposed to fears associated with a positive cancer diagnosis. On the other hand, Woods et al. (2006) focused primarily on fears associated with the diagnosis and treatment of prostate cancer. Therefore, the target of fears may or may not influence prostate cancer screening intent among African American.

Fear/apprehension is often cited as an obstacle to cancer screening among African Americans. Interestingly, there have been studies in which worry or fears about cancer have been positively associated with cancer screening, even after controlling for background variables such as SES and education (Friedman et al., 1995). The difficulty, however, has been in determining the degree in which fear is negatively or positively associated with the likelihood of African American men to participate in prostate cancer screening. For instance, at what point does fear becomes a barrier to screening among this population? Additionally, fear of screening and fear of screening outcomes may not be empirically separable, which suggests that fear has conflicting effects on prostate cancer screening behaviors.

Perceived Benefits. As a measure of attitude, perceived benefits of prostate cancer screening was univariately associated at a statistically significant level with prostate cancer screening intent in this study. These findings were consistent with a study conducted by Tinggen et al. (1998) who found that African American men believed the benefits of prostate cancer screening outweighed perceived barriers to screening. Interestingly, Price et al. (1993), using the Health Belief Model (Rosenstock, 1974) as a framework of their study, found that in their sample African American men reported that they perceived the benefit of going for screening at a similar level as Caucasian men;

however, prostate cancer screening participation rates of African American men were much less than those of Caucasian men.

Operationally, both Tingen et al. (1998) and Price et al. (1993) measured perceived benefits that focused on the main categories of health, peace of mind, detection, and early treatment. The theoretical linking of perceived benefits has been included in several health behavior models as an attitudinal construct of expected consequences of an action that has been found to be associated intentions to engage in specific behaviors (Ajzen, 1988; Schifter & Ajzen, 1985). Perhaps social inequalities associated with racial disparities in prostate cancer incidence and mortality provides some of the basis for perceived benefits of screening among African American men. In other words, African American men may view prostate cancer as an “issue” within the population, based on social class and less access to preventive care. If so, screening may be viewed as beneficial in minimizing the effects of prostate cancer among certain groups, but this perception may be competing with other barriers.

Subjective Norms

Social influence. Social influence, as a measure of social norms, assessed the level of influence family members and physicians had on the decision to engage in prostate cancer screening. This study found that social influence had a significant positive correlation with prostate cancer screening intent. These findings were consistent with those of (Odedina et al., 2008; Weinrich, 2006) In their study, social influence was operationalized through the approval of significant referents for annual screening, and motivation to comply based on the advice of significant referents. Odedina et al.

demonstrated that social influence was associated with prostate cancer screening intent among African American men.

In a similar study, Weinrich (2006) reported that the strongest factor associated with screening among African American men was the influence of physicians. The results of the Weinrich study were supported by Woods et al., (2006) who reported that a positive engagement of African American men by health care providers in shared decision making centering on prostate cancer screening is highly associated with the behavior. More importantly, findings suggest that when this engagement is enhanced by social influences, adherence to the behavior increases (Kravitz & Melnikow, 2001; Krupat et al., 2001).

Social influence may, to some extent, represent relationships that facilitate decision making and adherence to prostate cancer screening. However, it is unclear whether a patient provider relationship or relationships with important others have the greatest impact on prostate cancer screening intent. This study assessed social influence to the extent that important others were perceived as actively putting forth their views related to prostate cancer screening. Based on these findings, and the findings from other studies it could be posited that prostate cancer screening intent among African American men may be governed by social interactions that are culturally influence. However, in order to fully interpret the relationship between social influence and prostate cancer screening intent, there needs to be greater precision in assessing of the overall construct. Additionally, social influence needs to be examined for its possible role in moderating other barriers to screening behavior.

Situational Barriers

The concern about cost associated with prostate cancer screener was statistically significantly associated with prostate cancer screening intent. Cost has traditionally been identified as a likely barrier to health care access among African American men.

However, there have been inconsistencies in studies examining perceived barriers to prostate cancer screening among African American men. For example, McDougall et al. (2004) asked African American men to complete a prostate cancer barriers checklist. Cost was not found to be a significant barrier to prostate cancer screening in their study.

Similar studies have also assessed situational barriers and prostate cancer screening behaviors of African American men (Bloom et al., 2006b). Like McDougall et al. (2004), Bloom et al., found that the cost of a PSA test was ranked among the lowest of barriers associated with prostate cancer screening. On the other hand, Denmark-Wahnefried et al., (1995a) cited cost and trouble with scheduling as the most frequently cited barriers to screening among African American men.

Approximately one third of the sample in this study had an annual income of \$25,000 or less, which may explain why the relationship between cost and prostate cancer screening intent was statistically significant. However, cost can be interpreted in several ways. First, there are costs associated with not having insurance and the full cost having the screening tests. Second, there are costs associated with co-payments even with insurance. Third, there are costs associated with a positive cancer screen that may include time away from work, and the cost of treatments. According to the U.S. Census Bureau (2004) approximately 40% of African American men lack health insurance.

Based on these statistics, cost associated with income and lack of insurance would likely present a significant barrier to prostate cancer screening among the sample population.

Additional barriers assessed in this study that included concerns about screening discomfort, embarrassment, and finding the time to screen were not statistically significant in their association with reports of prostate cancer screening intent.

Interestingly, embarrassment ranked the lowest with respect to concerns about prostate cancer screening. Similarly, Denmark-Wahnefried et al (1995a) found that only a small percentage of men listed embarrassment associated with the DRE as a reason for screening delays. However, among qualitative studies exploring prostate cancer and screening perceptions of African American men, embarrassment associated with the examination was a common theme (Forrester-Anderson, 2005).

Social embarrassment associated the DRE, screening discomfort, and finding the time to screen are often suggested as reasons why African American men do not participate in prostate cancer screening. These barriers have primarily been identified in findings from qualitative research (Forrester-Anderson, 2005; McFall et al., 2006; Oliver, 2007). Theoretically, embarrassment is a deterrent to prostate cancer screening intent among African American men. According to the findings of this study, embarrassment associated with prostate cancer screening was not statistically significant. Perhaps when quantified, these barriers do not appreciably influence prostate cancer screening behaviors. For instance, African American men may be responding to negative social implications associated with the DRE. Even so, these implications may not function as a deterrent to participating in prostate cancer screening tests.

Knowledge of Prostate Cancer

Knowledge was added to the model to evaluate its potential contribution to health beliefs and behavioral intention. However, there was no statistically significant association between knowledge and prostate cancer intent among African American men in this study. From a comparative standpoint, most studies measuring prostate cancer knowledge have not done so with the aim of assessing its association with intent (Forrester-Anderson, 2005; Shelton et al., 2005). So, although African American men have generally been found to have lower levels of prostate cancer and screening knowledge when compared to Caucasians (Talcott et al., 2007; Winterich et al., 2009), there is little evidence to support whether or not it contributes in a significant way to screening behavior.

The results of this study found no statistical significance between knowledge and prostate cancer screening intent. This is in contrast to widely held beliefs, particularly among health promoters, that knowledge translates to positive health behaviors. This assumption, however, does not account for the relevance of health information, and how health information is delivered to specific groups. Perhaps among African American men, the social environment assigns a meaning and a subsequent response to the threat of prostate cancer and prostate cancer screening. These social environments include membership in organizations such as churches, neighborhoods, and workplaces (Yen & Syme, 1999). Thus, generic information related to prostate cancer would not be relevant to the targeted audience.

Perceived Risk of Prostate Cancer

This study also examined whether differences in the perceived risk of prostate cancer were associated with prostate cancer screening intent among African American men. Risks were based on family history and race. The results found a statistically significant relationship between the belief that family history of prostate cancer increases one's risk for developing prostate cancer, and prostate cancer screening intent. Conversely, there was no statistical significance between race as a risk factor for prostate cancer and prostate cancer screening intent. Interestingly, Bloom et al. (2006b) found that African American men with a self-reported family history of prostate cancer did not perceive their prostate cancer risk to be any higher than men without a family history. However, they were more likely to report having a recent PSA test, but not a digital rectal examination. Conversely, Weinrich's (2006) demonstrated that African American men with a strong family history of prostate cancer had significantly lower screening rates than Caucasians and African American who did not have a strong family history of prostate cancer.

The inconsistency in the results of this study when compared to similar studies may be explained by several factors. One reason may be the level of education. Approximately half of the men in this study's sample had a college level education. This suggests that awareness of personal risk factors may be linked to education level. Another factor could be that the average age of this sample contributed to better accuracy of family history reports. For example, younger men as opposed to older men may know that a father or brother had been diagnosed with prostate cancer.

Demographic Information

Demographic variables were also examined for their contribution to prostate cancer screening intent. The association between being married and increased PSA test use has been found in studies of African American men and prostate cancer (Finney et al., 2005; Swan et al., 2003). In this study approximately half of the participants (47.8%) were either married or living as married. However, there were no statistically significant differences between marital status and prostate cancer screening intent of men in this sample. Nevertheless, it is not known if being married is important to screening patterns over time.

Levels of education and income have also been associated with increased level of prostate cancer screening (Ross et al., 2005). However, this study did not demonstrate any statistically significant differences between annual income and level of education, and the intent to screen for prostate cancer. It could be argued the impact of education and income on prostate cancer screening intent may be related to the presence or absence of certain structural barriers. These barriers may include transportation, financial support, and geographical distance to a physician's office or clinic. However, in the absence of these barriers, education and income may not present any significant associations in prostate cancer screening intent among African American men.

An interesting finding of this study was that the intercorrelation among variables. For example, there was a statistically significant correlation between prostate cancer knowledge and fatalistic beliefs. However, these correlations do not provide information about a cause-effect relationship. It can, therefore, be speculated that both prostate cancer knowledge and cancer fatalism may be produced by a common cause, such as

education and income or a combination of factors. Consequently, intent to participate in prostate cancer screening may operate through complex interactions among the variables associated with prostate cancer screening. These interactions need to be unraveled in order to fully explain the health seeking behaviors of African American men.

Significance of the Study

This study contributes to the body of research focusing on the health seeking practices of African American men. There is currently a paucity of research that provides a theoretical approach to explaining the prostate cancer screening behaviors of African American men. The Theory of Planned Behavior provided a framework for the examination of sociocultural factors thought to be associated with the patterns of health behavior seen in African American men. Although this theory has been well supported by empirical evidence, its constructs have not been extensively applied to the examination of prostate cancer screening behaviors of African American men.

Godin and Kok (1996) reviewed the use of the Theory of Planned Behavior in health behavior research. They found that attitude and perceived behavioral control were strongly associated with behavioral intent. So, attitude towards the action and perceived behavioral control were most often found to be significantly associated with intent.

Concepts Supported by this Research

Subjective Norms. Social influence had the strongest association with reported prostate cancer screening intent among African American men in this study. This finding supports the idea that social influence may operate differently among certain groups. Furthermore, there were statistically significant negative correlations among social

influence, concerns over prostate cancer screening cost, and fatalism. These intercorrelations suggest that social influence may moderate or lessen some of the beliefs that negatively impact on prostate cancer screening intent. In a broader sense, social and cultural factors may play a larger role in shaping perceptions of and responses to prostate cancer and prostate cancer screening among African American men.

Attitudes. The perceived benefits of prostate cancer screening had the second largest statistically significant association with prostate cancer screening intent in this study. The second largest association with prostate cancer screening intent in this study was the perceived benefits of screening. Beliefs viewed as both facilitators and barriers to prostate cancer screening were assessed in this study. However, the only variable that demonstrated a statistically significant association with prostate cancer screening intent was the perceived benefits of screening. The concept of perceived benefits has been reported as an important factor prostate cancer screening behaviors (Myers et al., 1994; Price et al., 1993) and has outweighed barriers to screening (Myers et al., 1994).

Situational Barriers. Traditional barriers associated with prostate cancer screening among African American men commonly reported in the literature were not supported in this study. The least powerful, but nonetheless statistically significant variable associated with prostate cancer screening intent was concern about cost of the examination. Cost was the only statistically significant barrier associated with prostate cancer screening intent. Contrary to what was expected, embarrassment ranked the lowest among perceived barriers. This was significant because much of the literature points to embarrassment associated with the DRE as contributing significantly to lower prostate cancer screening rates among African American men. However, there may be a

number of reasons for the reported inconsistency. A study conducted by Gelfand et al. (1995) suggests that older, more educated, and higher income African American men did not view the DRE as negatively. The mean age of the sample for this study was 54 (SD 7.6). In addition, approximately 45% had a college degree and 65% has an annual income >\$25,000. It was also reported in the Gelfand et al. study that attitudes towards the DRE may become more negative when fear of cancer increases. This study found that there was no statistically significant association between prostate cancer and prostate cancer screening fear/apprehension and prostate cancer screening intent.

Summary of Findings

The aim of this exploratory research was to examine conceptual associations between prostate cancer and prostate cancer screening beliefs and knowledge, and the intent to participate in prostate cancer screening. While the multiple correlation of all nine variables with intent was not statistically significant, the model did explain 23% of the variance in screening behavior in this sample. Although the generalizability of this study is unlikely, the results do suggest that there are sociocultural factors operating among African American men that may influence their engagement in screening activities. For instance, prostate cancer screening intent may have less to do with prostate cancer and prostate cancer screening knowledge, educational level, and economic gradients and more to do with the complex interaction among social and cultural constructs. Therefore, the findings of this study highlight the need for further research examining sociocultural factors and the health seeking practices of African American men is needed.

Limitations of the Study

Although this was one of the few studies that measured prostate cancer screening intent using constructs from the Theory of Planned Behavior, there were some limitations that need to be acknowledged. One limitation of this study was related to participant recruitment. The participants were recruited from faith-based sites. These sites were used to facilitate access to the target population based on racial composition and subsequent risk factors associated with prostate cancer, such as race and age. It was recognized that the exclusive use of faith-based sites for participant recruitment could affect the external validity of the study. However, it was posited that the health seeking delays of African American men extends beyond religious beliefs to other sociocultural factors. Additionally, the faith community offers socioeconomic diversity that helps to establish some degree of representation among the target population.

Another limitation of the study was the self-reported information on family history of prostate cancer and prostate cancer screening history. The reliance on self-reported data is not always accurate and responses may not reflect actual family history of prostate cancer or prostate cancer screening history. Finally, the inability to measure actual screening outcomes was a limitation of this study. Although screening intention is considered to have the strongest association with engaging in prostate cancer screening behaviors, measuring actual screening outcomes would strengthen the overall study.

Recruitment of African American men into research studies has traditionally been difficult. Consequently, sample size was also a limitation of this study. However, it could not be stated that a larger sample size would have resulted in a statistically significant finding. However, if the same effect sizes had resulted from a larger sample,

the overall and the unique association of social influence would have been statistically significant.

An additional limitation of the study was the internal consistency reliability of scales used in the study. For instance, the Cronbach's alpha for the Knowledge scale was 0.69, and for the Fear/Apprehension scale was 0.67. According to Garson (2002), the widely accepted cutoff for items to be considered a scale in social science research is an alpha of .70 or higher. However, by convention, a lenient cut-off of .60 is common in exploratory research (Garson).

Implications for Nursing

Central to nursing is the ability to address racial and ethnic health disparities. Providing relevant and effective health care to African American men requires an understanding of their attitudes and beliefs about specific health issues. Nurses are responsible for informing and educating men of the benefits and limitations of prostate cancer and prostate cancer screening so that informed decisions can be made. The findings of this study indicate that prostate cancer and screening education alone may not necessarily prompt an African American man to engage in screening. Additionally, the intent to participate in prostate cancer screening may extend beyond barriers associated with socioeconomic status. Therefore it is essential for nurses to recognize the interaction of complex social and cultural factors that may influence prostate cancer prevention and control among African American men. This recognition should be reflected in the way in which prostate cancer and prostate cancer screening interventions are developed and delivered.

Addressing health disparities requires an understanding of their causes and mechanisms and avoiding misconceptions about cancer prevention and control behaviors of African American men. One of the biggest challenges nurses face is using evidence-based practice to address minority health disparities. The complex nature of health disparities requires the examination of multiple factors believed to contribute to differences in health outcomes between populations. However, this complexity often confounds efforts to synthesize what is empirically known about factors associated with higher prostate cancer incidence and mortality among African American men when compared to other racial groups. This synthesis is essential to construct an evidence-based account of what might be done to address this disparity. The use of theory can lend structure to a synthesis of relevant constructs and how they influence specific cancer-related health behaviors.

Recommendations for Future Research

Before interventions can be designed to address the prostate cancer and prostate cancer screening disparities affecting African American men, there needs to be a better understanding of the factors contributing to these disparities. Intervention research targeting African American men has typically addressed general attitudes and beliefs as opposed of identifying precise measures that reflect the complex interactions among sociocultural factors. However, psychosocial approaches to prostate cancer screening have been hampered by the lack of adequate instrumentation.

Theory-based psychosocial constructs need to be applied to studies examining prostate cancer screening behaviors of African American men. Applying these theories

will aid in the process of identifying variables that are useful in explaining actual screening behaviors of African American men. The emergence of specific variables relevant to these psychosocial constructs will allow researchers to develop a more reasoned understanding of the relationship between sociocultural factors and prostate cancer screening. For instance, empirically differentiating between the impact of *social influence* as a measure of *subjective norms* and prostate cancer screening would begin the process of refining the data that currently exists. Additionally, further work is needed to determine if other constructs are related to screening behavior.

Few studies have used a systematic framework to guide in the area of prostate cancer screening behaviors of African American men. Although the findings from this study lacked statistical significance among the sample, further testing of the conceptual model is needed. Replication of this study and testing of these findings among African American men in different regions of the country may elucidate regional differences in beliefs surrounding prostate cancer and prostate cancer screening. This is significant when tailoring interventions designed to meet the diverse needs of specific populations.

The literature also points to the need for additional intervention research examining the influence of sociocultural constructs on cancer-related health behaviors. Although the findings of this study are preliminary, they could be used to pilot an intervention aimed at exploring specific sociocultural variables that were statistically significantly associated with prostate cancer screening intent. For instance, social influence theories could be used to guide preventive interventions targeting African American men and prostate cancer screening.

In addition to the need for additional intervention research, there is a dearth of reliable measures developed specifically for measuring health-related sociocultural constructs among African American men. A critical review of studies published between 1990 and 2006 on the use of sociocultural constructs in cancer screening research among African Americans found that sources and psychometric properties of sociocultural measures were rarely reported (Deshpande et al., 2009). Although the multiple correlation of all nine variables with intent was not statistically significant in this study, the results indicate the need for further research that contributes to knowledge the knowledge of cancer-related disparities. Researchers need to be able to unravel and elucidate the specific roles that sociocultural constructs play in health and health-related behaviors.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL



Vanderbilt University

Institutional Review Board

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07/28/2009

Donna Kenerson
Nursing

Nashville, TN 37221

Rolanda L. Johnson
Nursing
521 Godchaux Hall 37240

RE: IRB# 090462 "Using the Theory of Planned Behavior to Assess Prostate Cancer Screening Intent Among African American Men"

Dear [Donna Kenerson](#):

A designee of the Institutional Review Board reviewed the Request for Exemption application identified above. It was determined the study poses minimal risk to participants. This study meets 45 CFR 46.101 (b) category (2) for Exempt Review. Approval is extended for the Request for Exemption application dated 7/28/2009 for Principal Investigator [Donna Kenerson](#).

Any changes to this proposal that may alter its exempt status should be presented to the IRB for approval prior to implementation of the changes. In accordance with IRB Policy III.C, amendments will be accepted up to one year from the date of approval. If such changes are requested beyond this time frame, submission of a new proposal is required.

DATE OF IRB APPROVAL: 7/28/2009

Sincerely,

Shannon Simmons BA
Protocol Analyst IV
Institutional Review Board
Behavioral Sciences Committee

Electronic Signature: Shannon D Simmons/VUMC/Vanderbilt : (F9146BB52DE7323E8B60279C1C26B9C8)
Signed On: 07/28/2009 12:18:31 PM CDT

APPENDIX B

ELIGIBILITY SCREENING FORM

ELIGIBILITY SCREENING FORM

- A1. Are you 40 to 70 years of age?
 YES..... 01
 Year of birth 19
 NO..... 00➔
 SKIP TO A.7
- A2. What is your race or ethnic background?
 White/Non-Hispanic..... 01
 SKIP TO A.7
 Black or African American.....02➔
 Hispanic/Latino.....03
 Asian or pacific Islander.....04
 Native American / American Indian.....05
 SKIP TO A.7
 OTHER (SPECIFY).....06

 DON'T KNOW.....-1
- A3. Do you have, or have you ever had, prostate cancer?
 YES.....01➔
 SKIP TO A.7
 NO.....00
 Don't know.....-1
- A4. Have you ever been told by a doctor that you have an enlarged prostate.
 This is called benign prostatic hyperplasia or BPH.
 YES.....01
 SKIP TO A.7
 NO.....00
 Don't know.....-1
- A5. Have you ever had a prostate ultrasound exam?
 YES.....01➔
 SKIP TO A.7
 NO.....00
 Don't know.....-1
- A6. Have you ever had a prostate biopsy?
 YES.....01
 SKIP TO A.7
 NO.....00
 Don't know.....-1➔
 GO TO B.1
- A7. Thank you for your time and interest. This is a survey of African American men
 who are between 40 and 70 years of age and have never had prostate cancer or
 BPH.
- A8. If this person qualifies for the study.....Go
 to B.1

APPENDIX C

THOMAS JEFFERSON UNIVERSITY PROSTATE CANCER SCREENING SURVEY

THOMAS JEFFERSON UNIVERSITY PROSTATE CANCER SCREENING SURVEY

C. KNOWLEDGE ATTITUDES AND BELIEFS ABOUT PROSTATE SCREENING

I am going to read some statements about prostate screening and prostate cancer. Please tell me whether you agree or disagree

Ask scale in 2 parts: Agree/Disagree. Then how strongly. Record one code per item

	Strongly Disagree	Sort of Disagree	Sort of Agree	Strongly Agree
C.1. The doctor I see is likely to think I should go through prostate screening (both with a rectal exam and PSA blood test)	01	02	03	04
C.2. I believe it is likely I will get prostate cancer at some time in the future	01	02	03	04
C.3. Being treated for prostate cancer is likely to increase my chances of living a healthier life	01	02	03	04
C.4. Arranging my schedule to go through prostate cancer screening would be an easy thing for me to do	01	02	03	04
C.5. I am bothered by the possibility that prostate screening might be physically uncomfortable	01	02	03	04
C.6. I intend to have a prostate cancer screening examination in the next six months	01	02	03	04
C.7. I think the benefits of prostate cancer screening outweigh any difficulty I might have in going through the tests	01	02	03	04
C.8. I have more important things to do than go for prostate screening	01	02	03	04
C.9. I want to do what members of my immediate family think I should do about prostate screening	01	02	03	04
C.10. I think prostate screening would be painful	01	02	03	04
C.11. If I have prostate cancer, I would just as soon not know about it	01	02	03	04
C.12. If I am meant to get prostate cancer, I will get it no matter what I do	01	02	03	04
C.13. Being treated for prostate cancer is likely to increase my chances of living a longer life	01	02	03	04
C.14. Having a prostate screening test makes sense to me	01	02	03	04
C.15. I believe that going through prostate screening would help me to be healthy	01	02	03	04

	Strongly Disagree	Sort of Disagree	Sort of Agree	Strongly Agree
C.16. I plan on having a prostate screening examination in the next six months	01	02	03	04
C.17. Men who go through prostate screening will have more problems than men who do not go through screening	01	02	03	04
C.18. I want to do what the doctor I see thinks I should do about prostate screening	01	02	03	04
C.19. If I get prostate cancer nothing can be done to cure me of the disease	01	02	03	04
C.20. I think African American men are more likely to develop prostate cancer than White men	01	02	03	04
C.21. I am afraid that if I have a prostate screening test, the test result will show that I have prostate cancer	01	02	03	04
C.22. Going through prostate cancer screening would be embarrassing	01	02	03	04
C.23. I think that it is likely that I will develop prostate cancer	01	02	03	04
C.24. I believe that prostate screening is an effective way to find prostate cancer early	01	02	03	04
C.25. In the next six months I plan to discuss prostate screening with a physician	01	02	03	04
C.26. Members of my immediate family are likely to think I should go through prostate screening	01	02	03	04
C.27. Because I don't have any prostate problems, it isn't necessary for me to be tested for prostate cancer	01	02	03	04
C.28. I believe that when prostate cancer is found early, it can be cured	01	02	03	04
C.29. I believe that I can protect myself from prostate cancer by going through screening	01	02	03	04
C.30. I think that men who have a father or brother with prostate cancer are more likely to develop prostate cancer than men who do not have a father or brother with prostate cancer	01	02	03	04
C.31. In the next six months, I don't plan on talking to my doctor about prostate cancer	01	02	03	04

D. DECISION FACTORS

Some things that you think are important may make you lean towards having a prostate cancer screening exam. Other things might make you lean towards not having a prostate cancer screening exam. I will read a list of statements. Please let me know if you agree or disagree with each statement and whether it makes you lean towards having or not having an exam.

(Read Item)

A. Do you agree or disagree with this?

B. Does that make you lean towards having an exam, not having an exam, or does it have no effect on you?

	A			B			
	Agree	Disagree	Don't know GO TO NEXT QUESTION	Lean towards having	Lean to <u>not</u> having	No effect	Don't know
D.1. I am interested in knowing if I have prostate cancer	01	02	-1	02	00	01	-1
D.2. I am concerned about the cost of having an exam	01	02	-1	02	00	01	-1
D.3. I am interested in having an exam only if I am certain that the results will be good for me	01	02	-1	02	00	01	-1
D.4. I am concerned about the physical discomfort of having an exam	01	02	-1	02	00	01	-1
D.5. I am interested in protecting my health	01	02	-1	02	00	01	-1
D.6. I am concerned about finding the time to have an exam	01	02	-1	02	00	01	-1
D.7. I am interested in improving my current physical ability to control when I urinate	01	02	-1	02	00	01	-1
D.8. I am concerned about the embarrassment of having an exam	01	02	-1	02	00	01	-1
D.9. I am interested in improving my physical ability to have sexual intercourse	01	02	-1	02	00	01	-1
D.10. I am worried that I could die from prostate cancer	01	02	-1	02	00	01	-1

D.11. Is there anything else that might make you lean towards having or not having an exam?

Yes..... 01 GO TO 11.a
 No..... 00 SKIP to E.1
 Don't know..... -1

D.11.a. What is it?

RECORD VERBATIM

D.11.b. And does that make you lean towards having an exam or not having an exam?

Yes..... 01
 No..... 00
 Don't know..... -1

E. APPRAISAL SUPPORT

Next I will read a short list of statements, each of which may be true or not true about you.

ASK SCALE IN TWO PARTS: TRUE/FALSE, THEN PROBABLY / DEFINITELY.
 RECORD ONE CODE PER ITEM.

First, (READ E.1) Would you say true or false? Is that definitely (true/false) or probably (true/false)?

Next, READ E.2). REPEAT SCALE AFTER EACH STATEMENT AS NECESSARY.

	Definitely true	Probably true	Probably false	Definitely false
E.1. When I need suggestions on how to deal with a personal health problem, I know someone in my family I can turn to	03	02	01	00
E.2. When I need suggestions on how to deal with a personal health problem, I know someone outside my family I can turn to	03	02	01	00

F. HELP AND SUPPORT

Now, I'm going to read a list of statements that apply to families. By family, I mean your extended family, including your parents, sisters and brothers, and children.

(READ STATEMENT) Would you say this is *not at all true*, *rarely true*, *somewhat true* or *very true* about your family?

	Not at all true	Rarely true	Somewhat true	Very true
F.1. Members of my family really help and support each other when someone has a serious health problem	01	02	03	04
F.2. Members of my family tell each other about personal health problems	01	02	03	04

APPENDIX D

KNOWLEDGE OF PROSTATE CANCER SCREENING SURVEY

KNOWLEDGE OF PROSTATE CANCER SCREENING SURVEY

Please answer each of the following sentences with “True (yes),” “False (no),” or “Don’t Know,”	True (YES)	False (NO)	Don’t Know
G.1. Men who have several family members (blood relatives) with prostate cancer are more likely to get prostate cancer.	01	02	-1
G.2. A man can have prostate cancer and have no problems or symptoms.	01	02	-1
G.3. Younger men are more likely to get prostate cancer than older men.	01	02	-1
G.4. Frequent pain often in your lower back could be a sign of prostate cancer.	01	02	-1
G.5. Most 80-year-old men do not need a prostate cancer screening.	01	02	-1
G.6. Some treatments for prostate cancer can make it harder for men to control their urine.	01	02	-1
G.7. Some treatments for prostate cancer can cause problems with a man’s ability to have sex.	01	02	-1
G.8. Some treatments for prostate cancer can stop a man from ever driving a car again.	01	02	-1
G.9. Doctors can tell which men may die from prostate cancer and which men will not be harmed by prostate cancer.	01	02	-1
G.10. An abnormal Prostate Specific Antigen (PSA) blood test means I have cancer for sure.	01	02	-1
G.11. I can have cancer and have a normal PSA blood test.	01	02	-1
G.12. Prostate cancer may grow slowly in some men.	01	02	-1

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