The Relationships between Cultural Identity, Family Support and Influence, Colorectal Cancer Beliefs, and Gender and an Informed Decision regarding Colorectal Cancer Screening Among African Americans

by

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Abstract

The colorectal cancer (CRC) mortality rate among African Americans is 45% higher than Caucasians and CRC screening rates among African Americans are lower than Caucasians (American Cancer Society, 2008). Informed decision-making may be a strategy to decreasing CRC disparities among African Americans. This study examined relationships between cultural identity, family support and influence, CRC beliefs, gender and an informed decision regarding CRC screening among older African Americans (*N*= 129). Bivariate correlations indicated that perceived family support and CRC beliefs were related to making an informed decision regarding CRC screening (r = .24, p<.01; r = .29, p< .01, respectively). Path analysis indicated that CRC beliefs explained 9% of the variance in an informed decision and cultural identity, family support and influence explained 36% of the variance in CRC beliefs. The path analysis of the overall model did not fit the data well.

Gender differences among African American men and women were examined through bivariate correlations, t-tests and path analyses. Bivariate correlations indicated that among African American men, CRC and racial pride were related to an informed decision regarding CRC screening (r =.320, p =.006; r =.330, p=.005, respectively). Family support was related to CRC beliefs among African American men (r = .599; p =.000) and African American women (r = .447; p = .000). T-tests indicated that men were different than women in responses to certain cultural identity factors, CRC beliefs and family support (p= .05). Path analyses indicated that the gender covariate and male models did not fit the data well. However, the female model fit the data well (X^2 = 5.10,

6df, p = .531, N=65, NFI = .905, CFI = 1.00, RMSEA = .000). Explained variance for an informed decision was 6% for the female model and 10% for the gender covariate and male models.

Based on study results, older African Americans should be assessed for certain cultural factors, CRC beliefs and family support to increase informed decision making. Assessments and interventions should consider gender differences. Additional research is needed to understand the influences, supports and predictors of an informed decision to create efficacious CRC interventions and decision aids tailored for African Americans.

CHAPTER I

Introduction

The general format of this dissertation uses a three-article/paper option. Chapter I provides an overview, including the purpose, specific aims and associated research hypotheses/questions, and the background and significance for the work. Chapters II, III, IV report the results in three papers and Chapter V focuses on the discussion of the results and conclusions of this dissertation.

Statement of Purpose

The incidence rate of colorectal cancer is 20% higher among African Americans and the mortality rate is 45% higher than in Caucasians (American Cancer Society (ACS), 2008). Routine colorectal cancer screening is a key factor in colorectal cancer prevention (ACS, 2008) yet African Americans reported lower screening rates of fecal occult blood testing and endoscopy within the recommended time interval than Caucasians (ACS, 2008; Seeff, et al., 2004). Increasing colorectal cancer screening rates is crucial in reducing the colorectal cancer disparity experienced by African Americans. Understanding the influences of an informed decision is relevant to nursing practice to promote participation in colorectal cancer screening. Informed decision-making may be a strategy to decrease the disparity in colorectal cancer among African Americans. However, little is known about informed decision-making, its meaning, process or antecedents, among African Americans.

Prior studies have shown that an increase in knowledge about colorectal cancer screening is not a predictor of adherence to a healthcare provider's recommendations regarding colorectal cancer screening or change in an individual's perception of colorectal cancer screening (Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c).

Cultural identity, family support and influence and colorectal cancer beliefs, which are important factors in decisions by African Americans, have not been examined as influences on an informed decision for colorectal cancer screening. Based on a review of prior studies, more research is needed on how best to promote and facilitate an informed decision regarding colorectal cancer screening (Underwood, Powe, Canales, Meade & Im, 2004). This dissertation research was developed to fill critical gaps in nursing knowledge and cancer prevention and control research.

The purpose of this study was to examine informed decision-making regarding colorectal cancer screening among African Americans within the context of their families and cultural identity.

The specific aims of this research were to:

1) Examine the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening in African Americans.

2) Determine if the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening are different in African American men and women.

Structure of the Dissertation

The results related to the specific aims of this dissertation research are examined in detail in the next three chapters with the focus on examining factors that may be associated with an informed decision regarding colorectal cancer screening among African Americans. Each chapter serves as a basis for a manuscript. Chapter II reports results of a comparative analysis of the Preventive Health Model (PHM) with two other widely used existing models (the Health Belief Model and the Theory of Planned Behavior) as a basis for the development of the conceptual framework for the study. Chapter III examines the relationships between colorectal cancer beliefs, family support

and influence and an informed decision regarding colorectal cancer screening. Chapter IV addresses the second specific aim; the focus is to determine whether the relationships between colorectal cancer beliefs, cultural identity and an informed decision vary according to gender. Chapter V provides an overall discussion of the results, implications of the results for practice, theory and research, limitations and conclusions.

Background and Significance

Significance of the Problem

Compliance or adherence to cancer screening guidelines is a major factor in reducing the number of people diagnosed with cancer in its later stages. Intervention research has examined methods to increase compliance to cancer screening guidelines. The results of the intervention research indicated that interventions like mass mailings, reminders, mass screenings and other strategies to increase screening rates, were not enough to significantly improve screening rates (Rimer, et al.et al., 2004, Stone, et al., 2002). The results of a meta-analysis that examined the effectiveness of interventions to increase cancer screening and adult immunization rates, found that patient reminders and patient education were among the least effective interventions to increase breast, colorectal, and cervical cancer screening rates (Stone, 2002).

Interest in patient decision-making began after compliance to screening intervention strategies failed to increase screening rates (Rimer, et al., 2004). Patient decision-making was viewed as being at the core of patient satisfaction and quality care. Patient decision-making intervention research, at that time, focused on improving the amount of information a patient has to make a decision. It was expected that increasing the amount of information a patient has at his or her disposal would increase decision-

making, adherence and patient satisfaction with their health care. Vast amounts of information are available via the Internet for healthcare providers, patients and consumers to assist in patient decision-making. However, educational and informational strategies had limited effectiveness and routine screening rates for some cancer have remained unchanged (Rimer, et al., 2004). Currently, the research on patient decision-making extends to patient education, patient-provider communication and satisfaction. Each of these areas not only involves communication but also requires the patient to make an informed decision.

Informed decision-making is a type of patient decision-making that began because of failure of information/knowledge and other prompts to increase satisfaction, patient-provider communication or preventative health guidelines. Informed decision-making is usually more flexible in the amount of participation the patient wants and is more focused on the patient making a decision that is consistent with the patient's preferences and values (Rimer, et al., 2004). Respect for patient preferences, needs and values are the core of an informed decision and quality health care and should guide all clinical decisions (Institute of Medicine, 2004). Yet, patient's preferences and provider recommendations regarding colorectal cancer screening often do not agree (Ling, et al., 2001). Consequently, consumer satisfaction with the health care industry and adherence to cancer screening levels are not at optimal levels. The informed decision-making process can help bridge the gap between the decreasing amounts of time a provider has to inform, educate and counsel patients and the patient's need for information. Informed decision-making may be particularly important to reducing the colorectal cancer disparity among African Americans, who most often experience difficulties with health care in terms of access, trust, communicating with their health care provider and receiving desired services. Increasing colorectal cancer screening

rates is crucial in reducing the colorectal cancer disparity experienced by African Americans.

An informed decision is a critical factor in increasing colorectal cancer screening rates (Dolan & Frisina, 2002; Pignone, Bucholtz & Harris, 2000; Wolf, 2000). An informed decision is made without the benefit of a client-provider interaction and has occurred once an individual understands the disease or condition being addressed; understands the risks, limitation, benefits alternative and uncertainties of the screening method and makes the decision, to act or defer a decision at a later time, based on his or her screening preferences and values (Briss, Rimer, Reilly, Coates, Lee, Mullen, et al.et al. 2004). Informed decision-making may be a strategy to decrease the disparity in colorectal cancer among African Americans. However, little is known about informed decision-making, its meaning, process or antecedents, among African Americans, especially related to colorectal screening.

This dissertation research aims to understand the relationship between colorectal cancer beliefs, family support and influence and cultural identity and their influence on an informed decision regarding colorectal cancer screening among adults using the Preventive Health Model as the theoretical framework. The target population of this research project is older African American men and women. To understand the utility of the Preventive Health Model in understanding the influence of cultural identity and family support and influence on colorectal cancer beliefs among African American men and women, two other theoretical models (Health Belief Model and Theory of Planned Behavior) were examined. Finally, to understand the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening by gender, the models for African American men and women were compared.

Theoretical Framework

The Preventive Health Model (PHM) (Myers, 2005) is used in the dissertation as the underlying theoretical framework to understand informed decision regarding colorectal cancer screening. The rationale for using this model is that the PHM proposes that there are internal and external factors influencing preventive health related actions and that the health actions (behaviors) are reflective of a person's self-system (Myers, 2005). The PHM has been used most often among African American men to predict prostate cancer screening behaviors and among Caucasian men to predict colorectal cancer screening behaviors (Myers et al., 2005; Tiro, Vernon, Hyslop & Myers, 2005; Bradley, Kash, Piccoli & Myers, 2005; McQueen et al., 2007).

The underlying assumptions of the Preventive Health Model (PHM) are that when addressing a health matter (e.g. risk for disease), an individual forms an intention to act (e.g. to be screened or not to be screened) based on the interaction of different representations operating in the self-system (Myers et. al., 2005). Action and appraisal of the outcomes follow and experience (past or no experience) then shapes the self-system (Myers et al., 2005). The implementation of the action plan can be modified by decision-making about behavioral alternatives, which include preference clarification and behavioral alternative selection (Myers et al., 2005). The PHM is unique in that it is the only health behavior model that incorporates a decision making process with beliefs, barriers, costs, benefits, sociocultural and demographic characteristics to address that the gap between psychosocial factors and the intention to do the identified cancer related health behavior (Myers et al., 2005).

The constructs of the PHM include: self-system, decision-making process and preventative intention (Myers et al., 2005). The *self-system* includes background factors, the cognitive/psychological representation factor, salience, efficacy and self-efficacy (Meyers et al., 1994; Meyers et al., 2005; Ford et al., 2006). The self-system

also includes the social support and influence factors and programmatic factors (Meyers et al., 1994; Meyers et al., 2005; Ford et al., 2006). The self-system can affect health behavior directly or through the mediators of preference clarification and alternative selection. The *decision-making process* includes preference clarification and alternative selection related to the health behavior (Meyers et al., 2005). *Preventative intention* includes intention to take action, planning to take action or not to take action, action behavior and the experience of taking or not taking action. The preventative intention process in turn affects the self-system as part of the individual's sociocultural background (Myers et al., 2005). As a whole, the PHM postulates that when a person faces a risk for cancer or chronic disease, interplay of the different factors in the self-system occurs and decisions are made about behavioral alternatives through the processes of preference clarification and alternative selection that leads to the preventative intention process (Myers et al., 2005). It is the decision-making process of preference clarification and behavioral alternative selection that may lead to new interventions to address adherence to cancer related screening. A comparative analysis of the PHM and two other models, the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB), which provides the rationale for use of the PHM, is presented in Chapter II.

For the current study, the conceptual model (Figure 1.1) comprised several of the constructs of the PHM. The conceptual model focused on the self-system and the specific components examined included cultural identity, family support and influence and colorectal cancer beliefs.

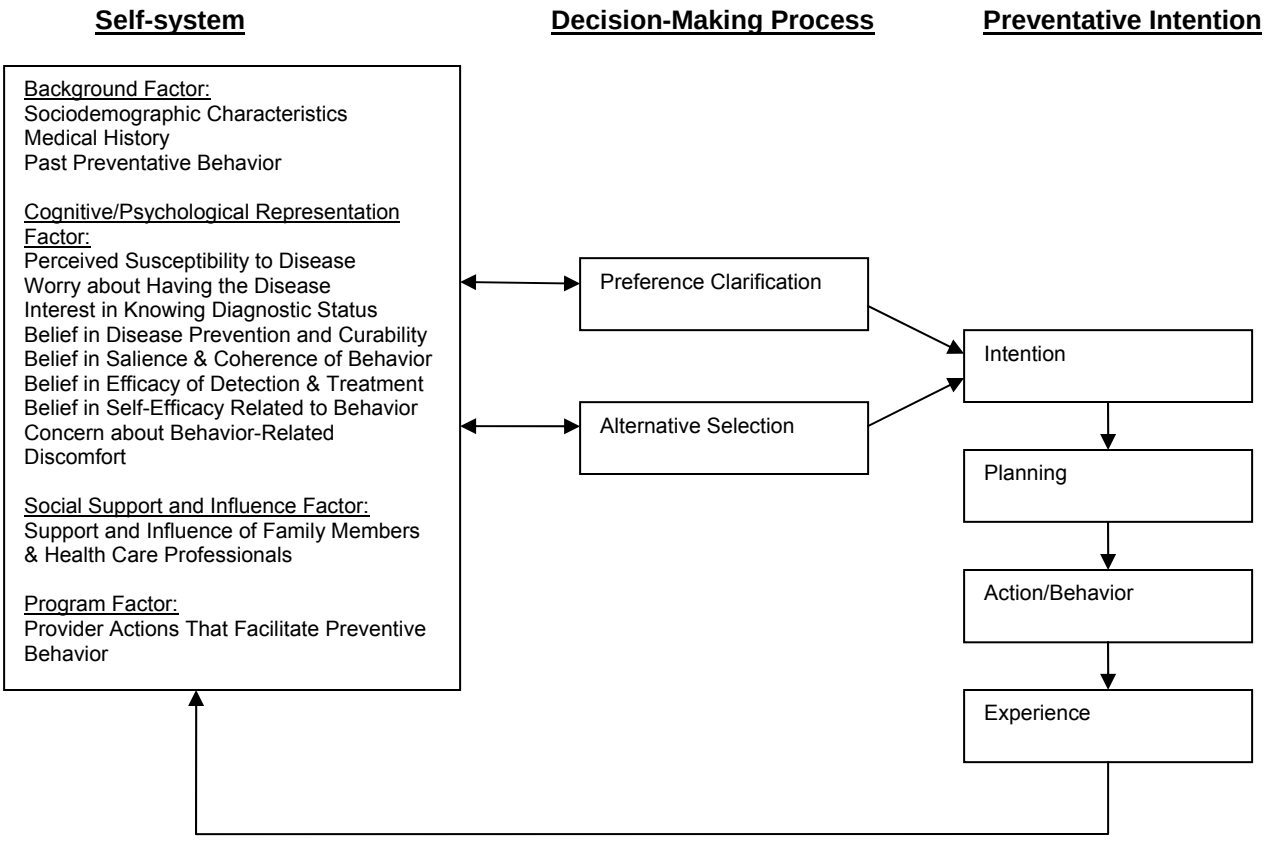

FIGURE 1. Preventive Health Model

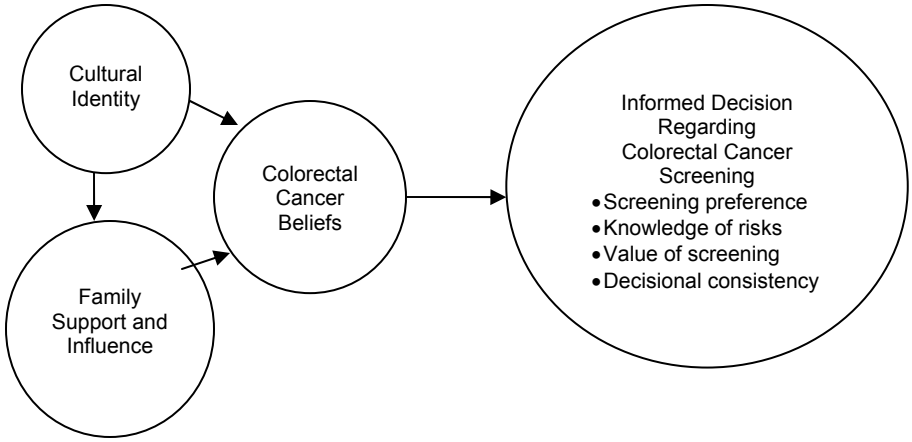

FIGURE 1.1. Conceptual Model: Influences of an informed decision regarding colorectal cancer screening among African Americans

Review of the Research Literature

According to the Preventive Health Model, an informed decision regarding colorectal cancer screening is influenced by the self-system, the decision-making process and preventative intention. While this dissertation research does not address each element of the self-system, decision-making process and preventative intention, the review of the research literature is structured in the order of the flow of the adaptation of the PHM used in the current study.

Self-System

Cultural Identity

Cultural identity is the compilation of important cultural characteristics that broadly identify the uniqueness of a culture (Lukwago, Kreuter, Bucholtz, Holt & Black, 2001). Cultural identity has been used to understand health behaviors related to HIV/AIDS, high blood pressure, diet, mammography, smoking and breast self examination in African Americans (Gueverra, Kwate, Tang, Valdimarsdottir, Freeman & Bovbjerg, 2004; Russell, Perkins, Zollinger, & Champion, 2006; Taylor, 2001). Cultural characteristics that are prevalent and most predictive among African Americans are:

collectivism, racial pride, religiosity, and time orientation (Lukwago, Kreuter, Bucholtz, Holt & Black, 2001; Klonoff & Landrine, 1999).

There is a growing body of studies examining the relationship between cultural identity and cancer screening behaviors. Russell, Perkins, Zollinger and Champion (2006), examined the relationships of cultural beliefs, health beliefs and sociodemographic characteristics with mammography screening and found that certain cultural characteristics, time orientation and religiosity, were predictive of mammography adherence. Erwin et al. (1999) found that breast cancer awareness education that was reflective of the cultural identity of African American women positively influenced breast cancer screening behaviors. Clearly, these research studies have begun examining the relationship between cultural identity and health behaviors related to cancer screening. However, the relationship between cultural identity and colorectal cancer screening behaviors has not been firmly established yet.

A limitation of most studies conducted regarding cancer screening and cultural identity among African Americans has been the lack of significant participation by African American males, except for studies focused on prostate cancer. Additionally, there has not been much attention given to the topic of cultural identity and decision-making (Weber & Hsse, 2000). When cultural identity and decision-making are explored, European American and Asian cultures are the most frequently examined populations (Weber & Hsse, 2000). While the number of studies that include African American cultural identity as a factor in health behaviors is growing, the number of studies examining the relationship between cultural identity and cancer screening behaviors like colorectal cancer screening is limited at best. Understanding how cultural identity influences informed decision making may lead to better interventions to increase the numbers of African Americans being tested for colorectal cancer.

Family Support and Influence

The family has a significant influence on the health of its individual members (Grzywacz & Fuqua, 2000; Lelinneth, Barnes, De La Cruz, Williams, & Rogers, 2006; Loveland-Cherry, 2005). The family has been shown to be a predictor of good and poor health outcomes including: mortality, cardiovascular heart disease, and complications in pregnancy (House, Umberson & Landis, 1998; Seeman, 2000; Kaplan, Strawbridge & Camacho, 1993). Much of the research conducted has not had a significant number of African American participants, thus limiting the generalizability of findings on the influence of the family on health for this segment of the population.

In the African American culture, the family is a major source of strength, comprised of persons related to each other by blood, marriage, formal adoption, informal adoption, or by appropriation (Billingsley & Caldwell, 1991). The African American family is the repository of specific cultural beliefs and health practices and is a source of cultural meaning (Becker, Gates & Newsom, 2004). Much of what has been studied concerning the African American family has focused on sociological problems such as adolescent pregnancy, absent fathers, aggression, fighting and academic success (Gonzales, Cauce, Friedman & Mason, 1996; Halle, Costes & Mahoney, 1997). Other research has focused on the positive characteristics of the African American family or studied the ties within the African American church, a part of the extended family for some African Americans, as exemplar (Billingsley & Caldwell, 1991; Lewis & Green, 2000; Littlejohn-Blake & Darling, 1993). There is limited research on the influence of the African American immediate family on the health of its members. In their qualitative study, Becker et al. (2004) found that self-care practices diabetes and high blood pressure were culturally-based and that African Americans reported their mother was a major source of support and advice. In addition, Becker et al. found that the support and

advice went from child to parent as well. There is a growing focus on the African American family and cancer.

Most studies examining the African American family and cancer or cancer screening focused on stress and coping, social support or survivorship (Katapodi, Facione, Miaskowski, Dodd & Waters, 2002; Mellon, 2002; Northouse, Caffery, Deichelboher, Schmidt, Trojniak, West, Kershaw & Mood, 1999). There is limited research on the influence of the African American family on cancer screening behaviors. Jernigan, Trauth, Ferguson & Ulrich, (2001), found that among African Americans, there appears to be a narrow social network regarding cancer screening. Women are more likely to mention additional sources for cancer screening such as church, while men were most likely to report that their main influence for cancer screening was a spouse or female family member (Jernigan et al., 2001).

There are limitations to much of the cancer research conducted with the African American family. These include a lack of attention to the possible differences in variable expression between African American men and women, and limited research on the influence of family on informed decisions regarding colorectal cancer screening among African Americans. To advance the body of research on cancer health disparities, it is imperative to examine what role the African American family takes in influencing cancer related beliefs and decisions regarding cancer screening behaviors. Understanding the African American family as a health-promoting unit can lead to the creation of more decision aids that are pertinent in terms of cultural appropriateness to increase African American colorectal cancer screening rates.

To date, there have been no studies examining the relationship between family support and influence and cultural identity as factors associated with an informed decision regarding colorectal cancer screening among African American adults. Understanding more about family support and influence between African American

adults, cultural identity and its relationship to an informed decision can broaden our knowledge of the cultural and familial influences for informed decision-making. This knowledge may give researchers another strategy to affect cancer health disparities.

Gender

Colorectal cancer is the third most common cancer in the United States (American Cancer Society, 2008). The risk of developing colorectal cancer is slightly higher in men than in women. Yet, nearly 50% of all Americans report not being screened for colorectal cancer (Center for Disease Control, 2005). In a survey conducted by the American Academy of Family Physicians (2007), 75% of men reported having a regular doctor and that the doctor was easy to talk to. However, 20% have never been told to have colorectal cancer screening. Of the men responding to the survey, 78% of those respondents who had a significant other or spouse reported that the individual had some influence over their decision to go to the doctor. Another study on women and health found that only 25% of women reported not seeking regular medical care (Salganicoff, Ranji & Wyn, 2005). However, research on colorectal cancer screening behaviors shows a gap between having a regular health care provider and colorectal cancer screening behaviors.

Weitzman (2001) found that white men and women age 50 to 65 and older believed that colorectal cancer and colorectal cancer screening were primarily for men and that more men reported being screened for colorectal cancer than women. Meissner et al., (2006), found that men were more likely to have been screened for colorectal cancer than women (47% versus 43%). Caucasian men were more likely to have been screened for colorectal cancer than Caucasian women (48% versus 44%) (Meissner et al., 2006). African American men and women were less likely to have had any colorectal cancer screening when compared to Caucasian men and women (Meissner et al., 2006). However, African American men reported having a colorectal

cancer screening more often than African American women (43% versus 38%) (Meissner et al., 2006). Most other studies examining barriers, beliefs, intention to screen and support and their relationship to colorectal cancer screening behaviors among minorities did not report gender differences responded because most of the respondents were women (James, et al., 2002; Wolf, et al., 2001). To reduce cancer health disparities, research must examine differences culture and family support and influence and their relationship to colorectal cancer and colorectal cancer screening perceptions and behaviors among African American men and women. Results of such studies may shape how information is tailored to increase colorectal cancer screening rates through tailored informed decisions among African Americans and shared decision- making discussions among African Americans and their health care providers.

Colorectal Cancer Beliefs

Beliefs about colorectal cancer screening have been identified as factors in the intent and performance of colorectal cancer screening behavior. The major concepts studied have been susceptibility/fatalism, saliency, worries/expected outcomes and barriers (Brenes & Paskett, 2000; Codori, 2001; Dassow, 2005; Green and Kelly, 2004; Myers, 1998). Myers (1998) found that intention to be screened was positively associated with beliefs about risk, efficacy of colorectal cancer testing, and colorectal cancer prevention (polyp removal) (all $p< 0.001$). Codori (2001) surveyed 1,160 healthy, adult, first-degree relatives of colorectal cancer patients. Codori found that a person is more likely to be screened if the person believes that colorectal cancer can be prevented ($p=0.033$) and has a higher perceived risk of getting colorectal cancer ($p<0.001$). Dassow (2005) compared women's beliefs about colorectal cancer screening to breast cancer and osteoporosis. Dassow found that beliefs about colorectal cancer severity and colorectal cancer susceptibility to be associated with adherence to screening recommendations ($p< 0.05$).

Three studies examining fatalism had a significant number of African American participants (Brenes & Paskett, 2000; Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c). The study by Powe (1995a, 1995b, 1995c) used a descriptive, correlational design to examine fatalism in African American (*n*=118) and Caucasian (*n*=74) men and women and found that African American women had significantly higher fatalism scores related to colorectal cancer compared to Caucasians and to African American men. Brenes and Paskett (2000) used a descriptive cross-sectional design to examine colorectal knowledge, beliefs, barriers, risk, worry and physician recommendation among African American (*n*=156) and Caucasian (*n*=46) women. The study found that the African American women who had low rates of flexible sigmoidoscopy screening, had beliefs about flexible sigmoidoscopy that were more negative, perceived more barriers to obtaining a flexible sigmoidoscopy, believed they were at lower risk of getting colorectal cancer, and worried less about getting colorectal cancer. Green and Kelly (2004), the only study to include exclusively African Americans, used a survey questionnaire given to 100 African Americans. They found that African Americans with less education perceived colorectal cancer as more of a threat than those with more education.

Researchers have examined individual beliefs about risk, efficacy of colorectal cancer testing and colorectal cancer prevention, and have found those beliefs are positively associated with the intent to be screened (Myers, 1998; Codori, 2001; Dassow, 2005). While these studies can lead to the development of interventions to address beliefs, most of the results can only be generalized to Caucasians or first-degree relatives of colorectal cancer patients (Myers, 1998; Codori, 2001; Dassow, 2005). The study of colorectal cancer beliefs among African Americans is growing (Brenes & Paskett, 2000; Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c). Closer examination of African American individuals' beliefs about colorectal cancer and

colorectal cancer screening in concert with family support and influence and cultural identity may yield additional critical information to develop colorectal cancer screening interventions for the African American population.

Decision-Making Process

Personal Testing Preferences

A component of an informed decision is that a choice is based on personal preferences, among other considerations (Briss, et al., 2004). Yet, many decisions made about colorectal cancer testing are not congruent with a patient's preference (Leard, Savides & Ganiats, 1997; Wolf, 2000). The literature (Leard et. al, 1997; Ling, Moskowitz, Wachs, Pearson & Schroy, 2001) suggests that many physicians presume that patients' preferences about colorectal cancer testing match their own preferences, but actually the preferences of the physician and patient are not alike. In a survey of patients and physicians in a general internal medicine practice at a university medical center, Ling et. al found a significant difference between physician perceptions of which test features were important to patients compared with the patients' actual response. The largest discrepancy was the fact that most patients (54%) wanted a colorectal cancer test that was the most accurate (e.g., colonoscopy), while the physicians perceived that level of discomfort (e.g., fecal occult blood testing [FOBT] produces least discomfort) involved with the colorectal cancer test would be the most important factor in making an informed decision on what type of colorectal cancer test to have. This incongruence could be the reason why 60% of those individuals eligible for colorectal cancer screening have not been screened and the low rates of subsequent adherence to colorectal screening recommendations (Vernon, 1997; Wolf, 2000). More research is needed to assess the influence of the family on colorectal cancer testing preferences of African Americans outside of medical settings, as most often this type of participant is engaging in health promoting activities on a routine basis. This study will look at the

following procedure preferences: fecal occult blood test and digital rectal examination and colonoscopy as it relates to family support and influence and an informed decision related to colorectal cancer screening.

Understanding Colorectal Cancer Screening and Value of Screening

The value of colorectal cancer testing has been examined in various ways from the specificity of the type of test to the importance of colorectal cancer screening to maintaining health (Green & Kelly, 2004; Ling, et al., 2001). To date there are very few studies that have studied whether or not a specific type of colorectal cancer screening is of value to the individual as an important health behavior over another type of colorectal cancer screening. This study examined personal health promotion/protection value of fecal occult blood test and digital rectal examination and colonoscopy.

Many studies have assessed a person's knowledge of colorectal cancer screening as a measure of understanding colorectal cancer screening (Green & Kelly, 2004). Very few studies have asked whether or not the person understands the risks and benefits colorectal cancer screening or has enough knowledge to make an informed decision about colorectal cancer screening. This study examined a person's understanding of the risks and benefits of specific colorectal cancer screening as part of an informed decision regarding colorectal cancer screening.

Decision Consistency

An informed decision occurs when a person makes a decision that is consistent with their testing preferences, values, and understanding etc (Briss, 2004). Many studies have not asked whether a person perceived that they have made a decision congruent with their testing values, preferences and understanding regarding colorectal cancer screening (Brenes & Paskett, 2000; Codori, 2001; Dassow, 2005; Green & Kelly, 2004; Myers, 1998). Understanding whether a person who has had or not had colorectal cancer screening made a decision that was consistent with their testing

preferences, values and understanding of the risks and benefits of specific colorectal cancer screening tests may lead to better interventions to increase colorectal cancer screening rates among African Americans.

Summary of Literature Review

Prior studies have shown that an increase in knowledge about colorectal cancer screening is not a predictor of adherence to a healthcare provider's recommendations regarding colorectal cancer screening or change an individual's perception of colorectal cancer screening (Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c). Based on a review of prior studies, more research is needed on how best to promote and facilitate an informed decision regarding colorectal cancer screening (Underwood, Powe, Canales, Meade & Im, 2004). This is especially important for African Americans. Colorectal cancer incidence and mortality is highest in African American men and women (ACS, 2008). Incidence rates among African American men and women are 20% higher that for white men and women, while mortality rates in African Americans are 45% higher than in whites (ACS, 2008). Cultural identity, family support and influence and support and colorectal cancer beliefs have not been examined as influences on an informed decision for colorectal cancer screening. Furthermore, how gender impacts colorectal cancer beliefs, cultural identity and its relationship to family support and influence and support have not been examined in relationship to an informed decision regarding colorectal cancer screening. In summary, to advance health behavior and cancer prevention and cancer control research among African Americans, studies of informed decision-making and its influences are necessary so that appropriate interventions that reflect the unique needs of this population may be developed.

Methods

Design

This study used a correlational, cross sectional design. The study examined the relationships among cultural identity, family support and influence, colorectal cancer beliefs and the informed decision regarding colorectal cancer screening among African Americans.

Sample

A purposive sample of 129 participants was recruited from a community partnership focused on cancer and African American businesses, agencies, organizations and self-referrals. A power analysis was conducted and it was determined that a sample size of 64 men and 64 women was required for sufficient power to use bivariate statistics. The power analysis conducted also determined that to conduct an analysis of the differences in model factors related to informed decision making regarding colorectal cancer screening between men and women, when using 7 predictors and to have 0.80 power to detect medium sized multiple correlations (R^2=.15) with alpha of .05, a sample size of 64 was required for each group, totaling a sample size of 128 (Cohen, 1992; Erdfelder, Faul & Buchner, 1996). The predictors of informed decision-making measured were cultural identity (collectivism, religiosity, racial pride, present time orientation and future time orientation), colorectal cancer beliefs, and family support and influence and support.

Eligibility criteria were as follow:

(1) African American men and women, (2) age 50 and older, (3) able to speak English, regardless of colorectal cancer screening history and family history of colorectal cancer. Exclusion criteria included men and women that were not African American, younger than 50 years of age, individuals that have or had colorectal cancer and individuals that do not have insurance coverage for colorectal cancer screening.

Recruitment

Study flyers were distributed at a quarterly meeting of the Detroit Community Network Partnership Program (CNP) for older underserved African Americans, a partnership between the Barbara Ann Karmanos Cancer Institute and the Wayne State University Institute of Gerontology (IOG)/Healthier Blank Elders project, funded by the National Cancer Institute. In addition to the Detroit area community based agencies, local businesses and community centers were asked to post the study flyer in highly visible areas and to post and/or distribute study flyers to their members. Eligible participants were asked to refer others meeting the inclusion criteria to participate in the study. An effort was made to recruit a sample that was approximately equally representative of men and women in order to understand gender differences among African Americans regarding informed decision making regarding colorectal cancer screening. To aid in the self-identification of study participants, all study flyers listed the study's inclusion criteria, phone number and e-mail address of the principal investigator.

Measures

Cultural Identity

To measure the cultural identity of the African American participants, five cultural identity sub-scales developed by Krueter, Lukwago, Bucholtz, Holt and Clark, (2001) were modified and used. Currently, the original sub-scales measure the cultural characteristics of African American women. The scale was modified by re-phrasing questions to identify "black people" instead of "black women". The Cultural Identity sub-scales have 32-items in total and measure five significant African American cultural characteristics; collectivism, religiosity, racial pride, present time orientation and future time orientation.

The psychometric testing of the scale resulted in a reported internal consistency as religiosity (α =0.88, r =.89, p =.001), collectivism (α =0.93, r =0.85, p =.001), racial pride (α =0.84, r =.52, p =.001), present time orientation (α =0.73, r =.52, p =.01) and future time orientation (α =0.72, r =.54, p =.07).

Colorectal Cancer Beliefs

To measure the beliefs about colorectal cancer screening among African American, the Colorectal Cancer Perceptions Scale (Green & Kelly, 2004) was used. An earlier version of the Champion and Scott (1997) Scale for Mammography Screening was modified by Green and Kelly to contain 35 items to measure beliefs about susceptibility, severity, benefits and barriers for colorectal cancer screening among African Americans (Green & Kelly, 2004). The construct validity for the scale (Green & Kelly, 2004) was determined by calculating a confirmatory factor analysis that demonstrated a MLR (maximum likelihood ratio) of 2.74. Internal consistency for the instrument was α=0.85. The reliability of the instrument used in their study was α =0.84.

Family Support and Influence

The Medical Outcomes Study Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1991) was used to measure family support. The purpose of the MOS-SSS is to serve as an indicator of the availability of overall social support through four dimensions of social support: emotional support; informational support; tangible support; affectionate support; and positive social interactions (Sherbourne & Stewart, 1991). The MOS-SSS is a reliable (α=0.97, r = 0.78, p=.01), 19-item measure of the availability of social support.

An additional 4-item scale to measure family influence was developed by the PI to specifically to measure the influence of the family on the respondent to complete and/or support colorectal cancer screening. For this study, the scale was found have adequate internal consistency reliability (α = .74).

Informed-Decision Making

An informed decision is made without the benefit of a client-provider interaction and has occurred once an individual understands the disease or condition being addressed; understands the risks, limitation, benefits alternative and uncertainties of the screening method and makes the decision, to act or defer a decision at a later time, based on his or her screening preferences and values (Briss, Rimer, Reilly, Coates, Lee, Mullen, et al., 2004). To measure informed decision making regarding colorectal cancer screening a 28-item scale was adapted from a measure of informed choice developed and tested by Marteau, Dormandy and Michie (2001). The adapted measure assessed colorectal cancer screening preferences (FOBT & DRE, colonoscopy and flexible sigmoidoscopy), understanding of colorectal cancer screening, knowledge of risks related to colorectal cancer screening, value of colorectal cancer screening and decisional consistency. The basis for the adapted questionnaire is the definition of informed decision-making (Briss, et al., 2004) and the decision-making process component of the PHM that is derived from the Multi-Attribute Theory. Using the decision-making process component of the PHM, the questions assess the respondent's colorectal cancer screening preferences and provide preference clarification. Currently, there are few reliable and valid measures of informed decision making related to colorectal cancer screening. Content validity of the proposed measure was established by the review of the measure by two expert judges who have a background in decision-making and/or oncology research. The scales were pilot tested with African Americans (n=30) similar to the study sample. Revisions in the items were not required based on the expert judges and the pilot test (α=0.65).

Demographics and Background

Participants completed a demographic questionnaire. The participant's socioeconomic level and previous healthcare experiences was collected using a

questionnaire currently used by Albrecht et al., (1999) in a study of patient-provider communication and clinical trials. Additional variables of participant's age, gender, experience with colorectal cancer screening and history of other chronic illnesses were collected. (See Appendix for complete questionnaire).

Procedures

All participation was voluntary. Potential participants learned of the proposed study and how to contact the principal investigator from flyer postings in the community and other participants. After being informed about the study, the potential participant decided whether or not to participate in the study. Upon determination of meeting the study's criteria, the principal investigator and participant arranged to meet at the principal investigator's office in Detroit in order for the principal investigator to review the research information sheet, answer questions about the information sheet or survey and complete the surveys (see Appendix for questionnaires). Consent to participate was obtained on the day of the proposed data collection session. Data collection was conducted at selected recruitment locations were confidentiality could be maintained. The principal investigator was present to answer questions about the questionnaires if the subject had any. Subjects completed the study in 20 to 40 minutes, with most doing so in approximately 30 minutes.

The purpose and content of this study were written in the instructions for the questionnaire and in the research information sheets.

Participants who completed either part of the questionnaire received a $25 gift certificate for a local department store.

Analysis

This researcher used SPSS 17.0 Windows program for data analysis. In order to maintain integrity of the data for analysis, the data were pre-coded and prepared for data entry. All data were entered in SPSS, cleaned and examined for outliers.

To examine the characteristics of the sample, simple descriptive statistics were used to determine frequencies, measures of central tendencies, means, standard deviations and skew and kurtosis and percentages of response subjects of each survey item.

Specific Aims

Aim 1:

To examine the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening in African Americans, we hypothesized that cultural identity was positively related to colorectal cancer beliefs and family support and influence among African American adults. To test this hypothesis, bivariate correlations using Pearson Product Moment Coefficients were computed between cultural identity and colorectal cancer beliefs and between cultural identity and family support and influence scores.

It was also hypothesized that family support and influence would be positively related to colorectal cancer beliefs among African American adults. To test this hypothesis, bivariate correlations using Pearson Product Moment Coefficients were computed between family support and influence and colorectal cancer beliefs. Additionally, it was hypothesized that colorectal cancer beliefs are positively related to an informed decision regarding colorectal cancer screening among African American adults. To test this hypothesis, bivariate correlations using Pearson Product Moment Coefficients were computed between colorectal cancer beliefs and an informed decision regarding colorectal cancer screening.

Lastly, it was hypothesized that colorectal cancer beliefs mediate the relationship between cultural identity and family support and influence and an informed decision regarding colorectal cancer screening among African American adults. To test the mediating effects of colorectal cancer beliefs on the relationship between cultural identity and family support and influence and informed decision making, the procedure recommended by Baron and Kenny (1986) and the Sobel test were used (Baron & Kenny, 1986; Dudley, Benuzillo, Carrico, 2004; MacKinnon, Lockwood, Hoffman, West & Sheets, 2002; Preacher & Hayes, 2004). The Sobel test, builds on the work of Baron and Kenny (1986), to provide a more precise view of the effect of mediation. The products from the three hypotheses were obtained and models were examined using the Sobel test. The models examined used colorectal cancer beliefs as mediating the relationship between cultural identity and an informed decision regarding colorectal cancer screening and colorectal cancer beliefs as mediating the relationship between the family support and an informed decision regarding colorectal cancer screening. In addition, path analyses were used to estimate the paths in the overall model to better describe the direct and indirect effects and total explained variance in informed decision making.

Aim 2:

To determine if the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening are different in African American men and women the following research question was examined: Do the influences of informed decision-making (cultural identity, colorectal cancer beliefs and family support and influence) differ between African American men and women? To test the male and female model predicting informed decision making regarding colorectal cancer screening, a multiple regression with gender as a variable was run to determine if gender is a significant predictor. If the

product terms in the model are significant, then separate path analyses will be run and compared for gender, men and women. For aim 2, to conduct an path analysis of the differences in model factors related to informed decision making regarding colorectal cancer screening between men and women, when using 7 predictors to have 0.80 power to detect medium sized multiple correlations (R^2=.15) with alpha of .05, a sample size of 64 is required for each group, totaling a sample size of 128.

Limitations

This study has several limitations because of its cross-sectional design and use of purposive sampling. First, a limitation of a cross-sectional design is that it is not possible to determine cause or effect, only relationships. Second, the study used a purposive sample. The use of the purposive sample of urban African Americans is a non-representative sample of the all African Americans. Thus, the results limit the generalizability to all African Americans. Third, the results cannot be generalized to all older African Americans. The sample population for the study was older urban African Americans with insurance. The results may differ among insured and uninsured African American men and women living in different regions of the United States. Last, only a segment of the PHM was tested. Thus, the PHM as a whole may not predict colorectal cancer screening. However, since there is limited research on African Americans, the support and influence of the family, cultural identity and colorectal cancer beliefs on an informed decision regarding colorectal cancer screening, the study contributes to the body of existing knowledge of those concepts.

Summary

The purpose of the this research project was to examine the influence of family and cultural identity on an informed decision regarding colorectal cancer screening

among African American men and women. The Preventive Health Model was the conceptual framework for the study, and the target population was African American men and women, age 50 years old and older. The organization of this dissertation was a three-manuscript format and results are comprehensively covered in the next three chapters. The first manuscript presented in Chapter II is a critical literature review focused on the conceptual model and comparative analysis of the Theory of Planned Behavior, Health Belief Model and The Preventive Health Model. The second manuscript, presented in Chapter III, presents the results of path analysis used to examine the relationships among cultural identity, colorectal cancer beliefs, family support and influence and informed decision making in African American adults, as proposed in the study's conceptual model. The third manuscript, presented in Chapter IV, examines the influence of gender on informed decision regarding colorectal cancer screening and its correlates among African Americans.

The results of the current study have the potential to generate information that may be important to bridging the colorectal cancer screening and colorectal cancer incidence disparities faced by African Americans. Additionally, when we compare African American men and women who have been screened to those who have not been screened for colorectal cancer, an important gap in the knowledge about colorectal cancer screening influences is addressed and more insight is given to assist in the development of potential interventions to increase the number of African Americans being screened for colorectal cancer.

Chapter II

Analysis of Conceptual Models to Explain Screening for Colorectal Cancer:
The Health Belief Model, Theory of Planned Behavior and Preventive Health Model

Abstract

This paper comparative analysis of two commonly used health behavior theories, the Health Belief Model (Janz & Becker, 1984) and the Theory of Planned Behavior (Montano & Kasprzyk, 2002) and one less commonly used the Preventive Health Model (Myers et al.,1994). The theories are compared using the following criteria 1) the predictive power of variables to understand cancer screening behaviors 2) use in the African American population and 3) empirical adequacy based on an analysis of the measures to operationalize the concepts in the models. The results of the analysis indicate that while all three models have strengths and weakness, the Preventive Health Model is more suitable to use as the framework for examining the relationship between an informed-decision and colorectal cancer screening.

Introduction and Background

Nursing interest in health behavior change interventions and research has increased in recent years. Traditionally, conceptual frameworks and theories have been used to explain health behaviors and guide interventions and research, such as the Transactional Model of Stress and Coping (Folkman & Moskowitz, 2000), the Health Belief Model (Janz & Becker, 1984; Rosenstock, Strecher, Becker, 1988), the Theory of Reasoned Action (Ajzen & Fishbein, 1980), and the Social Cognitive Theory (Bandura, 1997). The two most frequently used theories have been the Theory of Planned Behavior and the Health Belief Model (Nejad, Wertheim & Greenwood, 2005). The

Theory of Planned Behavior and the Health Belief Model have been used to examine health behaviors such as smoking cessation, cancer screening, HIV testing among other health behaviors. However, these theories have not adequately predicted cancer related screening behaviors among African Americans (Jennings-Dozier, 1999). Little attention has been given to examining other models that may provide additional insight into health behavior change. The Preventive Health Model (PHM) is a theory that has successfully predicted cancer related health behaviors among African Americans (Myers et al., 2005). The PHM, Theory of Planned Behavior (TPB) and the Health Belief Model (HBM) have similarities and differences and apparent usefulness to researchers and clinicians for understanding health behaviors; these three theories were selected for comparative analysis. The criteria used to evaluate and compare the theories were: 1) the predictive power of variables related to understanding cancer screening behaviors 2) use in the African American population and 3) empirical adequacy based on an analysis of the measures to operationalize the concepts in the models. The goal of this work was to provide a critical comparison and contrast of the Health Belief Model, Theory of Planned Behavior and the Preventive Health Model to provide the theoretical and empirical bases for future research projects and use of these models in practice settings.

Methods

A critical, integrative literature review was conducted to examine the theoretical and empirical literature on the Health Belief Model (HBM), Theory of Planned Behavior (TPB) and Preventive Health Model (PHM) and cancer related health behaviors among African Americans. Medline, the Cumulative Index of Nursing and Allied Health (CINAHL), PubMed, Cochrane Reviews and Google Scholar, as well as selected studies cited in other references were searched for studies using HBM, TPB and PHM. Taking into account changing cancer screening guidelines, increasing awareness programs and

interventions regarding cancer screening, and to obtain the most recent findings, the search was limited to studies published from 1990 through 2007. Search terms included "health belief model", "theory of planned behavior", "Preventive health model", "cancer screening", "cancer testing", "African Americans", "African American men", and "African American women". One hundred and fifty theory-based studies were found. The author reviewed all abstracts identified in the search and obtained articles and major review articles that appeared relevant for more detailed evaluation. Of those, 37 quantitative and/ or major review articles were included for the review.

Review of Conceptual Models

Health Belief Model

Within the literature, few theories are more frequently used to examine health behaviors than the Health Belief Model and the Theory of Planned Behavior. The Health Belief Model (HBM) was developed in the 1950s by Hochbaum and colleagues at the U.S. Public Health Services (Janz & Becker, 1984). The group developed the model to understand the failure of attempts to get people to adopt health measures to prevent or screen for disease before a person exhibited symptoms (Janz & Becker). Later, the HBM was applied to a person's response to symptoms and compliance to medical regimens (Janz & Becker). The HBM has its basis in social psychology and the work of a number of cognitive theorists (Janz, Champion & Strecher, 2002). Cognitive theorists believe that behavior is a function of the subjective value of an outcome and of the subjective probability or expectation that a particular action will achieve that outcome (Janz et al., 2002). Thus, the HBM is a value-expectancy theory. The HBM assumes: 1) the desire to avoid illness or to get well (value) and 2) the belief that a specific health action available to a person would prevent (or improve) illness (expectation) (Janz et al.,). Expectation has been further defined in terms of individuals' perceptions of their

personal susceptibility to and severity of an illness, and the likelihood of reducing the threat through personal action (Janz et al.,).

The seven major components of HBM include: 1) *Perceived susceptibility, 2) perceived severity, 3) perceived benefits, 4) perceived barriers, 5) cues to action, 6) additional variables, and 7) self-efficacy* (Janz & Becker). *Perceived susceptibility* refers to one's subjective perception of the risk of contracting a condition. Perceived susceptibility is used to assess the target populations' risk level and assess personalized risk based on an individual's characteristics or behavior. The goal of assessing perceived susceptibility is to determine how consistent perceived susceptibility is with an individual's actual risk (Janz & Becker, 1984; Janz et al., 2002). *Perceived severity* includes an individual's belief regarding both medical/clinical consequences (e.g., death, disability and pain) and social consequences (e.g., effects of the conditions on work, family life and social relations) related to contracting an illness or of leaving it untreated. Perceived severity is used to specify consequence of risk and the conditions that may occur if risk is not addressed. The combination of perceived severity and susceptibility is called perceived threat (Janz & Becker; Janz et al., 2002). *Perceived benefits* deal with an individual's belief in the efficacy of the advised action to reduce risk or seriousness versus leaving it untreated. Perceived benefits cover the action to take, how to take action, where to take action, when to take action and clarify the positive results of taking action. Even though individuals may accurately perceive their susceptibility and threat to a health condition, the HBM postulates that taking action depends on individuals' beliefs regarding the efficaciousness of the action to reduce risk/threat (Janz & Becker; Janz et al.,). *Perceived barriers* refer to the potential negative aspects of a particular health behavior that impede the completion of the recommended behavior. By identifying perceived barriers, perceived negative aspects of a health action are reduced through reassurance, correction of misinformation, provision of incentives and/or assistance.

The HBM postulates that an individual makes an unconscious analysis of the pros and cons of action versus inaction. The HBM further postulates that accurate perceived susceptibility and severity are the energy and force to act and the perception of benefits with reduced or eliminated perceived barriers provide a path to action (Janz & Becker; Janz et al.). *Cues to action* encompass the internal and external "triggers" that begin the decision making process. Cues to action provide the individual with information on how to access care/change behavior, promote awareness and/or employ reminder systems. Because of their complexity, cues to action have not been extensively studied. A cue to one person may not be a cue to another. Further, cues to action can be as simple as a reminder or flyer or as complex as a targeted multi-media messages (Janz & Becker; Janz et al.,). Additional variables-such as demographic, psychosocial and others may affect a person's perception and indirectly influence health related behavior. The HBM postulates that educational attainment has an indirect effect on behavior by influencing the perceptions of susceptibility, severity, benefits and barriers (Janz et al., 2002). *Self-efficacy* is defined as individuals' confidence in their ability to take action. Self-efficacy was added to the model in the late 1980s to address lifestyle behaviors that require long–term changes. Self-efficacy, while not explicitly shown in the HBM model (Figure 2), is used to provide training and guidance in performing the action, employs the use of progressive goal setting, giving verbal reinforcement, demonstrate the desired behavior and reduce the individual's anxiety regarding the action (Janz et al.). As a whole, the HBM (see Figure 2) postulates that individual perceptions (perceived susceptibility and perceived severity) are modified by demographic variables, perceived threat of an illness/disease and cues to action that affect the likelihood of action (perceived benefits minus perceived barriers) which lead to the likelihood to take action/behavior change and that self-efficacy is important for initiation and maintenance of the behavioral change (Janz & Becker; Janz et al.).

While the HBM includes many variables that influence health related behaviors, it does not address a person's conscious decision-making process and influences to take or not to take action. These two factors are important as they offer additional predictive power leading to more effective health related interventions. The Preventive Health Model (to be discussed later) addresses the conscious decision-making process to take or not to take action and influences to making a health related decision.

The HBM model as it relates to use in the African American population, cancer screening behaviors and empirical adequacy based on an analysis of the measures to operationalize the concepts will be discussed later in the paper.

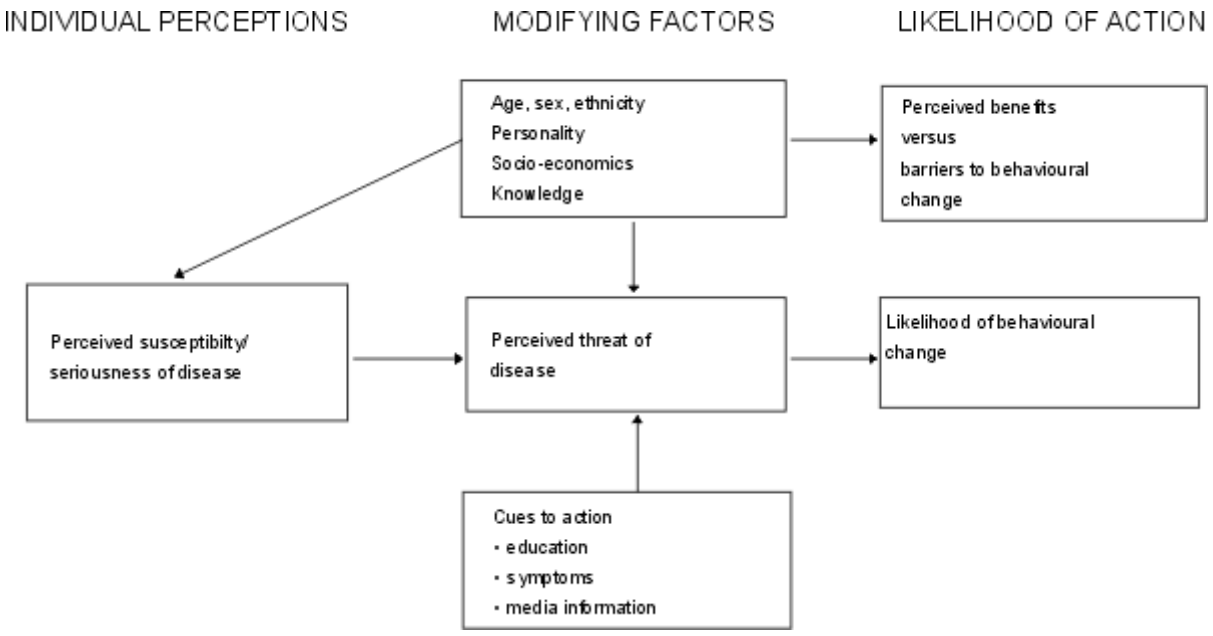

Figure 2. Health Belief Model, Glanz et al, 2002, p. 52

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) extends the Theory of Reasoned Action (TRA). The TRA and TPB have their bases in psychology and are expectancy-value theories (Montano & Kasprzyk, 2002). Both theories postulate that an individual's motivational factors determine the likelihood of performing a specific behavior (Montano & Kasprzyk, 2002). Further, demographic and environment and other variables operate through the constructs of each model and do not independently contribute to elucidating the likelihood of performing a behavior (Montano & Kasprzyk, 2002).

The Theory of Reasoned Action was introduced in 1967 by Fishbein to address the relationships among beliefs (behavioral and normative), attitudes, and intentional behavior. Fishbein developed the TRA to understand the relationship between attitude and behavior and to predict and understand motivational influences on behavior that are under individuals' volitional control. In research before the development of the TRA, the relationship between attitudes and behaviors had low correspondence (Montano & Kasprzyk, 2002). Most of the prior research attempted to explain the relationship between attitude toward health issue and behavior with respect to the object (Montano & Kasprzyk). Fishbein showed that attitude toward the behavior is a much better predictor of that behavior than the attitude toward the health issue (Montano & Kasprzyk).

The constructs of the TRA are 1) behavioral intention, 2) attitudes, 3) subjective norms, and 4) behavior. *Behavioral intention* is defined as the perceived likelihood of performing the behavior. According to the TRA, behavioral intention is the most important and proximal determinant of behavior (Montano & Kasprzyk, 2002); 2) *Attitude* is the overall evaluation of the behavior. Attitude toward the behavior is one of the direct determinants of behavioral intention and is further specified as including behavioral belief and evaluation of behavioral outcomes. *Behavioral belief* is the belief that performing the behavior will produce or is associated with certain outcomes or

characteristics. Behavioral beliefs determine attitude toward the behavior; *Evaluation of behavioral outcomes* is the value associated with the behavioral outcome or characteristic. Evaluations of behavioral outcomes interact with behavioral beliefs to determine attitude toward behavior. Thus, a person who has strong beliefs that positive and valued outcomes will result from performing a behaviors will have a positive attitude regarding the behavior. *Subjective norm* is the belief that most people either approve or disapprove of the behavior. Subjective norm is influenced by normative beliefs and motivation to comply. *Normative beliefs* involve perceptions of the person about whether important people approve or disapprove of performing the behavior. *Motivation to comply* is the person's motivation to do what important people think regarding the behavior. Thus, a person who believes that certain important people think he or she should perform a behavior is motivated to do that behavior and has a positive subjective norm (Montano & Kasprzyk). As a whole, the TRA postulates that *behavioral intentions* are the most proximal predictor of *behaviors* (Ajzen & Fishbein, 1980). The TRA assumes a causal chain that links behavioral beliefs and normative beliefs to behavioral intention and behavior by way of attitude and subjective norms (Montano & Kasprzyk).

The Theory of Planned Behavior (Ajzen, 1985) extends the TRA by adding perceived behavioral control (Figure 2.1). The addition of perceived behavioral control was based on the idea that performing a behavior is determined by both motivation (intention) and ability (behavioral control) (Montano & Kasprzyk, 2002). According to the TPB, a person is more likely to perform behaviors when they have a high perception of control over the performance of the behavior. High perception of control with high intention should have a direct effect on behavior performance. Behavior performance should be predicted with accuracy when there is an accurate assessment of actual control over the behavior and when perceived volitional control is not high (Montano & Kasprzyk). The TPB also postulates that perceived control is an independent

determinant of behavioral intention along with attitude toward the behavior and subjective norm (Montano & Kasprzyk). *Perceived behavioral control* is defined as the overall measure of a person's perceived control over behavior and is influenced by control beliefs weighted by perceived power. *Control beliefs* are the perceived likelihood of each facilitating or constraining condition occurring. *Perceived power* is the perceived effect of each condition in making performing the behavior easy or difficult. Thus, a person who has strong control beliefs about the factors that facilitate the behaviors will have high perceived control over the behavior and is more likely to perform the behavior. However, a person who has low perceived control is less likely to perform the behavior (Armitage & Conner, 2001). Few studies have operationalized perceived control using the underlying measures of control beliefs and perceived power (Montano & Kasprzyk). According to researchers that use the TPB, the addition of perceived behavioral control is necessary to explain potential constraints on action (incomplete volitional control) as perceived by the subject and is thought to explain why intention does not always predict behavior (Armitage & Conner).

The TPB addresses many important variables related to health behaviors including the influence of important people in an individual's life and their impact on behavior performance. However, the TPB does not address behavioral alternatives or preference clarification, which is becoming more essential as lifestyle changes become more complex. The Preventive Health Model addresses both behavioral alternative and preference clarification and will be discussed in the next section.

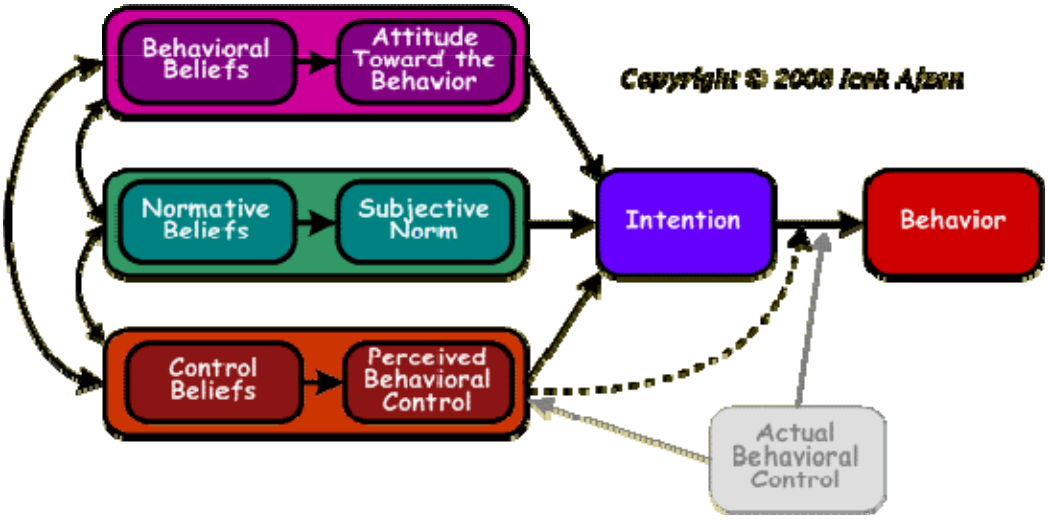

FIGURE 2.1. The Theory of Planned Behavior, www.people.umass.edu/aizen

Preventive Health Model

The Preventive Health Model (PHM) (Figure 2.2) was developed in the late 1980s to identify internal and external factors that influence an individual's decision to take action on health related behaviors (Myers et al.,1999; Myers et al., 2005; Ford, Vernon, Havstad, Thomas & Davis, 2006). The PHM originated from Myers' work in social welfare policy, medical sociology and behavioral epidemiology. The Preventive Health Model builds on other health behavior models like the Health Belief Model, Theory of Reasoned Action, Social Cognitive Theory, Multiattribute Theory and Self-Regulation theory (Myers et al., 1999; Myers et al., 2005; Ford et al., 2006). The underlying assumptions of the PHM are that when addressing a health matter (e.g. risk for disease), an individual forms an intention to act (e.g. to be screened or not to be screened) based on the interaction of different representations operating in the self-system (Myers et. al., 2005). Action and appraisal of the outcomes follows and experience (past or no experience) then shapes the self-system (Myers et al., 2005). The implementation of the action plan can be modified by decision-making about

behavioral alternatives, which include preference clarification and behavioral alternative selection (Myers et al., 2005). The PHM is unique in that it is the only health behavior model that incorporates a decision making process with beliefs, barriers, costs, benefits, sociocultural and demographic characteristics to address that the gap between psychosocial factors and the intention to do the identified health behavior (Myers et al., 2005).

The constructs of the PHM include: self-system, decision-making process and preventative intention (Myers et al., 2005). The *self-system* includes sociocultural background factors (e.g. demographic and socioeconomic factor personal and family health history and past health behavior), representations including cognitive and affective factors, such as knowledge, perceived susceptibility, worry (disease and health behavior), salience, efficacy and self-efficacy (Myers et al., 1994; Myers et al., 2005; Ford et al., 2006). The self-system also includes social support and influence factors (e.g. the support and influence of family members, friends and healthcare professionals) and programmatic factors (e.g. characteristics of the healthcare delivery systems, costs, accessibility, patient-provider relationship, etc) (Myers et al., 1994; Myers et al., 2005; Ford et al., 2006). The self-system can affect health behavior directly or through the mediators of preference clarification and alternative selection. The *decision-making process* includes preference clarification and behavioral alternative selection related to the health behavior (Myers et al., 2005). *Preventative intention* includes the intent to take or not take action, planning to take action or not to take action, taking or not taking action and the experience of taking or not taking action. The preventative intention process in turn affects the self-system as part of the individual's sociocultural background (Myers et al., 2005). As a whole, the PHM postulates that when a person faces a risk for cancer or chronic disease, interplay of the different factors in the self-system occurs and decisions are made about behavioral alternatives through the

processes of preference clarification and alternative selection that leads to the preventative intention process (Myers et al., 2005). It is the decision-making process of preference clarification and behavioral alternative selection that may lead to new interventions to address adherence to cancer related screening, unlike the HBM and TPB.

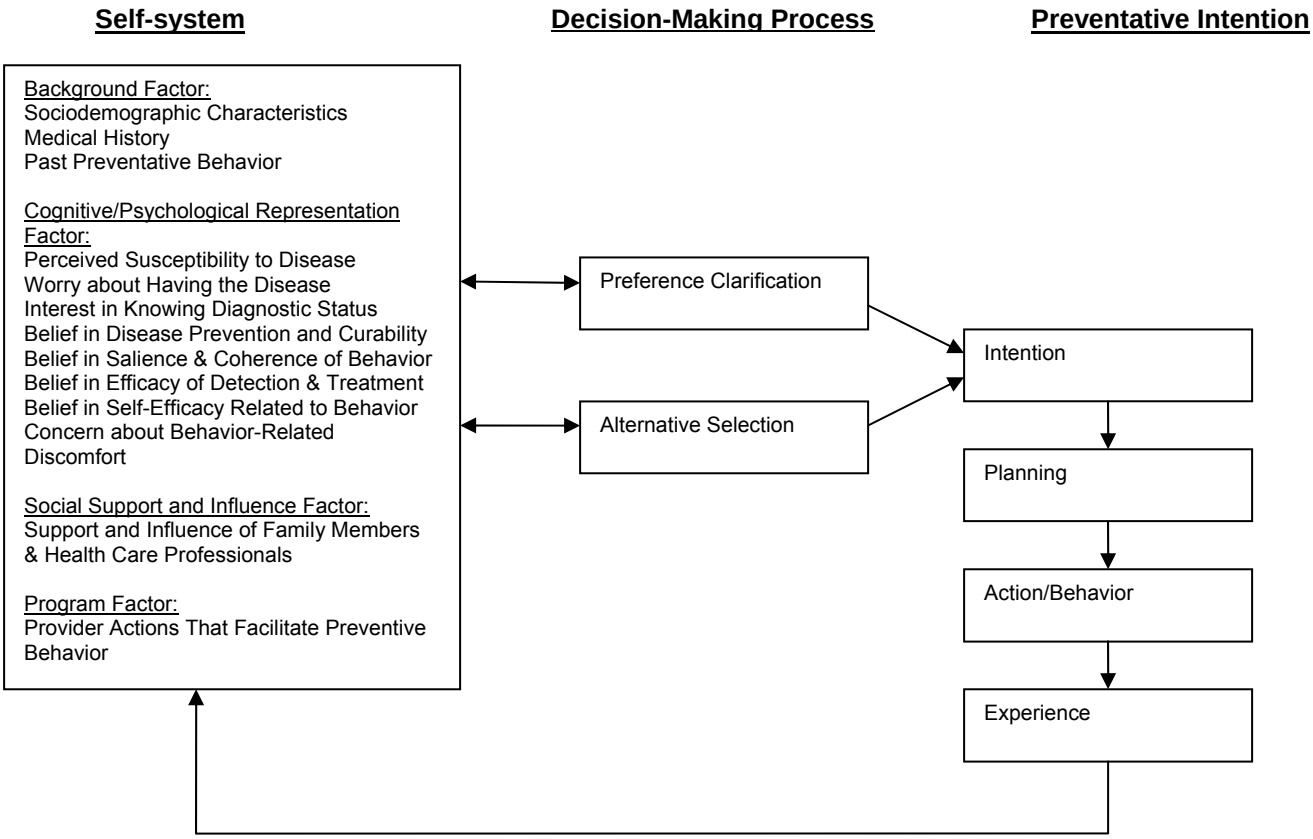

Figure 2.2. Preventive Health Model, Myers, 2005

Applications of the HBM, TPB and PHM to cancer screening behavior

Health Belief Model

Reviews of research utilizing the HBM across a wide range of health behaviors have shown that while the four components of the HBM provide consistent predictions of health behaviors, these predictions are weak (Farmer, Reddick, D'Agostino & Jackson,

2007; Russell, Champion & Skinner, 2006 ; Yarbrough & Braden, 2001). Results of the meta-analysis to reassess the predictive validity of four HBM variables (susceptibility, severity, benefits and costs) conducted by Harrison, Mullen and Green showed that the HBM variables are significant predictors of health behaviors. However, the amount of variance explained by each of the four variables was relatively small. The variance accounted for by the four HBM variables included in the meta-analysis ranged from .01 to .09. Of the 22 mean effect sizes found to be statistically significant, homogeneity was rejected on 15 of the 22 effect sizes; and the largest effect size was found for perceived susceptibility (r = .15, p<0.01).

The Health Belief Model has been used to examine cancer beliefs, breast cancer screening, breast self examination, mammography, testicular self-examination, the Pap test and colorectal cancer screening (James, Campbell & Hudson, 2002; Millon Underwood & Sanders, 1991; Russell, Champion & Skinner, 2006; Stein, Fox, Murata & Morisky, 1992; Green & Kelly, 2004). In a study exploring breast cancer screening, Stein et al. (1992) used path analysis and found that prior mammography and future intentions predicted past mammograms (r =.31,r^2 =.09, p≤.001) but not future mammography. Yarbrough and Braden (2001) examined the utility of the HBM to predict breast cancer screening behaviors. Of the 16 descriptive studies included in the analysis, the amount of variance explained by HBM variables and socioeconomic status did not exceed 47%. In studies that did not include socioeconomic status, the HBM variable accounted for 15% to 26% of the variance. As evidenced by the breast health literature, the HBM elucidates values, beliefs and behaviors, but the HBM has not predicted breast cancer screening well enough to predict points for targeting effective interventions. Thus, the HBM is not a good choice for predicting colorectal cancer screening given that colorectal cancer screening examinations are far more time consuming and invasive than breast and other cancer screenings.

Few studies have applied the HBM to the prediction of colorectal cancer (CRC) screening. Studies that have used HBM to predict CRC screening showed that perceived barriers and perceived susceptibility are significant predictors. For example, Macrae, Hill, St. John, Ambikapathy and Garner (1994) used the HBM to examine the difference between people who complete a fecal occult blood test (FOBT) and those who did not complete FOBT testing. Macrae et al. (1994) found that the HBM accounted for 12% of the variance in screening behavior. In the multiple regression analysis, perceived barriers to taking the FOBT and perceived susceptibility to colorectal cancer were the only significant constructs (Macrae, et al.,). James, Campbell and Hudson (2002) used the HBM to explore perceived benefits and barriers to colorectal cancer screening among African American adults and found that higher perceived barriers scores were associated with less likelihood of having been screened with an FOBT in the past year (*OR*= 0.91; CI: 0.86-0.97). The HBM variable that consistently predicted CRC screening was perceived barriers (James, Campbell & Hudson; Macrae, et al., 1994; Menon, Belue, Sugg-Skinner, Rothwell & Champion 2007). Yet, among studies with exclusively African American participants examining other health related behaviors (breast cancer screening, prostate cancer screening, etc) perceived threat was the most predictive HBM variable.

The results of the aforementioned studies provide insight into perceived barriers related to colorectal cancer screening, but the lack of research examining “cues to action”, (the component encompasses the internal and external “triggers” that begin the decision making process), limits the utility of the HBM in advancing the understanding of interventions that will successfully impact an individual’s health behavior, specifically in terms of colorectal cancer screening among low or moderate risk groups. The lack of consistent predictive results among ethnic groups and colorectal cancer screening is another limitation of the HBM. Further, studies using the HBM rely on cross-sectional

research designs. The lack of longitudinal studies makes it difficult to infer causal relationships between health beliefs and CRC using the HBM.

Theory of Planned Behavior

Review of research using Theory of Planned Behavior (TPB) shows that it has been used to examine an array of health behaviors. In a meta-analysis of the TPB, Armitage and Conner (2001), found that the average multiple correlation of intention to do health behaviors and perceived behavioral control (PBC) with behavior is .52 and accounts for 27% of the variance (R^2 = .27) (Armitage & Conner). Additionally, PBC adds an additional 2% to prediction of behavior, more than intention (Armitage & Conner). The average multiple correlation of attitude, subjective norms and PBC with intention is r = .63, accounting for 39% of the variance (r^2 =.39) (Armitage & Conner,). The PBC-intention correlation is weak and accounts for 18% of the variance when controlling for attitude and subjective norm (r^2=.18) (Armitage & Conner). Further, the subjective norm-intention correlation is weak (r^2 =.12) (Armitage & Conner). This result is possibly due to the conceptualization of subjective norms within TPB that do not adequately capture social influence. Adequately measuring social influence is particularly important in addressing cancer health disparities among African Americans.

The TPB has been used to predict cancer-screening behaviors such as cervical cancer screening (Jennings-Dozier, 1999), colorectal cancer screening (DeVellis, Blalock & Sandler, 1990), mammography (Bowie, Curbow, LaViest, Fitzgerald, et. al, 2003; Steele & Porche, 2005), breast self examination (McCaul, Sandsgren, O'Neill & Hinsz, 1993; Young, Lierman, Powell-Cope, Kasprzyk & Benoliel, 1991), breast and cervical cancer screening (Burnett, Steakly & Tefft, 1995), breast and testicular self-examination (Van Ryn, Lytle & Kirscht, 1996), prostate cancer screening (Shelton, Weinrich & Reynolds, 1999), testicular cancer (Murphy & Brubaker, 1990) and skin cancer (Hillhouse, Adler, Drinnon & Turrisi, 1997). The single study that quantitatively

and specifically applied the TPB to the prediction or intention to have colorectal cancer screening was conducted by DeVellis, Blalock and Sandler (1990). DeVellis, Blalock and Sandler performed regression analysis and found that among a group of Caucasians (n=144) at average risk for colorectal cancer, perceived behavioral control was not related to behavior when controlling for attitude and subjective norm (r^2 =.117, p=.08). Additionally, perceived behavioral control was also not significant when adding behavioral intention as a predictor variable to the aforementioned regression model among an average risk group (r^2 = .267, p= -.10). This finding indicates that control does not predict differences in those who completed or did not complete colorectal cancer screening in an average risk group (DeVellis, Blalock & Sandler, 1990). This finding contradicts the TPB which postulates that perceived behavioral control is essential to explaining potential constraints on action as perceived by the subject and is thought to explain why intention does not always predict behavior (Armitage & Conner, 2001).

An additional limitation of the TPB is that many of the studies utilizing the TPB have been cross sectional, which limits the inference of a causal relationship between the variables of the TPB and CRC. Unlike the TPB, the PHM has been used in cross sectional as well as randomized clinical trials to understand factors influencing colorectal cancer screening.

Preventive Health Model

A major strength of the PHM is that it has been used to exclusively predict cancer related health behaviors such as breast biopsy, prostate cancer screening and colorectal cancer screening (Myers et al., 2005; Tiro, Vernon, Hyslop & Myers, 2005; Bradley, Kash, Piccoli & Myers, 2005; McQueen et al., 2007). In a randomized clinical trial, Myers et al., (1994) studied adherence to colorectal cancer screening adherence among men and women, using logistic regression, and found that age (*OR*=2.2, CI: 1.0-4.8, p=.043) and belief in the efficacy of CRC screening (*OR*=2.0, CI: 1.4-2.8, p=.000) were

significant predictors of CRC screening adherence among women. Yet, among men, predictors of adherence were self-efficacy related to FOBT (*OR*=1.4, CI: 1.0-2.1, *p*=.035), belief in the efficacy of CRC screening (*OR*= 1.8, CI: 1.0-3.1, *p*=.043) and having a health education intervention which encourages preventative action (*OR*=6.0, CI: 2.9-12.7, *p*=.000). Myers et al., (1999), in a randomized clinical trial, studied adherence to prostate cancer screening among African American men. Myers et al., (1999) found that African American men who were 50 years or older (*OR*=2.6, CI: 1.7-3.9), were married (*OR*=1.8, CI: 1.2-2.9), believed in the efficacy of prostate cancer early detection (OR= 2.3, CI: 1.3-4.0) and had an intention to be screened (*OR*=1.9, CI: 1.2-2.9) were more likely to adhere to prostate cancer screening than were younger, unmarried African American men. The PHM also has been used to predict colorectal cancer screening.

In a randomized clinical trial, McQueen et al., (2007) used the PHM to study the correlates of colorectal cancer screening (FOBT) and prospective correlates of colorectal cancer screening among white male automotive workers with no history of CRC. Using multiple logistic regression, McQueen et al. (2007), found that among men who began CRC screening being married (*OR*= 1.94, CI: 1.5-3.55), a family history of CRC or polyps (*OR*= 2.09, CI: 1.27-3.45), a personal history of polyps (*OR*= 1.93, CI: 1.11-3.34), and a strong intention to be screened for CRC (*OR*= 2.34, CI: 1.44-3.81) were associated with CRC screening. Among men who maintained CRC screening, age (*OR*= 0.68, CI: 0.52-0.91), family history of CRC or polyps (*OR*= 1.38, CI: 1.04-1.84), a personal history of polyps (*OR*= 1.56, CI: 1.18-2.06), perceived self efficacy related to CRC screening (*OR*= 1.44, CI: 1.12-1.85), support among family members (*OR*= 1.75, CI: 1.29-2.38), strong intention to be screened (*OR*= 1.82, CI: 1.35-2.46), being a part of the intervention (*OR*= 1.55, CI: 1.09-2.20) having screening available at work all year long (*OR*= 1.92, CI: 1.11-3.31) and the ability to receive an FOBT test kit at educational

sessions (*OR*= 1.59, CI: 1.02-2.49). These results highlight the consistent results related to cancer screening and cancer health behaviors among men, women and African Americans when using the PHM.

Vernon, Myers and Tilley (1997) found that within the PHM that cognitive/psychological representation accounted for 90% of the variance (R^2 = .90) of past colorectal cancer screening behavior. Vernon et al., (1997) also found that intention explained 42% of the variance in past colorectal cancer screening behaviors (R^2 = .42).

Another strength of the PHM is that much of the research studies using the model have been randomized clinical trials, thus enhancing the inference of a causal relationship between the variables of the PHM and cancer related behaviors, especially CRC screening.

Applications of the HBM, TPB and PHM among men and women

Health Belief Model

James, Kramish, and Hudson (2002) used the Health Belief Model to examine the perceived benefits and barriers to colorectal cancer screening among African American men and women. The study found that the way people perceive colorectal cancer screening differs based upon the type colorectal cancer screening test. A Limitation of the design of the study was that it was not designed to examine differences in the perceived benefits and barriers among men and women as 72% of the sample were women. Weitzman, Zapka, Estabrook and Goins (2001) used the HBM to assess the knowledge of colorectal cancer perceived risk, barriers and facilitators, experience and intention related to colorectal cancer screening among Caucasian men and women. The study results showed no differences between men and women related to lack of awareness, lack of understanding of the recommendations and follow-up and the barriers to colorectal cancer screening. Limitations of this study include the use of a

small convenience sample, which limits the generalizability. Another limitation is the use of qualitative research. Qualitative research may be vulnerable to inconsistencies in how questions are asked and how the data are analyzed. Finally, Winfield and Whaley (2002) used the HBM to predict condom use among African American college students. Gender was found to be a negative predictor of condom use (β = -.56, t = -2.25, p<.05), meaning that men were more likely to use condoms (Winfield & Whaley, 2002). A limitation of using the HBM to study cancer screening behaviors is the inconsistent use of the model to examine gender differences among study variables. Another limitation of the model is its ability to predict gender differences in health related behaviors.

Theory of Planned Behavior

Sheeran, Norman and Conner (2001) used the TPB in a study to predict attendance at a health screening. The study results were that women were more likely to attend the health screening than men (r = .99, p<.001). TPB did not predict who delayed or did not attend the health screening. A limitation of this study is that women were the majority of the survey participants (58% vs. 46%). Thus, indicating the study results may have limited generalizability due to the sample of men and women not being equal.

The TPB was used in a study examining exercise intention and behavior among breast and prostate cancer survivors (Blanchard, Courneya, Rodgers & Murnaghan, 2002). Gender was significantly correlated with exercise and past exercise (r =.38, p<.001) and a predictor of past exercise (β= .30, p<.001). Men were more likely to have exercised currently and in the past. While this study compared breast and prostate cancer survivors, single sex cancers, the result indicates that future research on mixed gender cancer should consider gender as a potential predictor.

Like the HBM, the TPB has limitations in examining gender differences in health related behaviors. Many studies using the TPB failed to design the study to allow for the

examination of gender differences. The TPB has not been consistently used to examine gender differences in cancer related behaviors, particularly mixed gender cancers.

Preventive Health Model

The PHM has been used to examine health behaviors such as prostate cancer screening, colorectal cancer screening and breast biopsy (Myers et al., 2005; Tiro, Vernon, Hyslop & Myers, 2005; Bradley, Kash, Piccoli & Myers, 2005; McQueen et al., 2007). Myers et al., (1994) examined colorectal cancer screening adherence among men and women. Gender was not found to be a significant predictor of colorectal cancer screening adherence (Myers et al.,1994). Like the HBM and TPB, the PHM has not consistently been used to examine mixed gender cancer or health related behaviors. Like the other models, future research using the PHM should examine gender as a potential predictor of health related behaviors.

Applications of the HBM, TPB and PHM among African Americans

Health Belief Model

Of the studies using the Health Belief Model, few have used samples from diverse populations (Farmer, Reddick, D'Agostino & Jackson, 2007; Green & Kelly, 2004; James et al., 2002; Millon-Underwood & Sanders, 1991; Russell, Champion & Skinner, 2006). Russell, Champion and Skinner (2006) used the Health Belief Model to investigate health beliefs associated with repeat mammography among older African American women over a 5-year period. Using logistic regression, demographics, knowledge, provider recommendation, health belief variables and mammography were entered into the model and the overall logistic regression was found to be significant (χ^2 =32.03, p=.001). Of the HBM variables, perceived barriers were the most significant predictor of mammography adherence (OR=0.963, CI: 0.940-0.987, p=.003). Knowledge was also a significant predictor of mammography adherence (OR=0.591, CI:

0.398-0.878, p=.009) (Russell et al., 2006). Millon-Underwood and Sanders used the Health Belief Model to explore knowledge, health beliefs and practice of testicular self-examination (TSE) among African American men. Using multiple regression, knowledge of how to perform TSE was the most predictive variable (R^2=.13, p=.000) and explained 13% of the variance. Adding knowledge of testicular cancer incidence (R^2=.12, p=.05) and warning signs (R^2=.04, p=.05) explained an additional 16% of the variance. Utilizing the HBM, Millon-Underwood and Sanders explored the factors related to cancer screening, cancer risk factors and cancer prevention and early cancer detection behaviors among African American men. Using stepwise regression, Millon-Underwood and Sanders found that attitude related to the efficacy of screening was the most predictive of cancer screening/early detection behaviors (R^2=.34, p=.000) and 34% of the variance was explained by attitudes toward cancer screening/early detection behaviors. Green and Kelly used the HBM to determine the CRC knowledge, perceptions and screening behaviors and factors that influence the screening behaviors of older African Americans. Colorectal cancer screening behaviors studied were the FOBT, flexible sigmoidoscopy/colonoscopy, double contrast barium enema. In a multiple regression analysis of the data, Green and Kelly found that 33% of the variance was explained by demographics, history of CRC screening, family history of cancer and perceived threat (R^2 =.325) with history of CRC screening ($p \leq .01$) having the most impact on the model. A limitation of this study is that the insurance status of the participants was not assessed, which could have influenced the study's results, as those without insurance may have had a different perception of the influencing factors regarding CRC screening.

The results of these studies show that among the variables of the HBM, knowledge, barriers and perceived threat have been predictive of cancer screening behaviors among African Americans. Overall, the model is modestly productive in

predicting cancer related screening behaviors among African Americans. However, the small numbers of studies using the HBM that involve African Americans limit the generalizability of the studies.

Theory of Planned Behavior

Of the cancer screening studies that have used the Theory of Planned Behavior, few have included diverse populations (Bowie, Curbow, LaViest, Fitzgerald, et. al, 2003; Gorin, 2005; Jennings-Dozier, 1999; Shelton, Weinrich & Reynolds, 1999; Steele & Porche, 2005). Moreover, in studies using TPB among diverse populations of women the predictive power of the theory, specifically in the subjective norm construct, has been mixed. Steele and Porche used the TPB to predict mammography intention among women living in rural Louisiana. Using multiple regression, the TPB was shown to be effective in predicting mammography intention (R^2 = .238, $p \leq .001$) among the mostly African American study participants. Of the TPB variables, perceived behavioral control explained most of the variance (R^2 =.279, p<.001). Jennings-Dozier used the TPB to explain Pap smear intentions among African American and Latina women. Using multiple logistic regression, Jennings-Dozier (1999) found that attitude was the most predictive of Pap smear intention among African American women (r = .58, p<.001). The least predictive TPB variable was control beliefs with perceived power (r =. 30, p<. 01). Among Latinas, attitude was only slightly more predictive of pap smear intention (r =.40, p<.001) than perceived behavioral control (r = .35, p<.001). However, subjective norm was the only TPB variable that did not significantly contribute to the prediction of Pap smear testing intention among both African American and Latina women. Jennings-Dozier (1999) also suggested that the TPB was not adequate in explaining Pap smear use intention in either ethnic group and proposes a modified version of the TPB that includes measures of social support and subjective norms, but subjective norms already are in the TBP, be used for these ethnic groups. An explanation of the difference in the

findings between Steele and Porche's study and those of Jennings-Dozier could be how the concepts were operationalized in the studies. Bowie, Curbow, LaViest, Fitzgerald, et al., (2003) used TPB to study the repeat mammography intention among African American women. The authors expanded the TPB to include sociocultural, psychological and religious variables. Bowie, et al (2003) found that behavioral beliefs and perceived behavioral control were associated with intention. Additionally, the authors also found a significant correlation between attitudes and subjective norms (r =.23, p<.05) and go on to suggest that subjective norm could influence intention through attitude.

Use of the TPB to examine cancer-screening behaviors among diverse men is even smaller (Shelton, Weinrich & Reynolds, 1999). Shelton, Weinrich and Reynolds (1999) used the TPB to examine the relationship between perceived barriers and prostate cancer screening participation among African American men. The authors found that one barrier, "embarrassment", was statistically significant. A limitation of this study is that only "perceived barriers", which is part of perceived behavioral control, to prostate cancer screening was explored and not the full TPB model.

To date there has been no study that has used the TPB exclusively to study CRC screening in a minority population. Additional limitations of the research using TPB as a theoretical framework to predict cancer screening among diverse groups is that the variables of the model have not consistently predicted cancer screening participation or explained how subjective norms and/or perceived behavioral control influence intention (Bowie, Curbow, LaViest, Fitzgerald, et. al, 2003; Gorin, 2005; Jennings-Dozier, 1999; Shelton, Weinrich & Reynolds, 1999; Steele & Porche, 2005). This supports the uniqueness of cancer screening as a health behavior and that the TPB is not suited for exploring cancer screening among diverse populations.

Preventive Health Model

Much of the research using the Preventive Health Model has been in the African American population (Bradley et al, 2005; Myers, et al, 1999; Myers, et. al, 2005; Tiro et. al, 2005). From that research African American men have been the sole target population most often studied (Myers, et al, 1999; Myers, et. al, 2005). In a randomized clinical trial, Myers et al, (1999) studied adherence to prostate cancer screening among African American men. Using multiple regression, PHM variables that predicted prostate cancer screening adherence were background factors that included: being 50 year of age or older) (*OR*= 1.7, CI: 1.1-2.8) and being married (*OR*= 1.8, CI: 1.2-2.9); cognitive/psychological representation factors (belief in prostate cancer efficacy (*OR* = 2.3, CI: 1.3-4.0) and intention to be screened (*OR* = 2.6, CI: 1.2-2.9). The men who were in the enhanced intervention (print materials and telephone contact) were also more likely to be screened (*OR*=2.6, CI: 1.7-3.9). Myers et al. (2005) in a randomized clinical trial used the PHM to develop an intervention and test the effects of an informed decision making intervention on prostate cancer screening adherence among African American men. The multiple regression analysis showed that the PHM variable most predictive of prostate cancer screening adherence were program factors (participation in the enhanced intervention group (*OR* = 3.90, CI: 1.37-12.90, *p*=0.07) and having a primary care doctor (OR = 5.64, CI: 1.67-24.80, *p*=0.005). While there is not an extensive body of literature related to the use of the PHM, the few studies there are have shown that the PHM is consistently able to predict cancer related health behaviors among African Americans in the most rigorous form of research, a randomized clinical trial. Furthermore, those findings can later be used to create an intervention based on the PHM which then leads to increased adherence to cancer screening.

Combining the Theory of Planned Behavior and Health Belief Model

Recently, studies have attempted to increase the predictive validity of the TPB and HBM by combining the two theories to understand health behaviors such as dieting and fasting (Garcia & Mann, 2003; Nejad, Wertheim & Greenwood, 2005) and colorectal cancer screening (Gorin, 2005). Garcia and Mann examined the TPB, HBM and the TPB and HBM combined to predict resisting dieting and breast self-examination. The variables examined in both studies were attitude, subjective norms, susceptibility, severity, benefits, barriers, perceived behavioral control, self efficacy, efficacy in the behavior and intention. In the first study to predict intentions to resist dieting, the combined TPB and HBM theories explained 56% of the variance (p<.005). This was nearly as much as the HBM alone (r^2= .55, p <.005). Perceived behavioral control (r = .538, p< .005) and self-efficacy (r= .477, p < .005) were the variables that added most to the model. In the second study to predict intentions to do breast self-examination, the combined TPB and HBM explained 37% of the variance (p< .005) compared to 30% of the variance explained by the HBM (p< .005) and 31% of the variance explained by the TPB (p< .005). In this study, self-efficacy explained most of the variance in the model (R^2=. 444) in the combined TPB and HBM model compared to self-efficacy in the solely HBM (R^2 =.429). These results indicate that while the combined TPB and HBM predicted the health behaviors, each of the variables of the model respond differently to different health behaviors. Gorin combined constructs of the TPB and HBM to examine compliance with the fecal occult blood test (FOBT) among urban Hispanic women. The author suggested that combining the two models could reduce the overlap of the two models and better explain social and cognitive variables that influence colorectal cancer screening using FOBT among Hispanic women. Variables used in the study were awareness; knowledge; barriers to CRC screening; support for CRC; cues to action/social network; perceived severity/risk/susceptibility; fear/fatalism from the HBM

and intention to have FOBT from the TPB. In a stepwise logistic regression, Gorin (2005) found that fatalistic attitudes and beliefs affected FOBT screening (*OR*= 1.57, CI: 1.01-2.44, *p*< .05). In the multiple logistic regression analysis of the data; variables that did not predict FOBT adherence were intention (*OR*= 0.85, CI: 0.53-1.36, *p*=.50); perceived risk (*OR*= 0.86, CI: 0.60-1.25, *p*=.46); perceived severity (*OR*= 0.93, CI: 0.66-1.30, *p*=.60); physician recommendation (*OR* = 1.38, CI: 0.78-2.43, *p*= .66); friends and family (*OR* = 1.28, CI: 0.62-2.64, *p*=.65); supports to CRC screening (*OR* = 1.16, CI: 0.75-1.80, *p*=.57); barriers to CRC screening (*OR* = 0.73, CI: 0.46-1.16, *p*=.99); knowledge of CRC risk (*OR* = 1.06, CI: 0.84-1.33, *p*=.65) and awareness of CRC (*OR* = 0.87, CI: 0.58-1.29, *p*=.48). Further analysis was done to better understand the role of barriers in FOBT adherence. A significant relationship was found between fatalism and barriers to screening (*OR* = 1.60, CI: 1.09-2.35, *p*=.02) and cancer worry and barriers to screening (*OR* =0.85, CI: 0.72-0.99, *p*=.04). The findings of the reviewed studies indicate that simply combining the two theories is not enough to consistently predict health related behaviors among men and women of the same or diverse racial/ethnic backgrounds, especially in relation to CRC screening.

Results

Psychometric testing

Health Belief Model

Guided by the Health Belief Model, Champion and Scott (1997) described the psychometric properties of a scale to measure beliefs about mammography and breast self-examination among African American women. Building on previous work, the HBM constructs of susceptibility, benefits, barriers and self-efficacy were refined to be culturally relevant for African American women (Champion & Scott,). In the confirmatory factor analysis of the breast cancer screening belief scales, the maximum likelihood ratio

(MLR) was 2.74 and Goodness of Fit at .73 (Champion & Scott). Reliability of the susceptibility scale was acceptable with an alpha of .83 (Champion & Scott). The mammography benefits scale had an alpha of .65 and the breast self examination (BSE) benefits scale has an alpha of .69 (Champion & Scott). The alphas of the barriers to mammography and barriers to BSE scales were .85 and .83, respectively (Champion & Scott). For the confidence scale the alpha was reported at .90 (Champion & Scott). The test-retest reliability among the scales varied. The mammography and BSE benefits scales having the lowest test-retest reliability at r = .40 and .48, respectively (Champion & Scott). The test-retest reliability of the susceptibility, BSE and mammography barriers and confidence scales were reported as r =.68, r =.52, r =.66 and r =.65, respectively (Champion & Scott). One finding of note was that while the scales had significant correlations with breast cancer screening behaviors as did previous scales tested among Caucasian women, in this study the correlations were low and participating in breast cancer screening was not associated to perceived susceptibility among African American women (Champion & Scott). Champion and Scott proposed that perhaps the act of screening raised fear instead of decreasing fear in African American women.

Building on the work of Champion with the HBM, Rawl et al., (2001) developed scales to measure benefits, barriers to CRC screening, specifically to fecal occult blood test (FOBT), flexible sigmoidoscopy (FS) and colonoscopy (CS). The reliability of the benefits to FOBT, FS and CS scales were α = .65, α= .67 and α= .70, respectively (Rawl, et. al). The reliability of the barriers to FOBT, FS and CS scales were α = .72, α= .65 and α= .77, respectively (Rawl, et. al, 2001). A limitation of this scale is that it was tested on a majority Caucasian population and most scales developed and tested among Caucasians; using the HBM does not produce the same results for African Americans (Champion & Scott, 1997).

Also building on the work of Champion and Scott, Green and Kelly (2004) developed a 35-item subscale to measure susceptibility, severity, benefits and barriers regarding CRC screening among African American men and women for their study on the CRC knowledge, perceptions and behaviors of African American men and women. The confirmatory factor analysis demonstrated a MLR of 2.74 and a goodness of fit at 0.73. Reliability of the CRC subscale was α=.84.

The results of this review did not produce any studies that used a single scale developed from the HBM that showed that the scale had factorial equivalence across race and sex subgroups for any cancer related behavior. This is important when proposing to use a scale that will be administered to men and women to examine cancer related screening behavior that both men and women are to adhere to.

Theory of Planned Behavior

Among the studies reviewed, two reported some level of psychometric testing of an instrument related to cancer screening and only one used the TPB for the development of all survey instruments (Jennings-Dozier, 1999; Bowie et al., 2003). Ajzen and Fishbein specify that measures be developed for each study using a fairly clear procedure to do so. Jennings-Dozier (1999) used the TPB to develop the Pap Smear Questionnaire (PSQ) to measure the variables of the TPB related to an African American woman's intention to obtain a Pap smear (Jennings-Dozier). The PSQ contains 6 subscales 1) the belief-based attitude scale (α= .71), 2) the belief based subjective norm scale, which contains the normative beliefs scale (α= .85) and the motivation to comply scale (α= .94) and 3) the belief based measure of perceived behavioral control, which contains the control beliefs scale (α= .58) and perceived power scale (α= .78), 4) direct measure of intention (α= .73), 5) direct measure of attitude (α= .71), and 6) a direct measure of perceived behavioral control (α= .65) (Jennings-Dozier, 1999). As stated earlier in the paper, Jennings-Dozier (1999) reported that the study

results did not support the empirical adequacy of the TPB and suggested a revised version of the TPB be tested that includes measures of social support and subjective norms (Jennings-Dozier, 1999). Bowie et al., (2003) used the Theory of Planned Behavior to explore intention to repeat mammography among African American women. Among the eight scales was the Theory of Planned Behavior scale used to measure behavioral beliefs, subjective norms and perceived behavioral control. The behavioral beliefs subscale was used to measure attitudes about breast cancer screening and had an alpha of .65. The subjective norm subscale measured the influence of friends, family members and others on the decision to have another mammogram and had an alpha was reported as .62. The perceived behavioral control subscale measured the participants' perceived barriers and perceived control regarding a repeat mammogram and had an alpha of .57. As reported earlier in the paper, Bowie, et al found that behavioral beliefs and perceived behavioral control were associated with intention. Many of the subscales used in Bowie, et al (2003) and Jennings-Dozier (1999) have low reliabilities. These low reliabilities can be attributed to the limited number of items used to examine the concept/variable (Cook & Beckman, 2006; Henson, 2001). Another cause of low reliabilities could be attributed to the scale being an inappropriate measure of the variable to be examined (Cook & Beckman, 2006; Henson, 2001).

DeVellis, Blalock and Sandler (1990) developed an instrument to examine the role of perceived behavioral control among Caucasians who are at average and high risk for colorectal cancer. The telephone administered instrument measured behavior, intention, attitude, subjective norm, perceived control, belief in the efficacy in CRC screening, belief in barriers and belief-based subjective norm. The authors did not report reliability or validity statistics on the instrument. To date, there have been no studies that have used the TPB to predict CRC screening and reported reliability and validity statistics.

Preventive Health Model

Vernon, Myers and Tilley (1997) used the PHM to develop scales to predict colorectal cancer screening adherence among a population of white males (*N*=2693) with no history of colorectal cancer. The instrument contained five subscales to measure salience and coherence, self-efficacy, perceived susceptibility, worries/concerns and intention (Vernon, Myers & Tilley). Based on the results of the confirmatory factor analysis and of the multitrait scaling analysis, the five subscales were retained and internal consistency reliability was reported as follows, salience and coherence (α =0.91), self-efficacy (α=.82), perceived susceptibility (α=.79), worries/concerns (α=.64), intention (α= .79) (Vernon, Myers & Tilley). In order to establish construct validity, correlation coefficients between the final version of the scales and between the scales and age, education and past screening behavior were completed. Salience and coherence was found to be positively correlated to intention (r =.74, p< .001). Salience and coherence was also found to be positively correlated with self-efficacy (r =.58, p< .001). Intention and self-efficacy were found to be positively correlated (r =.55, p<.001). Building on the work of Vernon, Myers and Tilley, Tiro, Vernon, Hyslop and Myers (2005) developed a 16-item instrument using the PHM to predict colorectal cancer screening adherence and to establish factorial equivalence across race and sex subgroups. Tiro et al., (2005) used the salience and coherence, worries and perceived susceptibility subscales from the study conducted by Vernon et al., (1997). Two new subscales were developed for this study. A subscale was developed to measure efficacy of screening defined as beliefs that adopting a behavior will be effective in reducing disease threat (Tiro, et al., 2005). A second subscale was developed to measure social influence defined as perceived beliefs about and desire to comply with key references' (health professional or doctor and immediate family) attitudes toward CRC screening (Tiro, et al.). Study participants were Caucasian men

(*n*=274), Caucasian women (*n*=291), African American men (*n*=195) and African American women (*n*=653). Among the total study population (*N* =1,413), internal consistency reliabilities for the five subscales were reported as follows, salience and coherence (*α*=.56), cancer worries (*α*= .60), perceived susceptibility (*α*= .64), response efficacy (*α*= .63) and social influence (*α*= .61). Cronbach's alphas were consistent among the race-sex groups for salience and coherence (Tiro et al.,). Conversely, the Cronbach's alphas for cancer worry (*α*= .57 and .52, respectively) and perceived susceptibility (*α*= .52 and .59, respectively) were lower for African American men and women (Tiro et al., 2005). Many of the subscale have low reliabilities, which may be due to the small number of items used to measure the concept (Cortina, 1993). While these results show a slight difference between Caucasian men and women and African American men and women, this is consistent with other scales developed from other models (Champion & Scott, 1997; Rawl et al., 2001). A limitation of the scale is the small number variables that were used to operationalize each construct. This is probably the reason why the reliability of the scales was lower than the 0.70 level (Tiro et al., 2005). Yet, the results of this study indicate that unlike the HBM, instruments developed using the PHM to predict CRC screening performs well across race and sex subgroups.

Discussion

Each theory selected for analysis has strengths and weaknesses. Each theory was evaluated using the following criteria: 1) the predictive power of variables related to cancer screening behaviors 2) use in diverse populations and 3) empirical adequacy based on an analysis of the measures to operationalize the concepts in the models.

The strength of the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) are that the theories have been widely recognized for being able to

predict health behaviors ranging from influenza vaccination, medical regimen compliance, smoking cessation, condom use, breastfeeding, physical exercise and cancer screening (Armitage & Conner, 2001; DeVellis, Blalock & Sandler, 1990; Jennings-Dozier, 1999; Menon et al., 2007; Sheeran & Abraham, 1996). However, these theories have not had consistent predictive validity in studies related to cancer related decisions and health behaviors.

The Preventive Health Model has strengths and weaknesses, which include its complexity and challenges in terms of implementation. However, the PHM has been exclusively used to explore cancer related decisions and health behaviors (Bradley et al, 2005; Ford et al., 2006; McQueen et al., 2007; Meyers, et al, 1994; Meyers, et al, 2005; Tiro et al., 2005). Another strength of the PHM is the predictive power of the variables related to cancer screening behaviors, use among African American study participants and empirical adequacy. The predictive power of the PHM variables (self-system, representation factors, social support and influence factors, program factors and decision-making) to explain cancer related screening behaviors, and specifically CRC screening, is a major strength compared to HBM and TPB variables (McQueen, et al., 2007; Tiro et al., 2005; Vernon, Myers & Tilley, 1997). Further, PHM variables have been rigorously tested through randomized clinical trials and predicted cancer related behaviors (Bradley et al, 2005; McQueen, et al., 2007; Tiro et. al, 2005). Additionally, when used to predict CRC adherence, PHM predicted CRC screening adherence consistently when compared to both HBM and the TPB (McQueen, et al., 2007; Tiro et al., 2005; Vernon, Myers & Tilley, 1997). A possible explanation of strong predictive validity of the PHM is that cancer related health decisions are more complex than other health issues like breastfeeding, condom use and physical exercise. A cancer screening related decision is unique and complex in that it involves fear, disability, loss of independence, and mortality. The uniqueness of a cancer related decision may explain

why the HBM and TPB have had variable predictive validity in cancer health studies and why a theory that focuses on cancer specifically is more beneficial to studies involving cancer related decisions.

Another major strength of the PHM is its applicability in diverse populations in examining cancer screening behaviors. The PHM has been used most often among African Americans and successfully predicts cancer screening behaviors more often and more consistently than the HBM and TPB (Bradley et al, 2005; Ford et al., 2006; Myers, et al, 1999; Myers, et. al, 2005; Tiro et. al, 2005). Additionally important, the HBM and TPB have not had consistent predictive validity in cancer health related studies involving diverse populations or men (Champion & Scott, 1997; Green & Kelly, 2004; Jennings-Dozier, 1999; Rawl et al., 2001).

A limitation of the TPB and PHM is that the measures developed from the PHM have been established as valid, but have shown inconsistent reliability. The inconsistent reliabilities may be explained by the limited number of items used to examine the concepts/variables (Cook & Beckman, 2006; Henson, 2001). The number of items in the scales with low reliabilities cited in this study ranged from 1 to 13.

A limitation of the HBM, TPB and PHM is the inability to consistently address the concept of social support/influences as it relates to colorectal cancer screening. Of the reviewed studies, McQueen et al. (2007) used the PHM to study colorectal cancer screening adherence among Caucasian men and found that social/family support was one of the variables that influenced their decision to maintain colorectal cancer screening adherence. In none of the studies that examined colorectal cancer screening adherence among African Americans was social support found to be significant. These findings are not consistent with other research among African Americans that find that social support is significant. Further, and unfortunately, there is limited research on the influence of the African American family on cancer screening behaviors. One study

examined the influence of the African American family on cancer screening behaviors (Jernigan, Trauth, Ferguson & Ulrich, 2001). The results indicated that among African Americans, there appears to be a narrow social network regarding cancer screening (Jernigan et al., 2001). There also appear to be gender differences between African American men and women in terms of whom they identify as part of their network (Jernigan et al., 2001). Women are more likely to mention additional sources for cancer screening such as church, while men were most likely to report that their main influence for cancer screening was a spouse or female family member (Jernigan et al., 2001).

Much of the cancer research conducted with the African American family has not examined possible differences in variable expression between African American men and women. Additionally, there has been little research on the influence of family on informed decisions regarding colorectal cancer screening among African Americans with no family history of colorectal cancer. To advance research on cancer health disparities, it is imperative to examine what role the African American family plays in influencing cancer related beliefs and decisions regarding cancer screening behaviors. Understanding the African American family as a health-promoting unit can lead to the creation of more decision aids that are pertinent in terms of cultural appropriateness to increase African American colorectal cancer screening rates.

To date, no studies have examined the relationship between family support and influence and cultural identity as a factor associated with an informed decision regarding colorectal cancer screening among African American adults. Understanding more about family support and influence among African American adults, cultural identity and its relationship to an informed decision would broaden our knowledge of the cultural and familial influences for informed decision-making. This knowledge would give researchers another strategy to reduce cancer health disparities.

Despite the limitation of the PHM as it relates to the validity of measures created from the PHM, the PHM has several strengths. The PHM combines the best of several theories, including the HBM, the TPB, Social Cognitive Theory, Multiattribute Theory and Self-Regulation theory and has exclusively and consistently predicted cancer related behaviors among African Americans. Based on the results of this comparative analysis of the HBM, TPB and PHM, the PHM presents as an innovative and empirically adequate approach to examine cancer related health behaviors. The PHM allows for the examination of multiple factors within the three domains of the model-self-system, decision making process and preventative intention-that could illuminate our understanding of how and why African Americans make the decision to have or not have colorectal cancer screening. Previous research has shown that making an informed decision for colorectal cancer screening is a complex process and the antecedents are not fully understood among men and women, especially among African American women. The dissertation research will definitely add to the body of knowledge regarding African Americans and colorectal cancer screening. Expert and novice researchers and clinicians are urged to explore the PHM as an emerging theory to frame their work when examining the complex process of making an informed decision regarding cancer screening.

Chapter III

Influences on an informed decision regarding colorectal cancer screening among African Americans

Abstract

The use of the fecal occult blood test and endoscopy among African Americans is 40% compared to 50% among Caucasians (American Cancer Society, 2008). The purpose of this study was to examine the relationships between cultural identity, colorectal cancer beliefs and family influence and an informed decision on colorectal cancer screening among older African Americans. A purposive sample of 129 insured, community-based African Americans aged 50 and older (65 males and 64 females) participated in the study. The sample was recruited from a Midwest urban area. The relationships among study variables were examined using Pearson Product Moment Coefficients to assess bivariate correlations using SPSS 17.0 for Windows. AMOS 17.0 was used to conduct path analysis of the overall model. The results of the bivariate correlations indicate that perceived positive family support and colorectal cancer beliefs that support colorectal cancer screening were significantly related to making an informed decision regarding colorectal cancer screening (r = .24, p<.01; r = .29, p< .01, respectively). Additionally, positive beliefs about colorectal cancer beliefs were related to positive cultural beliefs about the family (r = .24, p< .01). The path analysis indicated that overall model did not fit the data well (X^2 =10.16, 7df, p = .18, N= 129, NFI = .952, CFI = .981, RMSEA = .059).

Introduction

The incidence rate of colorectal cancer among African Americans is 20% higher and the mortality rate is 45% greater than Caucasians (American Cancer Society, 2008).

Routine colorectal cancer screening is a key factor in colorectal cancer prevention (American Cancer Society, 2008) yet African Americans reported lower screening rates of fecal occult blood testing and endoscopy within the recommended time interval than Caucasians (Seeff, Nadel, Klabunde, et al, 2004). Increasing colorectal cancer screening rates is crucial in reducing the colorectal cancer disparity experienced by African Americans. There is very little published research that examines the factors that influence colorectal cancer screening informed decision making among African Americans. The purpose of this study was to examine the relationships between cultural identity, colorectal cancer beliefs, family support and influence and an informed decision regarding colorectal cancer screening.

An informed decision is a critical factor in increasing colorectal cancer screening rates (Dolan & Frisina, 2002; Pignone, Bucholtz & Harris, 2000; Wolf, 2000). An informed decision is made without the benefit of a client-provider interaction and has occurred once an individual understands the disease or condition being addressed; understands the risks, limitation, benefits alternative and uncertainties of the screening method and makes the decision, to act or defer a decision at a later time, based on his or her screening preferences and values (Briss, Rimer, Reilly, Coates, Lee, Mullen, et al 2004). Informed decision-making may be a strategy to decrease the disparity in colorectal cancer among African Americans. However, little is known about informed decision-making, its meaning, process or antecedents, among African Americans. Hence, in order to develop nursing interventions to increase colorectal cancer screening among African Americans, it is essential to understand the influences of family, cultural identity and colorectal cancer beliefs on an informed decision regarding colorectal cancer screening among African Americans.

The specific aims and related working hypotheses are:

1) To examine the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening in African Americans.

H.1.1 Cultural identity is positively related to colorectal cancer beliefs and family influence among African American adults.

H.1.2 Family support and influence is positively related to colorectal cancer beliefs among African American adults.

H.1.3 Colorectal cancer beliefs are positively related to an informed decision regarding colorectal cancer screening among African American adults.

H.1.4 Colorectal cancer beliefs mediate the relationships between cultural identity and family influence and an informed decision regarding colorectal cancer screening among African American adults.

A conceptual model (Figure 1) using the Preventive Health Model as a foundation was developed to summarize the hypothesized relationships between the independent and dependent variables.

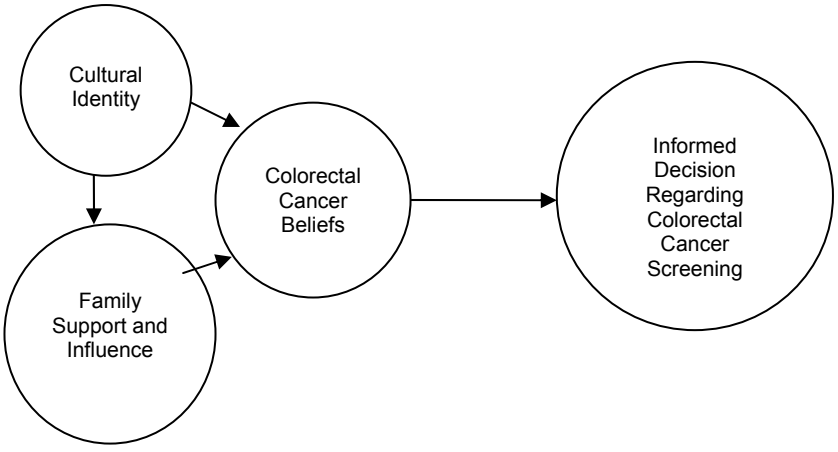

FIGURE 3. Conceptual Model: Influences of an informed decision regarding colorectal cancer screening among African Americans

Background and Significance

Cultural Identity

Cultural identity is the compilation of important cultural characteristics that broadly identify the uniqueness of a culture (Lukwago, Kreuter, Bucholtz, Holt & Black, 2001). Cultural identity has been studied as a factor in understanding the variance in health behaviors ranging from illicit drug use to smoking rates among the Asian, Hispanic, and Korean cultural groups (Ebin, Sneed, Morisky, Rotheram, Magnusson & Malotte, 2001; Lee, Sobal & Frongillo, 2000; Unger, Cruz, Rohrbach, Ribisl, Baezconde, et al, 2000). Cultural characteristics that are prevalent and most predictive among African Americans include collectivism, racial pride, religiosity, and time orientation (Lukwago, Kreuter, Bucholtz, Holt & Black, 2001; Klonoff & Landrine, 1999). Specifically, cultural identity has been used to understand health behaviors related to HIV/AIDS, high blood pressure, diet, mammography, smoking and breast self examination in African Americans (Erwin, Spatz, Stotts & Hollenberg, 1999; Gueverra, Kwate, Tang, Valdimarsdottir, Freeman & Bovbjerg, 2004; Lukwago et al, 2001; Russell, Perkins, Zollinger, & Champion, 2006; Taylor, 2001). There is a growing body of studies examining the relationship between cultural identity and cancer screening behaviors. Russell, Perkins, Zollinger and Champion (2006), examined the relationship of cultural beliefs, health beliefs and sociodemographic characteristics to mammography screening and found that cultural characteristics of time orientation and religiosity were predictive of mammography adherence among African American women. Gueverra et al., (2004) examined cultural identity, smoking and breast self-examination practices among African American women and found that inconsistent performance of the breast self-examination and being a non-smoker were negatively related to cultural identity. Erwin et al., (1999) found that breast cancer awareness education that was reflective of the cultural identity

of African American women positively influenced breast cancer screening behaviors. Clearly, these studies have begun the research examining the relationship between cultural identity and health behaviors related to cancer screening; the relationship between cultural identity and cancer screening behaviors is not yet firmly established.

A limitation of most studies conducted regarding cancer screening and cultural identity among African Americans has been the lack of significant participation by African American males, except for studies focused on prostate cancer. Additionally, there has not been much attention given to the topic of cultural identity and decision-making (Weber & Hsse, 2000). When cultural identity and decision making are explored, Caucasian and Asians are the most frequently examined populations (Weber & Hsse, 2000). While the number of studies that examine African American cultural identity as a factor in health behaviors is growing, the number of studies examining the relationship between cultural identity and cancer screening behaviors, including colorectal cancer screening, is limited at best. The study reported here addressed these gaps in the literature regarding the role of cultural identity in making an informed decision to seek colorectal cancer screening among African Americans.

Family Support and Influence

The family has a significant influence on the health of its individual members (Grzywacz & Fuqua, 2000; Lelinneth, Barnes, De La Cruz, Williams, & Rogers, 2006; Loveland-Cherry, 2005). Characteristics of the family have been shown to be predictors of health outcomes including: mortality, cardiovascular heart disease, and complications in pregnancy (House, Umberson & Landis, 1998; Kaplan, Strawbridge & Camacho, 1993; Langford, 1997). Much of the research conducted on the influence of family on health has not had significant African American participation, thus limiting the generalizability to African American families.

In the African American culture, the family is a major source of strength, and is comprised of persons related to each other by blood, marriage, formal adoption, informal adoption, or by appropriation (Billingsley & Caldwell, 1991). The African American family is the repository of specific cultural beliefs and health practices and is a source of cultural meaning (Becker, Gates & Newsom, 2004). Much of what has been studied concerning the African American family has focused on sociological problems such as adolescent pregnancy, absent fathers, aggression, fighting and academic success (Cotten, Resnick, Browne, Martin, McCarraher & Woods, 1994; Gonzales, Cauce, Friedman & Mason, 1996; Halle, Costes & Mahoney, 1997). Other research has focused on the positive characteristics of the African American family or studied the ties within the African American church, as part of the extended family for some African Americans (Billingsley & Caldwell, 1991; Corbie-Smith, Ammerman, Katz, St. George, Blumenthal, Washington, et al., 2003; Lewis & Green, 2000; Littlejohn-Blake & Darling, 1993). There is limited research on the influence of the African American immediate family on the health of its members. One study found the African American family to be an influence on health (Becker, Gates & Newsom, 2004). In their qualitative study, Becker et al. examined African American self-care practices concerning the daily management of chronic illnesses (diabetes and high blood pressure) and found that self-care practices were culturally biased and that men and women reported their mother was a major source of support and advice. In addition, Becker et al. found that the support and advice went from child to parent as well. There also is a growing focus on the African American family and cancer.

Most studies examining the African American family and cancer or cancer screening focused on stress and coping, social support or survivorship (Katapodi, Facione, Miaskowski, Dodd & Waters, 2002; Northouse, Caffery, Deichelboher, Schmidt, Trojniak, West, et al., 1999; Shelton, Weinrich & Reynolds, 1999). There is limited

research on the influence of the African American family on cancer screening behaviors. One study was found that examined the influence of the African American family on general cancer screening behaviors (Jernigan et al., 2001). The results indicated that among African Americans, there appears to be a narrow social network regarding cancer screening (Jernigan et al., 2001). To advance the body of research on cancer health disparities, it is imperative to examine what role the African American family takes in influencing cancer related beliefs and decisions regarding cancer screening behaviors. Understanding the African American family as a health-promoting unit can lead to the creation of more decision aids that are pertinent in terms of culturally appropriateness to increase African American colorectal cancer screening rates.

To date, there have been no studies examining the relationship between family influence and cultural identity as factors associated with an informed decision regarding colorectal cancer screening among African American adults. Understanding more about family support and influence in African American adults, cultural identity and their relationships to an informed decision can broaden our knowledge of the cultural and familial influences for informed decision-making. This knowledge may provide researchers another strategy to reduce cancer health disparities.

Colorectal Cancer Beliefs

Beliefs about colorectal cancer screening have been identified as factors in the intent and performance of colorectal cancer screening behavior. The major concepts studied have been susceptibility/fatalism, saliency, worries/expected outcomes and barriers (Brenes & Paskett, 2000; Codori, 2001; Dassow, 2005; Myers, 1998). Myers (1998) surveyed white male automobile industry employees to study factors associated with intention to participate in a company program for colorectal cancer testing. Intention to be screened was positively associated with beliefs about risk, efficacy of colorectal cancer testing and colorectal cancer prevention (polyp removal). Codori surveyed 1,160

healthy, adult, first-degree relatives of colorectal cancer patients. They found that a person is more likely to be screened if the person believes that colorectal cancer can prevented and has a higher perceived risk of getting colorectal cancer. Dassow compared women's beliefs about colorectal cancer screening to breast cancer and osteoporosis. Dassow found that beliefs about colorectal cancer severity and colorectal cancer susceptibility to be associated with adherence to screening recommendations.

Three studies had a significant number of African American participants (Brenes & Paskett, 2000; Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c). The study by Powe (1995a, 1995b, 1995c) used a descriptive, correlational design to examine fatalism in African American (*n*=118) and Caucasian (*n*=74) men and women and found that African American women had significantly higher fatalism scores compared to Caucasian men and women. Brenes and Paskett used a descriptive cross-sectional design to examine colorectal knowledge, beliefs, barriers, risk, worry and physician recommendation to seek colorectal screening among African American (*n*=156) and Caucasian (*n*=46) women. The study found that the African American women who had low rates of flexible sigmoidoscopy screening, had beliefs about flexible sigmoidoscopy that were more negative, perceived more barriers to obtaining a flexible sigmoidoscopy, believed they were at lower risk of getting colorectal cancer, and worried less about getting colorectal cancer. Green and Kelly (2004), the only study to include exclusively African Americans, used a survey questionnaire given to 100 African Americans. They found that African Americans with less education perceived colorectal cancer as more of a threat than those with more education.

Researchers have examined the person's beliefs about risk, efficacy of colorectal cancer testing and colorectal cancer prevention, and have found those beliefs are positively associated with the intent to be screened (Myers, 1998; Codori, 2001; Dassow, 2005). While these studies can lead to the development of interventions to

address beliefs, most of the results can only be generalized to Caucasians or first-degree relatives of colorectal cancer patients (Myers, 1998; Codori, 2001; Dassow, 2005). The study of colorectal cancer beliefs among African Americans is growing (Brenes & Paskett, 2000; Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c). Closer examination of African American individuals' beliefs about colorectal cancer and colorectal cancer screening in concert with family support and influence and cultural identity as well as if colorectal cancer beliefs act as a mediator between family support and influence or cultural identity may yield additional critical information to develop colorectal cancer screening interventions for the African American population.

Informed Decision-Making: Four Dimensions from an individual perspective

Personal Testing Preferences

A component of an informed decision is that a choice is based on personal preferences, among other considerations (Briss, et al., 2004). Yet, many decisions made about colorectal cancer testing are not congruent with a patient's preference (Leard, Savides & Ganiats, 1997; Wolf, 2000). The literature (Leard et. al, 1997; Ling, Moskowitz, Wachs, Pearson & Schroy, 2001) suggests that many physicians presume that patients' preferences about colorectal cancer testing match their own preferences, but actually the preferences of the physician and patient are not alike. In a survey of patients and physicians in a general internal medicine practice at a university medical center, Ling et al. found a significant difference between physician perceptions of which test features were important to patients compared with the patients' actual responses. The largest discrepancy was the fact that most patients (54%) wanted the colorectal cancer test that was the most accurate (e.g., colonoscopy), while the physicians perceived that level of discomfort (e.g., fecal occult blood testing [FOBT] produces least discomfort) involved with the colorectal cancer test would be the most important factor in

making an informed decision on what type of colorectal cancer test to have. This incongruence could be the reason why 60% of those individuals eligible for colorectal cancer screening have not been screened and the low rates of subsequent adherence to colorectal screening recommendations (Vernon, 1997; Wolf, 2000). More research is needed to assess the colorectal cancer testing preferences of African Americans outside of medical settings, as most often this type of participant is engaging in health promoting activities on a routine basis. This study looked at the following procedure preferences: fecal occult blood test and digital rectal examination, flexible sigmoidoscopy and colonoscopy.

Understanding Colorectal Cancer Screening and Value of Screening

The value of colorectal cancer testing has been examined in various ways from the specificity of the type of test to the importance of colorectal cancer screening to maintaining health (Green & Kelly, 2004; Ling, et al., 2001). To date there are very few studies that have examined whether or not a specific type of colorectal cancer screening is of value to the individual as an important health behavior over another type of colorectal cancer screening. This study examined personal health promotion/protection value of fecal occult blood test and digital rectal examination, flexible sigmoidoscopy and colonoscopy.

Many studies have assessed a person's knowledge of colorectal cancer screening as a measure of understanding colorectal cancer screening (Green & Kelly, 2004). Very few studies have asked whether or not the person understands the risks and benefits of colorectal cancer screening or has enough knowledge to make an informed decision about colorectal cancer screening. This study examined a person's understanding of the risks and benefits of specific colorectal cancer screening as part of an informed decision regarding colorectal cancer screening.

Decision Consistency

An informed decision occurs when a person makes a decision that is consistent with their testing preferences, values, and understanding, etc (Briss, 2004). Many studies have not asked whether individuals perceived that they have made a decision congruent with their testing values, preferences and understanding regarding colorectal cancer screening (Brenes & Paskett, 2000; Codori, 2001; Dassow, 2005; Green & Kelly, 2004; Myers, 1998). The study reported here examined whether a person who has had colorectal cancer screening made an informed decision about colorectal cancer screening, which is a decision that was consistent with their testing preferences, values and understanding of the risks and benefits of specific colorectal cancer screening tests.

Summary

Understanding the influences of an informed decision is relevant to nursing practice to promote participation in colorectal cancer screening. Prior studies have shown that an increase in knowledge about colorectal cancer screening is not a predictor of adherence to a healthcare provider's recommendations regarding colorectal cancer screening or change an individual's perception of colorectal cancer screening (Green & Kelly, 2004; Powe, 1995a, 1995b, 1995c). Based on a review of prior studies, more research is needed on how best to promote and facilitate an informed decision regarding colorectal cancer screening (Underwood, Powe, Canales, Meade & Im, 2004). This is especially important for African Americans. Colorectal cancer incidence and mortality are highest in African American men and women (ACS, 2008). Cultural identity, family support and influence and colorectal cancer beliefs have not been examined for their possible relationship to an informed decision to seek colorectal cancer screening. This study was developed to fill critical gaps in nursing knowledge and cancer prevention and control research.

Methods

Prior to data collection, approval for human subject research was obtained through the University of Michigan Health Science Institutional Review Board (HUM) on January 7, 2009.

Design

The study used a correlational, cross sectional design. The Preventive Health Model was used to develop the conceptual model that guided the study to examine the relationships among cultural identity, colorectal cancer beliefs, family support and influence and the informed decision regarding colorectal cancer screening among African Americans.

Sample

The inclusion and exclusion criteria were set to select those African American men and women, regardless of colorectal cancer screening history and family history of colorectal cancer, who were (1) age 50 and older and (2) able to speak English. Exclusion criteria included men and women that (1) were not African American, (2) were younger than 50 years of age, (3) have or had colorectal cancer and (4) do not have insurance coverage for colorectal cancer screening. Individuals without health care insurance coverage for colorectal cancer screening were excluded because it is known that lack of health cancer insurance and/or coverage for colorectal cancer screening is a barrier to colorectal cancer screening. The final sample for the study included 64 African American men and 65 African American women between the ages of 50 and 87 years of age, with health care coverage for colorectal cancer screening, and no personal history of colorectal cancer. Table 1 presents the description of the sample by age grouping and gender.

Study sites

African American women and men were recruited from places of business, community organizations and through the social networks of the residents of Detroit, Michigan. Study flyers were distributed at a quarterly meeting of the Detroit Community Network Partnership Program (CNP) for older underserved African Americans, a partnership between the Barbara Ann Karmanos Cancer Institute and the Wayne State University Institute of Gerontology (IOG)/Healthier Black Elders project, funded by the National Cancer Institute. The CNP is a partnership between the Detroit area community based organizations that serve older African Americans, Karmanos Cancer Institute and the Institute of Gerontology/Healthier Black Elders Project. The Detroit area community based organizations that are prominent fixtures in the African American community serve over 50,000 seniors (50 and older) each year, the majority of whom are African American.

In addition to the Detroit area community based agencies, local businesses and community centers were asked to post the study flyer in highly visible areas and to post and/or distribute study flyers to their members. Eligible participants were asked to refer others meeting the inclusion criteria to participate in the study. According to the U.S. Census Bureau (2000), in Detroit 70% of the population has a high school education or higher. In Detroit (2007), the per capita income was $15,300 compared to the Michigan per capita income of $25,000.

Procedures

The Principal Investigator (PI) recruited the study participants. The PI contacted member agencies of the Detroit CNP to ask to place flyers in the lobby areas and common areas of the agencies. No study participants were recruited from these sites,

possibly because there was no one on-site to immediately answer questions about the study and/or give them the survey when they were most interested in participating. Most of the study participants were recruited from a local hospital and through the social networks of the study participants. Posters were placed in the staff lounges of a local hospital and employees interested in participating in the study were to contact the PI to discuss the eligibility criteria or establish a time to meet to discuss study criteria. Of the study participants, 100% of the women and 60% of the men worked in the local hospital as nursing aides, patient transporters, patient service representatives or security officers. Male study participants who did not work in the hospital (40%) were referred to the PI by other male participants in their social network. Once it was established that the potential participant met the study's inclusion criteria, informed consent was obtained and the participant was given the survey to complete. On average, the survey took 30 minutes on average to complete. Upon completion and return of the survey participants received at $25 Target gift card.

Measures

Cultural Identity

To measure the cultural identity of the African American participants, five sub-scales of the Cultural Identity Scale developed by Krueter, Lukwago, Bucholtz, Holt and Clark (2001), were modified to be applicable to African American women and men and used. The scales were originally used among African American women and some questions specifically stated "Black women", so for this study the scales were modified to be appropriate for both genders to respond. These subscales contain 32-items in total and measure five significant African American cultural characteristics; collectivism, religiosity, racial pride, present time orientation and future time orientation. To measure religiosity, racial pride and time orientation (present and future), a 4-point response scale

with 1 corresponding with strongly disagree to 4 representing strongly agree was used. To measure collectivism a 4- point response scale was used with 1 corresponding to not at all important to 4 representing very important. The scores were computed by taking the sum of the values within each subscale to obtain a score for each of the 5 sub-scales. There is no total score for the Cultural Identity Scale. Lower scores on the subscales indicate lower perceptions of collectivism, religiosity, racial pride, present-time orientation and future-time orientation. The psychometric testing of the scale in other studies indicated that the subscales had high internal consistency reliability (Kreuter, et al, 2003): religiosity (α =.88), collectivism (α = .93), racial pride (α = .84), present time orientation (α =.73) and future time orientation (α =.72). For this study, the subscales were found to have high internal consistency reliability as follows: collectivism (α = .82), religiosity (α = .89), racial pride (α = .81), present-time orientation (α = .71) and future-time orientation (α = .70).

Colorectal Cancer Beliefs

To measure the beliefs about colorectal cancer screening among African American, the Colorectal Cancer Perceptions Scale (Green & Kelly, 2004) was used. Participants were instructed to rate each of the 35 items on CRC susceptibility, severity, benefits and barriers to screening using a 5-point Likert scale, with 1 corresponding with strongly disagree and 5 representing strongly agree. The scale is scored by obtaining a score for each sub-scale and the scores from each sub-scale are added to give a total score. For ease of data analysis, the scale was reverse scored so that higher scores on the scale indicate that the respondent has positive perceptions about colorectal cancer and colorectal cancer screening. Internal consistency for the instrument modified by Green and Kelly was α=0.85. For this study, the measure was found to be reliable (α = .92).

Family Support and Influence

The Medical Outcomes Study Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1991) was used to measure family support. The MOS-SSS measures the availability of overall social support through four dimensions of social support: emotional support (the expression of positive affect, empathetic understanding, and the encouragement of expressions of feelings); informational support (the offering of information, advice, guidance and feedback); tangible support (the provision of material aid or behavioral assistance); affectionate support (involving expressions of love and affection); and positive social interactions (the availability of other persons to do fun things with you) (Sherbourne & Stewart, 1991). The MOS-SSS is a reliable (α =.97) 19-item measure of the availability of social support. Participants were instructed to rate each of the 19 items using a 5-point Likert scale, with 1 corresponding with none of the time and 5 representing all of the time. The subscales are scored by calculating the average of the scores for all items in the subscale. To obtain the overall social support index, the average of the scores for the 19 items is calculated. A higher score for an individual scale or for the overall support index indicates more support. For this study, the measure was found to be reliable (α = .93).

An additional 4-item scale to measure family influence was developed by the PI to specifically to measure the influence of the family on the respondent to complete and/or support colorectal cancer screening. Participants were instructed to rate each of the 4 items using a 5-point Likert scale, with 1 corresponding with strongly disagree and 5 representing strongly agree. To obtain the family influence score the 4-items are totaled. A higher score indicates higher family support and influence for colorectal cancer screening. For this study, the scale was found have adequate internal consistency reliability (α = .74).

Informed-Decision Making

To measure informed decision making regarding colorectal cancer screening a 28-item scale was adapted from a measure of informed choice regarding prenatal testing developed and tested by Marteau, Dormandy and Michie (2001). The adapted measure replaced content related to prenatal testing with content related to colorectal cancer testing. However, the structure and much of the wording of the questions were maintained. The adapted measure assessed colorectal cancer screening preferences (FOBT & DRE and colonoscopy) understanding of colorectal cancer screening, knowledge of risks related to colorectal cancer screening, value of colorectal cancer screening and decisional consistency. The survey use a 4-point Likert scale with 1 corresponding to strongly disagree to 4 corresponding to strongly agree. Lower scores indicate lower informed decision making. Content validity was established by a review of the instrument by two experts in the field of decision making. The measure was pre-tested and found to be adequately reliable for an exploratory measure (α=.65). For this study, the measure had an adequate level of internal reliability (α = .68).

Analysis

Prior to data analysis, several approaches were used to examine missing cases and data distribution. First, a frequency and descriptive analysis was conducted to examine the pattern of missing data and found that minimal data was missing. Most often missing data was in the demographic survey, specifically responses to the income item (5%).

SPSS 17.0 for windows was used to describe the characteristics of the sample through descriptive statistics to determine frequencies, measures of central tendency, means, standard deviations and skew and kurtosis, and percentages of response of subjects of each survey item. The Sobel test (Baron & Kenny, 1986) was used to assess the relationships among, cultural identity, family support and influence variables, colorectal cancer beliefs and the informed decision. It was hypothesized that:

H.1.1 Cultural identity is positively related to colorectal cancer beliefs and family support and influence among African American adults.

H.1.2 Family support and influence is positively related to colorectal cancer beliefs among African American adults.

H.1.3. Colorectal cancer beliefs are positively related to an informed decision regarding colorectal cancer screening among African American adults. To test these three hypotheses, bivariate correlations using Pearson Product Moment Coefficients were computed.

H.1.4 Colorectal cancer beliefs mediate the relationship between cultural identity and family support and influence and an informed decision regarding colorectal cancer screening among African American adults. To test the mediating effects of colorectal cancer beliefs on the relationships between cultural identity, family support and influence and informed decision making, the Sobel test was used (Baron & Kenny, 1986; Dudley, Benuzillo, Carrico, 2004; MacKinnon, Lockwood, Hoffman, West & Sheets, 2002; Preacher & Hayes, 2004). The Sobel test, builds on the work of Baron and Kenny (1986) to provide a more precise view of the effect of mediation. Mediation analyses can provide an accurate understanding of the relationships among three or more variables. The correlations from H.1.1, H.1.2, H.1.3 and H.1.4 were obtained and two models were examined using the Sobel test; 1) Colorectal cancer beliefs as the variable that mediates the relationship between cultural identity and informed decision making and 2) colorectal cancer beliefs as the variable that mediates the relationship between family support and influence and informed decision making. A path analysis was conducted to test the overall model.

Results

Sample characteristics

Participants ranged in age from 50 to 86 years, with a mean of 58.5 (*SD* = 7.6) years. Twenty-three percent of the participants were high school graduates and 50% had some college. Approximately one-third of participants (33%) reported their annual income was between $10,000 and $29,000, and approximately another third (36%) of participants reported an annual income between $30,000 and $49,000. Thirty percent of the participants were unmarried and 30% were divorced. Participants reported having diagnoses of hypertension (53%), diabetes (23%) and high cholesterol (23%). Eighty-nine percent of the participants reported having a primary care provider that they visited on a routine basis. (See Table 1.)

Cultural identity, colorectal cancer beliefs and family support and influence

The relationship between the scores of the cultural identity subscales and colorectal cancer beliefs varied. Collectivism (r = .26. p<.01), religiosity (r = .21, p<.01) and future-time orientation (r = .35, p<.01) had significant positive relationships to colorectal cancer beliefs. In other words, study participants with more collectivism, religiosity and who had a future time orientation had positive beliefs about colorectal cancer screening. Present-time orientation was positively and significantly related to negative beliefs about colorectal cancer and colorectal cancer screening (r = -.33, p<.01). The relationship between colorectal cancer beliefs and racial pride was not statistically significant (Table 3). These results partially support the hypothesis that cultural identity is positively related to colorectal cancer beliefs. Certain aspects of cultural identity (collectivism, religiosity and future-time orientation) are related to beliefs about colorectal cancer that support colorectal cancer screening. The relationship between family support using the MOS-SSS scale and some of the subscales of cultural identity were significant. Collectivism, religiosity and future-time orientation were positively and significantly related to the MOS-SSS scale (Table 3). There was a significant inverse relationship between the MOS-SSS scale and present-time

orientation (Table 3). The study results means that participants that reported more perceive family support were not present-time oriented. The relationships between elements of cultural identity and family influence were not statistically significant. These results support the hypothesis that cultural identity is positively related to family support. However, the hypothesis that cultural identity is positively related to family influence was not supported.

Family support and influence and colorectal cancer beliefs

The relationship between family support and colorectal cancer beliefs was statistically significant (Table 3). These results indicate that perceived family support, as measured by the perception of having adequate emotional/informational, tangible and affectionate support as well as positive social interaction, is positively related to having colorectal cancer beliefs that support colorectal cancer screening. The relationship between family influence and colorectal cancer beliefs was not statistically significant (Table 3). These findings indicate that family influence directly related to colorectal cancer screening has no relationship to positive or negative beliefs about colorectal cancer screening. These results support the hypothesis that family support, measured by the MOS-SSS, is positively related to colorectal cancer beliefs. The results do not support the hypothesis that family influence is positively related to colorectal cancer beliefs.

Colorectal cancer beliefs and an informed decision regarding colorectal cancer screening

The relationship between colorectal cancer beliefs and an informed decision regarding colorectal cancer screening was statistically significant (Table 3). These results support the hypothesis that colorectal cancer beliefs are positively related to an informed decision regarding colorectal cancer screening.

Colorectal cancer beliefs, cultural identity, family support and influence and an informed decision regarding colorectal cancer screening

To understand whether colorectal cancer beliefs mediate the relationship between family support and influence and an informed decision and whether colorectal cancer beliefs mediate the relationship between cultural identity and an informed decision, regression models were run prior to the Sobel test. Thus, collectivism, religiosity, racial pride, present-time orientation and future-time orientation were used in the regression model.

The multiple regression model with the five cultural identity predictors of colorectal cancer beliefs indicated the model accounted for 20% of the variance in colorectal cancer beliefs (R^2 =.200, F (5,126) =6.06, p<.001). As can be seen in Table 4, the racial pride scale had a significant positive regression weight, indicating that respondents with high scores on the racial pride sub scale were more likely to have beliefs that do not support colorectal cancer screening. The present-time scale had significant positive regression weights, indicating that respondents with high scores on this sub-scale were more likely to have beliefs about colorectal cancer that do not support colorectal cancer screening. Future-time orientation, collectivism and religiosity did not significantly contribute to the multiple regression model (Table 4). Next, a regression was run to determine the relationship between colorectal cancer beliefs (predictor) and an informed decision regarding colorectal cancer beliefs. The linear regression model with colorectal cancer beliefs as a predictor of an informed decision regarding colorectal cancer screening indicated the model accounted for 9% of the variance in informed decision making (R^2=.088, F (1,128) =12.24, p<.05).

Next, the Sobel test was run to determine if colorectal cancer beliefs mediate the relationship between factors of cultural identity and an informed decision regarding colorectal cancer screening. To conduct the Sobel test, the regression coefficient and

standard error for the relationship between the independent variable (the 5 elements of cultural identity) and mediator (colorectal cancer beliefs) are used. Additionally, the regression coefficient and standard error for the relationship between the mediator (colorectal cancer beliefs) and the dependent variable (informed decision) were used (*B* = .084 and *SE*=.024). Of the 5 elements of cultural identity used in the Sobel test, racial pride (*p* =.02) and present-time orientation (*p*= .00) were statistically significant. However, when the Sobel test were run for racial pride and present-time orientation, neither was statistically significant. Thus, colorectal cancer beliefs do not mediate the relationship between racial pride and present-time orientation and an informed decision regarding colorectal cancer screening. Prior to the running of the next Sobel test to determine if colorectal cancer beliefs mediate the relationship between family support and an informed decision regarding colorectal cancer screening, regression models were run. Family influence was not used because the results of the bivariate correlations indicated that it was not related to colorectal cancer beliefs or an informed decision. The regression model used the Medical Outcomes Social Support Survey (MOS-SSS) scores for the independent variable family support and colorectal cancer beliefs as the dependent variable. The regression model produced R^2 =.253, *F* (1,126) =42.65, *p*<.001. The second regression model run used family support as the independent variable and the informed decision score as the dependent variable. The regression model produced R^2=.296, *F* (1, 127) =12.24, *p*<.05.

Next, the Sobel test was run to determine if colorectal cancer beliefs mediate the relationship between factors of cultural identity and an informed decision regarding colorectal cancer screening. To conduct the Sobel test, the raw unstandardized regression coefficient and standard error for the relationship between the independent variable (MOS-SSS score) and mediator (colorectal cancer beliefs) are used (*B*= .276 and *SE*=.091). Additionally, the raw unstandardized regression coefficient and standard

error for the relationship between the mediator (colorectal cancer beliefs) and the dependent variable (informed decision) were used (*B* = .075 and *SE*=.025, respectively). The Sobel test result was 2.13 (*p* =.001). Thus, colorectal cancer beliefs significantly mediate the relationship between family support and an informed decision regarding colorectal cancer screening.

In the overall model, the fit and misfit indices show that the model did not fit the data well (X^2 =10.16, 7df, *p* = .18, *N*= 129, NFI = .952, CFI = .981, RMSEA = .059).

Discussion

Findings from this study expand the limited research on the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening among African Americans. Collectivism, religiosity and future-time orientation were positively and significantly related to colorectal cancer beliefs, indicating that collectivism, religiosity and future-time orientation may be related to having positive beliefs about colorectal cancer and colorectal cancer screening. These results support our hypothesis and support previous studies on cancer screening among African American women and cultural identity (Kreuter, et al., 2003). Kreuter found that high scores on the cultural identity-collectivism, religiosity and future-time orientation-subscales were related to beliefs that supported breast cancer screening. Results from this study indicate that respondents that believe in the importance of the family or group as the basic unit of society had beliefs that supported colorectal cancer screening. The results also indicate that respondents who are more future-time oriented and place a high value on religiosity have colorectal cancer beliefs that support colorectal cancer screening.

In the current study, the hypothesis about the relationship between family support and collectivism, religiosity and future-time orientation was supported and was

statistically significant (indicating that those respondents reporting more family support and influence were more likely to place more importance on the family as the basic unit of society, place higher value on a religiosity and more apt to plan for the consequences of events that are far away). The results support previous research on cultural identity and cancer beliefs and extend the body of knowledge because of the study's focus on colorectal cancer and the inclusion of African American men (Erwin, Spatz, Stotts & Hollenberg, 1999; Lukwago et al, 2001; Russell, Perkins, Zollinger, & Champion, 2006). Also, perceived low family support was significantly related to a person being more present-time oriented. This means that the person is more likely to delay an activity that requires planning or future thought, like colorectal cancer screening.

In this study, positive perceived family support was related to having beliefs about colorectal cancer and screening that support colorectal cancer screening. This result supports previous research on the relationship between perceived family support and health related behaviors (Jernigan, Trauth, Ferguson & Ulrich, 2001). Further, the current study found that positive beliefs about colorectal cancer screening were related to making an informed decision regarding colorectal cancer screening. This study is one of the few to examine this relationship (Briss, 2004).

In the current study, it was determined that colorectal cancer beliefs mediate the relationship between family support and influence and an informed decision regarding colorectal cancer screening. This study is one of the few to examine the mediated relationship between family support and influence and colorectal cancer beliefs and an informed decision regarding colorectal cancer screening.

In the current study, the overall model did not fit the data well. However, it should be noted that the study sample size may not have been adequate for the analysis and should be interpreted with caution. However, the exploratory nature of the results and

how close the model came to good fit indices indicates that further research is needed to continue to develop the model of informed decision making among African Americans.

Limitations

This study has important limitations that should be noted. First, the research design for this study was correlational and cross-sectional. Correlation research has limitations because only conclusions about relationships between factors of cultural identity, family support and influence, colorectal cancer beliefs and an informed decision can be drawn. Cause and effect cannot be inferred. Second, the study was limited to 129 African American men and women, age 50 and older. Thus, results cannot be generalized to other studies of men and women who are younger or are from other ethnic groups. Third, this study of the influence of family support and cultural identity on an informed decision regarding colorectal cancer screening among African American women and men was limited to African American women and men living in a large urban area in the Midwest. African American women and men living in suburban and rural areas may have different experiences and outcomes than those who live in an urban area. Region and type of setting have important influences. Last, study participants may have given responses that could be considered socially acceptable, instead of providing accurate responses to the questions. More research on the relationship between cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening among African Americans is needed before conclusions could be drawn concerning support from family, friends and significant others, cultural factors and informed decisions.

Implications for Nursing Practice

This study has implications for nurses providing colorectal cancer screening information and charged with the care of African American women and men aged 50 and older who have or have not been screened for colorectal cancer. The results from this study indicate that certain cultural characteristics, perceived family support, and colorectal cancer beliefs are related to African-American's an informed decision related to seek colorectal cancer screening. Nursing assessments of family support and beliefs related to colorectal cancer screening should include questions about what the person has heard about colorectal cancer screening and from whom, how the person will get to and from the colonoscopy, who will they talk to about their decision regarding colorectal cancer screening and what might that person say. Nurses should also assess how the individual is able to plan ahead or deals more in the present moment. Understanding these factors may help nurses refer patients to the appropriate resources, like transportation, facilities that do colonoscopy on the weekends, or even give the person the information to enlist the support they need to get screened for colorectal cancer.

For nurse researchers, this information may lead to additional studies on the factors that support colorectal cancer screening and the development and testing of interventions to improve colorectal cancer screening rates.

Conclusion

Preliminary results from the current study are encouraging as they add knowledge regarding the factors that influence an informed decision regarding colorectal cancer screening among African Americans. Further research will provide more details into the socio-cultural context of informed decision making. Further research can inform intervention research that may improve colorectal cancer screening rates among African Americans.

Table 1

Demographic Characteristics among African American Men and Women

Demographic Characteristics (*N* = 129)	Number	Percent[a]
Gender		
Male	64	49.6
Female	65	50.4
Age[b]		
50-59 years	81	63.8
60-69 years	36	28.3
70-79 years	5	4.0
80 years and over	5	4.0
Educational Level[b]		
High School Graduate or less	43	34.7
Some College	63	50.8
Bachelor's Degree or higher	18	14.5
Marital Status[b]		
Divorced	39	30.7
Married	38	29.9
Single/never married	30	23.6
Widow/widower	20	15.7
Personal Income[b]		
Less than $9,000	10	8.3
$10,000 to $29,000	40	33.3
$30,000 to $49,000	44	36.7
$50,000 to $69,000	20	16.7
$70,000 to $89,000	6	5.0
Ever Screened for Colorectal Cancer		
Yes	64	49.6
No	65	50.4
Health Insurance		
Yes	129	100
No	0	0
Has Primary Care Provider		
Yes	109	88.6
No	14	11.4

[a] Percentage indicates valid percentage.

[b] Because of missing data, *n* values do not total sample size.

Table 2

Frequency Distribution of Variables among African American Men and Women (N=129)

Variables	Potential Range	Actual Range	Mean	SD
Cultural Identity				
Collectivism	6-24	11-24	22.25	2.82
Religiosity	9-36	14-36	30.40	4.48
Racial pride	7-28	4-28	23.59	2.82
Present-time orientation	5-20	7-16	9.11	2.43
Future-time orientation	5-20	6-20	14.65	2.40
Colorectal Cancer Beliefs*	30-150	66-150	106.14	15.68
Medical Outcomes Social Support Survey/Family Support	19-95	24-78	60.88	12.82
Family Influence	4-20	4-20	12.46	3.31
Informed Decision Regarding Colorectal Cancer Screening	0-70	9-35	24.35	4.57

Note. Colorectal cancer beliefs on scale cutoffs for the four subgroups were: 30-57 (bad), 58-88 (poor), 89-119 (fair), 120 to 150 (good).*

Table 3

Correlations between variables (N = 129)

Measure	1	2	3	4	5	6	7	8	9
1. Collectivism	___								
2. Religiosity	.36**	___							
3. Racial pride	.13	.23**	___						
4. Present-time orientation	-.24**	-.18*	-.10	___					
5. Future-time orientation	.37**	.45**	.02	-.32**	___				
6. Colorectal Cancer Beliefs	.26**	.21*	-.14	-.33**	.35**	___			
7. Family Influence	.04	.14	.26**	.03	.13	.09	___		
8. MOS-SSS-Family support	.40**	.27**	-.04	-.31**	.30**	.50**	.11	____	
9. Informed decision	.16	.15	.06	-.31**	.11	.30**	.03	.24**	___

Note.*$p<.05$, **$p<.01$

Table 4

Multiple Linear Regression Analysis-Cultural Identity (Colorectal Cancer Beliefs)

Variable	*B*	*SE B*	*β*	*p*
Collectivism	.92	.52	.16	.08
Religiosity	.13	.35	.03	.71
Racial pride	-.86	.37	-.20	.02*
Present-time orientation	-1.6	.56	-.25*	.00*
Future-time orientation	.98	.67	.14	.14
R^2	.200			
F	*6.06***			

Table 5

Direct and Indirect Causal Effects of the Variables in the Overall Model (n = 129)

Effect	Causal effects				
	Direct	Indirect	Total	β	R^2
On colorectal cancer beliefs:					.36
Collectivism	.006	.000	.006	.069	
Religiosity	.020	.000	.020	-.091	
Racial pride	-.113	.000	-.113	-.103	
Present-time orientation	-.141	.000	-.141	-.129	
Future-time orientation	.179	.000	.179	.130	
Family support	.414	.000	.414	.462**	
Family influence	-.144	.000	-.144	-.125	
On informed-decision regarding colorectal cancer screening:					.09
Colorectal cancer beliefs	.296	.000	.296	.300**	
Collectivism	.000	.002	.002		
Religiosity	.000	.006	.006		
Racial pride	.000	-.033	-.033		
Present-time orientation	.000	-.042	-.042		
Future-time orientation	.000	.053	.053		
Family support	.000	.123	.123		
Family influence	.000	-.043	-.043		

X^2 = 10.16, 7df, p = .18, N = 129, NFI = .952, CFI = .981, RMSEA = .059

* p< .05, ** p<.01

CHAPTER IV

Gender Influences on cultural identity, family support and influence and an informed decision regarding colorectal cancer screening

Abstract

The purpose of this exploratory study was to examine gender differences and other factors related to informed decision making regarding colorectal cancer screening among older African Americans. Bivariate correlations using Pearson Product Moment Correlation and path analysis were used to analyze the data.

There were several differences in the bivariate correlations between African American men and women. Two relationships were significant for men, but not for women; colorectal cancer beliefs were significantly related to an informed decision regarding colorectal cancer screening in a positive direction (r =.320; p =.006) and racial pride was positively and significantly related to an informed decision regarding colorectal cancer screening (r =.330; p=.005). These findings provide preliminary support for proposed relationships between colorectal cancer beliefs that support colorectal cancer screening, family support, racial pride, and making an informed decision regarding colorectal cancer screening for African American men, but not women. However, family support was positively and significantly related to colorectal cancer beliefs among African American men (r = .599; p=.00) and African American women (r = .447; p= .00), meaning that respondents that perceive high family support are more likely to have beliefs that support colorectal cancer screening.

A gender covariate model was evaluated using informed decision as the a priori model. AMOS 17.0 was used for path analysis. The fit and misfit indices indicated that the gender covariate model did not fit the data well. In the gender covariate model, the fit indices were X^2 =8. 85,6df, p=.182, female n=65, male n=64; NFI=.958; CFI=.983,

RMSEA =.061. Fit of the model for each gender was examined using path analysis to evaluate a model for female respondents and one for male respondents. The female model fit the data better (X^2 = 5.10, 6df, p = .531, n=65, NFI = .905, CFI = 1.00, RMSEA = .000) than the male model, which was a poor fit (X^2 =14.90, 6df, p = .021, n= 64, NFI = .912, CFI = .933, RMSEA = .153). Gender influences on an informed decision regarding colorectal cancer screening are discussed as well as the implications and limitations of this study.

Introduction

The purpose of this exploratory study was to use the informed decision model (Figure 1) to begin to examine gender differences in cultural identity, family support and influence, colorectal cancer beliefs and informed decision making regarding colorectal cancer screening. To examine the possible gender differences in the relationships of cultural identity, family support and influence and colorectal beliefs and an informed decision, bivariate correlations were examined and a gender covariate model was. Path analysis with AMOS 17.0, was used for model testing. Several fit and misfit indices were used to assess the model fit between the models and data, including X^2, the Bentler-Bonnett Normed Fit Index (NFI), The Comparative Fit Index (CFI), and Root Mean-Square Error of Approximation (RMSEA).

Background and Significance

Previous research on the factors that influence colorectal cancer screening has been limited to the examination of knowledge and the availability of screening (Green & Kelly, 2004; Myers, 2005, Powe, 1995a). Prior studies have shown that an increase in knowledge about colorectal cancer screening is not a predictor of adherence to a healthcare provider's recommendations regarding colorectal cancer screening or change an individual's perception of colorectal cancer screening (Green & Kelly, 2004; Powe,

1995a, 1995b, 1995c). Based on a review of prior studies, more research is needed on how best to promote and facilitate an informed decision regarding colorectal cancer screening (Underwood, Powe, Canales, Meade & Im, 2004). This is especially important for African Americans. Colorectal cancer incidence and mortality is higher in African American men and women than in other racial/ethnic groups (ACS, 2008). There is limited knowledge of how other important factors such as cultural identity, family support and influence and gender influence an informed decision regarding colorectal cancer screening in this population. A review of colorectal cancer beliefs, cultural identity, family support and influence and an informed decision regarding colorectal cancer screening was presented in Chapter II.

Gender

Research on colorectal cancer screening behaviors shows a gap between men and women and their colorectal cancer screening behaviors. Weitzman (2001) found that white men and women age 50 to 65 and older believed that colorectal cancer and colorectal cancer screening was for men and that more men reported being screened for colorectal cancer than women. Meissner et al., (2006), found that men were more likely to have been screened for colorectal cancer than women (47% versus 43%). Further, Caucasian men were more likely to have been screened for colorectal cancer than Caucasian women (48% versus 44%) (Meissner et al.,2006). Minority men and women were less likely to have had any colorectal cancer screening when compared to Caucasian men and women (Meissner et al., 2006). However, Black men reported having a colorectal cancer screening more often than Black women (43% versus 38%)(Meissner et al., 2006). Most other studies examining barriers, beliefs, intention to screen and support and their relationship to colorectal cancer screening behaviors among minorities did not report gender differences because most of the respondents were women (James, et al. 2002; Wolf, et al., 2001). Understanding gender differences

and their relationship to colorectal cancer beliefs, family support and influence, cultural identity and an informed decision regarding colorectal cancer screening among older African Americans may advance how colorectal cancer screening information is tailored related to gender and culture and how to increase colorectal cancer screening rates through tailored informed and shared decision-making discussions.

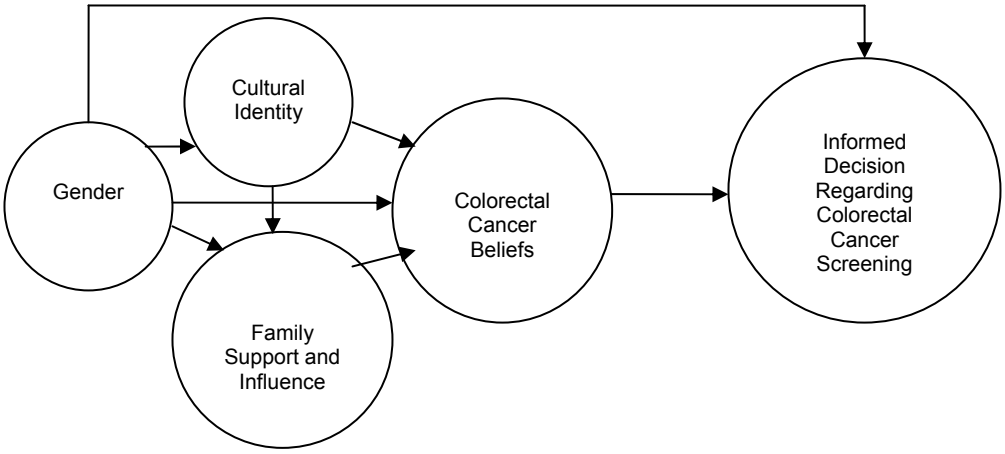

FIGURE 4. Conceptual Model with Gender influences

Theoretical Framework

The Preventive Health Model (PHM) (Myers, 2005) was used as the underlying theoretical framework to understand informed decision regarding colorectal cancer screening. The rationale for using the PHM is that it proposes that there are internal and external factors influencing preventive health related actions and that the health actions (behaviors) are reflective of a person's self-system (Myers, 2005). The PHM has been used most often among African American men to predict prostate cancer screening behaviors and among Caucasian men to predict colorectal cancer screening behaviors (Myers et al., 2005; Tiro, Vernon, Hyslop & Myers, 2005; McQueen et al., 2007). Few studies were found that used the PHM in studies of cancer screening in women.

For the current study, the conceptual model (Figure 1) comprised several of the constructs of the PHM. The conceptual model focused on the self-system and the specific components examined included cultural identity, family influence and colorectal cancer beliefs. The PHM proposes that when faced with a health problem (e.g. disease risk), the person forms an intention to act (e.g. to be screened or not screened) based on the interactions of various representations of the self-system. For this study, intention to act was defined by informed decision making regarding colorectal cancer screening. Thus, individuals make their decisions based upon certain preferences, values and available alternatives, identified for the current study as cultural identity, family support and influence, gender and colorectal cancer beliefs (Myers, 2005). Evidence supporting the relationships proposed in the conceptual model and any gender differences is limited, especially in African American older adults. Thus, the following research question was derived.

Do the relationships among cultural identity, family support, family influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening differ between older African American men and women?

Methods

Sample and Procedures

A purposive sample of 129 participants was recruited from the Detroit Community Network Program,-a community partnership focused on cancer and African American businesses, agencies, organizations and self-referrals. The predictors of informed decision-making measured were cultural identity (collectivism, religiosity, racial pride, present time orientation and future time orientation), family support and influence, and colorectal cancer beliefs. All participation was voluntary. Potential participants learned of the proposed study and how to contact the PI from flyer postings in the community

and other participants. Potential participants visited the PI at recruitment sites during scheduled times or called the PI and the PI verified whether the potential participant met the inclusion criteria. When a potential participant met or contacted the researcher by phone, the researcher informed the potential participant, in detail, about the purpose, scope and contents of the study. After being informed about the study, the potential participant decided whether or not to participate in the study. Upon determination of meeting the study's criteria, the PI and participant arranged to meet at the PI's office in order for the PI to review the research information sheet, answer questions about the information sheet or survey and complete the surveys (see Appendix for questionnaires). Consent to participate was obtained on the day of the proposed data collection session. Data collection was conducted at selected recruitment locations were confidentiality could be maintained. The PI was present to answer questions about the questionnaires if participants had any. It was estimated that the entire survey would take approximately 90 minutes to complete. In fact, most participants completed the study in approximately 30 minutes.

The purpose and content of this study were written in the instructions for the questionnaire and in the research information sheets. A self-administered questionnaire that measures informed decision-making and other study variables was used.

Participants who completed the questionnaire received a $25 gift certificate for a local department store. Prior to conducting the study, IRB approval was obtained from the University of Michigan Human Subjects Committee.

Eligibility criteria were as follow: regardless of previous colorectal cancer screening history and family history of colorectal cancer participants were, (1) African American men and women, (2) age 50 and older, (3) able to speak and read English. Exclusion criteria included men and women who did not self-identify as being African American, younger than 50 years of age, individuals that have or had colorectal cancer

and individuals that do not have insurance coverage for colorectal cancer screening. The final sample for this study was 129 African American men (*N*=64) and women (*N*=65). A power analysis using G-Power was conducted to assess the power for an analysis of separate models to examine factors related to informed decision making regarding colorectal cancer screening in men and women. In order to have 0.80 power to detect a medium effect size multiple correlations (R^2=.15) with seven predictors and an alpha of .05, a sample size of 64 is required for each group. The 10%-20% attrition rate was not taken into consideration since this was a one-time study with no additional follow-up. Thus, in addition to conducting a gender covariate model, separate models were estimated for men and women.

Measures

Cultural Identity

To measure the cultural identity of the African American participants, five cultural identity sub-scales developed by Lukwago, Kreuter, Bucholtz, Holt and Clark, (2001) were used. The scales were originally used among African American women and some questions specifically stated “Black women”, so for this study the scales were modified to be appropriate for both genders to respond. The Cultural identity sub-scales have 32-items in total and measure five significant African American cultural characteristics; collectivism, religiosity, racial pride, present time orientation and future time orientation. To measure religiosity, racial pride and time orientation (present and future), a 4-point response scale with 1 corresponding with strongly disagree to 4 representing strongly agree was used. To measure collectivism a 4- point response scale was used with 1 corresponding to not at all important to 4 representing very important. The scores were computed by taking the sum of the values within each scale thus obtaining a sub-scale score for each of the 5 sub-scales. There is no total score for the cultural identity scale. Lower scores on the subscales indicate lower perceptions of collectivism, religiosity,

racial prides, present-time orientation and future-time orientation. The reported (Lukwago et. al, 2001) internal consistency reliabilities for the measures are: religiosity (α =.88), collectivism (α =.93), racial pride (α =.84), present time orientation (α =.73) and future time orientation (α =.72). For this study, reliabilities for all of the subscales were adequate: religiosity (α =.89), collectivism (α =.82), racial pride (α =.81), present-time orientation (α =.71), future-time orientation (α =.70).

Colorectal Cancer Beliefs

To measure the beliefs about colorectal cancer screening among African American, the Colorectal Cancer Perceptions Scale (Green & Kelly, 2004) was used. Participants were instructed to rate each of the 35 items on CRC susceptibility, severity, benefits and barriers to screening using a 5-point Likert scale, with 1 corresponding with strongly disagree and 5 representing strongly agree. The scale is scored by obtaining a score for each sub-scale and the scores from each sub-scale are summed to give a total score. For ease of data analysis, the scale was reverse scored so that higher scores on the scale indicate that the respondent has positive perceptions about colorectal cancer and colorectal cancer screening. The reliability of the instrument reported by Green and Kelly was α =0.84. Internal consistency for the sample in the current study was α=0.92.

Family Support and Influence

The Medical Outcomes Study Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1991) was used to as an overall measure of perceived family support. The MOS-SSS measures the availability of overall social support through four dimensions of social support: emotional support (the expression of positive affect, empathetic understanding, and the encouragement of expressions of feelings); informational support (the offering of information, advice, guidance and feedback); tangible support (the provision of material aid or behavioral assistance); affectionate support (involving expressions of love and affection); and positive social interactions (the availability of

other persons to do fun things with you) (Sherbourne & Stewart, 1991). The MOS-SSS is a reliable (α=.97) 19-item measure of an individual's perceptions of the availability of social support in their network (Sherbourne & Stewart, 1991). Participants were instructed to rate each of the 19 items using a 5-point Likert scale, with 1 corresponding with none of the time and 5 representing all of the time. The subscales are scored by calculating the average of the scores for items in the subscale. To obtain the overall social support index, the average of the scores for the 19 items is calculated. A higher score for an individual scale or for the overall support index indicates more support. For this study, the measure of internal consistency was strong (α = .93).

An additional 4-item scale to measure family influence on colorectal cancer screening was developed by the PI to specifically measure the influence of the family on the likelihood of completing and/or supporting colorectal cancer screening. Participants were instructed to rate each of the four items using a 5-point Likert scale, with 1 corresponding with strongly disagree and 5 representing strongly agree. To obtain the family influence score the 4-items are totaled. A higher score indicates higher family influence for colorectal cancer screening. For this study, the scale demonstrated adequate internal reliability (α = .74).

Informed-Decision Making

To measure informed decision making regarding colorectal cancer screening, a 28-item scale was adapted from a measure of informed choice regarding prenatal testing developed and tested by Marteau, Dormandy and Michie (2001). The adapted measure replaced content related to prenatal testing with content related to colorectal cancer testing. However, the structure and much of the wording of the questions were maintained. The adapted measure assessed colorectal cancer screening preferences fecal occult blood testing(FOBT) and digital rectal examination (DRE), colonoscopy and flexible sigmoidoscopy), understanding of colorectal cancer screening, knowledge of

risks related to colorectal cancer screening, value of colorectal cancer screening and decisional consistency. The survey used a 4-point Likert scale with 1 corresponding to strongly disagree to 4 corresponding to strongly agree. Lower scores indicate lower informed decision making. Content validity was established by a review of the instrument by two experts in the field of decision making. The measure was pre-tested and found to be adequately reliable for an exploratory measure (α = .65). For this study, the measure had an adequate level of internal reliability (α = .68).

Gender

The gender variable was identified by self-reported bio-gender (1 =male; 2= female). This variable was used to divide the data into two subgroups (males and females) for comparison of the bivariate relationships and estimates of separate path models. There were slightly more females than males in the a priori gender covariate model (males= 64; females = 65)

Analysis

This researcher used SPSS 17.0 and AMOS 17.0 for Windows program for data analysis. Path analysis was chosen as the analytic approach to test the proposed relationships among the variables identified as having an effect on an informed decision regarding colorectal cancer screening.

Thus, based on the Preventive Health Model and results reported in Chapter III, the full path model to be tested was as follows: Gender was proposed to be related to all other variables, indirectly and directly (Figure 2). Each box in the diagram represents a construct, rather than an individual variable. The constructs shown in the model are: collectivism, religiosity, racial pride, present-time orientation, future-time orientation, family support and influence, gender, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. Arrows on the diagram represent potential paths among the various constructs.

With the exception of gender (1 = male, 2 = female), each construct was a continuous measure. The variables included in each of the constructs shown in Figure 2 are listed in Appendix A.

The residuals were examined to check the assumption of normally distributed error terms. Paths significant at the p = .05 level were retained for estimating the reduced models. Path coefficients were estimated by simultaneous entry of predictors for each dependent variable in the model using a series of maximum likelihood estimates. The results of each regression are summarized in Tables 4, 5 and 6.

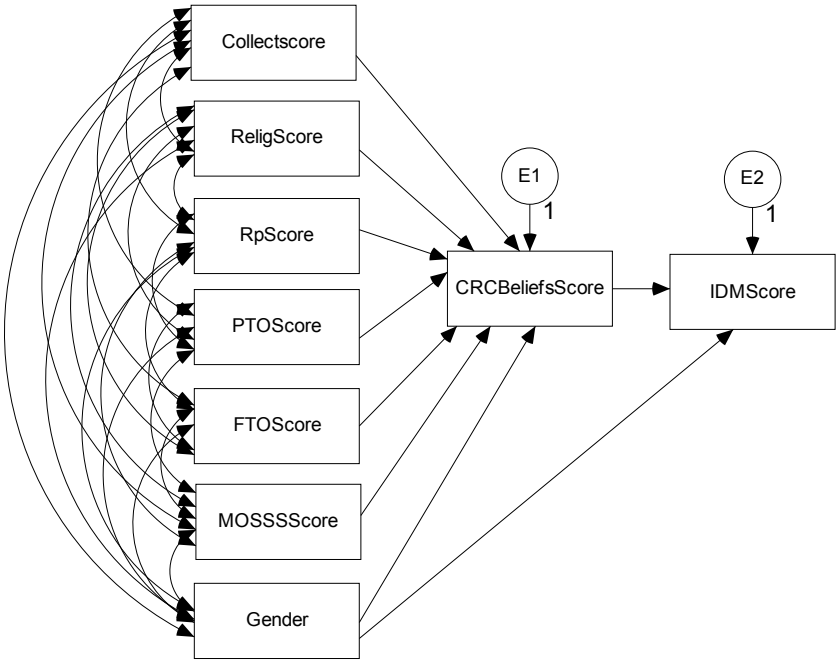

Figure 4.1: The Gender Model

Results

Zero order correlations were obtained for all of the variables included in the analysis. The study variables, their respective means and standard deviations, and the correlations are presented in Table 7. Standardized betas for the paths for the gender covariate model are given in Table 8. The explanatory variables accounted for 31% of

the variance in colorectal cancer beliefs. Racial pride and family support and influence had direct significant relationships with colorectal cancer beliefs. Gender had no significant relationship to colorectal cancer beliefs. Family support had the strongest direct relationship with colorectal cancer beliefs of all of the study variables. Colorectal cancer beliefs accounted for 10% of the variance in informed decision making regarding colorectal cancer screening in the gender covariate model. Gender had no significant relationship with an informed decision regarding colorectal cancer screening. Colorectal cancer beliefs had a direct significant path to an informed decision regarding colorectal cancer beliefs. However, the fit and misfit indices show the gender covariate model did not fit the data well. In the gender covariate model, the fit indices were X^2 =8. 85,6df, p=.182, female N=65, male N=64; NFI=.958; CFI=.983, RMSEA =.061

Differences in Model Variables by Gender

To examine the differences in the variables by gender, t-tests were conducted. The results revealed that collectivism, religiosity, present-time orientation, future-time orientation, colorectal cancer beliefs and family support were significantly different for male and female respondents (p< .05) (Table 9). The variables that were not significantly different by gender were racial pride, family influence and an informed decision. Of the significant results, females scored higher on the measures of collectivism, religiosity, future-time orientation and colorectal cancer beliefs. Males scored higher on present-time orientation. These results indicate that women had more positive perceptions of collectivism, religiosity, were more future-time orientated and had more positive beliefs about colorectal cancer screening and men were more present-time oriented.

Gender Specific Correlations in Model Variables

The means, standard deviations and bivariate correlations for men and women for the constructs in the path model are displayed in Tables 10 and 11. For women, the

bivariate correlation analysis revealed positive significant relationships between colorectal cancer beliefs and family support and an informed decision regarding colorectal cancer screening (r = .45, p<.001 and r = .25, p<.05), respectively. The bivariate correlations indicate that female participants, who reported having more perceived family support, are more likely to have made an informed decision regarding colorectal cancer screening. Additionally, female participants who scored lower on the racial pride subscale also reported having beliefs that support colorectal cancer screening (r = -.25, p<.05).

For men, the bivariate correlation analysis revealed positive significant relationships between colorectal cancer beliefs and family support and an informed decision regarding colorectal cancer screening (r = .50, p< .001 and r = .32, p<.05), respectively. These results indicate that for male respondents who reported having positive beliefs concerning colorectal cancer screening also reported having positive perceived family support and reported making an informed decision regarding colorectal cancer screening. Additionally, the bivariate correlation analysis revealed that males who reported having positive beliefs regarding colorectal cancer screening also reported having a high regard for the cultural relevance of the family, a high regard for the role of religion in their life and being future-oriented (Table 11). Male respondents who reported having beliefs that support colorectal cancer screening also were not present-time oriented (r = -.39, p<.001), meaning that men who reported having beliefs that support colorectal cancer screening were less likely to live as if they were subsisting in the present-time only. However, the relationships between present-time orientation, collectivism and religiosity relation to colorectal cancer beliefs were not found among female respondents. Male respondents with perceived positive family support reported making an informed decision regarding colorectal cancer screening (r = .40, p<.001).

This result indicates that men who report positive family support may be more likely to make an informed decision regarding colorectal cancer screening.

In order to further explore the relationships among study variables by gender, exploratory examination of the basic model for females and males was done using AMOS 17.0. The results need to be looked at with caution because of the small sample sizes. The results of the path analyses of the models for female and male participants are summarized in tables 12 and 13. The female model fit the data well (X^2 = 5.10, 6df, p = .531, n=65, NFI = .905, CFI = 1.00, RMSEA = .000). For the female model, the five factors of cultural identity and family support accounted for 30% of the variance in colorectal cancer beliefs. Additionally, colorectal cancer beliefs account for only 6% of the variance in an informed decision regarding colorectal cancer screening. For the male model, the five factors of cultural identity and family support account for 44% of the variance in colorectal cancer beliefs. Additionally, colorectal cancer beliefs accounted for 10% of the variance in an informed decision regarding colorectal cancer screening. However, the male model did not fit the data well (X^2 =14.90, 6df, p = .021, n= 64, NFI = .912, CFI = .933, RMSEA = .153).

Further analysis

To explore possible variables that may increase the explained variance of an informed decision among males and females and female exclusively and to respecify the male model, additional analyses were conducted. First, the gender covariate model was revised using only the variables significantly correlated with an informed decision. Thus, an informed decision regarding colorectal cancer screening was regressed on cultural identity measures, colorectal cancer beliefs, family measures, and gender. In the revised gender covariate model, when all study variables (collectivism, religiosity, racial pride, present-time orientation, future-time orientation, family support, family influence, cancer beliefs, and gender) were allowed to have a direct effect on an informed decision,

the explained variance increased to 17%, an increase from 10% explained variance in an informed decision in the original model. However, the path analysis revealed that the revised gender covariate model did not fit the data. For the female model, an additional analysis was conducted. First a multiple regression analysis was conducted where an informed decision was regressed on collectivism, religiosity, racial pride, present-time orientation, future-time orientation, family support, family influence, and cancer beliefs. The results indicated that this model explained 14% of the variance in an informed decision regarding colorectal cancer screening. However, the path analysis of the respecified female model did not fit the data well.

For the male model, an additional analysis was conducted. First, a multiple regression analysis was conducted where an informed decision was regressed on collectivism, religiosity, racial pride, present-time orientation, future-time orientation, family support, family influence, and cancer beliefs. The results indicated that this model explained 30% of the variance in an informed decision regarding colorectal cancer screening. However, the path analysis of the respecified male model did not fit the data well. Thus, respecification of the models did not improve the fit of the model for males and worsened the fit for females.

Table 6

Means, Standard Deviations, and Zero-order Correlations of Variables Included in the Path Analysis

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Collectivism	21.26	2.83	_								
2. Religiosity	30.40	4.48	.36**	_							
3. Racial pride	23.59	3.60	.13	.23**	_						
4. Present-time orientation	9.12	2.44	-.24**	-.18*	-.10	_					
5. Future-time orientation	14.65	2.41	.37**	.45**	-.02	-.32**	_				
6. Colorectal cancer beliefs	106.14	15.68	.24**	.21*	-.15	.36**	.39**	_			
7. MOS-SSS-Family support & influence	60.88	12.82	.40**	.27**	-.04	-.31**	.30**	.52**	_		
8. Informed Decision Making	24.35	4.57	.16	.15	.06	-.31**	.11	.29**	.24**	_	
9. Gender	1.50	.502	.17	.19*	-.12	-.25**	.22*	.18	.25**	.15	_

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Note: N=129

Table 7

Direct and Indirect Effects of Variables in the Gender Covariate Model (N = 129)

Effect	Causal effects				
	Direct	Indirect	Total	β	R^2
On colorectal cancer beliefs:					.33
Gender	-.037	.000	-.037	.001	
Collectivism	.015	.000	.015	.050	
Religiosity	.031	.000	.031	-.142	
Racial pride	-.152	.000	-.152	-.125	
Present-time orientation	-.170	.000	-.170	-.189*	
Future-time orientation	.161	.000	.161	.157	
Family support	.389	.000	.389	.471**	
On informed-decision regarding colorectal cancer screening:					. 10
Gender	.105	-.010	.094	.116	
Colorectal cancer beliefs	.279	.000	.279	.274*	
Collectivism	.000	.004	.004		
Racial pride	.000	-.042	-.042		
Present-time orientation	.000	-.047	-.047		
Future-time orientation	.000	.045	.045		
Family support	.000	.109	.109		

X^2= 8.85, 6df, p =.182, female *n*=65, Male *n*= 64; NFI = .958; CFI = .983; RMSEA = .061

* *p*< .05, ** *p*<.01

Table 8

Gender Differences and Model Variables

Model variables	Females (*n* =65)		Males (*n* = 64)	
	Mean	*SD*	Mean	*SD*
Collectivism*	21.74	2.53	20.77	3.04
Religiosity*	31.27	4.13	29.53	4.68
Racial pride	23.18	4.10	24.02	2.99
Present-time orientation*	8.52	2.32	9.72	2.42
Future-time orientation*	15.18	2.04	14.11	2.63
Colorectal cancer beliefs*	108.97	13.72	103.46	17.02
Family support*	64.12	10.48	57.64	14.15
Family influence	12.06	3.49	12.87	3.08
Informed decision	25.03	4.53	23.66	4.55

*. Correlation is significant at the 0.05 level (2-tailed).

Table 9

Means, Standard Deviations, and Zero-order Correlations of Variables Included in the Path Analysis for Females (n = 65)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
1. Collectivism	21.74	2.53	_							
2. Religiosity	31.27	4.13	.16	_						
3. Racial pride	23.18	4.10	-.12	.14	_					
4. Present-time orientation	8.52	2.32	-.17	-.07	.02	_				
5. Future-time orientation	15.18	2.04	.30*	.15	-.09	-.23	_			
6. Colorectal cancer beliefs	107.23	14.27	.07	-.08	-.25*	-.21	.04	_		
7. MOS-SSS-Family support	64.12	10.48	.24	.06	-.25*	-.09	.23	.45**	_	
8. Informed Decision Making	25.03	4.53	-.07	.01	-.13	-.18	-.04	.25*	-.02	_

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10

Means, Standard Deviations, and Zero-order Correlations of Variables Included in the Path Analysis for Males (n = 64)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
1. Collectivism	20.80	3.04	_							
2. Religiosity	29.53	4.68	.47**	_						
3. Racial pride	24.02	2.99	.49**	.42**	_					
4. Present-time orientation	9.72	2.42	-.24	-.18	-.35**	_				
5. Future-time orientation	14.11	2.63	.38**	.62**	.11	-.33**	_			
6. Colorectal cancer beliefs	103.39	16.18	.36**	.33**	.02	-.39**	.48**	_		
7. MOS-SSS-Family support	57.64	14.15	.46**	.33**	.23	-.40**	.28*	.50**	_	
8. Informed Decision Making	23.66	4.55	.32*	.22	.38**	-.38**	.18	.32*	.40**	_

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 11

Direct and Indirect Causal Effects of the Variables in the Female Model (n = 65)

Effect	Causal effects				
	Direct	Indirect	Total	*β*	R^2
On colorectal cancer beliefs:					.30
Collectivism	-.039	.000	-.039	-.005	
Religiosity	-101	.000	-101	-.197	
Racial pride	-.140	.000	-.140	-.148	
Present-time orientation	-.197	.000	-.197	-.170	
Future-time orientation	-.099	.000	-.099	-.101	
Family support	.446	.000	.446	.430**	
On informed-decision regarding colorectal cancer screening:					.06
Colorectal cancer beliefs	.251	.000	.251	.251*	
Collectivism	.000	-.010	-.010		
Religiosity	.000	-.025	-.025		
Racial pride	.000	-.035	-.035		
Present-time orientation	.000	-.049	-.049		
Future-time orientation	.000	-.025	-.025		
Family support	.000	.112	.112		

X^2 = 5.10, 6df, p = .531, *n*= 65, NFI = .905, CFI = 1.00, RMSEA = .000

* *p*< .05, ** *p*<.01

Table 12

Direct and Indirect Effects of Variables in the Male Model (n=64)

Effect	Causal effects				
	Direct	Indirect	Total	*β*	R^2
On colorectal cancer beliefs:					.44
Collectivism	.170	.000	.170	.254	
Religiosity	.041	.000	.041	-.091	
Racial pride	-.256	.000	-.256	-.245	
Present-time orientation	-.225	.000	-.225	-.204	
Future-time orientation	.255	.000	.255	.179	
Family support	.307	.000	.307	.393*	
On informed-decision regarding colorectal cancer screening:					
Colorectal cancer beliefs	-.291	.000	-.291	.317**	. 10
Collectivism	.000	.054	.054		
Religiosity	.000	.013	.013		
Racial pride	.000	-.081	-.081		
Present-time orientation	.000	-.071	-.071		
Future-time orientation	.000	.081	.081		
Family support	.000	.097	.097		

X^2 = 14.90, 6df, *p* =.021, *n* = 64, NFI = .912, CFI = .933, RMSEA = .153

* *p*< .05, ** *p*<.01

Discussion

The purpose of this exploratory study was to examine gender differences in cultural identity, family support, family influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. The t-tests conducted on the study variables revealed that means for the men and the women were significantly different when compared to each other. Women had higher scores than men for collectivism, religiosity, present-time orientation, future-time orientation, colorectal cancer beliefs and family support ($p<.05$). The results of the overall model testing suggested that present-time orientation and family support, not gender, are possible important factors in colorectal cancer beliefs and that colorectal cancer beliefs are possible important factors in an informed decision regarding colorectal cancer screening. However, the bivariate analyses were different between the men and women and the overall gender covariate model fit the data differently than the individual female and male models. Further, the model explained only a small portion of the variance in an informed decision.

The bivariate correlations for the female model indicated significant negative relationships between racial pride and family support and between racial pride and colorectal cancer beliefs. These results suggest that the less pride a woman has in being African American the more likely she is to perceive positive family support and have positive beliefs about colorectal cancer screening. This result may be due to the fact that the more a woman is acculturated she may be more likely to be receptive concerning positive health related messages from health care providers or significant people in her life and perhaps even have more access to accurate health information. The bivariate correlations revealed a significant positive relationship between colorectal cancer beliefs and an informed decision regarding colorectal cancer screening and colorectal cancer beliefs and family support. This result indicates that women who have

positive beliefs about colorectal cancer screening are more likely to make an informed decision regarding colorectal cancer screening. The results also indicate that women who have perceived positive family support are more likely to have positive beliefs about colorectal cancer screening. However, in the path analysis of the female model, only family support had a significant direct effect on colorectal cancer beliefs and there was no significant effect of colorectal cancer beliefs on an informed decision regarding colorectal cancer screening. These findings suggest that family support may be important in colorectal cancer beliefs among women, but that each variable examined in this study may not be as important as it relates to an informed decision regarding colorectal cancer screening among African American women.

The bivariate correlation analyses of the variables for males indicated significant positive relationships between an informed decision and family support, colorectal cancer beliefs, collectivism, and racial pride. These results indicate that family support, collectivism and racial pride may be important factors in an informed decision regarding colorectal cancer screening. There were significant positive relationships between family support, religiosity, future-time orientation, and colorectal cancer beliefs. These results indicated that for men, when family support is perceived to be high then the man is more likely to have beliefs that support colorectal cancer screening. Secondly, the results indicated that for the male respondents who reported having positive beliefs regarding colorectal cancer were more likely to be future-time oriented and place value in the cultural role of religion in their lives. It is possible that the gender differences occur in the bivariate correlations due to the difference in knowledge related to colorectal cancer and differences in perception of cultural identity and family support and influence. The gender covariate model was not a good fit, because of the possible inherent differences between African American men and women as it relates to making an informed decision regarding colorectal cancer screening.

The results of the gender differences analyses suggest that interventions may need additional tailoring for African American women and men to meet the groups differing needs. However, for each group, family support may be important factors in colorectal cancer beliefs. Additional analyses were conducted to determine variables that would increase the explained variance in the gender, as how those models fit the data. While the explained variance increased for the respecified models, none of the respecified models fit the data well. The overall, female and male models were distinctly different as well as the bivariate correlations of the overall, female and male data. These findings suggest that further research is needed to explore and understand the variables that explain an informed decision and the informed decision models of older African Americans.

Implications for nursing practice

Since nurses, community health providers, clinic nurses, and nurse practitioners are charged with educating patients about colorectal cancer and colorectal cancer screening, nursing strategies to increase an informed decision making regarding colorectal cancer screening among older African American men and women are critical to increase the numbers of African Americans begin screened for colorectal cancer. The results of the bivariate analysis suggest family support and colorectal cancer beliefs were significantly related to an informed decision regarding colorectal cancer screening among African American women and men. The results of the male and female bivariate correlations and path analyses suggest that there are differences in how the variables are expressed in women and men. While these are preliminary results and indicate that further research is needed to validate the relationships, the results have practice implications for nursing. Nurses should take note of their patient's perceived family support, colorectal cancer beliefs and continue to assess the patient's ability to attend to

testing that requires pre-testing preparation and planning. For nurse researchers, the relationships between present-time orientation, perceived family support, colorectal cancer beliefs and an informed decision may be important variables to consider when designing future studies related to colorectal cancer screening uptake and/or an informed decision regarding colorectal cancer screening. Implications for future nursing research include further exploring additional possible variables, such as screening history, the presence of other chronic diseases to understand what influences an informed decision regarding colorectal cancer screening as well as respecifying the model of informed decision making for African Americans.

Limitations

Although the findings of this study were valuable in understanding the influence of gender on an informed decision and how African American men and women are different as it relates to the variables of this study and the model of an informed decision regarding colorectal cancer screening, several limitations of this research must be noted. First, the research design for this exploratory study was correlational and cross-sectional. Correlation research has limitations because only relationships between factors of cultural identity, family support and influence, colorectal cancer beliefs and an informed decision can be drawn. Cause and effect cannot be inferred. Second, the study was limited to 129 African American men and women, age 50 and older. Thus, results cannot be generalized to other studies of men and women who are younger or are from other ethnic groups. Third, this study of the influence of family support and cultural identity on an informed decision regarding colorectal cancer screening among African American women and men was limited to African American women and men living in a large urban area in the Midwest. African American women and men living in suburban and rural areas may have different experiences and outcomes than those who live in an urban area. Region and type of setting have important influences. The findings

suggest that exploration of additional variables in future model construction and/or respecification of the model used in this study be done. Additional testing about informed decision making regarding colorectal cancer screening among older African Americans adults with larger samples should be done before conclusions could be drawn concerning gender differences and the influence of cultural identity, family support and influence, and colorectal cancer beliefs.

Summary

Although the research question was only partially addressed by the study's results, important findings were noted. Although gender was not related to each study variable nor was the gender covariate model supported, the finding showed that females and males respondents were significantly different in their responses; the results of the bivariate correlations were different and the results suggest that the informed decision models may be different. The bivariate correlations revealed that colorectal cancer beliefs were related to an informed decision regarding colorectal cancer, among African American women and men. However, colorectal cancer beliefs have to be assessed to assist the nurse in tailoring the level of information a patient requires to make an informed decision. Hence, nursing interventions should not only include an assessment of colorectal cancer beliefs but also assessments of racial pride, present-time orientation, future-time orientation and family support among African American men and women.

Gender was not a significant predictor of an informed decision among African American men and women. However, the findings revealed that collectivism, racial pride, family support and colorectal cancer beliefs were significant correlates of an informed decision regarding colorectal cancer screening among African American men. Unlike African American men, the findings revealed that for African American women, colorectal cancer beliefs were the singular correlate of an informed decision regarding

colorectal cancer screening. The results indicate a difference between African American men and women; hence more research is needed to further validate this study's findings among African American men and women and to determine the explanatory model for each gender.

There were significant differences in influencing factors on an informed decision regarding colorectal cancer screening among African American men and women. The path analyses of the female, which fit the data well, and male models, which did not fit the data well, suggest such differences. The path analysis of the female model revealed that collectivism, religiosity, racial pride, present-time orientation, future-time orientation, family support and colorectal cancer beliefs are a part of the informed decision process. Since none of the path analyses of the tested male models fit the data, the possible informed decision process has not been identified. These results indicate that further research will be needed to determine the variable of the gender covariate and male models and to validate the female model.

This study adds to our understanding of gender and its effects on an informed decision regarding colorectal cancer screening among African American men and women, but raises a number of questions. The models were developed from the Preventive Health Model (PHM), which provided a foundation for this study as the PHM includes the decision making variable as well as sociocultural and knowledge variables. Based on the results, future research should continue to use the PHM to further our understanding of an informed decision regarding colorectal cancer screening. In future research, additional variables such as having a primary health care provider, screening history and the presence of other chronic diseases may be important variables to examine in relation to an informed decision regarding colorectal cancer screening. More research is needed to better understand the influence of gender on cultural identity, family support, family influence and colorectal cancer beliefs on an informed decision

regarding colorectal cancer screening. Future research about informed decisions regarding colorectal cancer screening should be conducted among larger groups of African American men and women to continue the exploration of the possible impact gender may have on an informed decision regarding colorectal cancer screening. Researchers may want to include some of this study's variables due to the significant correlations to colorectal cancer beliefs, family support and an informed decision among men and women Knowledge gained from subsequent studies could be useful in developing nursing interventions tailored specifically for men and women to increase informed decisions regarding colorectal cancer screening and colorectal cancer screening rates among African American men and women.

Chapter V

Discussion and Conclusion

Introduction

Purpose

The purpose of this study was to examine informed decision-making regarding colorectal cancer screening among African Americans within the context of their families and cultural identity. An additional objective was to examine gender differences among African American men and women related to making an informed decision regarding colorectal cancer screening. The target population for this study was African American men and women age 50 and over. Bivariate correlations were used to examine relationships between cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. Additionally, path analyses were conducted to examine the relationships between the endogenous and exogenous variables of the overall model and gender covariate model using AMOS 17.0 for Windows. Additionally, gender specific models were used to examine gender differences between African American men and women.

Specific Aims

The two specific aims for the study were 1) examine the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening in African Americans and 2) determine if the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening are different in African American men and women.

Several important findings were obtained from this study and are helpful in understanding the factors that influence African Americans informed decision regarding colorectal cancer screening. Many of the findings support previous research on

colorectal cancer beliefs. However, some of the findings are new to the study of cultural identity, family support and influence, informed decision making and colorectal cancer screening among African Americans without a personal history of colorectal cancer.

Methodology

The methodology used for this study was feasible, appropriate, and relevant to examine the factors that influence an informed decision regarding colorectal cancer screening among African Americans. This study used a correlational, cross sectional design and had a sufficient sample to analyze the study data using multivariate and path analyses (Kline, 1998). The Preventive Health Model (PHM) (Myers, 2005) was used in the dissertation as the underlying theoretical framework to understand informed decision regarding colorectal cancer screening because the PHM proposes that there are internal and external factors influencing preventive health related actions and that the health actions (behaviors) are reflective of a person's self-system (Myers, 2005). Validity and reliability of the measures used in the study were evaluated using Cronbach's alpha and content analysis. Bivariate correlations, t-tests, linear regression and multiple path analysis were conducted to examine the relationships between cultural identity, family support and influence, colorectal cancer beliefs, gender and informed decision regarding colorectal cancer screening.

Discussion

The discussion of the results will occur in the context of the specific aims and the hypotheses or research questions associated with that specific aim. Possible implications of significant findings and as well as possible explanations for unsupported hypotheses are discussed.

Specific Aims

Specific Aim #1: Examine the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening in African Americans.

Cultural identity and colorectal cancer beliefs

Results of examining the relationships between cultural identity, family support and influence and colorectal cancer beliefs, supported several, but not all, study hypotheses. The study's findings partially supported the hypothesis that cultural identity is positively related to colorectal cancer beliefs. There are five subscales that are part of the cultural identity measure: collectivism, religiosity, racial pride, present-time orientation and future-time orientation. Collectivism, religiosity and future-time orientation were related to having positive beliefs about colorectal cancer screening. Collectivism is the belief that the family is the basic unit of society. Denham (2003) reported that the family unit assists individual family members with health promoting behaviors. Thus, if an individual believes strongly in the importance of the family, it is likely that the individual may be more likely to engage in health protective behaviors like colorectal cancer screening if they are seen as beneficial to the family. Religiosity is a determined by a range of dimensions from church attendance, spirituality and beliefs about God as a causal agent, reliance on prayer and religious practices. For those who place a high value on religiosity, then the fear for tomorrow and future events may be minimized (Warner-Robbins & Bomar, 2004). Thus, fear negative beliefs about colorectal cancer may be minimized among African Americans who place a high value on religiosity because of the belief in God and reliance on prayer, religious rituals and practices. Future-time orientation is important to colorectal cancer screening because colorectal cancer screening requires advanced planning. A special diet is required to ensure accurate results from a fecal occult blood test. An individual must have a person

accompany then to their colonoscopy. Thus, a person who is more future-time orientated may be more likely to prepare for and complete a colorectal cancer screening as well as consider possible consequences of not being screened. Present-time orientation was related to having negative beliefs about colorectal cancer screening. Meaning that a person who is more present-time orientated is less likely to complete colorectal cancer screening because they are less likely to plan for future activities and consider the possible consequences of not being screened. Only racial pride was not related to having positive or negative beliefs about colorectal cancer screening. Racial pride involves interest and involvement in traditional practices and holding positive attitude about one's race. This result means that for the study participants, involvement in traditional cultural practices and a positive attitude about being African American or the lack of did not impact colorectal cancer beliefs. Thus, the hypothesis that cultural identity and colorectal cancer beliefs were positively related was partially supported. These findings help to clarify the factors that may support positive and negative colorectal cancer beliefs and can inform future research among African Americans.

Family support and influence and colorectal cancer beliefs

The hypothesis that family support is positively related to colorectal cancer beliefs was supported. The results of the bivariate correlation indicated that perceived family support was positively related to having beliefs that support colorectal cancer screening. However, family influence was not related to colorectal cancer beliefs and thus the hypothesis that family influence was positively related to colorectal cancer beliefs was not supported. The family support and colorectal cancer beliefs results support previous research on family support and health behaviors. Family support includes: emotional support (the expression of positive affect, empathetic understanding, and the encouragement of expressions of feelings); informational support (the offering of information, advice, guidance and feedback); tangible support (the provision of material

aid or behavioral assistance); affectionate support (involving expressions of love and affection); and positive social interactions (the availability of other persons to do fun things with you) (Sherbourne & Stewart, 1991). Perceived positive family support provides a nurturing environment that contributes an increased sense of personal competence, sharing of information and maintaining motivation for health promoting behaviors like colorectal cancer screening (Loveland-Cherry & Bomar, 2004). Thus, the presence of positive family support may provide a foundation to increasing colorectal cancer screening rates among African Americans. Family influence is making a decision or completing a task based upon the ideas and opinions of one's family. In this study, family influence was not related to colorectal cancer beliefs. A possible explanation for the results could be that if a person's family is perceived as supportive then perhaps the support of one's family is all one needs to make an informed decision regarding colorectal cancer screening. For example, if a person's family desires for a person to have colorectal cancer screening, yet is unwilling to assist with transportation the day of the screening, then it matters less what the family wants you to do, if they are not able to support you in obtaining the screening. Thus, even though a family may have certain health related norms and customs it should be noted that acculturation to the larger population and to one's peer group, increased knowledge about screening and increased access and exposure to the health care system may mitigate the direct influence of the family on colorectal cancer beliefs.

Colorectal cancer beliefs and an informed decision regarding colorectal cancer screening

The hypothesis that colorectal cancer beliefs are positively related to an informed decision regarding colorectal cancer screening was supported. The relationship between colorectal cancer beliefs and an informed decision regarding colorectal cancer screening was positive and significant. This finding is consistent with extant literature.

Previous research by Myers (1994) indicated that positive beliefs about colorectal cancer screening, which include efficacy of colorectal cancer screening and self-efficacy as it related to the completion of colorectal cancer screening, were related to colorectal cancer screening adherence among men and women. An informed decision is made without the benefit of a client-provider interaction and has occurred once an individual understands the disease or condition being addressed; understands the risks, limitation, benefits alternative and uncertainties of the screening method and makes the decision, to act or defer a decision at a later time, based on his or her screening preferences and values (Briss, Rimer, Reilly, Coates, Lee, Mullen, et al. 2004). Thus, it is reasonable to consider, as the results of this study indicate, if an individual has beliefs that support colorectal cancer screening, an accurate understanding of one's susceptibility to colorectal cancer and severity of colorectal cancer, as well as the benefits to colorectal cancer screening and is able to navigate around or through barriers to colorectal cancer screening then that person may be more likely to understand and have considered the risks and benefits of colorectal cancer screening and make an informed decision that reflects their understanding of colorectal cancer and colorectal cancer screening.

Cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening

Colorectal cancer beliefs were hypothesized to mediate the relationship between cultural identity and an informed decision regarding colorectal cancer screening. The hypothesis was partially supported. The results of the Sobel test indicated that colorectal cancer beliefs mediate the relationships between two components of cultural identity, racial pride and present-time orientation, and an informed decision regarding colorectal cancer screening. However, colorectal cancer beliefs did not mediate the relationship between the remaining subscales of cultural identity and an informed decision regarding colorectal cancer beliefs. These findings help define the informed decision making

model related to colorectal cancer screening among African Americans and provide a framework for future research .

Additionally, colorectal cancer beliefs were hypothesized to mediate the relationship between family support and influence and an informed decision regarding colorectal cancer screening. The hypothesis was partially supported. The relationship between family influence and an informed decision was not evaluated because family influence was not correlated to an informed decision related colorectal cancer screening. Perhaps family influence was not correlated to an informed decision among older African Americans because most often they are the matriarch or patriarch of their family. Also, for older African American adults other factors such as a health care provider or peers may influence an informed decision regarding colorectal cancer screening. The results of the Sobel test using colorectal cancer beliefs as a mediator between family support and an informed decision indicated that colorectal cancer beliefs mediate the relationship between family support and an informed decision regarding colorectal cancer screening. Previous research indicates that family support is related to health outcomes that require decisions, like changes in diet, exercise. The results of the current study support those findings and expand the findings to colorectal cancer screening. Perceived positive family support help to shape colorectal cancer beliefs by providing motivation, emotional support and environment that supports self-efficacy, all important aspects in shaping positive colorectal cancer beliefs and an informed decision related to colorectal cancer screening (Acton, 2002; Denham, 2003).

Specific Aim #2: Determine if the relationships among cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening are different in African American men and women.

When examining the influence of gender and then comparing gender differences between African American men and women, several important findings should be noted. In the bivariate correlations, gender was found to have significant relationships to colorectal cancer beliefs, three of the five cultural identity factors, and family support. However, in the multiple regression analyses gender was not a significant predictor of colorectal cancer beliefs or an informed decision regarding colorectal cancer. The results of path analysis of the gender covariate model indicated that gender had no effect on colorectal cancer beliefs or an informed decision regarding colorectal cancer screening and the model did not fit the data well. In order to do preliminary assessment of how the model that was supported for the entire sample may differ for men and women, individual models were run for African American men and women. When responses of African American men and women were examined separately, the findings supported that African American men and women were different in their responses to the survey items. The results of the t-tests indicated significant differences between African American men and women in study measures. African American women scored higher on collectivism, religiosity, future-time orientation, colorectal cancer beliefs and family support (p=.05). African American men scored higher on present-time orientation (p=.05). The bivariate correlations indicated that among African American women, family support was related to colorectal cancer beliefs and colorectal cancer beliefs were related to an informed decision. However, among African American men, collectivism, religiosity, future-time orientation and family support were related to colorectal cancer beliefs. Additionally, among African American men, racial pride, colorectal cancer beliefs and family support were related to an informed decision. The path analyses of the female and male models provide some additional support of the differences between African American females and males. For the female model, the five factors of cultural identity and family support accounted for 30% of the variance in colorectal cancer

beliefs. Additionally, colorectal cancer beliefs account for only 6% of the variance in an informed decision regarding colorectal cancer screening. The female model fit the data well. Additionally, in the path analysis of the factors related to colorectal cancer beliefs among African American women, only family support had a significant direct effect. For the male model, the five factors of cultural identity and family support accounted for 44% of the variance in colorectal cancer beliefs. Additionally, colorectal cancer beliefs accounted for 10% of the variance in an informed decision regarding colorectal cancer screening. However, the male model did not fit the data well. The findings of the t-tests, bivariate analyses and path analyses indicate that there may be differences among African American men and women as it relates to the factors that influence colorectal cancer beliefs, their relationships to an informed decision regarding colorectal cancer screening and the informed decision making model. These differences may have their beginnings rooted in the roles that each gender is traditionally socialized to assume in relation to shaping, affirming and/or communicating health beliefs and behaviors. According to the path analysis of the female model of an informed decision regarding colorectal cancer screening, family support had a direct effect on colorectal cancer beliefs. Mothers are very influential regarding the family's health and many times she is the decision maker (Kim-Godwin, 2004). Furthermore, the mother's acceptance or rejection of health related behaviors will prove crucial (Kim-Godwin, 2004). Becker et al. (2004) examined African American self-care practices concerning the daily management of chronic illnesses (diabetes and high blood pressure) and found that men and women reported that their mother was a major source of support and advice. The path analyses on the male model of an informed decision regarding colorectal cancer screening did not fit the data well. This result was to be expected since the bivariate correlations and t-test indicated differences between the responses of African American women and men. This result means that first, the African American male role as it relates to his family's health

behaviors has not changed very much compared to the past (Eggly, 2007). In most families, the African American male is not the seeker or communicator of health information. Most often he is the receiver of information. Second, additional factors that may influence a man's decision regarding colorectal cancer screening may need to be added to the male model, such as having a health care provider. Third, how the variables relate to each other in the model may need to change. Perhaps, having a health care provider mediates or substantially contributes to the relationship between colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. Further research on colorectal cancer beliefs, an informed decision regarding colorectal cancer beliefs and the informed decision model may help to advance our understanding.

Amount of variance explained

The amount of variance explained by the full, male and female models differed (see Table 14). In the full model, 33% of the variance in colorectal cancer beliefs was explained by gender, cultural identity, colorectal cancer beliefs, family support and family influence. Gender and colorectal cancer beliefs explained 10% of the variance in an informed decision regarding colorectal cancer screening. However, gender did not have a significant direct effect on an informed decision. Findings of the gender models indicated a difference between African American men and women. Among African American women, cultural identity, colorectal cancer beliefs, family support and family influence explained 30% of the variance in colorectal cancer beliefs. Also, among African American women, colorectal cancer beliefs explained 6% of the variance in an informed decision regarding colorectal cancer screening. However, among African American men, cultural identity, colorectal cancer beliefs, family support and family influence explained 44% of the variance in colorectal cancer beliefs. Also, among African American women, colorectal cancer beliefs explained 10% of the variance in an

informed decision regarding colorectal cancer screening. Green and Kelly (2004) found that 33% of the variance in colorectal cancer screening behaviors among older African Americans was explained by demographic variables, history of colorectal cancer screening, family history of colorectal cancer, personal history of cancer, knowing someone who has had cancer and peer pressure. Of all of the variables, history of colorectal cancer screening had the greatest impact on colorectal cancer screening behaviors among older African Americans. Green and Kelly did not report gender comparison data. Rimer et al (2004) conducted a literature review of informed decision making related to cancer screening. Rimer et al found that informed decision making increased short-term improvements in knowledge, beliefs and accuracy of cancer risk perceptions. The literature review revealed that that the impact of informed decision making interventions on cancer screening was modest. Most often the reported results were small decreases in prostate cancer screening and slight increases in breast and cervical cancer screening (Rimer et al, 2004). Many informed decision studies examined the impact of decision aids, not the factors that influence an informed decision (Wolf, AM, Schorling, JB, 2000; Dolan, JG, Frisina, S., 2002). Thus, it is difficult to compare this study to the literature, in terms of an informed decision and the percent of explained variance. Rimer et al suggest that the most important outcome of an informed decision is that the patient makes an informed choice not the specific choice that is made. The current study maybe one of the few studies to examine an informed decision as an outcome variable, not whether or not the participant reports being screened for colorectal cancer. Although the explained variance in an informed decision regarding colorectal cancer screening in this study was small, there is nothing in this study to suggest that an informed decision is not important. Furthermore, this study adds to the knowledge base of what influences an informed decision as well as the informed decision making models of African American women and men as it relates to colorectal

cancer screening. The very small percentage of the variance in an informed decision and the difference in variance explained suggests that the factors that impact an informed decision regarding colorectal cancer screening are different for men than for women. The female model fit the data well and the male model did not fit the data. These findings should be used in future research to further understand an informed decision regarding colorectal cancer screening. Future research of predictors of an informed decision may choose to examine having a health care provider, history of screening as well as the score on a colorectal cancer informed decision scale. It should be noted that the focus of this study was to examine relationships between an informed decision, cultural identity and family support and influence. In fact, Rimer et al, makes the point that the study of informed decision making is a new field of study and that the lack of evidence of related to the effectiveness of informed decision making is not surprising, especially in community settings. To advance the knowledge base concerning informed decision making, future research should examine colorectal cancer screening as the outcome variable to better understand the role of an informed decision in colorectal cancer screening in the community setting.

Table 13

Percentage of the Variance Explained (R^2) by Each Model

Models/R^2 for each dependant variable		**Colorectal Cancer Beliefs**	**Informed Decision**
Gender Covariate Model		33%	10%
Gender Comparison Model	Female	30%	6%
	Male	40%	10%

Implications for nursing practice

Routinely, nurses provide the community, patients and families with information regarding the importance of colorectal cancer screening in the prevention of colorectal cancer. Public/community health nurses staff health fair exhibits and make sure the community is aware of the need for colorectal cancer screening. Nurse practitioners assess whether or not a person has been screened, talk to patients about their colorectal cancer risks and how to modify them, explain how to do the fecal occult blood test, explain the risks and benefits of a colonoscopy and give the patient a referral for a colonoscopy. Yet, colorectal cancer screening remains under 50% among Americans with health insurance and at 40% among African Americans. What more can be done? The results from this study indicate that certain cultural characteristics, perceive positive family support and colorectal cancer beliefs are related to an informed decision regarding colorectal cancer screening. The results of the study also indicate that perceived family support through colorectal cancer beliefs may be a predictor of an informed decision regarding colorectal cancer screening to a small degree. The results of the study indicate that nurses should assess for family support, beliefs related to colorectal cancer screening and cultural identity. The cultural identity assessment should evaluate cultural identity factors such as future-time orientation (i.e. if the individual is more of a person who is able to plan ahead or a person that deals more in the present moment. The assessment should also evaluate colorectal cancer beliefs and the individual's perception of family support as this study results indicated a relationship between family support, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. Understanding these factors may help nurses refer patients to the appropriate resources, like colorectal cancer screening information/decision aids, transportation, or even give the person the information to enlist the support they need to get screened for colorectal cancer.

Implication for future research

The National Institute of Nursing Research has identified the "Promoting Health and Preventing Disease" area as a research emphasis and stated that it is important to "identify factors that influence decision-making that results in behavioral changes that promote health and prevent disease and disability." (National Institute of Nursing Research [NINR], 2006, p. 16). Thus making this study and its findings a contribution to the knowledge base in the identification of such factors. Each factor of the model will be discussed in terms of future research related to the findings of this study.

Family support and influence

In the study, family support was related to an informed decision regarding colorectal cancer screening among African America men and women. However, when the groups are examined separately, family support was related to colorectal cancer beliefs for African American women and family support was related to colorectal cancer beliefs and an informed decision regarding colorectal cancer screening among African American men. This finding is significant in guiding future research related to cancer health disparities and any type of informed decision. These findings suggest that among African Americans support of the family should be considered when discussing preventive or risk reducing activities. Future research on family support among African Americans is important as there will be an increase of the number of older Americans who will be cared for by their adult children who may or may not live near them and as the composition of families change (divorced, single parent, blended, etc.). Further research on family support may help us understand how a family provides support and what type(s) of support is required for an individual to follow through on health behaviors. Future research on preventive and risk reducing activities should include family support as a study variable to continue to elucidate the relationship between colorectal cancer screening and family support. Although family influence was not

related to colorectal cancer beliefs or an informed decision regarding colorectal cancer screening, future research should continue to explore how to define and understand how a family influences colorectal cancer beliefs and an informed decision regarding colorectal cancer screening.

Cultural Identity

The tailoring of educational materials is of great interest to those interested in decreasing health disparities. Tailoring goes beyond putting pictures of people representing that culture on the fronts of brochures and having them say lines in videos or public service announcements. Current research is looking to elucidate specific cultural factors that will help effort to effectively create materials and decision aids that successfully reach the intended audience. The findings from this study suggest that there are relationships between the five factors of cultural identity, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. The findings also suggest that there are differences in how men and women perceive these factors. The findings of this study also offer new indicators of potential barriers to screening and other preventive/risk reduction activities, as well as ways to create interventions that address culturally related variables. Future research is needed to further validate the findings of these cultural factors and the gender differences as it relates to cultural identity found in this study.

Informed decision making

Since more and more information is available to families, many more families are making informed decisions, a decision that is made without a discussion with a health care provider. The results of this study indicated that additional research is needed to understand the influences, supports and predictors of an informed decision to create efficacious interventions and related decision aids, like handouts, websites and computer-aided models. The results of this study are an addition to the body of

knowledge as it relates to African American and an informed decision related to colorectal cancer screening.

For nurse researchers, the results of the current study raise questions that provide direction for additional studies on the factors that support colorectal cancer screening and the need to evaluate other factors that might be relevant to an informed decision making regarding colorectal cancer screening such as having a primary care provider. Furthermore, research will need to evaluate if an informed decision is related to actually being screened and work towards the development of interventions to improve colorectal cancer screening rates and eventually reduce cancer health disparities.

Limitations

While the methodology was appropriate for this study, it is important to note possible limitations associated with this correlational, cross sectional study. Correlation research has limitations because only relationships between factors of cultural identity, family support and influence, colorectal cancer beliefs and an informed decision can be drawn. Cause and effect cannot be inferred. Second, the study was limited to 129 African American men and women, age 50 and older. Thus, results cannot be generalized to other studies of men and women who are younger or are from other ethnic groups. Second, this study of the influence of family support and cultural identity on an informed decision regarding colorectal cancer screening among African American women and men was limited to African American women and men living in a large urban area in the Midwest. African American women and men living in suburban and rural areas may have different experiences and outcomes than those who live in an urban area. Region and type of setting have important influences. Last, study participants may have given responses that could be considered socially acceptable, instead of providing

accurate responses to the questions. More research on the relationship between cultural identity, family support and influence, colorectal cancer beliefs and an informed decision regarding colorectal cancer screening among African Americans is needed before conclusions could be drawn concerning support from family, friends and significant others, cultural factors and informed decisions.

Conclusion

There were many important findings in this study. First, family support, collectivism, religiosity and future-time orientation were related to having positive beliefs about colorectal cancer screening. The results of this study support previous research on family support and cancer screening beliefs (Jernigan, et al., 2001; Katapodi, Facione, Miaskowski, Dodd & Waters, 2002). However the study adds to the knowledge base related to social support and cancer screening behaviors because this study examined family support and its relationship to colorectal cancer beliefs among African American women and men. Very few studies have examined colorectal cancer beliefs and family support among African Americans. Additionally, this study expands the cancer behavior knowledge base because it examined cultural identity and colorectal cancer beliefs. Previous studies on cultural identity have focused on mammography and increasing fruit and vegetable consumption (Kreuter, Lukwago, Bucholtz, Clark, Sanders-Thompson, 2003) or prostate cancer beliefs (Blocker, Romocki, Thomas, Jones, Jackson, Reid, Campbell, 2006). This study's results indicated that collectivism, religiosity and future-time orientation-factors of cultural identity had a relationship to positive colorectal cancer beliefs among African American men and women. These findings enhance current knowledge but support continued research on cultural identity and family support and their relationship to colorectal cancer beliefs.

Other important findings from this study were that family support and colorectal cancer beliefs were related to an informed decision regarding colorectal cancer screening. This is one of the few studies to examine the relationship between family support and colorectal cancer beliefs and an informed decision regarding colorectal cancer screening (Briss, 2004). This study adds to the understanding of the relationship between family support and colorectal cancer beliefs and an informed decision regarding colorectal cancer screening. Unlike previous studies that have broadly examined an individual's understanding of colorectal cancer screening in terms of colorectal cancer screening guidelines knowledge, this study examined an informed decision terms of personal testing preferences, understanding of risks and benefits of colorectal cancer screening, assessing the value of screening and decision consistency. The results of this study suggest that future research is needed to advance the knowledge base related to the factors that influence an informed decision and then how an informed decision is related to having colorectal cancer screening.

Third, based on the findings of this study, the factors related to and model of an informed decision regarding colorectal cancer screening among African American women and African American men may be different. This study is unique in that it examined, through t-tests, bivariate and path analysis, the differences between African American women and men and this study's variables. The results of the t-tests indicated significant differences in between collectivism, religiosity, future-time orientation, colorectal cancer beliefs and family support among African American women and men. The bivariate correlations indicated differences as well. Among African American women, the bivariate correlations indicated that family support was related to colorectal cancer beliefs and colorectal cancer beliefs were related to an informed decision. However, among African American men, the bivariate correlations indicated that collectivism, religiosity, future-time orientation and family support were related to

colorectal cancer beliefs. Additionally, among African American men, racial pride, colorectal cancer beliefs and family support were related to an informed decision. Through path analysis, African American women and men informed decision making models were analyzed. The model analyzed for African American women fit the data well. However, the model analyzed for African American men did not fit the data well. These findings need to be viewed with caution as the sample sizes were relatively small and the study was cross-sectional. This study is one of very few studies that have examined differences among men and women in general and African American men and women specifically (Tiro, Vernon, Hyslop & Myers, 2005). The results supports the results of the study conducted by Tiro et al, that found that for African American men, the model that included salience and coherence, cancer worries, perceived susceptibility, response efficacy and social influence fit the data well. Yet, the data did not fit Caucasian men and women and African American women as well. This study and its findings are unlike Tiro et al's because this study, in addition to colorectal cancer beliefs and family influence examined cultural identity and family support as an additional constructs of the informed decision model. Additionally, this study examined an informed decision regarding colorectal cancer screening was studied as the outcome variable. The results of this study advance the work of Tiro et al and the knowledge base by examining how cultural identity and family support influence colorectal cancer screening beliefs and an informed decision making regarding colorectal cancer screening. To further advance this research, it is important to examine and compare gender differences among larger and more diverse ethnic groups. At that time, researchers will have a better understanding of gender differences and their relationship to how culture and family influence an informed decision regarding colorectal cancer screening.

Appendix

Appendix A

Data Collection Instruments

Cultural Identity

African Americans have a group of unique characteristics that is apart of everyday living. This survey asks questions to understand how you identify as an African American.

Collectivism

In your opinion, how important is it that you and your family…

1	**Let relatives stay with you a short time while they need some help**			
	1	**2**	**3**	**4**
	Not at all important	**Somewhat important**	**Important**	**Very important**

2	**Turn to each other in times of trouble.**			
	1	**2**	**3**	**4**
	Not at all important	**Somewhat important**	**Important**	**Very important**

3	**Raise each other's children whenever there is a need.**			
	1	**2**	**3**	**4**
	Not at all important	**Somewhat important**	**Important**	**Very important**

4	**Do everything you can to help each other move ahead in life.**			
	1	**2**	**3**	**4**
	Not at all important	**Somewhat important**	**Important**	**Very important**

5	**Take responsibility for caring for older family members.**			
	1	**2**	**3**	**4**
	Not at all important	**Somewhat important**	**Important**	**Very important**

6	**Call, write or see each other often.**			
	1	**2**	**3**	**4**
	Not at all important	**Somewhat important**	**Important**	**Very important**

Religiosity

Do you agree or disagree with the following statements?

1	**I talk openly about my faith with others.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

2	**I often read religious books, magazine or pamphlets.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

3	**I often watch of listen to religious programs on the television or radio.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

4	**My spiritual beliefs are the foundation of my whole approach to life.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

5	**I am often aware of God's presence in my life.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

6	**I have a personal relationship with God.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

7	**When I am ill, I pray for healing.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

8	**I pray often.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

9	**I rely on God to keep me in good health.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

Racial Pride

Do you agree or disagree with the following statements?

1	**Black people make America strong.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

2	**The people I respect most in my life are Black.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

3	**Being Black is an important part of who I am.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

4	**I feel strongly connected to other Black people.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

5	**Racial pride is important to developing strong Black families.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

6	**I think everybody should be taught about how Black people helped to build America.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

7	**Black people should keep up with issues that are important to the Black community.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

Present-time orientation

Do you agree or disagree with the following statements?

1	**My day-to-day life is too busy to think about the future.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

2	**If I want something now, I always buy it no matter what the price.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

3	**There's no sense of thinking about the future before it gets here.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

4	**What happens to me in the future is out of my control.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

5	**As long as I feel good now, I don't worry about having health problems later in life.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

Future-time orientation

Do you agree or disagree with the following statements?

1	**I have a plan for what I want to do in the next 5 years of my life.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

2	**I often save money or use layaway to but thing I can't afford right now.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

3	**The choices I have made in life clearly show that I think about the future.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

4	**When I plan a part or get-together, I always start weeks ahead of time.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

5	**I often think about how my actions today will affect my health when I am older.**			
	1	**2**	**3**	**4**
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**

Colorectal Cancer Beliefs

This is a survey that asks you about your beliefs about colorectal cancer and colorectal cancer screening.

Susceptibility

1	**It is extremely likely that I will get colorectal cancer**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

2	**My chances of getting colorectal cancer in the next few years are great**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

3	**I feel I will get colorectal cancer sometime in my life**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

4	**Developing colorectal cancer is currently a possibility for me**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

5	**I am concerned about the likelihood of developing colorectal cancer in the near future**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

Saliency

1	**The thought of getting colorectal cancer scares me**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

2	When I think of colorectal cancer I feel nauseated				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3	If I had colorectal cancer my career (life) would change				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4	When I think of colorectal cancer my heart beats faster				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5	Colorectal cancer would endanger my marriage (relationship)				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6	Colorectal cancer is a hopeless disease				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7	My feelings about myself would change if I got colorectal cancer				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8	I am afraid to even think about colorectal cancer				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9	My financial security would be endangered if I got colorectal cancer				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

10	Problems I would experience from colorectal cancer would last a long time				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

11	If I got colorectal cancer, it would be more serious than other diseases				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

12	If I got colorectal cancer my whole life would change				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Worries/Expected outcomes

1	Colorectal cancer screening is embarrassing				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2	I am afraid I will find out there is something wrong with me when I have colorectal cancer screening				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3	I am afraid to have colorectal cancer screening because I don't understand what will be done in the test				
	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4	**Having colorectal screening would expose me too much radiation**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

5	**Having colorectal cancer screening would take too much time**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

6	**Colorectal screening exams may be painful**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

Barriers

1	**I don't know how to go about scheduling a colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

2	**People doing colorectal cancer screening may be rude**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

3	**It is difficult to get transportation to get colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

4	**I have other problems that are more important than getting colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

5	**Colorectal cancer screening would interfere with my activities**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

6	**Having colorectal screening costs too much money**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

7	**I cannot remember to schedule an appointment for colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

Family influence

1	**I want to do what members of my immediate family think I should do about colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

2	**Members of my immediate family think I should have colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

3	**I want to do what my extended family think I should have colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

4	**I want to do what my extended family think I should do about colorectal cancer screening**				
	1	**2**	**3**	**4**	**5**
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

Medical Outcomes Study: Social Support Survey Instrument

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

Circle one number on each line.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Emotional/informational support					
Someone you can count on to listen to you when you need to talk	1	2	3	4	5
Someone to give you information to help you understand a situation	1	2	3	4	5
Someone to give you good advice about a crisis	1	2	3	4	5
Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
Someone whose advice you really want	1	2	3	4	5
Someone to share your most private worries and fears with	1	2	3	4	5
Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
Someone who understands your problems	1	2	3	4	5
Tangible support					
Someone to help you if you were confined to bed	1	2	3	4	5
Someone to take you to the doctor if you needed it	1	2	3	4	5
Someone to prepare your meals if you were unable to do it yourself	1	2	3	4	5
Someone to help with daily chores if you were sick	1	2	3	4	5

Affectionate support					
Someone who shows you love and affection	1	2	3	4	5
Someone to love and make you feel wanted	1	2	3	4	5
Someone who hugs you	1	2	3	4	5
Positive social interaction					
Someone to have a good time with	1	2	3	4	5
Someone to get together with for relaxation	1	2	3	4	5
Someone to do something enjoyable with	1	2	3	4	5
Additional item					
Someone to do things with to help you get your mind off things	1	2	3	4	5

Informed decision regarding colorectal cancer testing

This survey will ask you questions about your decision to have or not to have colorectal cancer testing.

1. Have you ever been screened for colorectal cancer? (circle one)
   Yes No

2. Which test have you had? (circle all that apply)
   a) Fecal Occult Blood Test (FOBT)
   b) Colonoscopy
   c) Digital Rectal Exam (DRE)
   d) None of these
   e) All of these
   f) Not sure

A. Knowledge-Fecal Occult Blood Test (FOBT)

1. Which of these diseases do you think that a Fecal Occult Blood Test (FOBT) checks for?
   a) breast cancer
   b) prostate cancer
   c) colorectal cancer
   d) none of these
   e) don't know

2. If 100 people decided to have the FOBT test, about how many do you think would have a normal result?
   a) 95
   b) 50
   c) None

d) 100
e) 5
f) Not sure

3. What do you think a normal FOBT result means?
    a) I definitely do not have colorectal cancer
    b) It is highly unlikely that I have colorectal cancer
    c) I might have colorectal cancer
    d) It is highly likely that I do have colorectal cancer
    e) I definitely have colorectal cancer
    f) None of these
    g) I don't know

4. Again, imagine that 100 people have an FOBT. About how many people do you think would have an abnormal result?
    a) 95
    b) 50
    c) None
    d) 100
    e) 5
    f) Not sure

5. What do you think an abnormal FOBT result means?
    a) I definitely do not have colorectal cancer
    b) It is highly unlikely that I have colorectal cancer
    c) I might have colorectal cancer
    d) It is highly likely that I do have colorectal cancer
    e) I definitely have colorectal cancer
    f) None of these
    g) I don't know

6. Imagine 100 people with an abnormal FOBT result. About how many do you think will
   have colorectal cancer?
    a) 100
    b) 10
    c) None
    d) 50
    e) Not sure

7. The benefits of having the FOBT test are (circle all that apply)
    a) I don't have to miss work
    b) I can do it at home
    c) I will know for sure whether I have colorectal cancer
    d) Not sure
    e) It is low cost

8. The risks of having the FOBT test are (circle all that apply)
    a) Bleeding after the test
    b) Having a false positive result
    c) Infection

d) An irregular heartbeat during the test
e) Not sure
f) None of these

B. Knowledge-Colonoscopy

1. Which of these diseases do you think that a colonoscopy checks for?
   a) breast cancer
   b) prostate cancer
   c) colorectal cancer
   d) none of these
   e) don't know

2. If 100 people decided to have the colonoscopy test, about how many do you think would have a normal result?
   a) 95
   b) 50
   c) None
   d) 100
   e) 5
   f) Not sure

3. What do you think a normal colonoscopy result means?
   a) I definitely do not have colorectal cancer
   b) It is highly unlikely that I have colorectal cancer
   c) I might have colorectal cancer
   d) It is highly likely that I do have colorectal cancer
   e) I definitely have colorectal cancer
   f) None of these
   g) I don't know

4. Again, imagine that 100 people have a colonoscopy.
   About how many people do you think would have an abnormal result?
   a) 95
   b) 50
   c) None
   d) 100
   e) 5
   f) Not sure

5. What do you think an abnormal colonoscopy result means?
   a) I definitely do not have colorectal cancer
   b) It is highly unlikely that I have colorectal cancer
   c) I might have colorectal cancer
   d) It is highly likely that I do have colorectal cancer
   e) I definitely have colorectal cancer
   f) None of these
   g) I don't know

6. Imagine 100 people with an abnormal colonoscopy result.
   About how many do you think will have colorectal cancer?

a) 100
b) 10
c) None
d) 50
e) Not sure

7. The benefits of having the colonoscopy test are (circle all that apply)
   a) I don't have to miss work
   b) If something is found it can be taken out right away
   c) I will know for sure whether I have colorectal cancer
   d) Not sure
   e) My insurance will cover it

8. The risks of having the colonoscopy test are (circle all that apply)
   a) Bleeding after the test
   b) Having a false positive result
   c) Infection
   d) An irregular heartbeat during the test
   e) Not sure
   f) None of these

B. Value

For the following questions, please circle the response that best describes how you feel at the moment.

1. Having colorectal cancer testing is very important to me.
   Strongly Disagree Disagree Agree Strongly Agree

2. Having colorectal cancer testing is beneficial to me.
   Strongly Disagree Disagree Agree Strongly Agree

3. Having colorectal cancer testing is a good thing.
   Strongly Disagree Disagree Agree Strongly Agree

4. Having colorectal cancer testing is pleasant.
   Strongly Disagree Disagree Agree Strongly Agree

C. Preference

For the following questions, please circle the response that best describes how you feel at the moment.

1. I prefer to have a yearly test for colorectal cancer, which is the fecal occult blood test (FOBT).
   Strongly Disagree Disagree Agree Strongly Agree

2. I prefer to have a test every 10 years for colorectal cancer, which is the colonoscopy.
   Strongly Disagree Disagree Agree Strongly Agree

3. I prefer a test I can do at home by myself.
Strongly Disagree Disagree Agree Strongly Agree

4. I want to have the test that is going to see as much as possible.
Strongly Disagree Disagree Agree Strongly Agree

5. I know what colorectal cancer test I want before I talked to my health care provider.
Strongly Disagree Disagree Agree Strongly Agree

6. I will choose the colorectal testing test that I was right for me.
Strongly Disagree Disagree Agree Strongly Agree

7. My health care provider chose the test for me; I would have chosen another test.
Strongly Disagree Disagree Agree Strongly Agree

8. My health care provider chose the test for me; I would have chosen the same test.
Strongly Disagree Disagree Agree Strongly Agree

Demographic Questionnaire

1. **Age:_____**

2. **Gender:** (circle one) M F

3. **Marital Status** (circle one): married single/never married divorced widow/widower

3. **Race/ethnicity:** (fill in) _____

4. **Do you have any of the following health concerns?**
High blood pressure
Diabetes
High cholesterol
Kidney disease
Other_____

5. **Do you have a healthcare provider that you see on a regular basis (once a year or more)?**
a) Yes

b) No

6. **Have you or a family member had colorectal cancer?** (circle one or two responses)
a) Yes, I have had colorectal cancer

b) Yes, my family member has had colorectal cancer

c) No

d) I do not know

7. **Have you had any of the following tests for colorectal cancer?**
(circle all that apply)
   a) fecal occult blood test/stool test (FOBT)
   b) digital rectal exam (DRE)
   c) flexible sigmoidoscopy
   d) colonoscopy
   e) I have not been tested for colorectal cancer
   g) I do not know

8. **What is your highest level of education?**
   a) Less than High school
   b) High school graduate
   c) Some college
   d) College graduate (e.g. Bachelor, Masters, etc.)

9. **On the average, what is your estimated yearly income?**
   a) Less than $9,000
   b) $10,000 – 29,000
   c) $30,000 – 49,000
   d) $50,000 – 69, 000
   e) $70,000 – 89,000
   f) Over $90,000

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