COLORECTAL CANCER SCREENING AND YOUNG AFRICAN-AMERICAN MEN: MALE ROLE NORMS, KNOWLEDGE, ATTITUDES, AND PERCEPTIONS

A Dissertation

by

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ABSTRACT

Of cancers affecting both men and women, colorectal cancer (CRC) is the second leading cancer to kill African Americans in the U.S. Compared to White men, African-American men have CRC incidence and mortality rates 20% and 45% higher, respectively. Owing to CRC's high incidence and younger age at presentation among African-American men, CRC screening (CRCS) is warranted at age 45 rather than 50. Yet, most studies have focused on men older than 45. The findings of these studies suggest that CRC survival is inversely related to early detection, and advocate the continued need for development, testing, and translating prevention interventions into increase screening behavior. Hence, the two-fold purpose of this study was to (1) conduct a systematic review of the professional literature to assess African-American men's knowledge, beliefs, and behaviors regarding CRCS; and (2) assess the knowledge, attitudes, male role norms, perceptions of subjective norms, and perceptions of barriers associated with CRCS among young adult African-American men (ages 19-45) employing survey research methodology. Utilizing Garrard's Matrix Method, the systematic literature review synthesized 28 studies examining African-American men's knowledge, beliefs, and behaviors regarding CRCS. Six factors emerged as associated with CRCS intentions and behaviors: previous CRCS, CRC test preference, perceived benefits, perceived barriers, CRC/CRCS knowledge, and physician support/recommendation. In addition, the mean methodological quality score of 10.9 indicated these studies were, overall, of medium quality and suffered from specific

flaws. The second component of this study -- an on-line survey questionnaire -- described the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers associated with screening for CRC among a non-random sample of 157 young adult African-American men. Ultimately, family history of cancer, work status, and perceived barriers were the critical factors associated with attitudes in all of our models/analyses. Of these, perceived barriers are the only factors amenable to change through health education efforts. Because this study was narrowly-focused on a specific group of African Americans, it provides a solid basis for developing structured health education interventions to increase young adult African-American men's intention to screen for CRC.

DEDICATION

I dedicate this dissertation to my mother Denise Palmer Covington; my grandparents Annie Jean Palmer (1933 – 2004), John West Palmer (1934 – 1999), and Myrtle Mae Rogers (1930 – 2013); my cousin Janice Joyce Coggins (1963 – 2013); and anyone who has poured into my life to assist me with reaching this pinnacle. The best is yet to come.

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NOMENCLATURE

ACG	American College of Gastroenterology
ACS	American Cancer Society
CRC	Colorectal Cancer
CRCS	Colorectal Cancer Screening
EDS	Early Detection Screening
FOBT	Fecal Occult Blood Test
IOM	Institute of Medicine
MQS	Methodological Quality Score
MRNI-SF	Male Role Norms Inventory-Short Form
NCHS	National Center for Health Statistics
NCI	National Cancer Institute
SES	Socioeconomic Status
SLRs	Systematic Literature Reviews
TPB	Theory of Planned Behavior
USDHHS	U.S. Department of Health and Human Services

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1. INTRODUCTION

Of cancers affecting both men and women, colorectal cancer (CRC) is the second leading cancer killer among African Americans in the United States (American Cancer Society [ACS], 2012). Despite the benefits of early detection and the availability of effective screening tests, CRC remains the third leading cause of death among African Americans (Rawl, 2012). Compared with Whites, African-American men and women have poorer survival once a CRC diagnosis is made (Jemal et al., 2007). The five-year relative survival is lower for African Americans than Whites within each stage of diagnosis for CRC (Jemal et al., 2007). Racial disparities in CRC mortality are attributable to numerous prevention and care factors, including patient behaviors, questionable treatment, as well as healthcare system biases that are poorly understood and require further investigation.

Factors known to contribute to this disproportionate burden of CRC incidence and mortality among African Americans vary, yet include – alongside the factors mentioned previously – differences in timely diagnosis, treatment, and access to high-quality regular screening (Jemal et al., 2007). While cancer screening is generally increasing in the United States, CRC screening (CRCS) uptake is relatively low, especially among groups that lack health insurance or a usual source of care (Breen et al., 2001). In addition to the lack of access to screening and limited or no health insurance, other socioeconomic factors such as low educational attainment and negligible use of preventive services may also be associated with decreased screening

and, consequently, diagnosis of CRC at a later stage (Woods, Narayanan, & Engel, 2005).

African-American men live sicker and die younger in contrast to their White counterparts (Institute of Medicine [IOM], 2002; National Center for Health Statistics [NCHS], 2011). Compared to White men, African-American men have 20% higher incidence rates and 45% higher mortality rates from CRC (ACS, 2012). Moreover, African-American men continue to have less access to healthcare than White men in the United States (Kaiser, 2000). When they do have access, Johnson et al. (2004) documented that African-American men and their physicians demonstrated lower levels of patient-centered communication in comparison to White men and their physicians. Explicitly, African-American men rarely see healthcare providers who are genuinely interested in their health concerns (Underwood, 2009).

Since routine screening detects CRC at an earlier, more treatable stage, the ACS (2012) and Rex et al. (2009) with the American College of Gastroenterology recommend routine screening at age 50 for all men at average risk using a combination of the following: fecal occult blood test (FOBT) each year, flexible sigmoidoscopy every 5 years, or colonoscopy every 10 years. Despite evidence that these three recommended early detection screening (EDS) practices can reduce CRC mortality, screening rates remain low among African Americans (Inadomi et al., 2012). Most men over age 50 have not undergone screening, and disparities in screening persist, with African-American men having lower levels of screening than White men (Hall et al., 2012).

Given the lower rates of CRCS among African-African men, it may be beneficial to begin educating them about this disease and the aforementioned three EDS practices before age 50 (Powe, 2006; Rex et al., 2009). Because there is a high incidence and younger age at presentation of CRC in African Americans, the initiation of CRCS is warranted at the age of 45 years rather than 50 (Agrawal et al., 2005; Rex et al, 2009).

The factors contributing to CRCS and treatment outcome disparities among African-American men are complex. Thus, there is a need for research that advances understanding of the complex factors influencing screening for CRC among young adult African-American men. In order to move closer to the long term goal of achieving health equity for all in the U.S., this study can also contribute to solutions that eliminate disparities in health, cancer treatment/prevention, and healthcare in general.

Purpose

The purpose of this dissertation is to describe and advance understanding of the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers related to screening for CRC among young adult African-American men. Specifically, this dissertation will: (1) synthesize and assess the quality of the current literature documenting African-American men's knowledge, beliefs, and behaviors regarding CRCS and (2) describe the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers associated with CRCS among a sample of young adult African-American men (ages 19-45) employing survey research methodology. The outcome of this study will be comprehensive information about

young adult African-American men's perceptions of male role norms, as well as their knowledge, attitudes, perceived subjective norms, and perceived barriers, which might shape future decisions to screen for CRC. This information can be useful for designing culturally relevant health promotion and early-intervention prevention programs responsive to the specific needs of these men.

Format

This dissertation comprises four sections, where Sections 2 and 3 represent manuscripts to be submitted for publication in peer-reviewed journals. The following is a description of each section:

- Section 1 provides an overview of the topic being examined throughout this document. Additionally, Section 1 outlines the purpose, significance, and innovation of the study.
- Section 2 documents the current professional health literature regarding African-American men's knowledge, beliefs, and behaviors regarding CRCS. This systematic review of the literature will follow the reviewing strategies proposed in Garrard's (2007) Matrix Method. The systematic literature review provides insight into which set of factors are amenable to change and can, thus, become targets for culturally relevant health education interventions. A total of 772 articles were identified from database searches and bibliography searching. Of the original 772 "hits", 28 were retained in the final sample. In addition, this section assesses the

methodological quality of the evidence obtained from the reviewed studies. The criteria for the methodological quality included assessments of each study's use of theory, design, sample design and size, utilization of complex analytical techniques, reporting of the validity and reliability of the study's data, and the inference of appropriate conclusions. This section represents the first journal article.

- Section 3 provides findings from an assessment of the knowledge, attitudes, and perceptions (specifically, male role norms, perceived subjective norms, and perceived barriers) related to screening for CRC among young adult African-American men (ages 19-45) employing survey research methodology. A conceptual framework that integrated select concepts and constructs of the Theory of Planned Behavior and perceptions of specific cultural values related to male role norms guided the study. An on-line survey questionnaire assessed beliefs regarding male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers related to CRCS among a non-random sample of 157 African-American men, ages 19 to 45. These men were recruited nationally through various social networks such as list-serves, predominantly African American-serving barbershops, National Pan-Hellenic Council fraternities, African-American male recruitment and retention initiatives in various university campuses, and others. This section represents the second journal article.

- Section 4 presents the conclusions reached by examining the theory and evidence found in Sections 2 and 3. Implications for future cancer prevention and control efforts are discussed and recommendations for future research are highlighted.

2. FACTORS ASSOCIATED WITH COLORECTAL CANCER SCREENING AMONG AFRICAN-AMERICAN MEN: A SYSTEMATIC REVIEW

Of cancers affecting both men and women, colorectal cancer (CRC) is the second leading cancer to kill African Americans in the United States (American Cancer Society [ACS], 2012). Of the nearly 42 million African Americans comprising about 13% of the total population, the U.S. Cancer Statistics Working Group (2013) estimates that approximately 18,000 African-American men and women will be diagnosed with colorectal cancer in 2013—and in that same year, 6,850 (38%) of them will die of the disease. Compared with Whites, African-American men and women have poorer survival once a CRC diagnosis is made (Jemal et al., 2007). Compared to White men, African-American men have incidence and mortality rates 20% and 45% higher, respectively, from CRC (ACS, 2012).

Factors known to contribute to this disproportionate burden of CRC incidence and mortality among African-American men vary, yet include differences in timely diagnosis, treatment, and access to high-quality regular screening (Jemal et al., 2007). In 2010, Holden and colleagues reviewed the barriers and facilitators associated with screening for CRC. Among the barriers, the review documented factors associated with lower screening rates at the patient-level: having low income, less education, being uninsured, being of Hispanic or Asian descent, and having less or reduced access to care. Conversely, higher screening rates were found to be associated with being non-Hispanic white, having higher income or education, being insured, participating in other cancer

screenings, having a family history of CRC or personal history of another cancer, as well as receiving a physician recommendation to be screened. Among the facilitators, intervention-related factors effectively increasing CRC screening (CRCS) included eliminating structural barriers, enacting system-level changes, adding patient reminders, and implementing one-on-one interactions.

The qualitative systematic review conducted by Guessous and colleagues (2010) also provided an inventory of the facilitators and barriers to CRCS for older persons (ages 65 and above), and documented the changes in barriers and facilitators since Medicare began covering the costs of screening colonoscopy in 2001. In that review, Guessous et al. (2010) recommended that researchers and intervention planners pay particular attention to modifiable factors. In addition, the authors also called for further quantitative research to address whether the facilitators/barriers to CRCS among older persons differ from those for younger persons.

Despite the availability of these important reviews, neither *specifically* examined uptake of CRCS among African-American men, or the barriers and facilitators of CRCS uptake among young adults. In the systematic review by Holden et al. (2010), for instance, authors reviewed studies that included respondents 50-89 years of age in their samples. Similarly, most of the studies in the review by Guessous et al. (2010) addressed an asymptomatic average-risk older population and used ≥65 years of age as their definition of older persons.

Why is it important to understand factors influencing screening behaviors among younger African-American men (i.e., younger than 50)? The initiation of CRCS is

warranted at the age of 45 years rather than 50 since there is a high incidence and younger age at presentation of CRC among African Americans (Agrawal et al., 2005, Rex et al., 2009). Therefore, there is a critical need to explore the poorly understood, complex factors that shape decisions to screen for CRC and screening behaviors among African-American men who are younger than those traditionally assessed by health promotion researchers and clinicians.

Central Question

To the best of our knowledge, a systematic review of the factors influencing young adult African-American men's intention to screen and/or their CRCS behaviors has not been reported in the literature. Thus, in order to provide insight into whether the factors influencing young adult African-American men's screening intentions and behaviors are changeable through structured health education interventions, a systematic review was conducted. The two-fold purpose of the review was to (1) synthesize the evidence from published studies examining African-American men's knowledge, beliefs, and behaviors regarding CRCS; and (2) assess the methodological quality of this evidence. This review can be used as the foundation for further analyses of specific factors that might influence CRCS among young adult African-American men (ages 19-45, specifically).

Rationale for Systematic Literature Reviews

Systematic literature reviews (SLRs) represent an efficient research method with a rationale firmly grounded in several premises. Researchers should conduct systematic reviews before embarking on primary research to reduce replication and help ensure that any primary research conducted subsequently is informed by evidence (Bambra, 2011). This method also provides a synthesis of the best research evidence for clinical decisions, thus ultimately strengthening the link between research evidence and optimal health (Cook, Mulrow, & Haynes, 1997).

Among its advantages, SLRs can help counteract the generalizability deficiency often evident in studies conducted among one particular population, as reviews include multiple studies conducted across varying groups (Egger, Smith, & O'Rourke, 2001; Light and Pillemer, 1984). Moreover, systematic reviews render transparency in the review process—"leading to the replacement of unhelpful descriptors such as "no clear evidence", "some evidence of a trend", "a weak relationship" and "a strong relationship" oftentimes used to describe a body of research (Rosenthal, 1990). Finally, another positive feature of SLRs is the critical appraisal of the methodological quality of primary studies (Oxman and Guyatt, 1988). As a central part of the review process, critical appraisal permits systematic and careful assessment of studies to determine their reliability, relevance, and value (Belsey, 2009; Higgins and Green, 2008).

Methods

Eligibility Criteria

For inclusion in this review, articles had to (a) be primary empirical studies that either involved human subjects, or reported research findings, (b) be published in English-language peer-reviewed journals, (c) be published between January 2000 (two years before the U.S. Preventive Services Task Force's CRCS recommendations for age 50 or older were published) and February 2013, (d) be conducted in the United States, (e) have explored factors associated with CRCS, (f) have included African-American men, (g) align themselves with the reviews' purpose and have assessed African-American men's knowledge, beliefs, and behaviors regarding CRCS, and (h) have samples that included African-American men younger than 50.

Information Sources

This review utilized Garrard's (2007) Matrix Method for conducting Systematic Literature Reviews. Following the procedures outlined in the Matrix Method, the core search strategy was based on an analysis of the keywords, Medical Subject Headings (MeSH), and key terms from relevant articles in four widely used bibliographic databases: Cinahl, Embase, Medline, and PsycInfo. The search was limited to studies published in English from January 2000 through February 2013. MeSH terms for the searches included colorectal neoplasms, colonoscopy (including colonography and computed tomography), sigmoidoscopy; major headings included mass screening; and key terms included stool test, FOBT, and DNA stool); and African American or Black

(Appendix A). Cited reference searching for the final sample was also utilized to evaluate and identify studies for inclusion using Scopus.

Selection Process

The titles and abstracts obtained through key-word searches were independently scanned to determine their eligibility for further screening. Articles considered for the first round of screening contained titles and abstracts that met the eligibility criteria. If it was not clear from the title or abstract whether an article was consistent with the review's eligibility criteria, the article was submitted to a second round of screening. This round involved electronically downloading the articles and examining the entire text to determine if they met the eligibility criteria.

Data Abstraction

To systematically organize and structure the information collected from each study, a review matrix was developed (Appendix B). This matrix captured information regarding the purpose/research question(s), keywords, sample characteristics, study design, study findings (in reference to knowledge, beliefs, behaviors) and other major factors/findings, limitations, and generalizability.

Methodological Quality Score (MQS)

To assess the conceptual and methodological characteristics of this body of literature, each reviewed study received an overall methodological quality score (MQS)

Table 1. Criteria for Assessment of Reviewed Studies' Methodological Quality Characteristics and Frequency Distributions for Each Characteristic

Methodological Quality Characteristic	**Scoring Options** *(Maximum total score = **21** points)*	**Distribution of characteristics among(28) reviewed studies** **Frequency (n)** **Percent (%)**	
Conceptual			
Does a theoretical framework drive the study?	Explicit use of theory = **2** points Implicit use of theory = **1** point Not reported = **0** points	17 1 10	60.7 3.6 35.7
Research Design			
What is the research paradigm?	Experimental = **3** points *[e.g., RCT]* Quasi-experimental = **2** points *[e.g., observational, comparison pre-test/post-test]* Non-experimental = **1** point *[e.g., exploratory and/or qualitative]*	4 4 20	14.3 14.3 71.4
What is the study's design?	Longitudinal = **2** points Cross-sectional = **1** point	5 23	17.9 82.1
Does the study exclusively focus on African-American men?	Yes = **1** point No = **0** points	0 28	0 100

Table 1 Continued.

Methodological Quality Characteristic	**Scoring Options** *(Maximum total score = **21** points)*	**Distribution of characteristics among(28) reviewed studies**	
		Frequency (n)	**Percent (%)**
Sampling			
What is the sample design?	Random/Nationally Representative = **3** points Random/Not Nationally Representative = **2** points Convenience/Nonprobability = **1** point	1 9 18	3.6 32.1 64.3
What is the sample size?	Large (n >300) = **2** points Medium (100 ≥ n ≥ 300) = **1** points Small (n < 100) = **0** points	3 10 3	10.7 35.7 10.7
Data Analyses			
What were the most advanced statistical techniques utilized?	Multivariate statistics = **4** points *(e.g., Structural Equation Modeling)* Multiple/Logistic Regression = **3** points ANOVA/Bivariate statistics = **2** points Descriptive/Univariate statistics = **1** point Qualitative analyses = **0** points *(e.g., Grounded Theory, Content Analysis, Thematic Analysis, Narrative Analysis)*	9 8 4 5 2	32.1 28.6 14.3 17.9 7.1
Was any validity reported?	Yes = **1** point No = **0** points	8 20	28.6 71.4

Table 1 Continued.

Methodological Quality Characteristic	**Scoring Options** *(Maximum total score = **21** points)*	**Distribution of characteristics among(28) reviewed studies**	
		Frequency (n)	**Percent (%)**
Was any reliability reported?	Yes = **1** point No = **0** points	8 20	28.6 71.4
Were appropriate conclusions inferred?	Yes = **1** point No = **0** points	28 0	100 0

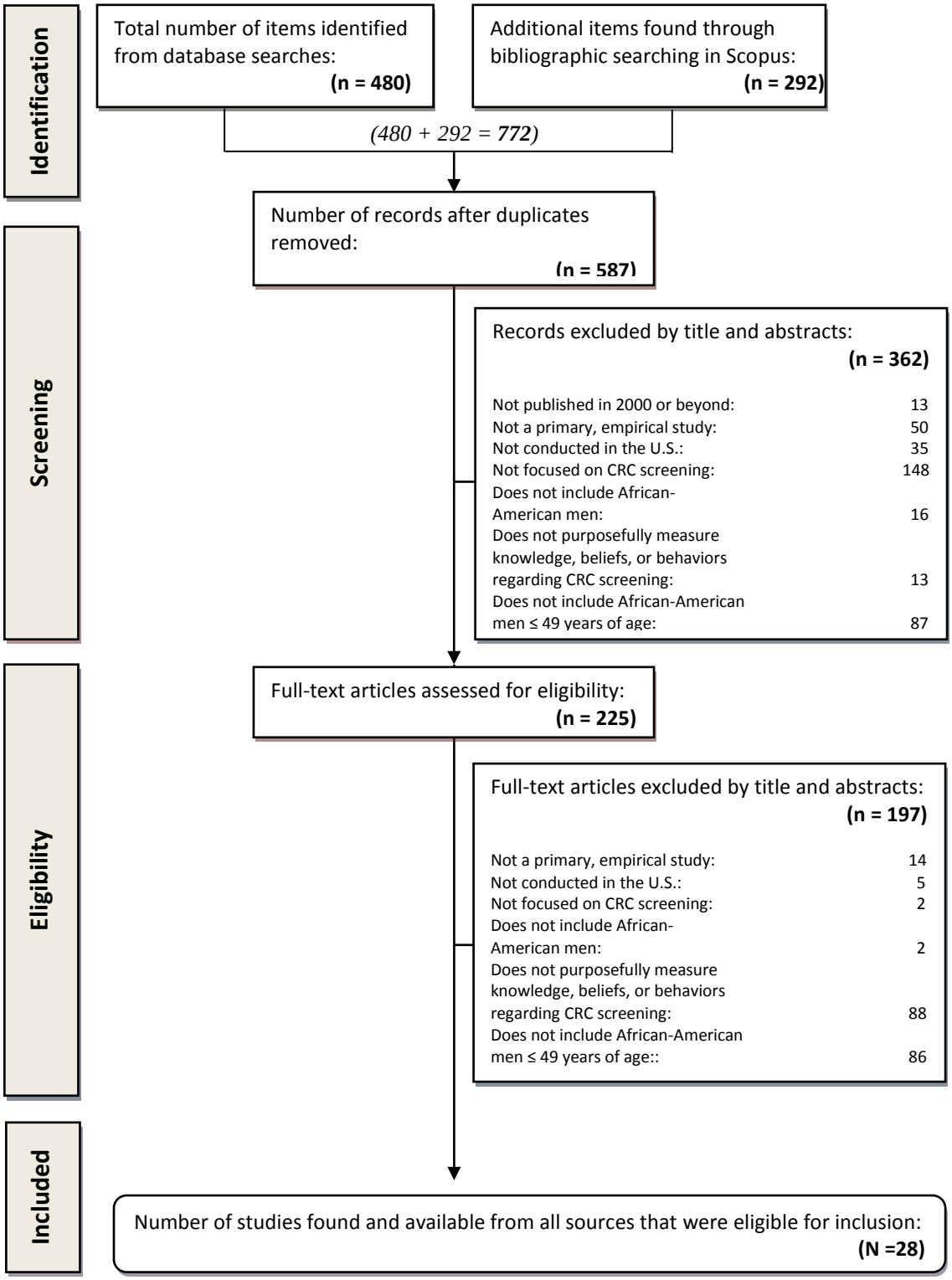
(Lee, Schotland, Bacchetti, & Bero, 2002). The highest possible MQS was 21 (Table 1). The criteria for the MQS included assessments of each study's use of theory, its design, sample design and size, utilization of complex analytical techniques, reporting of the validity and reliability of the study's data, and the inference of appropriate conclusions. Table 1 lists the frequency distributions of each criterion of the MQS for the 28 reviewed studies along with the scoring criteria. Better methodological quality is reflected in a higher MQS. Seven of the studies (25%) were randomly selected and assigned to another reviewer to establish the reliability of the data abstraction and methodological quality scoring processes.

Findings

Sample

A total of 772 articles were initially identified from the four databases searched. Among the total, 225 (29%) articles met the eligibility criteria for the first round of screening via titles and abstracts. The next step involved a second round of screening to assess which full-text articles met the eligibility criteria. Meeting the criteria were 28 (12%) of the 225 studies, which represented 4% of the articles retrieved originally. Figure 1 provides explicit details regarding the identification, screening, eligibility, and inclusion processes.

Figure 1. PRISMA Flow Diagram



Studies' Characteristics

A total of 28 manuscripts met the inclusion/exclusion criteria. These included 20 studies with a non-experimental research design, 4 with a quasi-experimental design, and 4 with an experimental design. Forty-three percent were published in the following journals: Health Psychology (*n* = 3), Preventive Medicine (*n* = 3), Gastroenterology Nursing (*n* = 2), Journal of Community Health (*n* = 2), and the Journal of General Internal Medicine (*n* = 2). Studies were published between 2002 and 2012, with the largest number (*n* = 17) appearing between 2007 and 2011. A few authors published more than one study on the topic (36%), namely. James (*n* = 3), Manne (*n* = 3), Greiner (*n* = 2), and Griffith (*n* = 2). Five of the reviewed studies (18%) evaluated an intervention. The factors most frequently studied in the reviewed studies were behaviors (79%), beliefs (68%), and knowledge (61%) of CRC and CRCS.

Behaviors, Beliefs, and Knowledge Regarding CRC and CRCS

Many factors were identified in the reviewed literature as being associated with CRC screening. For the purposes of this review, I will report the factors documented in at least half of the studies.

Behaviors

Findings related to behaviors were the most frequently examined factors associated with CRCS, reported by 22 reviewed studies (79%). Ten of these studies (45%) used the Health Belief Model and four (18%) used Social Cognitive Theory as a

theoretical framework – two of the most widely used models in health promotion, for understanding behavior change.

Among these 22 studies reporting behavior as a factor influencing CRC and CRCS, previous CRCS (screening history) emerged as a strong determining factor for being screened among 43% of the studies. For example, Fisher and colleagues (2007) assessed the proportion of 500 patients from a Veterans Affairs (VA) facility who completed an ordered FOBT. Of this predominantly male sample (97%), current FOBT adherence was strongly associated with prior FOBT completion. According to Fisher et al. (2007), "this could reflect many factors, such as better understanding of instructions, increased interest in FOBT screening, higher level of compliance with medical recommendations in general, and increased understanding of the importance of CRCS" (p. 95). Several other behaviors were examined, but none emerged as significantly associated with future CRCS."

Beliefs

Assessment of beliefs was reported in 19 reviewed studies (68%). Among these, CRCS test preference, perceived benefits, and perceived barriers emerged as factors influencing participants' views of and behaviors related to CRC and CRCS.

DeBourcy and colleagues (2007) determined the screening test preferences of 323 colonoscopy-naive participants ages 40-79 in Denver, CO. When given time to consider comprehensive, written information about 2 CRCS tests, more than half of the sample preferred FOBT over colonoscopy. At least 40% preferred FOBT over

colonoscopy in almost every demographic subgroup based on race/ethnicity, type of health insurance, employment, marital status, educational attainment, and age. Conversely, Greiner and colleagues (2005) assessed CRCS preferences among 55 African-Americans over 40 years of age in their qualitative focus group study. Following an education lecture session at the end of each focus group, 33% of the participants reported a preference for colonoscopy followed by FOBT (26%).

Perceived benefits were a key factor in the study by Palmer and colleagues (2007). The researchers examined the relationship between health beliefs and attitudes toward CRCS, as well as the relationship between health beliefs, being appropriately screened for CRC, and the strength of family history among 511 patients between the ages of 35 and 55 at Harvard Vanguard Medical Associates (a multi-specialty group practice throughout metropolitan Boston, MA). Individuals who had the highest level of perceived cancer risk and greater CRC family risk were found to be nearly three times more likely to be appropriately screened for CRC. Based on family history, participants' perceived cancer risk and the potential influence from family and close friends to screen for CRC (subjective norms) also increased incrementally. Similarly, Purnell et al. (2009) examined the relationship between socio-cultural factors and perceived benefits, perceived barriers, and CRCS intentions among 198 African-Americans ages 45-93 in two large Midwestern cities. Regardless of the level of medical mistrust or traditional cultural orientation, a greater perception of CRCS benefits was found among individuals who perceived themselves as having high group susceptibility to CRC.

In terms of perceived barriers to CRCS, James and colleagues (2008) conducted a prospective intervention trial to assess whether certain perceived barriers to CRCS were more common among 291 patients 40 years and older from a lower SES. The researchers determined that the two most common barriers to undergoing a FOBT, among their sample, were *fear that the results would show something bad* (37%) and *disgust* (34%). Similarly, a study by Holt and colleagues (2011) evaluated the efficacy of a spiritually-based CRC educational intervention delivered by trained community health advisors to 122 individuals from one predominantly White and two predominantly African American churches in Alabama. The important role of perceived barriers to screening and perceived benefits (constructs from the Health Belief Model) were inferred from the finding that perceived benefits of screening and CRC knowledge increased from baseline to follow-up, as did perceived benefits of colonoscopy, specifically.

Knowledge

Findings related to CRC and CRCS knowledge were less frequently examined, but reported by 17 reviewed studies (61%). Powe, Finnie, and Ko (2006) compared knowledge and awareness of CRC among 345 participants (predominantly African American) in three age groups (20–29, 30–49, 50–75 years) who attended federally funded primary care centers. There were no significant overall differences in the CRC knowledge between the three age groups, but the participants did not have adequate knowledge of CRC, overall. For instance, only 31% recognized the increased risk

associated with age and only 51% believed that a history of CRC among first-degree relatives increased their risk of CRC. Furthermore, the 20–29-year old group was not only less likely to know the relationship between CRC and diet, but also less likely to indicate the relationship between increased CRC risk and family history.

A worksite-based study in the Midwest conducted by Menon and colleagues (2003), involving a random sample of 508 employees, found that participants with high knowledge scores were more likely to have had a colonoscopy (62%) than those with low knowledge scores (39%). Furthermore, those with a bachelor's degree (14%) were least likely to have had a colonoscopy compared with those with a graduate/professional degree (51%), some college (47%), and high school or less education (48%).

Healthcare Provider Recommendation

Findings related to physician support/recommendation for CRCS were reported by 18% of the reviewed studies. Ford, Coups, and Hay (2006) examined CRCS knowledge and potential covariates (e.g., cancer information seeking, health care) among 3,131 adults of at least 45 years of age from the 2003 Health Information National Trends Survey (HINTS 2003). The participants were "less likely to have CRCS knowledge if they were not advised to have FOBT in the past year, had never been advised to receive sigmoidoscopy or colonoscopy, or had never had an FOBT, sigmoidoscopy, or colonoscopy" (Ford et al., 2006, p. 28). Furthermore, the researchers found that those who were ages 45-49 or over 70 were less likely to have adequate screening knowledge. According to Ford et al. (2006), this difference by age not only

places attention on the significant increase in CRCS knowledge at age 50, but also may indicate that providers are recommending CRCS at this age, exclusively.

Geiger and colleagues (2007) documented that among 6,349 participants in the Health Information National Trends Survey (HINTS 1), of those without a primary healthcare provider, only 9% had undergone a colonoscopy. The major difference between the group who had undergone a colonoscopy and the group that had not, was not their own behavior, but the behavior of their health care provider. A number of the participants (23.7%) indicated they had never had a colonoscopy or sigmoidoscopy because their primary care provider "*did not order it or did not say they needed it*."

In the qualitative study conducted by Griffith, Passmore, Smith, and Wenzel (2012), 14 African-American men and women -- aged 40 or older with at least one first-degree family member affected by CRC -- participated in four focus groups to explore barriers and facilitators to screening for CRC, as well as suggestions for improving screening among African Americans with first degree relatives with CRC. For some of these participants, strong physician recommendation was deemed instrumental in their decision to be screened for CRC. One participant stated,

> "[M]y doctor determined that my brother had cancer, [and] he made me get my test. And [I] took the colonoscopy, first time I took that they found three polyps so they removed them and it hasn't any more polyps showed up since then" (Griffith et al., 2012, p. 303).

Other Factors

Fear of any pain or discomfort associated with the CRCS procedures and fear of illness or diagnosis emerged as determining factors for being screened for CRC in 14% of the reviewed studies. For example, Geiger and colleagues (2007) identified barriers to screening for colonoscopy among 6,349 participants in the HINTS 1. Among their sample, fear that the CRCS results would show something bad, fear of injury to the colon from CRCS, and fear of embarrassment with CRCS were identified as perceived barriers that were affective in nature.

Similarly, in the qualitative study conducted by Winterich et al. (2011), 65 African-American and White men with diverse education backgrounds were interviewed to compare how education, race, and screening status affected their knowledge about CRC and their views of 3 early detection screening practices (i.e., fecal occult blood test (FOBT), sigmoidoscopy, and colonoscopy). Specifically, men in each education group (e.g., low, medium, and high educational attainment) refused to comply with the FOBT as a result of their negative views of the test. According to Winterich et al. (2011), this finding/barrier not only suggested that some of the men who had been screened experienced the FOBT negatively, but also indicated that "the embarrassment of putting stool on a stick and mailing fecal samples...could prevent men from complying with screening and rescreening" (Winterich et al., 2011, p. 532). The attitudes of these men about the 3 exams varied with education, but as education increased so did the men's negative views. As per Winterich et al. (2011), it appeared that the more these men knew about what the exams entailed, the more they disliked them.

Perceived CRC severity was also reported as a key factor, but only by 3 (11%) of the reviewed studies examined this perception. Manne et al. (2003) tested a mediational model predicting CRCS intention among 534 siblings of patients from the northeastern U.S who were diagnosed with CRC prior to age 56. The researchers found a significant association between perceived severity and colonoscopy intentions. According to Manne et al. (2003), "intervention efforts to increase colonoscopy intentions may benefit from targeting family influences…as well as physician influence, cancer-related distress, perceived CRC severity, and perceived benefits and barriers to colonoscopy" (p. 71).

Methodological Quality Assessment

Many scholars recommend assigning an overall methodological quality score (MQS) to reviewed studies to assess their conceptual and methodological characteristics (Lee, Schotland, Bacchetti, & Bero, 2002; Miller & Wilbourne, 2002; Wortman, 1994). Accordingly, each study in this review's final sample was assessed and scored, to determine which ones met specific methodological standards (see Table 1). Seven studies (25%) were assessed by two reviewers, to check for inter-rater reliability and validity of the abstraction and methodological quality scoring processes. Raters achieved an agreement rate of 86% for all ten questions on the MQS form. On 5 of the questions (study type, the exclusive study of African-American men, sample size, validity, and appropriate inference of conclusions), raters agreed 100%. Raters discussed their disagreements and achieved consensus for assigning the final MQS.

As expected, the reviewed studies varied in terms of their methodological quality (Table 1). The average MQS was 10.9 (SD = 3.44), within a range of 4 to 17 points (actual range, 0 to 21 total possible points). Fourteen studies (50%) scored above the mean and the median score was 10.5, indicating that at least half of reviewed reports fell below average in terms of methodological quality.

In terms of conceptual quality, seventeen studies (60.7%) explicitly used one or more of the following theories: Health Belief Model (n = 12), Social Cognitive Theory (n = 4), Theory of Planned Behavior (n = 4), Dual Process Theory (n = 3), Social Support models (n = 3), Stages of Change/Transtheoretical Model (n = 3), Powe Fatalism Model (n = 2), Patient/Provider/System Theoretical Model (n = 1), Kleinman's Explanatory Models of Illness (n = 1), Mediational Model (n = 1), Precaution Adoption Process Model (n = 1), PRECEDE-PROCEED Model (n = 1), Risk Reappraisal Hypothesis (n = 1), and the Social-Ecological Model (n = 1). Ten studies (35.7%) did not report a theoretical framework.

Regarding the research design, most reviewed studies (82.1%) comprised cross-sectional designs and more than a third (35.7%) examined medium ($100 \geq n$ participants ≥ 300) samples. Although studies included African-American men in their sample, none had samples comprising African-American men, exclusively.

The majority of the studies utilized a non-experimental research paradigm (71.4%), a phenomenon that may have affected the overall methodological quality of the sample. Of the 9 studies (32.1%) utilizing more robust statistical techniques, all but one were non-experimental in design.

Convenience/Nonprobability sample designs (64.3%) were utilized the most, but the majority of researchers failed to report their data's validity and reliability: only 28.6% reported any data validity and 28.6% reported any data reliability. In regards to assessments of validity and reliability of the reviewed study's data, we awarded the study a score if any reporting of the data's validity or reliability was available, including – albeit not ideal -- validity/reliability information from other samples, from previously conducted studies.

Two longitudinal intervention studies, Campbell et al. (2004) and Leone and colleagues (2010), obtained the highest MQS of 17 total points as they explicitly used theory, had large (> 300 participants) random but not nationally representative samples, and utilized a 2 × 2 factorial research design. The WATCH (Wellness for African Americans through Churches) Project examined by the two teams of researchers was primarily guided by Social Cognitive Theory, the Stages of Change Transtheoretical framework, the Health Belief Model, and Social Support models (Campbell et al., 2004; Leone et al., 2001). Both of these studies also reported validity and reliability of their own data, and utilized multiple/logistic regression for analyses.

Discussion

In fulfilling its first purpose—to synthesize the evidence from published studies examining African-American men's knowledge, beliefs, and behaviors regarding CRCS—this review identified 6 key factors associated with CRC and CRCS. These 6 factors included: previous CRCS (screening history), CRC test preference, perceived

benefits, perceived barriers, CRC and CRCS knowledge, and physician support/recommendation.

Also supporting the findings in this review, previous screening (screening history) and test preference have been found to be significant factors associated with EDS for other diseases, besides CRC. For instance, Makubate and colleagues (2013) conducted a retrospective cohort study of 3361 women with breast cancer. The researchers learned that "there was no significant difference for low adherence over the treatment period and recurrence, or breast cancer death, but patients with high annual adherence for 5 years had better outcomes than those with 3 or less (Makubate et al., 2013, p. 1515).

Perceived benefits, perceived barriers, and lack of knowledge also have been reported as factors influencing decisions regarding adherence to, or underutilization of screening for other chronic diseases. In a study by Calvocoressi and colleagues (2005), researchers studied psychosocial predictors of mammography screening. The African-American women in the study were found to utilize this early detection screening tool for breast cancer if they had high-perceived susceptibility to breast cancer, had confidence they could get the mammography, , and perceived the importance of obtaining one. Similarly, a substantial knowledge deficit regarding recommended mammography guidelines was reported as a factor that affected African-American women's lack of participation in mammography screening (Champion, Russell, & Skinner, 2006).

This review's finding that physician support/recommendation is a critical factor is consistent with the literature. In the study conducted by Post and colleagues (2008), a questionnaire assess patients' knowledge, beliefs, and barriers regarding CRC and CRCS screening was completed by 104 participants who were at least 51 years of age. Physician recommendation for a CRCS test was found to be significantly associated with CRCS. With a physician's recommendation, participants also showed odds of completing a CRCS test of 11.24 times the odds of other participants. Other research has also confirmed the importance of physician involvement and communication (Bass et al., 2011; Epstein & Street, 2007).

Fear of any pain or discomfort associated with the CRCS procedures, fear of illness or diagnosis, and perceived CRC severity were other factors reported, yet not as frequently. Fear/anxiety was a key theme in the qualitative study by Sly and colleagues (2013), for instance, carried out with sixteen patients (> 50 years of age with no previous colonoscopy or medical comorbidities) who received patient navigation services but did not complete a colonoscopy. "When asked specifically why they had not completed the scheduled colonoscopy, half of the participants said that they were fearful or anxious about the colonoscopy and indicated that this was the primary reason that they did not keep their scheduled appointment" (Sly et al., 2013, p. 453).

The review we reported here has been useful in synthesizing the salient factors shaping young African-American men's view of CRC and CRCS behaviors. Armed with this knowledge, how should health promoters (and, in particular, health educators) proceed? While prevention and early detection are key factors to increased survival

rates and decreased medical costs, the reality remains that health equity is still a dream deferred (Eyre, 2004).

To oppose such reality, Teutsch (2003) argues that the ability to effectively communicate is critical and represents a potential solution to many health disparities issues. Communication between health promoters and the lay public, between health care providers and their patients, between scientists and practitioners – all forms of communication, if taking the factors synthesized in this review into account, may represent a strategy for changing the health disparities status-quo. Specifically supported in our findings is the suggestion that medical providers capitalize on their influence and join policy makers in efforts to eliminate CRCS disparities among African-American men.

A second purpose of this review was to assess the methodological quality of the reviewed studies. The mean methodological quality score (MQS) of 10.9 indicates these studies are, overall, of medium quality (relative to a perfect score totaling 21), and an array of significant flaws transpire from this analysis.

The first weakness of this body of literature involves the extensive use of non-experimental research designs. Only 4 of the 28 reviewed studies (14.3%) utilized the gold standard for research paradigms, experimental designs (e.g., Randomized Control Trials). The majority (n = 20; 71%) employed non-experimental research designs (e.g., exploratory and/or qualitative studies). Future research should strive to either be driven by methodologically rigorous designs that are also theory-based, or be guided by naturalistic inquiry approaches, in order to elicit the complexity of, and relationships

among, the multi-level factors affecting screening behaviors. Granted, examination of factors influencing behaviors does not easily lend itself to neat, experimental designs, and most researchers must rely on convenience or clinical samples available to them. Furthermore, qualitative researchers often struggle with negative perceptions of qualitative inquiry and shy away from naturalistic approaches. Nonetheless, it is important that researchers remain aware of the need for rigor, and *strive* to achieve the highest methodological standards in their studies, along with the most meaningful and useful data, possible.

A second weakness in this group of studies is the absence of samples comprised exclusively of African-American men. A little more than a third of the studies (36%) involved a medium sample size ($100 \geq n \geq 300$) and 64% employed convenience/nonprobability sample designs. Although the sample sizes are respectable, the fact that none of the studies exclusively examined African-American men does not allow for generalizable results that can assist in developing effective interventions to decrease CRC and CRCS disparities.

A third and final weakness involves data analyses. The most advanced statistical techniques (e.g., structural equation modeling) were only utilized by a third of the studies (32%). It appears that some studies attempted to compensate for weak research and sample designs with more rigorous statistical analyses. Yet, when 71% of the reviewed studies did not report any tests of validity or reliability of their own data, it becomes difficult to determine the quality of the evidence being reported, thus undermining the confidence readers/consumers can have regarding the data analyses.

Without testing for the data's validity and reliability, there is no way to determine how much measurement error comes into play and may be weakening the evidence. The quality of the data, therefore, is being taken for granted and assumed to be high; policies, practices and interventions may be based on data for which there is, in fact, no evidence of quality. Future researchers, therefore, should strive to report evidence of the quality of their data, and tests of validity and reliability are among the most common types of evidence that can be easily provided. Given that validity and reliability are sample-specific, they should be documented in each research report (Thompson, 2002).

Alongside the **weaknesses in the reviewed body of literature, the review itself suffers from specific limitations.** One limitation is a weakness inherent in nearly all systematic literature reviews and meta-analyses: the possibility of having missed one or more relevant studies/reports. We made every effort, however, to ensure that our search yielded all relevant data. For instance, to be as inclusive as possible throughout the search process, we not only searched electronic databases, we also added a manual search of cited references (i.e., reference lists of electronically-identified reports). This technique retrieved additional references which were not indexed well in the databases originally searched.

Another limitation is the lack of validation of the MQS criteria we chose to use in this study. Nonetheless, the criteria we developed were based on previously published reports (e.g., Goodson et al., 2006), found to adequately capture most of the salient methodological characteristics of empirical studies.

Despite these limitations, this review contributes to the body of knowledge on African-American men's knowledge, beliefs, and behaviors regarding CRCS, by organizing and assessing the quality of the available evidence. We hope that findings from this review can guide future research in terms of its focus and rigor, and foster the development of appropriate educational interventions promoting the health of African-American men in the U.S.

3. COLORECTAL CANCER SCREENING AND YOUNG AFRICAN-AMERICAN MEN: MALE ROLE NORMS, KNOWLEDGE, ATTITUDES, AND PERCEPTIONS

African-American men have more illnesses and die younger in contrast to their White counterparts (Institute of Medicine [IOM], 2002; National Center for Health Statistics [NCHS], 2011). Compared to White men, African-American men have incidence and mortality rates 20% and 45% higher respectively from colorectal cancer (CRC) (American Cancer Society [ACS], 2011). In addition, African-American men continue to have less access to healthcare than White men in the United States (Kaiser, 2000). Moreover, Johnson et al. (2004) found that African-American men and their physicians demonstrated lower levels of patient-centered communication in comparison to White men and their physicians. Explicitly, African-American men rarely see healthcare providers who are genuinely interested in their health concerns (Underwood, 2009).

Since routine screening detects CRC at an earlier, more treatable stage, the American Cancer Society (ACS) (2012) and Rex and colleagues (with the American College of Gastroenterology) (2009) recommend routine screening at age 50 for all men at average risk using a combination of the following: yearly fecal occult blood test (FOBT), flexible sigmoidoscopy every 5 years, or colonoscopy every 10 years. Despite evidence that the three recommended early detection screening practices (EDS) can

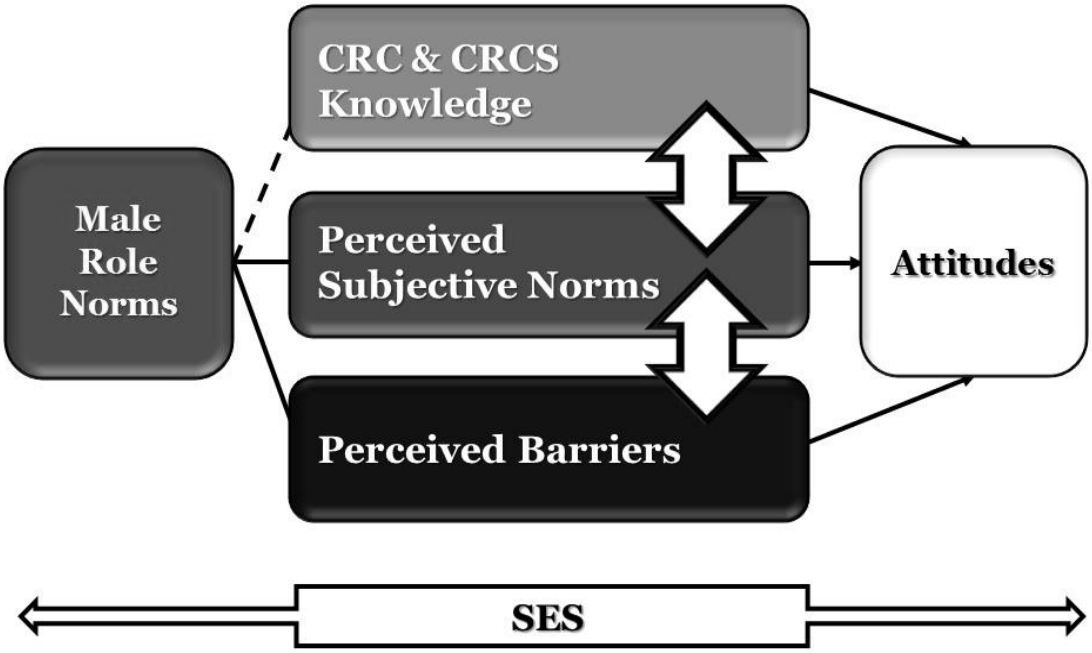
reduce CRC mortality, screening rates remain low among African Americans (Inadomi et al., 2012).

Most men over age 50 have not undergone screening, and disparities in screening persist, with African-American men having lower levels of screening than White men (Hall et al., 2012). Given the lower rates of CRC screening (CRCS) among African-African men, it may be beneficial to begin educating African-American men about this disease and the aforementioned three EDS practices before age 50 (Powe, 2006; Rex et al., 2009). As there is a high incidence and younger age at presentation of CRC in African Americans, the initiation of CRCS is warranted at the age of 45 years rather than 50 years (Rex et al., 2009; Agrawal et al., 2005). Accordingly, the purpose of this study was to describe the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers associated with screening for CRC among young adult African-American men (ages 19-45, specifically) employing survey research methodology.

Male Role Norms, Knowledge, Attitudes, and Perceptions

Conceptual models are good representations of relationships among constructs, help clarify our thinking about complex issues, and are useful in narrowing both research questions and the targets of interventions (Earp and Ennett, 1991). Because the factors shaping perceptions of CRC and its prevention are complex, I propose the following conceptual model to help understand the factors I examine in this study: male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers (Figure 2).

Figure 2. Conceptual Model of Factors Shaping Attitudes toward CRC and CRCS among Young Adult African-American Men.



Male Role Norms

Sex role norms refer to the set of beliefs, characteristics, and behaviors widely viewed and shared as desirable for males or females (Pleck, 1981). These role norms for males may be conceptualized as a common collection of distinct but related socially constructed expectations and standards of what constitutes masculinity in contemporary America (Brannon, 1976, Connell, 1995; Levant et al., 2007; Hammond & Siddiqi, 2013; Mahalik et al., 2003). Similarly, Thompson and Pleck (1986) operationalized male role norms as the behaviors and attributes men should ideally embrace, based on

sociocultural norms. This stereotyped male role behavior has been defined by David and Brannon (1976) with four short phrases or themes: (1) *No Sissy Stuff*: the need to be different from women; (2) *The Big Wheel*: the need to be superior to others; (3) *The Sturdy Oak*: the need to be independent and self-reliant; and (4) *Give 'Em Hell*: the need to be more powerful than others, through violence if necessary. Together, these four masculinity norms suggest a range of complex and dynamic roles which influence masculinity for African-American men.

Masculinity, or prevalent male role norms, has been identified as potentially dangerous to men's health, as it plays a critical – but, oftentimes negative - role in healthcare use, mortality, and health behaviors of African-American men in the U.S. (Courtenay, 2000; Griffith, Gunter, & Watkins, 2012; Harrison, 1978; Marcell, Ford, Pleck, & Sonenstein, 2007). Over the past three decades, research has confirmed that masculinity is indeed dangerous to the health of African-American men who die more often of cancer than any other racial/ethnic group in the nation (Griffith & Johnson, 2013, Henry J. Kaiser Family Foundation, 2007). Despite the fact that early detection screening does aid in CRC prevention, Winterich et al. (2009) found that some men disliked colonoscopies because they associate any penetration as an insult to their masculinity. Similarly, a qualitative study by Beeker, Kraft, Southwell, and Jorgensen (2000) documented that "perceived 'offensiveness'" was a concern of their participants, with an African-American male commenting: "Probing around in my rectum . . . [is] treading on my masculinity" (p. 268). Although studies have explored how masculinity and gender affect men's health, research that specifically examines whether male role

norms are associated with attitudes related to CRC and CRCS, among young men of color, is sorely lacking (Harrison, 1978; Levant, 1996; Griffith et al., 2012).

Knowledge

Knowledge has been identified as a barrier to CRCS (see Chapter 2). Brown, Potosky, Thompson, and Kessler (1990) found that having a positive attitude about cancer prevention, being White or female, and residing in the non-Southern sections of the U.S. are all factors associated with greater knowledge of the tests, but not with greater uptake, among those with stronger awareness. . Since health system factors are strongly associated with knowledge, Brown and colleagues (1990) also recommended preventive health education as an effective aide to increasing the use of screening tests and access to health care services among African-American men, a group that has low screening uptake.

Green and Kelly (2004) found a sample of 100 African-American men and women had inadequate knowledge of CRC in a study of knowledge, perceptions, and behaviors of African Americans. In their study, the mean age was 65.2 years for the 58 females and 42 males in the study ranging from 50 to 90 years. Average years of education were 10.3 in a range of 1 to 20 years. Test scores on a CRC Knowledge test ranged from 56-100 points with a mean score of 78.4. Unlike previous findings in the professional literature, the men had a higher percentage of correct responses than the women. This, in part, could be related to the finding that low income men felt more susceptible to getting CRC than the women (yet the women scored higher on the scale

assessing the seriousness of colorectal cancer). Only 38% of the participants in the study by Green and Kelly (2004) correctly identified CRC as not usually fatal.

The importance of susceptibility and need for screening for colorectal cancer were significant as Green and Kelly (2004) stressed the need to educate older, low-income African Americans about CRC in order to increase their awareness of CRC and the importance of early detection screening. Yet, a recent study by Winterich et al. (2011) found that African-American men (aged 40-64) with low education (defined as high school or less), from diverse socioeconomic backgrounds in North Carolina have little knowledge about anything related to CRC and early detection screening. They also found that low knowledge in addition to structural issues (e.g., access to healthcare and screening) may partly account for screening disparities.

Attitudes

Fishbein and Ajzen (1975) broadly define an attitude as one's "position on a bipolar affective or evaluative dimension" (p. 6). More precisely, Myers (1999) suggests that an attitude can be defined as "a favorable or unfavorable evaluative reaction toward something or someone, exhibited in one's beliefs, feelings, or intended behavior" (p. 9).

Research has identified attitudes as another barrier to CRCS among all ethnic groups studied. A qualitative study conducted by Beeker, Kraft, Southwell, and Jorgensen (2000) explored attitudes towards CRC and early detection screening practices as a screening barrier. Results from their sample of men and women aged 50 and older included participants being poorly informed about CRC and the possible

benefits of screening, participants reporting little or no information obtained from physicians or mass media, negative attitudes toward screening procedures, and a fear of cancer. Similarly, Wolf et al. (2001) interviewed 115 urban, working-class, predominantly minority men and women by telephone in their pilot study to assess knowledge, perceptions, and barriers relevant to CRC and CRCS. More than half (53.9%) of the participants were unable to name a CRCS test.

Sociocultural perceptions about CRC and its early detection screening practices have been explored as a barrier to screening uptake among African Americans as well. In Detroit, Michigan, various social organizations and barbershops, a medical center, and an NCI-designated comprehensive cancer center served as the setting for a study conducted by Brittain, Loveland-Cherry, Northouse, Caldwell, and Taylor (2012). The purpose involved the examination of the relationships among sociocultural factors (e.g., cultural identity, family support, CRC perceptions) that may influence an informed CRCS decision among older African-American men and women (ages 50-86). The findings of the study suggested that family support is positively related to CRC perceptions among African Americans, and CRC perceptions are positively related to informed decisions about CRCS. Family support was also positively related to an informed decision about CRCS among African-American men, specifically. In order to improve CRCS rates among African Americans, Brittain et al. (2012) recommended that informed decision-making interventions address family support, CRC perceptions, and elements of cultural identity. Griffith, Gunter, and Allen (2012) add that incorporating

the gendered nature of culture, particularly for men, may be essential for interventions focused on modifying men's cancer outcomes and health risk behaviors.

Perceived Subjective Norms

Ajzen (1991) broadly defines subjective norms as "the perceived social pressure to perform or not to perform the behavior" in question (p. 188). More precisely, Finlay, Trafimow, and Moroi (1999) add that subjective norms may be measured by asking "how much a person's important others want the person to perform the behavior" (p. 2381). These 'important others'/social structures may include family members, coworkers, social clubs, and other communities that have a strong influence on how one views health (Freidson, 1970).

Research suggests that this perceived support promotes positive beliefs about health-related behavior (e.g., screening for CRC; Brittain, Taylor, Loveland-Cherry, Northouse, & Caldwell, 2012; Israel, 1985; Jernigan, Trauth, Ferguson-Neal, & Ulrich-Cartier, 2001). Cassel (1976) and Cobb (1976) were the first to suggest that social relationships provide support that can influence health. While assessing the role of social support networks, Honda and Kagawa-Singer (2006) found that family/friend subjective norms about CRCS uptake were strongly associated with CRCS adherence. CRCS research has found that social support is related to CRCS adherence among African Americans (Kinney, Bloor, Martin, & Sandler, 2005). However, the use of sample populations older than 64 years is one limitation of previous research (ACS, 2011). Furthermore, little is known about perceptions of support or "social pressure" for CRCS

among younger-aged groups, especially younger African Americans (Ajzen, 2002, p. 665).

Perceived Barriers

Ajzen (2002) describes control beliefs (perceived barriers) as "beliefs about the presence of factors that may further or hinder performance of the behavior" (p. 665). It is assumed that these perceived barriers determine people's perceptions of their "ability to perform a given behavior (or sequence of behaviors)", and such perceptions are known as perceived behavioral control (Ajzen, 2002, p. 668). Together with behavioral intention, perceived behavioral control can predict behavioral achievement directly (Ajzen, 1991). Similarly, Glasgow (2008) defines a perceived barrier as "a judgment of the degree of difficulty of a set of diverse factors (barriers) that can interfere with accomplishment of a specified health behavior."

A variety of factors influence these judgments among young adult African-American men intending to screen for CRC. Internal personal barriers (e.g., discomfort, embarrassment, and pain associated with having a sigmoidoscopy or colonoscopy) have been found to impact scheduling and completion of CRCS among low-income African Americans and Latinos (Bazargan, Ani, Bazargan-Hejazi, Baker, & Bastani, 2009). Additional internal perceived barriers that can prevent African-American men from screening for CRC include fear of illness or diagnosis and fatalism (Stacy, Torrence, & Mitchell, 2008). Perceived external barriers (e.g., mistrust of doctors or hospitals, screening tests cost, patient-provider communication) have also been found to prevent

African-American men from getting tests for CRC (Bazargan et al., 2009; Hammond & Siddiqi, 2013; Post et al., 2008, Purnell et al., 2010; Stacy et al., 2008).

In addition to the lack of access to screening and limited or no health insurance, other socioeconomic factors (i.e., low educational attainment, and negligible use of preventive services) likely represent additional barriers, all of which are associated with decreased screening and, consequently, a more severe diagnosis of CRC (Breen, Wagener, Brown, & Davis, 2001; Woods, Narayanan, & Engel, 2005). While poor nutrition, substandard housing, lack of adequate health care, and other previously mentioned barriers contribute, in tandem, to the health problems of African Americans, they alone cannot account for African-American men having mortality rates from CRC 45% higher than White men (ACS, 2012; Doyal, 1995, Gibbs, 1988 Laveist, 1993; Pappas, Queen, Hadden, & Fisher, 1993).

Theory

Ajzen and Fishbein (1980) grounded the Theory of Planned Behavior (TPB) on the premise that behavior is a function of intention, attitudes, and specific perceptions (such as perceptions of subjective norms and behavioral control). Yet, the TPB typically does not provide an explicit context for considering cultural values. Thus, this study will be guided by a conceptual framework that integrates select concepts and constructs of the TPB and perceptions of specific cultural values related to male role norms (see conceptual model in Figure 2).

Figure 2 postulates there are four factors that shape/affect a young adult African-American male's attitudes toward CRC and its prevention: male role norms, knowledge, perceived subjective norms, and perceived barriers. The attitudinal factor refers to an African-American male's favorable or unfavorable beliefs and values towards CRC and CRCS. Knowledge is the familiarity, awareness, or understanding of CRC and three recommended early detection screening practices (i.e., Fecal Occult Blood Test [FOBT], Sigmoidoscopy, and Colonoscopy). The perceived subjective norms component deals with an African-American male's perception that important members of his social support network value screening for CRC. Perceived barriers, originally added to the TPB by Ajzen (1991) as perceived behavioral control, accounts for those obstacles that stand in the way of a positive attitude or a specific behavior. Male role norms are beliefs regarding rules, expectations, or social norms that dictate what an African-American man considers an acceptable masculine attitude and behavior regarding CRCS, within a particular cultural and historical context (Brannon, 1976; Levant, 1996; Mahalik et al., 2003). In this model, male role norms represent how much men agree or disagree with an array of dominant cultural norms of masculinity (Levant & Richmond, 2007; Mahalik et al., 2003; Levant, 1992). Since socioeconomic status (SES) contributes to health risk disparities among U.S. men and influence the kind of masculinity that men construct, SES factors will be included as control variables or covariates in the statistical analyses (Courtenay, 2000). These factors include age, marital status, sexual orientation, educational level, household income, work status, health insurance, and religious

preference. Research suggests that these factors influence both the perceptions of CRC as well as the behaviors of screening for CRCS (Beydoun and Beydoun, 2008).

Methods

Study Design

This study employed a survey design methodology, utilizing a third-party online survey engine (PsychData), and various venues for recruitment (see below).

Study Population

From March to June 2013, a convenience and snowball sampling plan was used to recruit 157 young adult African-American men. Eligibility criteria included: (a) young adult (ages 19-45), (b) men who self-described as African American, (c) residing in the U.S., and (d) able to speak and understand the English language.

Recruitment: Participants were recruited nationally through various existing social networks such as list-serves (e.g., Texas A&M University's Black Graduate Students' Association), on-line networks (e.g., Facebook, LinkedIn, Twitter), predominantly African American-serving barbershops, National Pan-Hellenic Council fraternities (e.g., Alpha Phi Alpha Fraternity, Inc.), African-American male-dominant organizations (e.g., Todd Anthony Bell National Resource Center on the African-American male in Columbus, OH), predominately African American mega-churches (e.g., Destiny Metropolitan Worship Church in Marietta, GA), and others.

Data Collection

Prior to any data collection, approval was obtained from the Texas A&M University's Institutional Review Board (IRB). In order to eliminate transcription errors and prevent survey alternation by the participants, Andrews, Nonnecke, and Preece (2003) recommend the utilization of web-based surveys. Accordingly, data collection was performed through a survey questionnaire administered on-line with the assistance of PsychData. PsychData is an online survey software tool specifically designed to meet and exceed IRB standards for the protection of research participants in addition to industry standards for Internet security.

Two previously-developed instruments were employed for data collection in this study. They included: (1) the Male Role Norms Inventory-Short Form (MRNI-SF) developed by Levant, Hall, and Rankin (2013), and (2) a modified version of the CRC Knowledge and Perceptions Survey for Older African Americans Survey developed by Green and Kelly (2004). Items from both the MRNI-SF and CRC Knowledge and Perceptions Survey for Older African Americans Survey were employed with permission, to assess each of the conceptual model's constructs. The author developed the items measuring all other constructs. Appendix C depicts how each of the constructs in the theoretical model were operationalized for this study.

Prior to beginning data collection, the on-line instrument was pilot-tested with a small convenience sample of nine Texas A&M undergraduate and graduate students (aged 22-48) from the departments of Educational Health Promotion and Community Health Sciences, Counseling Psychology, Health and Kinesiology, and Epidemiology

and Biostatistics. In an attempt to ensure that these participants understood the survey questions in the intended manner, individuals representing the population groups ineligible to participate in the study due to ethnicity or gender (e.g., women, White, Hispanic/Latino) were also included (Collins, 2003). With this sample, "cognitive interviewing", a process that elicited input from participants as they responded to the survey in real time, was conducted. This method provided further assurance that the participants and research had a shared understanding about the meaning of the items on the survey and, hence, enhanced the validity of the scale (DeVellis, 2011). Specifically, the interviewer asked participants: a) how he/she understood each question in the survey and the respective response options; b) whether the question was likely to elicit an honest response, in the field; c) whether specific wording of questions communicated adequately or should be changed/adapted; and d) the user-friendliness of the on-line setup for the questionnaire, among other process-oriented questions. The pilot-testing also allowed assessing participants' comfort-level with using PsychData, and whether any built-in skip patterns functioned as planned. The final versions of the survey tool may be found in Appendix D.

In order to assure the successful transfer of the participants' survey responses directly into the secure PsychData database, the survey was located at a domain called "ChangeThaGame.com" (http://www.ChangeThaGame.com). When participants visited this site, they were informed that the playing field is not even as it relates to deaths from CRC for African-American men. Furthermore, it informed them that their participation was requested to begin addressing this complex issue and assure a win in their (i.e., the

young adult African-American male participants') favor. The webpage stated that participation was voluntary and would last approximately 30 minutes.

After reading the information sheet about the study posted on the website, participants were asked to select yes or no in regards to giving consent to participate in the study. By selecting yes, participants began the survey. Upon completing the survey, participants were given the choice to be entered into four drawings to win one of four incentives: (1) Google Nexus 7 tablet, (2) Beats by Dre™ PowerBeats™ In-Ear Headphones, (3) an Amazon Kindle Fire, and (4) Apple TV with 1080p.

Measures

Demographic Characteristics

Participants' demographic characteristics assessed in the survey included: race, gender, age, current residence, marital status, sexual orientation, highest level of educational attainment, formal association with any health related field (e.g., pursuing or hold a degree in Health Education, Public Health, Nursing, Allied Health), household income, work status, health insurance status, religious preference, church attendance, family history of cancer, family history of CRC, and history of colorectal cancer (self). This section also included two questions inquiring how participants learned about the study and if they had one doctor they regularly saw.

Male Role Norms

Part II of the survey consisted of 21 items, with responses options on a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*), from the Male Role Norms Inventory-Short Form (MRNI-SF) developed by Levant, Hall, and Rankin (2013). Three of the "highest loading items from each [original] subscale of the Male Role Norms Inventory-Revised" (MRNI-R) by Levant and colleagues (2010, p. 230) form the MRNI-SF. These subscales are as follows: Avoidance of Femininity, Negativity toward Sexual Minorities, Self-reliance through Mechanical Skills, Toughness, Dominance, Importance of Sex, and Restrictive Emotionality. Higher scores among the 21 items of the MRNI-SF "indicate higher levels of endorsement of traditional masculinity ideology" when high scores are obtained (Levant et al., 2013, p. 230).

CRC and Early Detection Screening Knowledge, Beliefs, and Values

Part III of the survey included 46 items divided into two sections stemming from a modified version of the CRC Knowledge, Perceptions, and Screening Survey originally developed by Green and Kelly (2004): Knowledge about CRC and Early Detection Screening (EDS), Beliefs and Values about CRC and EDS, and Perceptions about CRC and EDS. Section 1, Knowledge, initially consisted of 21 true/false items on CRC warning signs and symptoms, incidence and mortality, truths and myths, participation in screening, and screening modalities. After exploratory factor analysis, 8 items were later removed to improve the reliability and validity of the final knowledge scale. Each item was assigned 1 point if correct for a total of 13 possible points or 100%.

Participants had to answer 11 out of 13 questions correctly (85%) to receive a passing score. Section 1 was initially adapted by Green and Kelly (2004) from the 18-item Breast Cancer Knowledge test by McCance, Mooney, Smith, and Field (1990).

Section 2, the *Beliefs and Values about CRC and EDS scale* (later to be re-labeled the *Attitudes scale*, the *Perceived Barriers scale,* and the *Perceived Subjective Norms scale*), consisted of 54 items on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree), that measure CRC severity, screening benefits, screening barriers, and perceived subjective norms. Section 2 was initially adapted by Green and Kelly (2004) from a scale developed by Champion and Scott (1997).

Data Analysis

The data from the survey were imported into SPSS from the survey engine, PsychData, and analyzed using version 20.0 of the SPSS software. Multiple regression was the primary form of analysis used to explore the relationships among the constructs found in Appendix C. To test for potential moderating effects, participants were divided into those with health insurance versus those without, and those with high school or less versus some college or more for educational status. Age was treated as a continuous variable.

Descriptive (frequencies, percentages, means), bi-variate (Pearson's r, Chi-Square), and multivariate (multiple regression) statistics were employed to assess the relationships among the factors assessed in this study, explore potential group differences, and test moderator effects. The critical value of .05 was used for assessment

of statistical tests. All variables were tested for normality and other assumptions, as appropriate. There was no need to normalize any of the variables used in the bivariate and multiple regression analyses, because the variables did not violate any of the assumptions (Curran, West, & Finch, 1996).

Missing Data

The data were thoroughly reviewed to explore the "*mechanism of missingess*—that is, the hypothesized reason for why data are missing" (Osborne, 2013, p. 109). Purposeful patterns of nonresponses were present as some data appeared to be missing not at random (MNAR). When data are "made missing by systematic influences," Buhi, Goodson, and Neilands (2008) argue that "complex issues [may arise] for analysts who decide to use certain missing data techniques, as MNAR is the most problematic pattern of missingness" (p. 85). Similarly, Rubin (1976) previously confirmed that MNAR data could potentially have a strong biasing influence.

We decided, therefore, to remove participants with MNAR responses from the sample, given that: (a) their numbers were relatively small ($n = 4$), and (b) many of them stopped responding when they reached the first male role norms item, "*Homosexuals should never marry"* – leaving approximately 78% of the survey unanswered. Imputing values for more than 50% of the survey would therefore, bias the survey's responses, in a systematic way, and potentially add to the bias-problem, instead of solving it.

"As the rate of item nonresponse rises, so does the potential for it to affect estimates", reminds Fowler, Jr. (2009, p. 158). Accordingly, any participants who did

not respond to at least 94% of the survey (n = 11) were removed from the final sample. Three participants did not give consent to participate and four gave consent yet did not continue the remainder of the survey, so the data for all seven were removed. Seventeen participants were removed from the final sample due to age, race, or gender (i.e., they did not meet the 19-45 year-old, African-American male criterion). Lastly, the data were carefully scrutinized to determine whether the same participants completed the survey more than once or whether several computers in a common computer lab were used (sharing the same IP address). Cases that were similar or the same were deleted from the sample. Ultimately, although the deletion of cases is not ideal, the small numbers of MNAR in the sample led to the choice of deletion as the best strategy.

Results

Sample Characteristics

A total of 207 surveys were assessed for eligibility and 157 met full inclusion criteria after missing data issues were resolved. Study participants had a mean age of 29.78 ± 5.87. Specifically, 28 (17.8%) were younger than age 25, 103 (65.6%) were 25 to 35 years old, and 26 (16.6%) were ages 36 to 45 years. Nearly half were single (46.5%) and had a Master's/Advanced degree (45.2%). The median household income per year was $35,000-$49,000; the majority of the participants worked a full-time (62.4%) or part-time (17.8%) job; and most had health insurance (83%). In respect to the four regional divisions used by the U.S. Census Bureau, 77.1% of the participants'

current residence was in the South followed by the Midwest (12.1 %), Northeast (7%), and West (3.8 %).

In regards to cancer history, 98% were never diagnosed with CRC and did not have a family history of CRC (68%), but 40% did have a family history of *cancer*. In terms of having a primary care/family physician, 52% of the participants had a doctor they continually connected with. In terms of participation/enrollment: 48% learned about the study via their friends/family member/someone told them about it, 24% via Facebook/Twitter, 22% via email/common interest list-serves, and half of the sample (52%) was currently active/participating in some form of male dominant social group (e.g., AAU basketball, fraternity, bowling league, Bible study group). Additional participant demographic characteristics are presented in Table 2.

Data Reliability

To assess whether the 21 items that were summed to create the *male role norms* variable, the 21 items in the knowledge scale, the 17 items in the *attitudes scale*, the 10 items in the perceived subjective norm scale, and the 4 items in the *perceived barriers scale* were internally consistent (for each scale), Cronbach's alpha was computed. The lowest-scoring scales were the knowledge index ($\alpha = .45$; see table on p. 60) and the *perceived barriers scale* ($\alpha = .71$; see table p. 68). All other scales had reliability coefficients close to or above .80 (role norms $\alpha = .90$ [see table on p. 58]; attitudes $\alpha = .79$ [see table on p. 64]; perceived subjective norms $\alpha = .87$ [see table on p. 69]).

Table 2. Participant Demographic Characteristics*

Sample Characteristics (N = 157)	n	%
Age		
19-24	28	17.8%
25-35	103	65.6%
36-45	26	16.6%
Current Residence		
Midwest	19	12.1%
Northeast	11	7.0%
South	121	77.1%
West	6	3.8%
Marital Status		
Single	73	46.5%
Unmarried in a relationship	29	18.5%
Married	45	28.7%
Divorced	4	2.5%
Separated	3	1.9%
Widowed	1	0.6%
Sexual Orientation		
Straight	140	89.2%
Gay	12	7.6%
I am struggling with my sexual orientation.	4	2.5%
Highest Education Level Completed		
High School Diploma	7	4.5%
Partial College (at least one year)	22	14.0%
Two Year College/Associate Degree	5	3.2%
Bachelor's Degree	52	33.1%
Master's/Advanced Degree	71	45.2%
Are you currently pursuing or already have a degree in Health Education, Public Health, Community Health, or any health related field (e.g., Nursing, Allied Health)?		
Yes	33	21.0%
No	124	79.0%
Household Income per Year		
< $15,000	24	15.3%
$15,000 - $24,999	21	13.4%
$25,000 - $34,999	16	10.2%
$35,000 - $49,000	20	12.7%
$50,000 - $74,000	26	16.6%
> $75,000	50	31.8%
Do you currently work *(please select all that apply)*?		
No	8	5.1%
Yes, part-time	28	17.8%
Yes, full-time	98	62.4%
Student	23	14.6%

* Information that does not add up to N = 157 (100%) is a result of data that were not reported.

The low score for the *knowledge scale* is not surprising for an index assessing a cognitive/recall-type variable, because knowledge of various *dimensions* of CRC and CRCS was measured. Aside from the knowledge scale, the strong reliability coefficients for all other scales suggest the variables/scales we created based on the data had acceptable-to-good levels of internal consistency or score reliability. Based on EFA findings (see below), 8 items were deleted from the final *knowledge scale*. The alpha for the re-defined scale was 0.54.

The coefficient alphas were evaluated using the criteria developed by Ponterotto and Ruckdeschel (2007) which involves clustering scale lengths into three general ratings (e.g., moderate, good, and excellent) to consider "the adequacy of magnitudes for coefficient alpha in light of item count and sample size" (p. 1002). For the Male Role Norms Inventory-Short Form (MRNI-SF) subscales and total scale, those for the men were good (.80 –.84) to excellent (.85 and up), with the exceptions of the moderate (.75-.79) alphas observed for the subscales of Self-Reliance through Mechanical Skills (.79), Negativity toward Sexual Minorities (.78), Toughness (.79), and Dominance (.79). The General Traditional Masculinity Ideology Factor (MRNI-SF Total Score) was excellent (.90). The participants on average scored toward the traditional end on two subscales, Self-reliance through Mechanical Skills and Toughness (see Table 3).

Data Validity

Principal component analysis with Varimax rotation was conducted to assess the underlying structure for the 21 items of the *male role norms scale*. Seven factors were

Table 3. Raw Score Means, Standard Deviations, and Alpha Coefficient Alphas for MRNI-SF

Measure	*M*	*SD*	α
Restrictive Emotionality	2.18	1.03	.80
Self-Reliance through Mechanical Skills	4.58	1.55	.79
Negativity toward Sexual Minorities	3.00	1.75	.78
Avoidance of Femininity	3.64	1.62	.76
Importance of Sex	3.20	1.41	.80
Toughness	4.50	1.38	.79
Dominance	2.19	1.43	.79
MRNI-SF Total Score	3.33	1.00	.90

Note. MRNI-SF scale scores range from 1 to 7. Higher values indicate greater endorsement of traditional masculinity ideology.

expected, based on the original model by Levant et al. (2013) designed to index 7 subscales: (1) Avoidance of Femininity, (2) Negativity toward Sexual Minorities, (3) Self-reliance through Mechanical Skills, (4) Toughness, (5) Dominance, (6) Importance of Sex, and (7) Restrictive Emotionality. Upon analysis, this study's sample yielded 6 subscales/factors instead of the 7 put forth by Levant et al. (2013). After rotation, the first factor accounted for 15.85% of the variance (M = 3.33, SD = 1.49) and the sixth factor accounted for 9.05% (M = 4.55, SD = 1.36). Table 4 displays the items alongside the factor loadings for the rotated factors and each factor's reliability coefficient (Cronbach's alpha), with loadings less than .50 omitted to improve clarity. The item *"All homosexual bars should be closed down"* had its highest loading on the second factor, but had a cross-loading over .5 on the first factor. Since the item is conceptually closer the other items in the first factor (assessing *Negativity toward Sexual Minorities*), and based on the analysis put forth by Levant et al. (2013), I chose to keep this item in the first factor.

We employed the same techniques (principal component analysis with Varimax rotation) to assess the underlying structure for the 21 items of the *knowledge scale*. Initially, 10 factors were obtained after rotation, where the first factor accounted for 7.61% (M = .69, SD = .40) of the variance and the tenth factor accounted for 5.99% (M = .34, SD = .22). Tables 5 and 6 display the items and factor loading for the rotated factors, with loadings less than .40 omitted to improve clarity. Because preliminary analyses indicated the possibility of a two-factor model, we forced the analyses into a two-factor solution. After rotation, the first factor accounted for 11.25% of the variance and the

Table 4. Factor Loadings for the Rotated Factors Forming the Male Role Norms Scale*

Items+	Factor Loading						
	1	2	3	4	5	6	Communality
29. Boys should prefer to play with trucks…	.78						.79
20. Homosexuals should never marry.	.72						.69
32. Homosexuals should never kiss in…	.72						.74
27. A man should prefer watching action…	.68						.72
23. Men should watch football games…	.63						.67
24. All homosexual bars should be…	.54	.61					.81
22. Men should be the leader in any…		.88					.81
21. The President of the U.S. should…		.83					.76
31. A man should always be the boss.		.81					.80
25. Men should have home improvement…			.86				.82
26. Men should be able to fix most things…			.85				.87
33. A man should know how to repair his…			77				.68
34. A man should never admit when…				.78			.70
35. Men should be detached in emotionally...				.77			.70
40. Men should not be too quick to tell others…				.68			.61
28. Men should always like to have sex.					.79		.76
30. A man should not turn down sex.					.70		.64
37. A man should always be ready for sex.					.61		.64
36. It is important for a man to take risk, even…						.67	.47
38. When the going gets tough, men should get…						.65	.70
39. I think a young man should try to be physically…						.57	.51
Eigenvalues	3.33	3.02	2.56	2.04	2.03	1.90	
% of variance	15.85	14.38	12.19	9.71	9.65	9.05	TOTAL α
Chronbach's Alpha	.87	.87	.86	.68	.72	.87	.90

Note. Loadings < .50 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 5. Factor Loadings for the Rotated Factors for the Knowledge Scale – Part A*

Items+	Factor Loading						
	1	2	3	4	5	6	Communality
59. African-American men should begin…	.78						.85
58. Men and women should begin screening…	78						.81
54. There are several screening tests for CRC.		.88					.82
57. A Colonoscopy is an appropriate test to…		.47					.62
45. The risk of developing CRC is greater as…			.65				.52
41. CRC is a cancer of the colon or rectum.			.63				.70
44. CRC is the third most common cancer…			.49				.87
50. Symptoms such as bleeding from the rectum…				.74			.58
60. Screening tests for CRC are not necessary for...				-.68			.65
42. CRC is the leading cause of cancer death…					.78		.68
43. CRC is a disease that affects only older, white…					.66		.50
49. Bleeding from the rectum, blood in your stool…						.74	.58
Eigenvalues	1.60	1.45	1.44	2.04	2.03	1.90	
% of variance	7.61	4.38	6.99	6.79	6.68	6.62	TOTAL α
Chronbach's Alpha	.69	.48	.32	-.38	.20	---	*See Part B of table*

Note. Loadings < .40 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 6. Factor Loadings for the Rotated Factors for the Knowledge Scale – Part B*

Items+	Factor Loading				
	7	8	9	10	Communality
48. Most colorectal cancers begin as a...	.71				.64
46. Both men and women are at risk for…	.69				.59
53. CRC is usually fatal.		-.74			.75
56. A Sigmoidoscopy is an appropriate test…		.63			.59
55. A FOBT is an appropriate test to…		.52			.76
61. Screening test for CRC are not covered…			.81		.70
52. There is nothing anyone can do about…				.77	.62
47. There are no known causes of CRC.				.50	.72
51. You should see your doctor if you have…				-.46	.70
Eigenvalues	1.39	1.37	1.27	1.26	
% of variance	6.61	6.54	6.04	5.99	TOTAL α
Chronbach's Alpha	.30	-.03	---	-.02	.45

Note. Loadings < .40 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 7. Factor Loadings for the Rotated Factors for the Knowledge Scale – Forced-Factor Extraction (2 Factors Only)*

Items+	Factor Loading		
	1	2	Communality
58. Men and women should begin screening…	.67		1.0
44. CRC is the third most common cancer…	.56		1.0
59. African-American men should begin…	.51		1.0
54. There are several screening tests for CRC.	.47		1.0
55. A FOBT is an appropriate test to…	.46		1.0
45. The risk of developing CRC is greater as…	.41		1.0
49. Bleeding from the rectum, blood in your stool…	.40		1.0
57. A Colonoscopy is an appropriate test to…	.39		1.0
48. Most colorectal cancers begin as a...	.29		1.0
46. Both men and women are at risk for…	.28		1.0
52. There is nothing anyone can do about…	.07		1.0
50. Symptoms such as bleeding from the rectum…	.04		1.0
42. CRC is the leading cause of cancer death…		.54	1.0
56. A Sigmoidoscopy is an appropriate test…		.50	1.0
51. You should see your doctor if you have…		.47	1.0
41. CRC is a cancer of the colon or rectum.		-.46	1.0
43. CRC is a disease that affects only older, white…		.32	1.0
60. Screening tests for CRC are not necessary for...		.27	1.0
53. CRC is usually fatal.		-.26	1.0
47. There are no known causes of CRC.		.25	1.0
61. Screening test for CRC are not covered…		-.04	1.0
Eigenvalues	2.36	1.63	
% of variance	11.25	7.78	TOTAL α
Chronbach's Alpha	.56	.13	.45

Note. No loadings omitted.
* Varimax Rotation
+ Item numbering corresponds to order in the survey

second factor accounted for 7.78%. Table 7 displays the items and factor loadings for the rotated two factors. The first and second factor had weak loadings (less than .30) for 8 of the items. Thus, these 8 items were removed in an attempt to improve the reliability and validity of the final *knowledge scale*. Without these items, and after rotation, the first factor accounted for 17.13% of the variance and the second factor accounted for 11.78%. Table 8 displays the items and factor loadings for the rotated factors for the final *knowledge scale*, with loadings less than .30 omitted to improve clarity.

We also assessed the underlying structure for the 16 items of the *attitudes scale*. Initially, 4 factors were obtained after rotation where the first factor accounted for 19.35% of the variance and the fourth factor accounted for 10.42% (see Table 9). Table 10 displays the items and factor loadings for the rotated factors, with loadings less than .50 omitted to improve clarity. Because we wished to have a single attitude variable for the multivariate analyses, we examined if a forced, one-factor solution was reasonable for these items. Upon analysis, we found the single factor accounted for 19.42% of the variance after rotation. After removing the 5 items with loadings < .30, the single factor accounted for 32.16% of the variance (see Table 11), with loadings less than .10 omitted to improve clarity. One more attempt to improve the scale's validity involved omitting the one item that loaded less than .40, *"Having CRCS will decrease my chances of dying from CRC"*. After removing this item, the first factor accounted for 34.83% of the variance after rotation (see Table 12). Table 12 displays the items and factor loadings for the rotated factors for the final *attitudes scale*, with loadings less than .10 omitted to improve clarity.

Table 8. Factor Loadings for the Rotated Factors for the Knowledge Scale – Forced-Factor Extraction (2 Factors Only)* after Deletion of Select Items

Items[+]	Factor Loading		
	1	2	Communality
58. Men and women should begin screening…	.68		1.0
44. CRC is the third most common cancer…	.55		1.0
59. African-American men should begin…	.61		1.0
54. There are several screening tests for CRC.	.47		1.0
57. A Colonoscopy is an appropriate test to…	.41		1.0
45. The risk of developing CRC is greater as…	.43		1.0
41. CRC is a cancer of the colon or rectum.	.37		1.0
49. Bleeding from the rectum, blood in your stool…	.33		1.0
42. CRC is the leading cause of cancer death…		.63	1.0
56. A Sigmoidoscopy is an appropriate test…		.53	1.0
51. You should see your doctor if you have…		.48	1.0
55. A FOBT is an appropriate test to…		.47	1.0
43. CRC is a disease that affects only older, white…		.39	1.0
Eigenvalues	2.22	1.53	
% of variance	17.13	11.78	TOTAL α
Chronbach's Alpha		.57 .38	.54

Note. Loadings < .30 are omitted.

* Varimax Rotation

[+] Item numbering corresponds to order in the survey

Table 9. Factor Loadings for the Rotated Factors for the Attitudes Scale*

Items+	Factor Loading					
	1	2	3	4		Communality
72. If CRC is found early though screening…	.82					.69
74. Having CRCS will decrease my chances…	.81					.72
73. Having CRCS is the best way to find a…	.80					.66
75. When I have CRCS, I am doing something…	.79					.62
71. Having CRCS will help me find CRC…	.69					.62
70. If I got CRC, my whole life would change.		.75				.62
66. My feelings about myself would change if…		.75				.58
68. My financial security would be endangered...		.69				.52
63. If I had CRC, my career/life would be over.		.58				.50
78. I am afraid to have CRCS because I don't…			.81			.70
76. CRCS is embarrassing to me.			.70			.51
77. I am afraid to find out there is something…			.63			.51
81. CRCS exams would be painful.			.54			.33
64. When I think of CRC my heart beats faster.				.68		.62
62. The thought of getting CRC scares me.				.67		.62
67. I am afraid to even think about CRC.				.62		.68
83. I have other problems more important…				-.50		.60
Eigenvalues	3.29	2.54	2.48	1.77		
% of variance	19.35	14.93	14.56	10.42		TOTAL α
Chronbach's Alpha		.85	.71	.67	.72	.79

Note. Loadings < .50 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 10. Factor Loadings for the Factors for the Attitudes Scale – Forced-Factor Extraction (1 Factor Solution)*

Items+	Factor Loading	
	1	Communality
70. If I got CRC, my whole life would change.	.60	.44
67. I am afraid to even think about CRC.	.65	.53
64. When I think of CRC my heart beats faster.	.58	.44
77. I am afraid to find out there is something…	.55	.36
62. The thought of getting CRC scares me.	.54	.41
66. My feelings about myself would change if…	.52	.37
68. My financial security would be endangered...	.52	.33
78. I am afraid to have CRCS because I don't…	.49	.49
63. If I had CRC, my career/life would be over.	.48	.36
76. CRCS is embarrassing to me.	.41	.31
81. CRCS exams would be painful.	.33	.20
74. Having CRCS will decrease my chances…	.30	.52
83. I have other problems more important…	.24	.26
73. Having CRCS is the best way to find a…	.24	.52
75. When I have CRCS, I am doing something…	.21	.49
71. Having CRCS will help me find CRC…	.17	.54
72. If CRC is found early though screening…	.16	.60
Eigenvalues	3.30	
% of variance	19.42	TOTAL α
Chronbach's Alpha	.79	.79

Note. Loadings < .10 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 11. Factor Loadings for the Factors for the Attitudes Scale – Forced-Factor Extraction (1 Factor Solution)* after Deletion of Select Items

Items[+]	Factor Loading	
	1	Communality
67. I am afraid to even think about CRC.	.74	.55
70. If I got CRC, my whole life would change.	.64	.41
64. When I think of CRC my heart beats faster.	.63	.40
77. I am afraid to find out there is something…	.61	.37
63. If I had CRC, my career/life would be over.	.60	.36
78. I am afraid to have CRCS because I don't…	.59	.35
66. My feelings about myself would change if…	.59	.35
68. My financial security would be endangered...	.58	.34
62. The thought of getting CRC scares me.	.55	.30
76. CRCS is embarrassing to me.	.49	.24
81. CRCS exams would be painful.	.40	.16
74. Having CRCS will decrease my chances…	.19	.03
Eigenvalues	3.86	
% of variance	32.16	TOTAL α
Chronbach's Alpha	.80	.80

Note. Loadings < .10 are omitted.

* Varimax Rotation

[+] Item numbering corresponds to order in the survey

Table 12. Factor Loadings for the Factors for the Attitudes Scale – Forced-Factor Extraction (1 Factor Solution)* after Deletion of Select Items

Items[+]	Factor Loading	
	1	Communality
67. I am afraid to even think about CRC.	.75	.56
64. When I think of CRC my heart beats faster.	.64	.41
70. If I got CRC, my whole life would change.	.63	.40
77. I am afraid to find out there is something…	.61	.37
63. If I had CRC, my career/life would be over.	.61	.37
78. I am afraid to have CRCS because I don't…	.59	.35
66. My feelings about myself would change if…	.59	.35
68. My financial security would be endangered...	.58	.34
62. The thought of getting CRC scares me.	.54	.29
76. CRCS is embarrassing to me.	.48	.23
81. CRCS exams would be painful.	.40	.16
Eigenvalues	3.83	
% of variance	34.83	TOTAL α
Chronbach's Alpha	.81	.81

Note. Loadings < .40 are omitted.

* Varimax Rotation

[+] Item numbering corresponds to order in the survey

Principal component analysis with Varimax rotation also was conducted to assess the underlying structure for the 10 items of the *perceived subjective norms scale*. Because preliminary analyses indicated the possibility of a three-factor model, we forced the analyses into three factors. Three factors were obtained after rotation where the first factor accounted for 25.68% of the variance and the third factor accounted for 20.96%. Table 13 displays the items and factor loadings for the rotated factors, with loadings less than .60 omitted to improve clarity. To confirm this was the best decision before moving forward with multivariate analyses, we examined if a forced, one-factor solution was reasonable for these items. In the forced extraction, after rotation, the first factor accounted for 46.4% of the variance. Table 14 displays the items and factor loadings for this single factor in the final *perceived subjective norms scale*, with loadings < .60 omitted to improve clarity.

Finally, we assessed the underlying structure for the 4 items of the *perceived barriers scale*. The analysis yielded a structure of a single factor, accounting for 56.12% of the variance. Table 15 displays the items and factor loadings, with loadings less than .30 omitted to improve clarity.

Male Role Norms

Male role norms were measured by 21 items, with responses options on a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). For descriptive analysis purposes, the level of agreement or disagreement was determined by combining those who responded strongly agree with those who responded agree, and similarly for those

Table 13. Factor Loadings for the Rotated Factors for the Perceived Subjective Norms Scale – Forced-Factor Extraction (3 Factor Solution)*

Items+	Factor Loading			
	1	2	3	Communality
91. My siblings believe CRCS is an appropriate…	.86			.84
93. My close friend believes CRCS is an…	.83			.73
89. My "significant other" believes CRCS is…	.78			.70
94. It is important for me to comply…close...		.86		.82
92. It is important for me to comply…siblings…		.84		.81
90. It is important for me to comply…"significant…		.69		.64
88. It is important for me to do what my parents…			.61	.68
85. The important people in my life believe CRCS…			.81	.70
86. It important for me to do what important…			.78	.71
87. My parents believe CRCS is an appropriate…			.66	.51
Eigenvalues	2.57	2.57	2.10	
% of variance	25.68	25.65	20.96	TOTAL α
Chronbach's Alpha	.84	.85	.74	.87

Note. Loadings < .60 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 14. Factor Loadings for the Factors for the Perceived Subjective Norms Scale – Forced-Factor Extraction (1 Factor Solution)*

Items+	Factor Loading	
	1	Communality
92. It is important for me to comply…siblings…	.78	.60
91. My siblings believe CRCS is an appropriate…	.77	.60
94. It is important for me to comply…close...	.76	.58
90. It is important for me to comply…"significant…	.72	.51
89. My "significant other" believes CRCS is…	.70	.70
87. My parents believe CRCS is an appropriate…	.68	.46
88. It is important for me to do what my parents…	.62	.38
86. It important for me to do what important…	.59	.35
85. The important people in my life believe CRCS…	.49	.24
Eigenvalues	4.64	
% of variance	46.40	TOTAL α
Chronbach's Alpha	.87	.87

Note. Loadings < .40 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

Table 15. Factor Loadings for the Factors for the Perceived Barriers Scale*

Items+	Factor Loading	
	1	Communality
79. I don't know how to go about scheduling…	.35	.60
82. Having CRCS would expose me to too…	.35	.62
84. Having CRCS costs too much money.	.33	.55
80. Having CRCS could take too much time.	.31	.48
Eigenvalues	2.25	
% of variance	56.12	TOTAL α
Chronbach's Alpha	.73	.73

Note. Loadings < .30 are omitted.

* Varimax Rotation

+ Item numbering corresponds to order in the survey

who disagreed and strongly disagreed. The statement with the highest percentage of participants agreeing/strongly agreeing was *when the going gets tough, men should get going* (50%) followed by 46% who agreed/strongly agreed *men should have home improvement skills.* Conversely, the highest percentage of disagreement/strong disagreement was for the statement *a man should never admit when others hurt his feelings* (79%) followed by 74% who disagreed/strongly disagreed *the President of the U.S. should always be a man* (see Table 16).

The mean scores for the sample (n = 143) on the Male Role Norms section of the survey ranged from 1.97 to 5.10 for each question. The sample had a total mean score of 3.33 (SD = 1.00; [see Table 16]) for all of the questions. This indicates the men, on average, slightly *disagreed* with endorsing a traditional masculinity ideology. Forty-one percent of the participants scored below the group's mean score meaning they disagreed/strongly disagreed with male role norm items.

CRC and Screening Knowledge

The knowledge items were initially assessed by 21 true/false statements associated with CRC and CRCS knowledge. After exploratory factor analysis, 8 items were removed to improve the reliability and validity of the final *knowledge scale*. The statement with the highest percentage of participants responding correctly was *CRC is a disease that affects only older, white men* (99% - false statement) followed by *CRC is a cancer of the colon or rectum* (98% - true statement), *bleeding from the rectum, blood in your stool, or blood in the toilet after a bowel movement may be symptoms of CRC* (98%

TABLE 16. Male Role Norms, Attitudes, and Perceptions Associated with CRCS

Construct Items[+]	(%) Strongly Disagree	(%) Disagree	(%) Neither Agree/Disagree	(%) Agree	(%) Strongly Agree
Male Role Norms* (*M* = 3.33, *SD* = 1.00)					
29. Boys should prefer to play with trucks…	8.9	10.8	14.0	21.7	21.0
20. Homosexuals should never marry.	28.7	17.2	22.9	6.4	17.2
32. Homosexuals should never kiss in…	24.2	26.1	22.3	6.4	9.6
27. A man should prefer watching action…	19.1	23.6	26.1	8.9	3.2
23. Men should watch football games…	27.4	17.2	23.6	11.5	4.5
24. All homosexual bars should be…	40.8	29.9	17.2	1.9	5.7
22. Men should be the leader in any…	40.1	33.8	8.9	1.3	4.5
21. The President of the U.S. should…	50.3	23.6	7.6	3.2	7.0
31. A man should always be the boss.	40.8	33.1	9.6	2.5	1.3
25. Men should have home improvement…	7.0	6.4	7.6	21.7	24.2
26. Men should be able to fix most things…	7.0	7.6	10.2	18.5	14.6
33. A man should know how to repair his…	10.8	14.0	7.0	14.0	3.2
34. A man should never admit when…	38.9	40.1	4.5	1.3	0.6
35. Men should be detached in emotionally...	35.7	33.8	6.4	1.3	1.9
40. Men should not be too quick to tell others…	26.8	38.2	8.3	1.3	1.9
28. Men should always like to have sex.	15.3	19.7	23.6	8.9	11.5
30. A man should not turn down sex.	33.8	22.3	17.8	2.5	2.5
37. A man should always be ready for sex.	15.3	24.8	19.7	9.6	4.5
36. It is important for a man to take risk, even…	11.5	13.4	10.2	16.6	8.3
38. When the going gets tough, men should get…	4.5	9.6	7.6	27.4	22.9
39. I think a young man should try to be physically…	8.3	12.1	14.0	19.7	12.1
Attitudes (*M* = 2.81, *SD* = .435)					
67. I am afraid to even think about CRC.	17.8	41.4	19.1	15.9	5.1
70. If I got CRC, my whole life would change.	5.1	22.3	13.4	43.3	15.9
64. When I think of CRC my heart beats faster.	14.6	35.0	26.8	19.7	3.8
77. I am afraid to find out there is something…	15.3	35.7	7.6	35.0	5.7
63. If I had CRC, my career/life would be over.	24.8	49.0	19.1	5.1	1.3
78. I am afraid to have CRCS because I don't…	21.0	40.8	16.6	17.8	3.2
66. My feelings about myself would change if…	19.7	30.6	15.3	29.3	5.1
68. My financial security would be endangered...	8.3	26.8	17.9	33.8	12.7
62. The thought of getting CRC scares me.	3.8	9.6	15.3	48.4	22.9
76. CRCS is embarrassing to me.	25.5	36.9	17.2	16.6	3.2
81. CRCS exams would be painful.	10.2	15.9	43.3	22.3	6.4
74. Having CRCS will decrease my chances…	3.2	2.5	10.2	38.2	44.6

TABLE 16 Continued.

Construct Items[+]	(%) Strongly Disagre	(%) Disagre e	(%) Neither Agree/Disagree	(%) Agree	(%) Strongly Agree
Perceived Subjective Norms (*M* = 3.45, *SD* = .637)					
92. It is important for me to comply…siblings…	4.5	15.9	42.7	26.3	6.4
91. My siblings believe CRCS is an appropriate…	3.2	3.8	54.1	26.1	10.8
94. It is important for me to comply…close...	5.1	14.6	43.3	29.9	5.1
90. It is important for me to comply…"significant…	3.8	6.4	32.5	42.0	12.1
89. My "significant other" believes CRCS is…	2.5	1.3	47.8	29.9	16.6
87. My parents believe CRCS is an appropriate…	1.9	6.4	42.7	32.5	15.9
86. It is important for me to do what my parents…	5.1	10.2	27.4	42.7	13.4
88. It important for me to do what important…	5.7	13.4	19.1	42.7	17.8
85. The important people in my life believe CRCS…	3.8	5.7	33.8	35.7	20.4
Perceived Barriers (*M* = 2.47, *SD* = .719)					
79. I don't know how to go about scheduling…	17.8	35.0	8.3	32.1	6.4
82. Having CRCS would expose me to too…	19.7	49.0	24.8	4.5	1.3
84. Having CRCS costs too much money.	11.5	26.1	46.5	11.5	3.2
80. Having CRCS could take too much time.	19.7	49.0	24.8	4.5	1.3

[+] Item numbering corresponds to order in the survey

***** *Neither Agree/Disagree* is equivalent to *No Opinion*

- true statement), *the risk of developing CRC is greater as a person gets older* (94% - true statement), *CRC is the leading cause of cancer death in the* U.S. (89% - false statement), *most colorectal cancers begin as a growth in the colon or rectum* (89% - true), *CRC is the third most common cancer in African Americans* (83% - true statement), and *African-American men should begin screening for CRC at age 45* (76% - true statement). Conversely, the highest percentage of incorrect response was for the statement *men and women should begin screening for CRC soon after turning 50 years of age* (39% - true statement) followed by *a sigmoidoscopy is an appropriate test to screen for CRC* (33% - true statement). The distribution of correct answers to each of the items in the *knowledge scale* is presented in Table 16.

Although 3 different screening tests are recommended for CRC, participants differed in agreeing that a Colonoscopy (89%), FOBT (85%), and Sigmoidoscopy (67%) are appropriate for testing. Ninety-eight percent of the participants responded correctly to the true statement *bleeding from the rectum, blood in your stool, or blood in the toilet after a bowel movement may be symptoms of CRC*.

The scores for the total sample on the CRC and Screening Knowledge section of the survey ranged from 6 to 13 with a mean score of 11.02 (SD = 1.65; [Table 17]). In order to receive a passing score, participants were expected to answer 11 out of 13 questions correctly (85%). Sixty-seven percent of the study sample received a passing score (n = 105), of which 22% received a perfect score of 100% (n = 34).

Before determining the relationship between education and CRC-and-screening-knowledge (as proposed in the theory section), the seven education categories in the

Table 17. Colorectal Cancer Knowledge Scale Scores*

Range	6-13
Mean score	11.02
Standard deviation	1.65
CRC Knowledge Scale Item[+]	Percentage Correct
58. Men and women should begin screening…	61
44. CRC is the third most common cancer…	83
59. African-American men should begin…	76
54. There are several screening tests for CRC.	89
57. A Colonoscopy is an appropriate test to…	89
45. The risk of developing CRC is greater as…	94
41. CRC is a cancer of the colon or rectum.	98
49. Bleeding from the rectum, blood in your stool…	98
42. CRC is the leading cause of cancer death…	89
56. A Sigmoidoscopy is an appropriate test…	67
51. You should see your doctor if you have…	73
55. A FOBT is an appropriate test to…	85
43. CRC is a disease that affects only older, white…	99

[+] Item numbering corresponds to order in the survey
CRC, colorectal cancer
CRCS, colorectal cancer screening

survey instrument were combined into three levels: *low* (partial high school, GED or equivalent, and high school diploma), *medium* (partial college and two year college/associate degree), and *high* (Bachelor's degree and Master's/Advanced degree). A one-way ANOVA showed no significant differences in the mean CRC and CRCS knowledge scores among the low (M = 11.71, SD = 1.11), medium (M = 10.85, SD = 1.49), and high (M = 11.02, SD = 1.71) education groups, F (2, 154) = 0.750, p = 0.474. In short, there was no significant difference in the knowledge scores among the three educational levels in our sample.

Attitudes towards CRC and CRCS

The attitudes towards CRC and CRCS were initially measured by the responses to 7 items covering CRC severity, 5 items addressing screening benefits, and 5 items covering screening barriers from the Beliefs and Values about CRC and EDS section of the survey (see table on p. 73). After exploratory factor analysis, 5 items (i.e., 4 items addressing screening benefits and 1 item addressing screening barriers) were removed to improve the reliability and validity of the final *attitudes scale*. These items were on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). For descriptive analysis purposes, the level of agreement or disagreement was determined by combining those who responded strongly agree with those who responded agree, and similarly for those who disagreed and strongly disagreed. Regarding CRC severity, 71% agreed/strongly agreed *the thought of getting colorectal cancer scares me;* and 59% agreed/strongly agreed *if I got colorectal cancer, my whole life would change*. Conversely, 74% disagreed/strongly disagreed with the statement *if I had colorectal cancer, my career/life would be over* (see table on p. 73). Furthermore, a large segment believed screening can decrease mortality: 83% agreed/strongly agreed that *having colorectal cancer screening will decrease my chances of dying from colorectal cancer* (See table on p. 73).

Of the four items that measured perceptions of screening barriers, the highest percentage of *disagreement* were responses to *colorectal cancer screening is embarrassing to me* (62%). Forty-one percent admitted being *afraid to find out there is something wrong when I have colorectal cancer screening*, and 21% were *afraid to have*

colorectal cancer screening because I don't understand what will be done (see table on p. 73).

The mean score for the total sample (n = 149) on the Attitudes towards CRCS section of the survey ranged from 1 to 4.75 for each question with a total mean score of 2.91 (SD = .617) for the composite scale. Fifty-one percent of the participants scored above the group's mean score, indicating the sample was equally split in terms of positive and negative attitudes.

Many private insurance plans as well as Medicare Part B (medical insurance) cover several types of early detection screening (EDS) tests for CRC (Centers for Medicare & Medicaid Services., n.d.; National Center for Chronic Disease Prevention and Health Promotion, 2013). Thus, I wanted to explore whether attitudes towards EDS test for CRC varied according to this important factor (health insurance). A one-way ANOVA was run and no statistically significant differences in the mean attitude toward CRCS scores among those without health insurance and those with health insurance were found, F (1, 147) = 0.612, p = 0.435. The table on p. 73 shows that the mean attitude score was 2.81 (SD = 0.71) for participants without health insurance, and 2.93 for those with health insurance (SD = 0.60).

Perceived Subjective Norms

Perceived subjective norms were measured by 10 items from the Beliefs and Values about CRC and EDS section. These items were on a 5-point Likert-type scale (1 = strongly agree, 5 = strongly agree). For descriptive analysis purposes, the level of

agreement or disagreement was determined by combining those who responded strongly agree with those who responded agree, and similarly for those who disagreed and strongly disagreed. The highest percentages of agreement/strong agreement with the items measuring perceived subjective norms were responses for *the important people in my life believe colorectal cancer screening can help prevent colorectal cancer* (56%) and *it is important for me to do what important people in my life think is appropriate* (61%). The item, *it is important for me to comply with what my "significant other" believes in*, exhibited the lowest proportion of agreement/strong agreement (54%) (see table on p. 74).

The mean scores for the sample (n = 149) on the Perceived Subjective Norms section of the survey ranged from 3.16 to 3.64 for each question with a total mean score of 3.45 (SD = .637; [see table on p. 73]) for the composite scale - meaning, overall, the men in our sample were rather ambivalent regarding subjective norms. Specifically, forty-nine percent of the participants scored below the group's mean score, indicating that, similar to the attitudes, the sample was split between weaker and stronger perceptions of subjective norms.

Perceived Barriers

Perceived barriers were measured by the responses to 4 items on screening barriers from the Beliefs and Values about CRC and EDS section of the survey. The 4 items on screening barriers were on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). For analysis purposes, the level of agreement or disagreement was

determined by combining those who responded strongly agree with those who responded agree, and similarly for those who disagreed and strongly disagreed. Of these items that measured perceived subjective norms, more than 50% of the sample disagreed with 3 of the statements. The highest percentages of disagreement/strong disagreement to the items measuring perceived barriers were responses to *having colorectal screening could take too much time* (69%) and *having colorectal screening would expose me to too much radiation* (54%) (see table on p. 74).

The mean scores for the sample (n = 153) on the Perceived Barriers section of the survey ranged from 2.17 to 2.74 for each question with a total mean score of 2.47 (SD = .719; [see table on p. 74]) for the composite variable. Fifty-five percent of the participants scored above the group's mean score, indicating the majority of participants had a strong awareness of potential barriers to CRCS.

Factors Shaping Attitudes toward CRC and CRCS

To examine the relationships among male role norms, knowledge, perceived subjective norms, perceived barriers and attitudes, while controlling for various demographic characteristics of the sample, a series of multiple regression models were run with attitudes as the predicted variable. Table 18 presents these models, and allows for comparisons among predictors for each model. There was no issue of multicollinearity for all models tested as none of the variance inflation factors (VIF) associated with the predictor variable was greater than 10. The assumption of homoscedasticity and linearity seemed not to be violated for any of the models tested as

the scatterplot of the regression standardized residuals and the regression standardized predicted values were evenly scattered around zero, while the normal P-P plot of the regression standardized residual for the dependent variable seemed fairly linear, respectively.

Model 1A

A multiple linear regression was calculated predicting participants attitudes based on their socioeconomic status (SES). In our study, SES refers to the following demographic variables: age, current state of residence according to the four Census Bureau-designated areas (i.e., Northeast, Midwest, South, West), marital status, sexual orientation, education level, health insurance, household income per year, religiosity, and work status.

The regression equation was not significant (F (17, 109) = 1.068, p = 0.394) with an R^2 of .143. None of the variables examined predict participants' attitudes toward CRCS (see Table 18).

Model 1B

This model examined participants' attitudes in relationship to their family history of cancer, and no other covariates. This time, the set of predictors, as whole, significantly predicted attitudes, F (4, 144) = 2.633, p = 0.037, with an R^2 of .068. In the analysis, family history of cancer consisted of four variables coded as SureCancer (participants have a family history of cancer), UnsureCancer (participants are unsure of

their family history of cancer), SureCRC (participants have a family history of CRC), and UnsureCRC (participants are unsure of their family history of CRC). No family history of cancer and CRC were the reference groups. Family history of cancer was significantly associated with attitudes toward screening for CRC, in this sample. Compared to those that do not have a family history of cancer, those that were *unsure* of their family history of cancer had a significantly better attitude toward screening for CRC, keeping all other covariates constant (β = .286, p = .005; see Table 18).

Model 1C

In this model, we controlled for participants' SES, when examining the relationship between family history of cancer and attitudes. With the covariates, the regression equation, overall, was not significant (F (21, 105) = 1.437, p = 0.118) with an R^2 of .223. Yet, family history of cancer maintained its significant relationship with attitudes. Compared to those that do not have a family history of cancer, those that were *unsure* of their family history of cancer had a significantly better attitude toward screening for CRC, keeping all other covariates constant (β = .351, p = .003; see Table 18).

Model 2

In this model, we examined the relationship of male role norms with attitudes, using the 6 factors in the *male role norms scale* as separate predictors in the equation, along with SES and family history of cancer. The regression equation was not significant (F (27,

90) = 1.092, $p = 0.367$) with an R^2 of .247. Yet, family history of cancer and work status maintained their significant association with attitudes toward screening for CRC. Compared to those that do not have a family history of cancer, those that were *unsure* of their family history of cancer had a significantly better attitude toward screening for CRC, keeping all other covariates constant ($\beta = .281$, $p = .030$). Compared to those that work, those that do not work had a significantly *worse* attitude toward screening for CRC, keeping all other covariates constant ($\beta = -.235$, p = .037; see Table 18) [1].

Model 3

This model assessed whether attitudes toward CRC and CRCS were related to SES, family history of cancer, *male role norms* broken down as 6 factors, and knowledge with forced-factor extraction (2 factors only). The regression equation was not significant (F (29, 83) = 1.068, $p = 0.396$) with an R^2 of .272. Yet, family history of cancer continued to significantly predict attitudes toward screening for colorectal cancer. Compared to those that do not have a family history of cancer, those that were *unsure* of their family history of cancer had a significantly better attitude toward screening for CRC, keeping all other covariates constant ($\beta = .281$, $p = .033$; see Table 18).

Model 4

In this model, the variable *male role norms* was removed and the equation estimated participants' attitudes based on their SES, family history of cancer, and

[1] I ran two additional models, removing work status and health insurance, and the outcomes were no different than the one in Model 2.

knowledge with forced-factor extraction (2 factors only). Once again, the regression equation was not significant (F (23, 97) = 1.300, p = 0.188) with an R^2 of .236. Yet, family history of cancer maintained its role as significant predictor of attitudes toward screening for colorectal cancer. Compared to those that do not have a family history of cancer, those that were *unsure* of their family history of cancer had a significantly better attitude toward screening for CRC, keeping all other covariates constant (β = .342, p = .005; see Table 18).

Model 5

In this model, we examined the role of perceived subjective norms (with forced-factor extraction-1 factor only), added to the prediction equation, along with SES, family history of cancer, and male role norms broken down as 6 factors. The regression equation was not significant (F (28, 85) = 1.156, p = 0.300) with an R^2 of .276. In this model, family history of cancer lost its significant association with attitudes, and none of the other variables predict participants' attitudes toward CRCS. This suggests that perceived subjective norms "overrides" the strength of family history variable, but does not have an association with attitudes that is greater than zero (see Table 18)[2].

[2] Additional analyses indicated the male role norms (MRN) variable could be construed as a single-factor variable (with a Chronbach's alpha of .90), therefore I ran an additional model using the single-factor MRN variable. Yet, findings remained the same.

Model 6

This model examined the role that *perceived barriers* might play in participants' attitudes. A multiple linear regression was calculated to predict participants' attitudes based on their SES, family history of cancer, male role norms broken down as 6 factors, and perceived barriers. This time, the set of predictors, as whole, significantly predicted attitudes, F (28, 89) = 2.278, p = 0.002, with a modest effect size (R^2 = .417). Specifically, participants' perceptions of barriers toward CRCS and their work status significantly predicted attitudes. Stronger perceptions of barriers (i.e., agreeing/strongly agreeing there are several barriers to screening) was significantly associated with more negative attitudes toward screening (β = .505, p = .000). To recall, negative attitudes were represented by higher scores on the attitudes scale. Compared to those that work, those that do not work had a significantly *worse* attitude toward screening for CRC, keeping all other covariates constant (β = -.245, p = .014; see Table18).

Discussion

The average participant in our study's sample is a 30 year-old African American adult, with $35,000-$49,999 in household income per year, single, and living in the Southern region of the U.S. He has health insurance, is employed (working part- or full-time), and has obtained a Bachelor's degree. Never diagnosed with CRC, he enjoys a "passing knowledge" of the illness and of CRCS, and does not have extremely positive or negative attitudes towards male role norms and perceived subjective norms. He

Table 18. Standardized Beta Coefficients for Predictors of *Attitudes toward Colorectal Cancer Screening,* According to Regression Models

Predictors	Model 1A Adj. R^2=.143 β	Model 1B* Adj. R^2=.068 β	Model 1C* Adj. R^2=.223 β	Model 2 Adj. R^2=.247 β	Model 3 Adj. R^2=.272 β
SES					
Age	-1.27		-.161	-.177	-.189
NE Region	.103		.105	.087	.068
MW Region	.042		.050	.069	.054
W Region	.089		.084	.070	.066
Gay Orientation	-.173		-.157	-.145	-.122
Struggling Orient.	-.235		-.114	-.095	-.090
Married	-.065		-.012	-.016	.012
Separated	-.033		.116	.127	.103
Med. Education	.123		-.112	-.129	-.042
Adv. Education	-.065		-.028	-.084	-.048
Low Income	-.033		-.040	-.079	-.060
Middle Income	.123		.092	.026	.026
Work Status	-.172		-.191	**-.235***	-.238
Health Insurance	.165		.166	.104	.120
Prac. Christian	-.199		-.155	-.029	-.031
Prac. Other	-.066		-.018	.005	-.019
Nominal Other	-.111		-.116	-.067	-.052
Family History					
SureCancer		.152	.128	.115	.096
UnsureCancer		**.286****	**.351****	**.281***	.281*
SureCRC		-.453	-.012	-.040	-.057
UnsureCRC		-.194	-.465	.012	.029
Male Role Norms					
Negative Femininity				-.012	-.022
Male Dominance				-.213	-.228
Self-Reliance…				.111	.125
Restrictive Emotion.				.159	.185
Importance of Sex				.165	.152
Toughness				-.149	-.109

Table 18 Continued.

Predictors	Model 3 Adj. R^2=.272 β	Model 4 Adj. R^2=..236 β	Model 5 Adj. R^2=..276 β	Model 6** Adj. R^2=.417 β
Knowledge				
Knowledge_1	.064	.019		
Knowledge_2	-.003	.001		
Subjective Norms			.213	**.505*** **
Perceived Barriers				
SES				
Age		-.187	-.097	-.063
NE Region		.100	.073	.088
MW Region		.032	.063	-.011
W Region		.075	.050	.098
Gay Orientation		-.150	-.143	-.151
Struggling Orient.		-.122	-.069	-.081
Married		.000	-.045	-.069
Separated		.086	.104	0.84
Med. Education		-.051	-.068	-.129
Adv. Education		-.014	-.042	-.129
Low Income		-.021	-.092	-.198
Middle Income		.081	.033	-.034
Work Status		-.201	-.165	**-.245***
Health Insurance		.192	.051	.138
Prac. Christian		-.158	-.094	-.019
Prac. Other		-.025	-.037	-.075
Nominal Other		-.100	-.086	-.021
Family History				
SureCancer		.105		
UnsureCancer		**.342****		
SureCRC		-.005		
UnsureCRC		-.029		
Male Role Norms				
Negative Femininity			.015	.004
Male Dominance			-.252	-.188

Table 18 Continued.

	Model 5 Adj. R^2=.272	Model 6 Adj. R^2=..236
Predictors	β	β
Male Role Norms		
Self-Reliance…	.073	.028
Restrictive Emotion.	.165	.070
Importance of Sex	.151	.139
Toughness	-.147	-.154

NOTE: * p <.05; ** p <.01; ***p <.001. Only statistically significant predictors are shown.

perceives many barriers to getting screened for CRC, and these perceptions are associated with more negative attitudes towards screening.

In designing this study, we had anticipated that this average participant's beliefs regarding norms of masculinity would be critical for shaping his attitudes toward CRC and CRCS. Contrary to expectations, however, scores on the male role norms scale were not associated with scores for attitudes toward CRC and CRCS, when controlling for several covariates. This finding suggests that male role norms may influence CRCS through different mechanisms or pathways, rather than through shaping attitudes toward CRC/CRCS, directly.

The constructions of masculinity and their influence on men's well-being are of the utmost importance, yet research that studies how male role norms shape young adult African-American men's attitudes toward CRCS is conspicuously absent. Courtenay (2000) explored how such factors as social context, educational level, economic status, sexual orientation, and ethnicity influence men's construal of masculinity and contribute to differential health risks among men in the U.S. He argued that "some men do defy social prescriptions of masculinity and adopt health behaviors, such as getting annual physicals and eating healthy foods. But although these men are constructing a form of masculinity, it is not among the dominant forms adopted by most men" (Courtenay, 2000, p. 1397). Griffith et al. (2012) strongly agree, and add that "masculinity, whether operationalized as a singular or plural term, plays a critical role in the health of men of color" (p. S192). Specifically, future research associated with masculinity ideologies

should examine male role norms' direct effects on intention to screen for CRC and screening behaviors, and/or other theoretically plausible mechanisms of influence.

Absence of a relationship between male role norms and attitudes in our sample could be explained by measurement error, but tests of the validity and reliability of the male role norms scale indicated the data were of adequate quality. Yet, it is important to note that, along with this intriguing finding, the problems associated with our missing data may suggest the need to assess the male role norms scale, more carefully. While the scale has been recently tested by other researchers (Levant et al., 2013), in our study we determined that a number of participants chose to withdraw after reaching the male role norms questions associated with *Negativity toward Sexual Minorities*. Anecdotally, friends of certain participants commented on how they (the participants) were offended by the *Negativity toward Sexual Minorities* items. This reaction can be telling, and deserves more attention in future studies, as it could lead to biased samples and biased measures.

CRC and Screening Knowledge

Our average participant's knowledge score was better than the mean knowledge scores for African-American men (>50 years of age) sampled in the descriptive correlational study conducted by Green and Kelly (2004), indicating that younger men in our study might be more knowledgeable about CRC. While we found no age differences related to knowledge among our sample, other studies have found variations. For instance, "Ford, Coups, and Hay (2006) who examined CRCS knowledge and potential

covariates (e.g., health care, cancer information seeking) among over 3,000 adults (>45 years of age) from the 2003 Health Information National Trends Survey (HINTS 2003), found that those who were ages 45-49 or over 70 were less likely to have adequate screening knowledge. According to Ford et al., this difference by age not only calls attention to the significant increase in CRCS knowledge at age 50, but also may indicate that providers are recommending CRCS at this age, exclusively" (see Chapter 2).

Despite intensive promotion of screening after 50, our younger participants may be progressively developing a perception of risk for CRC, and may, therefore, be increasingly interested in learning about the illness and its prevention, much like their older counterparts. Seventy-six percent of participants in our study answered correctly the knowledge item, *African-American men should begin screening for colorectal cancer at age 45* (true statement), may suggest these younger men might be hearing messages regarding earlier screenings.

Even though the knowledge items in this study performed adequately – the original Cronbach's alpha was .45, and after removal of eight items, improved to 0.54 – better measures of knowledge are still needed to develop interventions that do address knowledge as a factor in CRCS (Menon et al., 2003; Powe et al., 2006). Nonetheless, as indicated in this study (and in our systematic literature review – see Chapter 2), prevention efforts focusing solely on knowledge might be less-than-useful, given the absence of a direct relationship between knowledge and attitudes toward CRC and CRCs.

Attitudes towards CRC and CRCS

When designing this study, my informal hypothesis was that participants would espouse negative attitudes towards screening for CRC. I also informally hypothesized that male role norms would significantly influence participants' attitudes regarding CRCS. Although we did find the sample held more negative attitudes toward CRC and CRCS, rather than positive, male role norms had no association with attitudes.

Instead, we observed an interesting interplay between family history and perceived subjective norms: the latter, overriding the former, yet still not predicting attitudes in a statistically significant way. We believe this phenomenon provides clues for future program development: something seems to be "going on" related to both family history and perceived subjective norms – something our sample was not able to capture entirely, but other studies might explore. For program planning purposes, subjective norms and family history variables might offer better "starting-points" than other factors commonly targeted in prevention programs (e.g., male role norms and knowledge) for shaping young African-American men's 'attitudes toward CRC and CRCS. In this study, the models did not provide a clear-cut picture, but their behavior suggests the potential salience of these variables. Future research would do well to explore these relationships we encountered, even further.

Ultimately, *family history of cancer*, *work status*, and *perceived barriers* were the critical factors associated with attitudes in all of our models/analyses. Of these, perceived barriers are the only factors amenable to change through health education efforts.

Regarding perceived barriers, the findings of our study were similar to the internal and external barriers commonly reported in other studies (where the minimum age to participate was age 50), such as: pain, fear of cancer diagnosis, embarrassment, cost of screening tests, cost of treatment if diagnosed with CRC, never recommended by primary physician and/or health care provider (James et al., 2002; Stacy, Torrence, & Mitchell; 2008). For instance, James and colleagues (2002) investigated perceived barriers and benefits to CRCS among 850 African-American adults participating in a church-based health promotion program in rural northern North Carolina. Among this over-50 sample, participants "with a stronger perception of barriers were less likely to report a recent FOBT, but that higher perceived benefits did not significantly affect FOBT rates. A similar pattern for perceived barriers emerged with sigmoidoscopy, in which higher scores on perceived barriers were associated with lower rates of recent sigmoidoscopy" (p. 532).

More than half of our participants agreed/strongly agreed that *the thought of getting CRC scares me* and *if I got CRC, my whole life would change*. Forty-one percent admitted being *afraid to find out there is something wrong when I have CRCS*, and 21% were *afraid to have CRCS because I don't understand what will be done*.

Fear and anxiety have been well documented in the literature as a barrier to CRCS among African-Americans (see Chapter 2). Specifically, fear of medical procedures and fear of receiving a morbid diagnosis were cited as significant barriers to seeking medical care among the young men in a study by Ravenell, Whitaker, and Johnson (2008). These researchers sought to elicit barriers to primary healthcare use and

health among seventy-one African-American men (ages 16-75 years) residing in a low-income neighborhood in Chicago, IL. Moreover, in a recent study by Sly and colleagues (2013), researchers attempted to better understand why sixteen African-American men and women participating in a patient navigation intervention did not complete a colonoscopy. The interviews revealed that most participants "were afraid or anxious about the procedure itself and not knowing what to expect during the exam. A man stated; 'I just have some pent up fears about it. You know, people digging all in you and stuff'" (Sly et al., 2013, p. 453).

In a study by Good and colleagues (2010), fear, dislike, and apprehension accounted for nearly 50% of the reasons given by 179 study participants in Virginia, for not seeking CRCS. While this finding was not unexpected, the researchers argued how these feelings may have a historic background tied to the medical mistrust among African Americans that has been warranted by the legacy of previous medical research abuses, such as the Tuskegee Syphilis Study. The deception associated with the Tuskegee study in which 400 African American men were denied treatment for syphilis, as well as concerns about being treated as a 'guinea pig',' frequently emerge in studies of African Americans' attitudes toward any form of medical research (Corbie-Smith et al., 1999; Thomas & Quinn, 1991). Thus, research that strives to diminish this underlying issue of mistrust and fear must be addressed in order to improve the attitudes of young adult African-American men towards future research associated with CRCS.

That a couple of contextual variables emerged as strong, independent predictors of attitudes in most of the models – family history of cancer and work status – suggests

to health educators the need to consider CRC and CRCS attitudes from an ecological perspective, where contextual variables such as employment and uncertainty about family history of illnesses play, perhaps, a more salient role than individuals' knowledge and attitudes.

As health educators, we do not have the power to change work status, or clients' family history of cancer, but we *can* strive to promote the use of family health history tools (Chen et al., 2013; Goodson et al., 2013) and assure that those men who are "unsure" of their family cancer history become more informed of steps to prevent CRC and other chronic diseases.

In terms of perceived barriers (e.g., fear, embarrassment, patient-provider communication), health educators, alone, cannot eliminate these barriers, yet they can become team players in partnerships among community-based organizations, public health professionals, transdisciplinary research teams, and policymakers:

> "When [these collaboration efforts] work well, we engage in research to answer questions of importance. Most important, well-crafted research in health education puts us in a position to act prospectively rather than reactively to health needs. It also allows us to act in an informed manner" (Gold & Atkinson, 2001, p. 302).

Health educators can – and should – contribute significantly to systemic changes that reverse the saddening reality of African-American men, whose "health […] is the worst of any demographic group in the United States." (Troutman & Marshall, 2013, p. 331).

Limitations

There were several limitations to this study. Some selection bias may have been present as only those who had access to computers or were willing to fill out the on-line questionnaire were included. Recruitment strategies inhibited random sampling and any attempts at generalizing to a larger population.

Another limitation of this survey relates to its focus on evaluating young adult African-American men's male role norms, knowledge, perceptions, and attitudes regarding CRCS. It was not designed to determine the influence of these men's attitudes on their intention to screen for CRC. Although intention to carry out a behavior is a strong predictor of the behavior's occurrence, unless the time lag in measuring both variables – intention and actual behavior – is short/small, the strength of the predictive relationship diminishes and becomes less useful for researchers (Sheeran & Orbell, 1998). However, researchers who have access to measures of actual screening behaviors would do well, in the future, to explore the association between the variables examined in this study and young adult African-American men's intentions to screen *along with* actual screening behaviors (also outside the scope of this project).

Other limitations this study suffered were the use of a convenience sample, and its small size, limiting the ability to generalize these findings to a larger population of African-American men in the U.S. Nonetheless, the enthusiasm demonstrated by participants (some sent emails thanking for the opportunity to participate, and wishing the researcher success with the project) suggests this population might view participation in research positively if the researcher is perceived as trustworthy and the topic is

relevant to the African-American community (Katz et al., 2006; McCallum, Arekere, Green, Katz, & Rivers, 2006).

Finally, the decision to delete from the sample the surveys comprising incomplete data could have biased the analyses, given the data were not missing completely at random. Their numbers, however, were small enough that, we believe, their inclusion in the dataset would not have altered the findings significantly. Nonetheless, researchers who wish to pursue this topic in the future would do well to examine respondents' discomfort with sexuality-related questions. For this study, eliminating those that stopped at the homosexuality item did not ensure our sample was not, potentially, biased. Perhaps, because we pre-tested the survey items with, mostly, graduate students, such discomfort was not readily apparent for any of the survey's items.

Despite these limitations, the study makes valuable contributions to understanding young adult African-American men's views of CRC and CRCS. Because this study was narrowly-focused on a specific group of African Americans, it provides a solid basis for developing structured health education interventions to increase young adult African-American men's intention to screen for CRC. As Simons-Morton, McLeroy, and Wendel (2012) propose,

> "The more narrowly we can focus on a particular population group, the better we can assess the factors related to their health and behavior, and the better we can develop programs consistent with their needs" (p. 36).

4. CONCLUSION

Summary

Racial disparities in health in the United States are extensive. Over the past twenty years, these health disparities have been an area of focus for the Healthy People's overarching goals (Healthy People is a government endorsed initiative for improving the health of Americans - National Center for Health Statistics, 2009; U.S. Department of Health and Human Services [USDHHS], 2012). In Healthy People 2000, one goal was to *reduce* health disparities among Americans. In Healthy People 2010, the goal became to *eliminate and reduce* health disparities. This goal was expanded even further in Healthy People 2020 to "achieve health equity, eliminate disparities, and improve the health of all groups" (USDHHS, 2010) - a broadening of scope that incorporates both the negative (reduction/elimination) as well as the positive (achievement of equality) dimensions of health inequities.

More specifically, the overarching goal of the National Cancer Institute (NCI) is to "understand the causes of cancer health disparities and develop effective interventions to reduce and, ultimately, eliminate them" (NCI, n.d., p. 3). Yet, research that explains the poorly understood, complex factors contributing to colorectal cancer screening (CRCS) and treatment outcome disparities among African-American men is still in development and its findings, still incomplete. Therefore, additional research on these factors is still needed and can contribute to solutions to eliminate cancer disparities.

The aims of this dissertation were to: (1) synthesize and assess the current literature documenting African-American men's knowledge, beliefs, and behaviors regarding CRCS and (2) to describe the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers associated with CRCS among a sample of young adult African-American men (ages 19-45) employing survey research methodology.

For the first aim, a systematic review of scientific literature provided insight into which set of factors are amenable to change and can, thus, become targets for culturally relevant health education interventions. Specifically, factors most frequently studied in the reviewed studies were behaviors (79%), beliefs (68%), and knowledge (61%) of CRC and CRCS.

Furthermore, after assessing the conceptual and methodological characteristics of the reviewed studies, we documented that half of them fell below average in terms of methodological quality. Specifically, the majority of the studies utilized a non-experimental research paradigm that may have affected the overall methodological quality of the sample, and less than a third of them utilized robust statistical techniques.

A conceptual model of factors shaping attitudes toward CRC and CRCS among young adult African-American men guided the second aim of this study. By employing survey research methodology, the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers related to CRC and CRCS among these men were examined. Sixty-seven percent of the study sample received a passing knowledge score (85% or better), yet there was no significant difference in this score among the

three educational levels (i.e., low, medium, high). More negative attitudes towards CRCS were associated with the participants' strong perceptions of perceived barriers, but no extremely negative or positive attitudes towards male role norms and perceived subjective norms were found. The factors significantly associated with attitudes were family history of cancer (*unsure*), work status, and perceived barriers.

This dissertation study is significant because it seeks to describe and advance understanding of the male role norms, knowledge, attitudes, perceived subjective norms, and perceived barriers associated with screening for CRC among young adult African-American men. The study's innovative quality lies in its sample: a sample consisting exclusively of African-American men, younger than 50 years of age – an age group and population consistently absent from the current knowledge-base for CRC and CRCS.

Despite the benefits of early detection and the availability of effective screening tests, CRC remains the third leading cause of death among African-American men (Rawl, 2012). New recommendations are being made for screening at an earlier age, 45 years rather than 50, as a result of the younger age at presentation and high incidence of CRC among African Americans. However, little is known about how young African-American men may view screening and CRC, overall.

Conclusions

As "the disease no one has to die from" (Pochapin, 2004), CRC is such a preventable and treatable condition when early detection occurs, that the gap which currently exists in the professional literature and research among young adult African-

American men should not be so extensive. Only three years ago, Powe, Faulkenberry, and Harmond (2010) noted that the number of intervention studies designed to increase CRCS among African-Americans was relatively small. Findings from this study suggest that culturally relevant health promotion and early-intervention prevention programs for African-American men should be developed addressing the salient factors shaping young African-American men's view of CRC and early detection screening behaviors. Furthermore, future research should consider utilizing family health history tools and collaborations at the national, state, and community levels to change young adult African-American's perceptions of barriers toward CRC, as well as their work status, and knowledge of their family history of cancer -- three factors that – at least in this study's sample – may shape these men's future decisions to screen for CRC.

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APPENDIX A

Search strategy: MEDLINE (OVID)

01. exp Colorectal Neoplasms/
02. (colorectal adj1 (cancer$ or neoplasm$)).ti,ab.
03. or/1-2
04. exp Colonoscopy/
05. exp Occult Blood/
06. exp Colonography, Computed Tomographic/
07. exp Mass Screening/
08. exp Sigmoidoscopy/
09. (colonoscop$ or sigmoidoscop$ or fobt).ti,ab.
10. ("stool test" or "fecal immunochemical testing" or "occult blood" or "dna stool").ti,ab.
11. or/4-9
12. exp African Americans/
13. (african american$ or black$).ti,ab.
14. or/12-13
15. (men or male$).ti,ab.
16. 3 and 11 and 14 and 15
17. limit 16 to english language
18. exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp canada/ or exp greenland/ or exp mexico/ or exp south america/ or exp antarctic regions/ or exp arctic regions/ or exp asia/ or exp atlantic islands/ or exp australia/ or europe/ or exp indian ocean islands/ or exp oceania/ or exp "oceans and seas"/ or exp pacific islands/
19. exp rodentia/ or rats/
20. 17 not 18
21. 20 not 19

APPENDIX B

Review Matrix for Literature on Factors Associated with CRCS among African-American Men

						SAMPLE/POPULATION			FINDINGS					
Ref ID	**Author(s). Title. *Journal.***	**Year**	**Purpose/Research Question(s)**	**Evaluation of an Intervention? (Y/N)**	**Keywords**	**Exclusively AA Men? (Y/N)**	**Sample Design *(e.g., survey, longitudinal, cross-sectional)***	**Type of Sample *(e.g., convenience, snowball)***	**Knowledge**	**Beliefs**	**Behaviors**	**Other Major Factors/Findings**	**Limitations**	**Appropriate Generalizations (Y/N)**
2660	**Campbell et al.** Improving Multiple Behaviors for Colorectal Cancer Prevention Among African American Church Members. *Health Psychology.*	2004	-Reported the study design and framework, intervention, and primary study outcomes on the basis of participant surveys pre- and post-intervention for the WATCH (Wellness for African Americans Through Churches) Project -- *a church-based research study aimed at improving nutrition, physical activity, and*	N	Intervention Studies, Dietary Habits, Physical Activity, Colorectal Cancer, African Americans, Behavioral Research	N	Longitudinal *[2 x 2 factorial research design]*	Random/Not Nationally Representative	N/A	N/A	-The TPV intervention demonstrated the **most improvement** in FOBT adherence (87% increase over baseline levels), *although the result had marginal significance statistically.* - The effect of the TPV intervention on FOBT screening rates was encouraging but difficult to interpret because of the complexity of CRCS recommendations and the relatively short-term (1-year) follow-up period.	-The study findings **failed** to confirm the original study hypothesis that a multicomponent approach combining a tailored and a targeted home-based intervention with a lay helping, church-based intervention would be more effective than either intervention alone. -Surprising Finding: the study did not demonstrate efficacy of the LHA intervention either alone or in combination with TPV, based on	-Their inability to obtain completed contact logs from the LHAs prevented them from assessing more specific numbers and types of people with whom information was shared. -Findings based on self-report information *that can be subject to a number of **biases**.* -Only followed participants for **1 year**, *thereby*	Y

						SAMPLE/POPULATION			FINDINGS					
Ref ID	Author(s). Title. *Journal.*	Year	Purpose/Research Question(s)	Evaluation of an Intervention? (Y/N)	Keywords	Exclusively AA Men? (Y/N)	Sample Design *(e.g., survey, longitudinal, cross-sectional)*	Type of Sample *(e.g., convenience, snowball)*	Knowledge	Beliefs	Behaviors	Other Major Factors/Findings	Limitations	Appropriate Generalizations (Y/N)
			CRCS among rural African Americans.									previous research. -The tailored print and video (TPV) intervention, consisting of four computer-tailored newsletters and four targeted videotapes, had **statistically significant effects** on participants' fruit and vegetable consumption and recreational exercise.	*not assessing long-term maintenance of behavior change, or sustainability of information dissemination by each intervention strategy.* -Study response rates were adequate although not exceptionally high, and n**o** information regarding nonrespondents to the baseline survey was collected. -The **small** number of clusters (12) and factorial design in	

						SAMPLE/POPULATION			FINDINGS					
Ref ID	Author(s). Title. *Journal.*	Year	Purpose/Research Question(s)	Evaluation of an Intervention? (Y/N)	Keywords	Exclusively AA Men? (Y/N)	Sample Design *(e.g., survey, longitudinal, cross-sectional)*	Type of Sample *(e.g., convenience, snowball)*	Knowledge	Beliefs	Behaviors	Other Major Factors/Findings	Limitations	Appropriate Generalizations (Y/N)
													this study probably **limited** the ability to detect significant between-groups differences and argues for study replication with a larger number of churches. - The l**imited** number and geographic location (rural eastern North Carolina) of the churches in this study may not be generalizable to other types of churches, other population groups, or other geographic areas.	

						SAMPLE/POPULATION			FINDINGS					
Ref ID	Author(s). Title. *Journal.*	Year	Purpose/Research Question(s)	Evaluation of an Intervention? (Y/N)	Keywords	Exclusively AA Men? (Y/N)	Sample Design *(e.g., survey, longitudinal, cross-sectional)*	Type of Sample *(e.g., convenience, snowball)*	Knowledge	Beliefs	Behaviors	Other Major Factors/Findings	Limitations	Appropriate Generalizations (Y/N)
													-The **lack** of impact on dietary fat consumption *warrants further investigation to strengthen future interventions, especially considering the high rates of obesity observed in this population*.	
2979	**DeBourcy, A. C., Lichtenberger, S., Felton, S., Butterfield, K. T., Ahnen, D. J., & Denberg, T.** Community-based preferenc	2007	- Determine the screening test preferences of colonoscopy-naïve adults in a diverse community-based sample;	N	Colorectal Cancer Screening; Colonoscopy; Fecal Occult; Blood Testing; Patient Preferences;	N	Cross-Sectional Survey	Convenience	-**Lack** of knowledge of the fact that removing polyps from the colon can **reduce** the risk of CRC was **highly** correlate	- Respondents who selected colonoscopy volunteered test accuracy as the **most** important reason for their choice.	N/A	N/A	-Survey items designed to assess screening test preferences and attitudes may **not** predict patients' actual preferences and	Y

						SAMPLE/POPULATION			FINDINGS					
Ref ID	Author(s). Title. *Journal.*	Year	Purpose/Research Question(s)	Evaluation of an Intervention? (Y/N)	Keywords	Exclusively AA Men? (Y/N)	Sample Design *(e.g., survey, longitudinal, cross-sectional)*	Type of Sample *(e.g., convenience, snowball)*	Knowledge	Beliefs	Behaviors	Other Major Factors/Findings	Limitations	Appropriate Generalizations (Y/N)
	es for stool cards versus colonoscopy in colorectal cancer screening. *Journal of General Internal Medicine.*		-Describe concerns and values that influence their screening test preferences; -Assess the strength of these preferences and the degree to which they might be influenced by physician recommendation; and -Determine whether test preferences are associated with respondents' knowledge, attitudes, and		Informed Decision-Making				d with a preference for FOBT.	-When given time to consider detailed, written information about 2 CRCS tests, more than half of all colonoscopy-naïve respondents in a large and diverse community-based sample **preferred** FOBT over colonoscopy. -In almost every demographic subgroup based on age, race/ethnicity, marital status, employment, educational			behavior when primary care providers (PCPs) present them with choices or recommend a specific test. -Decisions informed by a review of written information are **not** necessarily the same as those that would emerge during face-to-face conversations with PCPs. -Because there was a **forced** choice for a screening test, those who would have preferred	

						SAMPLE/POPULATION			FINDINGS					
Ref ID	Author(s). Title. *Journal.*	Year	Purpose/Research Question(s)	Evaluation of an Intervention? (Y/N)	Keywords	Exclusively AA Men? (Y/N)	Sample Design *(e.g., survey, longitudinal, cross-sectional)*	Type of Sample *(e.g., convenience, snowball)*	Knowledge	Beliefs	Behaviors	Other Major Factors/Findings	Limitations	Appropriate Generalizations (Y/N)
			sociodemographic characteristics.							attainment, and type of health insurance, at least 40%**preferred** FOBT over colonoscopy. Among colonoscopy-naïve adults who did not receive a recommendation for a specific test, a substantial proportion felt **definite** about FOBT or **reticent** about colonoscopy after reviewing a written description of each.			no screening or an option that is less invasive than colonoscopy are **most likely** to have been included in the FOBT Group. -Although they made every effort to present the characteristics of FOBT and colonoscopy in an accurate and objective manner, some may **not agree** that they adequately achieved this goal. -Survey respondents—including younger ones who,	

						SAMPLE/POPULATION			FINDINGS					
Ref ID	Author(s). Title. *Journal.*	Year	Purpose/Research Question(s)	Evaluation of an Intervention? (Y/N)	Keywords	Exclusively AA Men? (Y/N)	Sample Design *(e.g., survey, longitudinal, cross-sectional)*	Type of Sample *(e.g., convenience, snowball)*	Knowledge	Beliefs	Behaviors	Other Major Factors/Findings	Limitations	Appropriate Generalizations (Y/N)
													in most cases, have not yet made real decisions about CRCS—were able to consider **more** information and had **more** time to do so than is **typically feasible** during primary care visits, meaning their understanding of the 2 options was likely to have been closer to the ideal recommended by the USPSTF and other professional societies. The study was not population based.	

						SAMPLE/POPULATION			FINDINGS					
Ref ID	**Author(s). Title. *Journal.***	**Year**	**Purpose/Research Question(s)**	**Evaluation of an Intervention? (Y/N)**	**Keywords**	**Exclusively AA Men? (Y/N)**	**Sample Design *(e.g., survey, longitudinal, cross-sectional)***	**Type of Sample *(e.g., convenience, snowball)***	**Knowledge**	**Beliefs**	**Behaviors**	**Other Major Factors/Findings**	**Limitations**	**Appropriate Generalizations (Y/N)**
2402	**Fisher, D. A., Johnson, M. S., & Shaheen, N. J.** Fecal occult blood testing completion in a VA population: Low and strongly related to race. *Journal of Clinical Outcomes Management.*	2007	-To determine the proportion of subjects who returned an ordered fecal occult blood test (FOBT) within 9 months -To explore any demographic predictors of FOBT card return in the Veterans Affairs (VA) health care system.	N	N/A	N	Cross-sectional *[Retrospective study]*	Convenience	-N/A	-N/A	-Prior FOBT completion was **strongly** associated with current FOBT adherence. *This could reflect many factors (e.g., better understanding of instructions, increased interest in FOBT screening, higher level of compliance with medical recommendations in general, and increased understanding of the importance of CRCS. It may also reflect increased preference for FOBT as a screening modality.* -White patients were almost **twice** as likely to return FOBT cards as African-American	-The VA is a **potentially favorable** environment for CRCS as patients have more equal access to medical care than those in traditional fee-for-service settings, the providers have a reminder system for screening, protocols for administering the test have been developed, and the FOBT kits include a postage-paid envelope for return of the cards. -Findings pointed to a **weakness** of the current provider reminder system. Specifically, ordering an FOBT inactivates the VA	-**Inability** to assess differences in knowledge or perceptions of FOBT screening, understanding of FOBT instructions, or preferences for CRCS. -Other important potential predictors (e.g., highest level of education, family income level) were **not available** for inclusion as covariates in their model because of the limits of the data sources. -Findings	Y

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											patients. -Variability in postal issues (for FOBT kits) was **not** an important predictor of screening behaviors	automatic CRCS reminder for 6 months even if test is not completed and counts the patient as successfully screened during that period.	from a single-center study need to be interpreted with some **caution**.	
2998	**Ford, J. S., Coups, E. J., & Hay, J. L.** Knowledge of colon cancer screening in a national probability sample in the united states. *Journal of Health Communication.*	2006	-Examine the distribution of knowledge about colon cancer1 screening modalities in a U.S. national probability sample (HINTS 2003) that is the largest assessed to date -Examine age, racial/ethnic, income, and marital-status-	N	N/A	N	Cross-Sectional Complex Sample Survey	Random/Nationally Representative *(National Probability)*	-**Low** rates of colon cancer screening knowledge were found. -Fewer than 60% (57.3%) could name **any** CRCS test, and only 21% met our criteria for having FOBT or sigmoidoscopy/colonoscopy screenin	N/A	N/A	**No relationship** between colon cancer screening knowledge and whether the interview was conducted in Spanish or English, having a regular health care provider, having health care coverage, overall health status, ever having had a sigmoidoscopy or colonoscopy, being a cigarette smoker, level of physical activity, and	-They were unable to examine the relationship between knowledge and screening adherence given the nature of the HINTS 2003 data. -Not only were the data **limited** in being cross-sectional, the measurement of knowledge was **limited**	Y

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			related differences in knowledge of colon cancer screening tests. -Examine novel factors that could usefully inform the development of colorectal cancer screening messages for certain subgroups, *including extent of health care coverage (health care coverage, presence of regular provider, health care visit frequency), medical factors (overall health status, personal*						g knowledge. *To satisfy their criterion, participants had to demonstrate that they had heard of the test in question, knew the start age for screening, and knew the recommended frequency of testing.* -Those who were ages 45–49, and over 70, were less likely to have adequate screening knowledge. -			primary source of cancer information.	(sigmoidoscopy and colonoscopy were asked together in one question), and the measurement of screening behavior did **not** limit screening to preventive screening in the absence of symptoms. -The **relatively low** response rate of the HINTS 2003 survey may **limit** generalizability of their findings regarding CRCS knowledge and its related covariates.	

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			and family cancer history), screening history (ever advised about, and ever completed, FOBT, flexible sigmoidoscopy, or colonoscopy), lifestyle colon cancer risk factors (cigarette smoking, physical activity, fruit and vegetable consumption, and body mass index [BMI]), and presence and extent of cancer information seeking (ever searched for, first source						Individuals who had no visits with a health care provider in the previous year (compared with 1 to 4 visits), or had never looked for cancer information, had **lower** colon cancer screening knowledge. - Individuals who reported seeing their health care provider 5 or more times in the prior year had					

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			found, level of satisfaction with information found).						**less** knowledge than those who saw their provider between 1 and 4 times. - Individuals who had never undergone FOBT had **lower** screening, knowledge than those who had undergone FOBT.					
2949	**Geiger, T. M., Miedema, B. W., Geana, M. V., Thaler, K., Rangnekar, N. J., & Cameron, G. T.** Improving	2007	-To identify barriers to screening colonoscopy in eligible patients (HINTS 1). -5 major questions to be	N	Colorectal Cancer, Endoscopy	N	Cross-sectional	Random/Nationally Representative	- Knowledge regarding colon cancer screening testing, and accurate and current knowledge about	- The attitude of those who had undergone colonoscopy was generally **better** than those who had not. Of those having	-Those who had previously undergone an endoscopic procedure were **more likely** to answer that ‘‘regular colon cancer checks increase	-Most patients had heard of a stool blood test (61%) **but** only 44% of eligible patients had actually had a stool blood test in the past year. The most common	-Some selection bias may be present as **only** those willing to fill out the questionnaire were included. The data is	Y

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	rates for screening colonoscopy: Analysis of the health information national trends survey (hints i) data. *Surgical Endoscopy.*		addressed by the data set: 1. What is the general knowledge about colon cancer within the general population? 2. How widespread is accurate and correct knowledge about colonoscopy and sigmoidoscopy within the general population? 3. What are the possible reasons for not having a colonoscopy/sigmoidoscopy? 4. Are						colonoscopy was quite **poor.** **-Lack** of Knowledge: Most thought that **nothing** detects colon cancer (43%), and only 36% **correctly** identified colonoscopy as a colon cancer screening test. -There was considerable **misunderstanding** of the interval between colonoscopies (e.g., every 5 to < 10 years). -Most patients	had a colonoscopy 58% thought that having colon cancer screening was **easy**, compared to 39% in others.	changes of finding treatable cancer'' compared to those who have not undergone an examination (84% versus 71%). -A **major** factor between the groups who had undergone a colonoscopy and the group which had not was having a health care provider. -There was also a **direct** correlation between the number of times a participant had visited a physician and the likelihood that they had undergone a colonoscopy ($\rho = 0.01$).	reasons for **not** having a stool blood test were ''no reason'' and ''doctor **didn't** say I needed it.'' -Half of patients responded that they were **afraid** of finding colon cancer if they were checked. -Those who had undergone an endoscopic examination previously tended to be **more likely** to trust the information delivered by a physician than those who had not undergone endoscopic screening ($\rho = 0.007$). -49% of respondants indicated they would chose to go to a	relatively recent (2003) but current trends such as Internet usage may have already changed. The data given was **not** crosschecked with other sources so a recall bias is likely present. The survey was constructed to evaluate the public's use of cancer-related information and **not** specifically designed to address barriers to colonoscopy.	

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			attitudes of those who had a colonoscopy/sigmoidoscopy different from those who did not haveone regarding the procedure? 5. What are the most frequently used media channels of those who had a colonoscopy/sigmoidoscopy?						(89%) agreed that regular colon checks **improved** the chances of finding treatable colon cancer. -**Neither** age or employment status played a major role in influencing CRC knowledge. -Ethnic background also had a **significant** influence on cancer knowledge. Hispanics had the **lowest** degree of recognition as to			physician first for any health information. However, most subjects (47%) actually reported going to the internet **first** for health information, and only 11% reported seeking information from a physician first. -Probably the **major** research question that emerges from this data is that the **most** important reason for not having colonoscopy is ‘‘no reason’’.		

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									what a colonoscopy was and its purpose. - Education level had a **strong** influence on knowledge of colonoscopy. *A **higher** education level was correlated with the proportion of participants who had heard of a colonoscopy or knew of its use for cancer screening. Over 90% of those with a college degree*					

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									*or higher level of education **were** knowledgeable, compared to 15% of those who reported having less than a high school diploma or being illiterate.*					
2537	**Glenn et al.** Changes in Risk Perceptions in Relation to Self-Reported Colorectal Cancer Screening Among First-Degree Relatives of Colorectal Cancer Cases Enrolled in a Randomized Trial.	2011	-To evaluate the applicability of the Risk Reappraisal Hypothesis, which postulates that performance of a health protective behavior will result in a lowering of risk perceptions for a relevant	Y	Perceived Risk, Colorectal Cancer, Cancer Screening, Health Behavior, Theory	N	Longitudinal	Random/Not Nationally Representative	N/A	-Relatives who received the tailored educational intervention reported **greater increases** in perceived risk for CRC over the study period. *Although **not** a direct test, this finding appears to lend **support***	N/A	-If they examined the relationship between screening status and perceived risk only at 12-month follow-up, they may have inaccurately concluded that perceived risk was inversely related to screening, given that unscreened intervention participants endorsed higher levels	-Did **not** have information regarding the exact length of time between screening receipt and report of screening. -The **limited** number of late screeners and analyses including this group	Y

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	Health Psychology.		health condition, in the context of a CRCS screening intervention trial.							*for the Behavior Motivation Hypothesis, in that **increases** in perceived risk accompanied an **increase** in CRCS rates.* -Although perceived risk increased in the intervention group as a whole, this increase was **limited** to those participants who did **not** receive screening as recommended. *This finding lends **support** for the Risk Reappraisal Hypothesi*		of perceived risk than those who were screened. *These findings illustrate the importance of a prospective research design with more than one follow-up assessment.*	may have been underpowered. -Relied on self-report of CRCS, which could lead to **over-reporting** of screening receipt & **misclassification** of participants based on screening status. -The measure of perceived risk was **not** conditioned on any planned behavior of the participant. -**Only** able to collect data at three time points (0, 6, 12) and may have	

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										s, which suggests that individuals who perform a health behavior subsequently ***reappraise*** *their risk for the relevant health condition and* ***lower*** *their risk perception.* -Six months after the start of the study, individuals who had not yet received screening showed **larger increases** in perceived risk for CRC compared to those who had already been screened.			**missed** changes in perceived risk that occurred between assessment points. -This paper was **limited** in focus to specifically examine the relationship between perceived risk and screening, *although the intervention also targeted other potential influences on screening (i.e., knowledge, perceived efficacy of screening).*	

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										*This finding offered further **support** for the Risk Reappraisal Hypothesis.* -One year after study entry, participants who were never screened showed **continued increases** in perceived risk compared to those who were screened early in the study period. *This finding offered further support for the Risk Reappraisal Hypothesis.*				

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										-Changes in perceived risk did **not** differ when comparing unscreened participants to those who were screened late in the study period.				
2512	**Good, K., Niziolek, J., Yoshida, C., & Rowlands, A.** Insights Into Barriers That Prevent African Americans From Seeking Colorectal Screenings: A Qualitative Study. *Gastroenterology Nursing.*	2010	-To identify and describe some of the barriers to colorectal cancer screening in the African American population in our community (i.e., Central VA) RQ: *What are the barriers that prevent African*	N	N/A	N	Cross-sectional	Convenience	-*UNAWARE:* Many participants were **not aware** that colorectal cancer is the third most common cause of cancer deaths and that screening tests such as a colonoscopy and polypect	-N/A	-*INABILITY:* The **"inability"** to undergo CRCS was an important barrier for underutilization of preventive screening (e.g., [1] **lack** of transportation and [2] **lack** insurance or financial ability to pay)	-*F.A.D*: Fear, apprehension, and dislike accounted for 48.4% of the reasons given as why the participants would **not** seek CRCS. -*INDIFERENCE*: Thirteen of the (6.5%) participants stated that they "did **not** want to know" whether they had cancer or not. -*INCONVENI*	-The findings could **not** be shared with the participants, w*hich would have allowed them time to review the findings and determine whether the concepts developed did reflect their experiences.* -Some of	Y

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			Americans from seeking preventive colorectal cancer screening?						omy could prevent colorectal cancer and save lives. - *UNAWARE:* Participants were **unfamiliar** with the screening options available and the advantages and disadvantages of each option. - *UNAWARE*: Most participants had **no** knowledge of the American Gastroenterologist Association guidelines calling for earlier screenin			*ENCE*: Seven percent (n = 14) of the participants **struggled** with taking time off from work to have a colonoscopy.	the participants who completed the survey were **not** African Americans. The results from the study were based on participants from only one area and the findings may lack generalizability beyond central Virginia.	

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									gs in African Americans.					
2907	**Greiner, K. A., Born, W., Nollen, N., & Ahluwalia, J. S. Knowledge and** perceptions of colorectal cancer screening among urban african americans. *Journal of General Internal Medicine.*	2005	-To explore colorectal cancer (CRC) screening knowledge, attitudes, barriers, and preferences among urban African Americans as a prelude to the development of culturally appropriate interventions to improve screening for this group.	N	Colorectal Cancer; Screening; African American; Minority; Qualitative	N	Cross-sectional	Convenience *(focus groups)*	- KNOWLEDGE: Participants uniformly described a **lack** of CRC knowledge and voiced a desire for **more** information on this. *A large number of participants specifically described CRC knowledge and awareness as **solutions** to the problem of **low** CRCS rates.*	-HOPE: Participants had **positive** perceptions of early screening and agreed that detecting cancer early can lead to its cure and can save lives. *Hope was connected to personal religious or spiritual beliefs, with participants turning things over to God and being assured that things would turn out alright.* - FATALIS		-MISTRUST: Focus group participants described how the current health care system **does not** meet patient care needs. *Costs contributed to mistrust.* -FEAR: Some stated that members of the African-American community in general often adopt a **passive** role and **avoid** seeking medical care out of **fear** and **denial** that something might be wrong. *Fear was described as a **major** factor influencing use of*	- Participants were recruited from a **single** site, and the findings may **lack** generalizability beyond the Mid-west and with non-urban-dwelling African Americans. -The sample was **exclusively** low income. -Focus groups were **not** stratified in any way. *This may have hindered open*	Y

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										M: A number of comments generally reflected the idea that once a person gets cancer, **not much** can be done about it. *Participants would sometimes describe fatalistic beliefs among their friends and community and attribute **lack** of CRCS to such beliefs.*		*services and follow-up with physicians.* - ACCURACY: Most focus group participants expressed a **strong preference** for colon cancer screening tests that were thorough and accurate.	*honest communication among participants.* -Another limitation was failing to capture **only** participants over the age of 50 years. *This may have artificially created a low CRC knowledge level among our participants.*	
2565	**Greiner et al.** Predictors of fecal occult blood test (FOBT) completion among low-income	2005	-To examine the knowledge, preferences, perceptions, and attitudes of a	N	Colorectal Cancer; Screening; Minority Populations; Socioe	N	Quasi-experimental (Longitudinal) *[Prospective study]*	Convenience	-Education and being up-to-date with CRCS were **related**, and that FOBT	-Cancer fatalism was **negatively** related to FOBT card return of those ≥50 who were not up-to-date	-**Increasing** participant age and FOBT barriers predicted FOBT card kit return over 90 days.	-Education, age, and trust in health care providers were associated with FOBT **barriers**. -Test preference,	-The results may actually **overestimate** CRC knowledge among those studied because	Y

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	adults. *Preventive Medicine.*		multiethnic, low-income adult population toward CRCS and to assess predictors of FOBT kit completion among this same cohort.		conomic Status; FOBT; Endoscopy				barriers had a **strong** trend for significance with regard to card return among those ≥50. -**Increasing** age was associated with CRCS knowledge in the multivariate model. -Results suggest that it is over time, but **not** necessarily at or before age 50, that knowledge increases.	with CRCS. -**Informed** individuals often prefer what they perceive as the most ‘‘thorough’’ screening test.		age, female gender, and trust in health care providers were associated with endoscopy **barriers**.	they were required to mention FOBT kits during the informed consent process. -**Limited** generalizability because it was only conducted at a single site and utilized a convenience sample. -**Unable** to determine the number of individuals **declining** participation and calculate a response rate; *because participants were recruited throughout the health center by a team of research assistants working independe*	

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													ntly -Just over half of the participants were under age 50, and would not typically be eligible for CRCS. -For the sub-analysis of FOBT kit return in those ≥50, the ability to detect significant predictors was **limited** by the **small** sample size of those ≥50 (n = 131) and **low** return rates.	
289	**Griffith, K. A., McGuire, D. B., Royak-Schaler, R., Plowden,**	2008	-To address the gap in the literature related to risk appropriat	N	Mass Screening, African Americans, Colorectal	N	Cross-sectional	Convenience	N/A	-Risk perception was **not** associated with risk-appropriate, timely CRCS in	-Provider recommendation for CRCS was a **significant** predictor of risk-appropriate,	-The combination of age >65 years and eligibility for Medicare was a **powerful** predictor of	-Analyses, as with all secondary data sources, were **limited** to the data	Y

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	K. O., & Steinberger, E. K. Influence of family history and preventive health behaviors on colorectal cancer screening in african americans. *Cancer.*		e, timely screening completion in African Americans and the role of a family history of CRC and other predictors of CRCS suggested by the literature.		Neoplasms, Disparity.					those with a family history of the disease	timely screening, for both those with and those without a family history of CRC. -Activity level **was predictive** of timely screening in individuals both with and without a family history of CRC in this study. *Several studies have demonstrated that regular exercise increases awareness and completion of CRCS.* -PSA screening **was associated** with risk-appropriate, timely CRCS for men without a family history of CRC in this study.	risk-appropriate screening. *Risk-appropriate, timely screening was significantly **lower** in those who had a family history of the disease.* -The results from this study provide a **strong** argument for exploring the barriers related to screening in African Americans, especially those who have family members with CRC.	available. -Individuals who were deleted because of incomplete data on the variables required to calculate the dependent variable, risk-appropriate CRCS, may have **biased** the analysis toward those who could recall details related to screening history, including tests and recommendations. -The data consisted of individuals from Maryland **only**; thus, the results	

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													cannot be generalized to the larger U.S. African-American population -The health insurance coverage rate of 88.6% among study participants was somewhat **higher** than the overall 81.5% rate for African-American Marylanders, **limiting** the generalizability of their results to African-American Marylanders *until similar findings from subsequent studies*	

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													are demonstrated. - Individuals classified as having a family history were those who reported having ≥ 1 first-degree relative(s) affected with CRC. -Collection of data regarding the age at which relatives were diagnosed was **not** done; therefore, it is possible that some individuals who were classified as being at increased risk for CRC were done so **unnecess**	

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													arily.	
2183	**Griffith, K. A., Passmore, S. R., Smith, D., & Wenzel, J.** African Americans With a Family History of Colorectal Cancer: Barriers and Facilitators to Screening. *Oncology Nursing Forum.*	2012	-To explore barriers and facilitators of CRCS among African Americans with first-degree relatives diagnosed with CRC, -To gather suggestions for program content designed to improve CRCS rates within this population.	N	N/A	N	Cross-sectional *[Descriptive study]*	Convenience	-**Lack** of information about CRC risk emerged as a **barrier** during the focus groups. -Educational materials should be **culturally tailored** to the African American community. -Education was **the most common** suggestion for addressing **barriers** to screening.	-Participants in all four groups noted that **fear** of illness or diagnosis was a principal reason why people **avoid** CRCS. -**Fears** of any pain or discomfort associated with the CRCS procedure *also inspired comments in three groups.* -Participants suggested that some members of the target population do **not**	-**[1]** Belief in personal risk (family or friend experience with CRC or other serious illness), **[2]** physician's recommendation, **[3]** general knowledge of risk factors for CRC, and **[4]** family responsibility were mentioned as important reasons **to** screen. -The understanding that advancing age is associated with CRC and the need to be screened for it was an important concept that influenced CRCS.	-**Mistrust** of doctors or hospitals was mentioned as a **barrier** to CRCS *in three of the four groups* and expanded on by several participants. -**Lack** of access to health care was introduced as a **barrier** *in two discussions.* -**Absence** of symptoms was a **barrier** to screening *for participants in two groups.* -Participants noted a **reluctance** to talk about illness, particularly among older members of the community *in*	-Qualitative methods include a tendency toward **small** sample size and related sample **bias**. -Recruiting African Americans who were first-degree relatives of an individual affected by CRC was a **slow, time-consuming** process, both in terms of identifying potential participants and in gaining their trust. -The sample	Y

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										perceive benefits related to screening. -**Myths** and **misinformation** were discussed as a **barrier** *in three groups. Participants noted that they believed or heard things about CRC that acted as barriers to CRCS.*		*two groups,* -Provider recommendation to have CRCS emerged as a **meaningful** facilitator. -A personal connection in health care was **important** from suggestions for community-based education (i.e., community outreach, church-based, or mobile unit education), the decision to screen, and as social support for CRCS, *which could be done by patient navigators or provision of peer counselors who have experienced CRCS.*	was **limited**, likely because of l**ow** numbers of people meeting the requirements of being an African American and first-degree relative of a patient with CRC. -A selection **bias** may have existed toward those who were not intimidated by the healthcare system, as well as those interested in learning more about CRC. -Healthcare provider **mistrust**	

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													may have been a factor in **deterring** participation.	
2632	**Holt et al.** Your Body Is the Temple: Impact of a Spiritually Based Colorectal Cancer Educational Intervention Delivered Through Community Health Advisors. *Health Promotion Practice.*	2011	-To evaluate the initial efficacy of a Level 4 spiritually based CRC educational intervention delivered by trained Community Health Advisors, in Alabama churches. *-The aim of the intervention was to increase knowledge and awareness of CRC and early detection, and to eventually increase*	Y	Colorectal Cancer; Cancer Screening; African American; Church-Based; Spirituality	N	*Quasi-experimental*	Convenience	-There was a great deal of confusion about the screening tests, *which was evidenced when participants were completing the interviews. The confusion was mainly reflected in participants' being uncertain as to whether they had had an FS or a CS.*	-The Whites scored **higher** on perceived benefits to CRCS and to FOBT, than did the African Americans. -Perceived barriers to screening **decreased** for FOBT and for CS. *This finding illustrates the important role of perceived benefits of and barriers to screening as part of the Health Belief Model.*	-Self-report screening rates overall were **low**, about 50% for each of four screening modalities. -Physician recommendation for screening was uniformly and unacceptably **low**. *Participants were more likely to report a physician recommendation for the FOBT than the other tests; however, the rates of reported recommendations still fell generally below 20%.*	-The small group of Whites tended to rate the trustworthiness of the intervention as **higher** than did the African Americans. -Participants rated the project **high** overall, with the materials and interactions with the CHAs being seen as interesting, relevant, easy to understand, and trustworthy.	-**Limitations** in study resources allowed for only a pre–post design as opposed to a full randomized design. -**No** control or comparison group and thus pre–post changes over time may have been due to factors other than the intervention itself. -By involving three churches, *two of them*	Y

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			CRCS rates. *-<u>NOTE</u>: Level 4 interventions may involve use of relevant scripture passages or religious themes such as taking care of the body, which is a gift from God or the notion of body, mind, and spirit.*						-With regard to CRC knowledge, it appears that Whites experienced an **earlier** gain over the intervention period relative to African Americans. -CRC knowledge and perceived benefits of screening **increased** from baseline to follow-up, as did perceived benefits of CS specifically. *This finding illustrates the*				*African American and one White, although there may have been an opportunity with sufficient sample size and retention over the 1-year period,* **modest** sample size in the White church precludes comparisons of intervention efficacy between churches. -Self-report data is inherently **limited** and may **not** reflect rates of actual screening behaviors.	

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									important role of perceived benefits of and barriers to screening as part of the Health Belief Model. -Through learning more clearly which types of examinations a participant may have already had or not had, participants became **more** informed health care consumers.					
2513	**James, A. S., Daley, C. M., & Greiner,**	2011	-To assess levels of knowledg	N	Colon Cancer, Focus Groups	N	Cross-sectional	Purposeful and Snowball	-**Low** levels of CRC knowledg	-Men who thought they had been	N/A	-The **complex** role of family history in	-The nonprobabilistic sample	Y

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	K. A. Knowledge and Attitudes About Colon Cancer Screening Among African American. *American Journal of Health Behavior.*		e, identify prominent barriers, and identify attitudes associated with CRCS that might inform development of future interventions to improve screening rates. - *ABSTRACT: To explore knowledge and attitudes about CRCS among African American patients age 45 and older at a community health center serving low-income and uninsured*		, African American, Low-Income				e were found along with **confusion** between the prostate and colon, **not** being sure where the colon is, and other **misperceptions** *that could* ***hamper*** *communication and intervention efforts.* - Participants **knew** many of the standard risk factors for cancer (e.g., diets low in fat and high in	screened for CRC because they knew they had prostate screening, women who thought CRC only affects men, and patients who were **not** sure know what "colon cancer" really referred to would likely **ignore** recommendations because they do not perceive a need for screening.		perceived personal risk warrants further study *(e.g., several participants hypothesized decreased risk because most of their cancer-affected family members were of the opposite gender).* -Participants were **attuned** to public health messages regarding cancer risk and "caught" the conflicting or changing messages that are often put forth by media outlets and researchers. -Themes about perceived screening norms in the data reflected a tendency to **not** discuss medical	**limits** their abilities to generalize much beyond this study.	

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			patients.						fruits and vegetables, smoking, lack of exercise, being overweight).			conditions in general, but rarely was a specific **hesitancy** to discuss the topic of CRC verbalized. -Many participants who mentioned not wanting to know or being **afraid** that they would find cancer often expressed that they had already fought too many **hurdles** in life or that what they **feared** most was a prolonged and **painful** illness resulting in **death**.		
2906	**James, A. S., Hall, S., Greiner, K. A., Buckles,**	2008	-Were interested in whether there were	N	Socioeconomic Status, Colorectal	N	Cross-sectional *(prospective intervention study)*	Convenience	N/A	-Perceived barriers that were affective or related to the	-A reported **unwillingness** to undergo the procedure was more common	- Logistic or practical **barriers** related to SES included difficulty	-As a result of self-reporting, reporting **errors** and	Y

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	D., Born, W. K., & Ahluwalia, J. S. The impact of socioeconomic status on perceived barriers to colorectal cancer testing. *American Journal of Health Promotion*.		certain perceived barriers that were more common in patients from a lower SES.		Cancer, Cancer Screening, Underserved Populations					consequences of screening were associated with several SES markers: **fear** of injury (with income and insurance), **fear** of the results (with education, insurance), and **embarrassment** (with insurance, unemployment)	among participants who were of lower income, had less education, or lacked health insurance	getting to the appointment (income), scheduling the appointment (unemployment), and cost (uninsured).	**biases** may persist. - The use of a convenience sample, the inclusion of adults aged 40 to 49 years, and their sample size may **limit** their ability to generalize these findings. -They conducted several analyses, which **increased** their **risk** of a type I error.	
2385	**James, A. S., Leone, L., Katz, M. L., McNeill, L. H., & Campbell, M. K.** Multiple Health Behaviors	2008	-To examine whether obesity was associated with CRCS, fruit and vegetable consumption, and	Y	Colorectal Cancer, Fruit And Vegetable, Physical Activity, African Americ	N	Cross-sectional	Convenience	N/A	N/A	N/A	-Found an **association** between past-year CRCS and weight for women but not for men. -Obese respondents were more	-The use of **self-report**. -Analyses were dependent on **self-reported** height and weight (for calculating	Y

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	among Overweight, Class I Obese, and Class II Obese Persons. *Ethnicity & Disease.*		recreational physical activity from the WATCH (Wellness for African Americans through Churches) data. *The WATCH Project was a CRC prevention intervention study implemented in African American churches in rural North Carolina.* -To examine the relationship between weight and selected behavioral psychosocial correlates		ans, Overweight, Obesity							likely to agree that screening is too expensive and to report that their doctor did not recommend CRCS. -Potentially one **contributor** to the lower screening rates is that obese participants may have **more** co-morbidities or **acute** needs, which are **prioritized higher** than cancer screening tests. -Obese women were less likely to report having had a CRCS test in the past year, but this association was not detected for individual tests.	BMI).	

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			including knowledge, perceived benefits and barriers, self-efficacy, and social support for these behaviors											
2561	**Leone, L. A., James, A. S., Allicock, M., & Campbell, M. K.** Obesity Predicts Differential Response to Cancer Prevention Interventions Among African Americans. *Health Education & Behavior.*	2010	-To know if the intervention was able to improve behaviors among obese individuals. Specifically, whether changes in these behaviors differed by weight group (normal weight, overweight, obese I, obese II+) post intervention.	Y	Weight Disparities; Obesity; Intervention Preference; Cancer Prevention; Physical Activity; Colorectal Cancer Screening	N	Longitudinal *[2 × 2 factorial trial]*	Random/Not Nationally Representative *[Cluster-randomized]*	N/A	N/A	-Obese individuals appeared to **benefit more** from the tailored print and video (TPV) intervention than the lay health advisor (LHA) intervention. -Participants in the TPV group reported **greater** interaction with the tailored newsletters than those in the combined group, *which may partly explain why obese*	N/A	-**Self-report** nature of the data *(e.g., self-reported weight and height data used to calculate BMI)* -The outcome variable used was **past**-year screening rather than adherence to screening guidelines. *Thus, it is possible that individuals had*	Y

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			-To determine if certain weight groups responded better to one intervention condition versus another (i.e., within–weight group comparisons). -***This analysis is related to the WATCH (Wellness for African Americans Through Churches) Project*								*individuals in the TPV group **increased** their physical activity more than those in the combined group.* -Weight-related disparities in past-year screening rates **persisted** even after exposure to the intervention. -The LHA program seemed to work **well** for normal and overweight individuals, whereas TPV appeared to work **better** for obese participants.		*completed other screening tests such as colonoscopy **prior** to the intervention and were not due to receive another screening during the intervention period.* -At the time of the trial, FOBT was a **much more common** screening test than endoscopy and was more accessible in terms of insurance and affordability;	
2852	**Manne et al.** A randomize	2009	-To evaluate the effect of three	Y	Colorectal Cancer Screeni	N	Cross-sectional	Convenience	N/A	N/A	- CRCS adherence **increased** among	-The identification of mediators was	-The population was **primarily**	Y

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	d trial of generic versus tailored interventions to increase colorectal cancer screening among intermediate risk siblings. *Annals of Behavioral Medicine.*		increasingly intense behavioral interventions on CRCS adherence among first-degree relatives (FDRs; siblings, parents, children) of individuals diagnosed with CRC before the age of 61 years who were not on schedule with regard to CRCS. -To evaluate possible moderators and mediators for intervention effects.		ng, Tailored Interventions, Intermediate Risk Siblings						intermediate risk siblings enrolled in **all** three intervention groups. Participants in both tailored intervention groups obtained CRCS at a **significantly higher** rate than participants in the generic print group. -CRCS adherence in the two tailored groups was **greater** than that noted in previous studies of intermediate risk FDRs of individuals with CRC. -The addition of a telephone counseling session did **not** increase CRCS significantly	**challenging** for this study. A review of the **limited** relevant literature suggests that mediator identification has been relatively **challenging** for other cancer screening interventions as well.	white, married, and possessed health insurance. -There were **more** women in the sample than men. -The acceptance rate among index patients and siblings was **modest**. -Participant siblings in the present study were **more** likely to be female and younger than refusers which may have **biased** our study results in	

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													an unknown manner.. -The timing of the assessment of mediating variables which were assessed at the time of the follow-up assessment. -The follow-up period was **only** 6 months and it is possible that there would have been **greater** reported CRCS rates with a longer follow-up. -The external validity and potential for disseminat	

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													ion of the tailored print intervention evaluated in this study.	
3331	**Manne et al.** Understanding intention to undergo colonoscopy among intermediate-risk siblings of colorectal cancer patients: A test of a mediational model. *Preventive Medicine.*	2003	-To evaluate whether perceived benefit of engaging in colorectal cancer screening plays a mediating role in the association between perceived susceptibility to CRC, perceived severity of CRC, affective responses to the family member's colorectal cancer, and social influence and the intention	N	Colorectal Cancer Screening; Intermediate Risk Persons; Screening Intentions	N	Cross-sectional	Convenience		-The hypothesized mediational role of perceived benefits was **partially** supported. -They found that the association between sibling closeness and intentions **was** mediated by perceived benefits. -High perceived benefit was associated with **increased** intention	-In terms of HBM, TPB, and Dual Process Theory constructs, all variables with the exception of perceived risk **were** associated either directly or indirectly with screening intentions. -Family and physician support for screening had both a direct relation with colonoscopy screening intentions and an indirect association through their associations with perceived	-**Greater** severity was associated with **greater** barriers but was not associated with benefits.	-Their cross-sectional design **cannot** establish the direction of causality among constructs. -The procedures used for finding the best-fitting model were data driven and thus susceptible to capitalization on **chance**. -The relative homogeneity of the ethnic and socioecon	Y

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			to undergo colorectal cancer screening.							and higher barriers were associated with **lower** CRCS intention.	benefits and barriers.		omic composition of the sample and the focus on affected patients who were still alive **limited** the ability to generalize their findings. -Their examination of differences between participants and refusers suggested that men were more likely to **refuse** participation. -While behavioral intentions are a worthwhile target of study, a longitudinal study examining predictors	

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													of actual screening behavior would be **valuabl**e.	
3019	**Manne et al.** Correlates of colorectal cancer screening compliance and stage of adoption among siblings of individuals with early onset colorectal cancer. *Health Psychology.*	2002	-To evaluate current compliance with and stage of adoption of CRCS. -To examine associations of a set of psychological variables included in the HBM, TTM, and dual process models, as well as nonpsychological variables, with current screening compliance and stage of adoption.	N	Colorectal Cancer, Screening, Health Belief Model, Transtheoretical Model	N	Cross-sectional	Convenience	-Siblings with lower education levels were **less** likely to engage in screening. .	-Siblings who were on schedule reported significantly more pros and fewer cons than siblings who were not on schedule, indicating that current **compliance** corresponded with beliefs about the usefulness and characteristics of the screening procedures in a similar manner as has been reported for mammogr	-In this examination of CRCS among siblings of individuals diagnosed with CRC **prior** to age 56, they found that screening acceptance was relatively **high**. *Approximately half of the participants were currently on schedule with regard to CRCS, and over half of the sample was in the action or maintenance stage of adoption.* This investigation provided encouraging results for	-Perceived risk compared with the average person was **greater** among siblings who were compliant and increased with higher or more committed stages of adoption. One of the most interesting findings was the **consistent** association between one affective construct from the dual process model. *Both screening compliance and stage of adoption*	-Cross-sectional designs **cannot** distinguish temporality among variables. -The sample was predominantly White, well-educated, middle class, and had access to health insurance, which **limits** the generalization of results to a more disadvantaged population. -Siblings rated perceived	Y

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			-To evaluate the contribution of the proposed set of psychological variables after taking into account nonpsychological factors, including demographics, health history and practices, affected relative medical status, CRC knowledge, and doctor and family input.							aphy. *These results also provide support for the utility of two of the process-of-change constructs: commitment to screening and, to a lesser extent, avoidance of the health care system.*	extending the TTM to CRCS. *First, the pro and con items that were developed for CRCS had **excellent** internal consistency. Second, cons were associated with differences across the stages of adoption in the predicted direction: Cons **decreased significantly** as the stage progressed from never heard to maintenance.* -Physician input was a very **strong** predictor of screening. Siblings were **more** likely to engage in and **continue** with regular screening when their physicians **encouraged**	*were associated with **closeness** of the emotional tie with the affected sibling.*	pros and cons related to CRCS in general rather than providing separate ratings of each test. -It is possible that patients and siblings who refused participation were **less likely** to have engaged in CRCS. *Potential selection biases were **difficult** to assess because they were unable to measure screening behaviors of study refusers.*	

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											them. -Family member recommendation to screen *may* be a **significant** correlate of screening. *Family input has received relatively little attention in the cancer screening literature.*			
3251	**McNeill, L. H., Coeling, M., Puleo, E., Suarez, E. G., Bennett, G. G., & Emmons, K. M.** Colorectal cancer prevention for low-income, sociodemographically-diverse adults in public housing: Baseline findings of a	2009	-To describe the *Open Doors to Health* study design and intervention components, and to present the demographic characteristics of the study population by age (under 50 years old/age 50 and	N	N/A	N	RCT *(Cluster randomized design)*	Random/Not Nationally Representative	N/A	N/A	-A **strong** relationship was found between access to care and screening uptake; however with almost universal health coverage, 34% of those over 50 years old were not CRC current.	-Baseline findings from *Open Doors to Health (ODH)* suggests that segments of this population, i.e., Hispanics and unemployed adults, are at even **greater increased** risk for CRC given their **low** socioeconomic position and **low** levels of physical activity.	-**Limited** generalizability to other populations other than low-income, urban, racial/ethnic minorities living in public housing.	Y

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	randomized controlled trial. *BMC Public Health.*		above) and in relation to their conceptual model. *-This RCT was designed to increase CRCS, physical activity, and multivitamin use among low-income public housing residents; a key aim was to determine ways in which attending to the social context in low-income, ethnically diverse populations may address disparities in CRC preventive*									-Overall, daily, regular multivitamin use was **very low** in this population (28%) and even lower among those under 50 years old (17%); however, use among Hispanics regardless of age (16% for Hispanics under 50 years; 31% for Hispanics age 50 and up), was much lower than all other racial/ethnic groups. *Understanding and resolving barriers to multivitamin use among Hispanics may **help** to reduce CRC risk in this group. A 2001 study found that multivitamins use is predictive of CRCS among*		

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			behaviors .									*women.* -Blacks and Hispanics were the least active, and physical activity was lowest among blacks over 50 years old (mean = 3968 steps/day), indicative of a sedentary lifestyle and increased risk for chronic health conditions and poor health outcomes.		
3129	**Menon, U., Champion, V. L., Larkin, G. N., Zollinger, T. W., Gerde, P. M., & Vernon, S. W.** Beliefs associated with fecal occult	2003	-To identify beliefs and demographic factors associated with FOBT and colonoscopy use, respectively. *The sample was derived*	N	N/A	N	Cross-sectional	Convenience	-Those with high knowledge scores were more likely to have had a colonoscopy than those with low knowledge scores (61.3% versus	-Those who had had a colonoscopy perceived higher benefits to the test, higher self-efficacy or confidence in their ability to have the test, and	N/A	-If, as recent research suggests, a colonoscopy becomes the preferred CRCS mechanism, then the theoretical framework that guided this study could be used to develop **effective**	-A single worksite sample for whom the cost of colonoscopy was paid for by the employer. -The lack of ethnic diversity in the sample.	Y

						SAMPLE/POPULATION			FINDINGS					
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	blood test and colonoscopy use at a worksite colon cancer screening program. *Journal of Occupational and Environmental Medicine.*		*from among employees of a large Midwestern pharmaceutical company (Eli Lilly and Company) who are offered a somewhat-unique Colon Cancer Program.* -The three research questions were as follows: 1. What beliefs and demographic factors predict ever having had an FOBT? 2. What beliefs and demographic factors						38.6%);	higher knowledge. -High perceived barriers **significantly** predicted lower odds of ever having had an FOBT, while high benefits predicted **higher** odds of having had an FOBT in the last year.		interventions to **increase** colonoscopy use. -Provider recommendation was a **significant** predictor of colonoscopy and FOBT use, *suggesting a simple and cost-effective intervention to **increase** screening behavior.*	-retrospective research design poses another limitation to the interpretation of results. -the interpretation of the results for gender, ethnicity, and marital status since there were greater numbers of men, Caucasians, and those with partners in this study.	

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			predict having had an FOBT in the last year? 3. What beliefs and demographic factors predict past use of colonoscopy?											
285	**Palmer, R. C., Emmons, K. M., Fletcher, R. H., Lobb, R., Miroshnik, I., Kemp, J. A., & Bauer, M.** Familial risk and colorectal cancer screening health beliefs and attitudes in an insured population. *Preventiv*	2007	-To examine the relationship between health beliefs and attitudes toward colorectal cancer screening, strength of family history risk, and being appropriately screened for colorectal cancer.	N	Colon Cancer; Cancer Screening; Health Beliefs; Family History	N	Cross-sectional	Random/Not Nationally Representative	N/A	-Perceived cancer risk and subjective norms incrementally **increased** based on family history. -Perceived cancer risk emerged as the **only** psychosocial correlate that was associated with being appropriately screened	-Individuals with no family history of CRC were screened **more** appropriately based on Harvard Vanguard Medical Associates (HVMA) guidelines than individuals with a family history. *Individuals with **greater** CRC risk due to family history are **not** participating in screening*	N/A	-Study participants were receiving care at a prevention-oriented practice and were insured so the study findings may **not** be representative of the general population. -The demographic characteristics of participant	Y

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	e Medicine									for CRC.	*as recommended and potentially reduce the benefit achieved from early detection.* -There was a **significant** difference for subjective norms across family history categories.		s were relatively homogenous, which could have made it **difficult** to detect differences across demographic groups. -The initial survey response rate was also **low** and introduces the potential for biased study results. -Differential participation by strength of family history and screening experience could have influenced our study findings. -Self-	

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													report of family history may have also introduced some **misclassification**. -The number of screening colonoscopies may have been **underestimated** for study participants with no, weak, or intermediate family histories who were newer members of HVMA *since current guidelines recommend a 10 year screening period for these individuals*. -Because the data obtained	

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													for this study was entirely cross-sectional, inferring causality should be done **cautiously**.	
243	**Powe, B. D., Finnie, R., & Ko, J.** Enhancing Knowledge of Colorectal Cancer Among African Americans: Why Are We Waiting Until Age 50? *Gastroenterology Nursing.*	2006	-To compare knowledge and awareness of CRC among participants of age 20–29 and 30–49 years with those of age 50–75 years who attend federally funded primary care centers.	N	N/A	N	Non-experimental [*descriptive, comparative design]*	Convenience	-Participants were **not** generally knowledgeable about this disease (CRC). -There were **no** significant overall differences in the knowledge of CRC between persons in the age groups of 20–39, 40–49, and 50–74 years.	-The participants in this study tended to **associate** the need for screening with the presence of symptoms **as opposed** to viewing screening as a routine preventive measure.	N/A	-It is **unclear** where the **critical** point lies in terms of when to begin focusing on information about CRC given the age-specific guidelines for screening. -19% of the participants reported receiving **no** information about cancer. *The **most frequently** cited source for information about cancer was television or radio, providers, and*	-Sample size -Restricted geographical area -Limited income variability -Moderately low reliability of knowledge survey	Y

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												magazines. -The Internet as a source of cancer information received **low** preference. -A **greater** percentage of those of age 50–75 years reported getting cancer information from their socials. -Cancer-related services and organizations are frequently viewed as a **ready** source of information about cancer		
2575	**Purnell et al.** Social and cultural factors are related to perceived colorectal cancer screening benefits	2010	-To examine the relationship between socio-cultural factors (e.g., traditional acculturati	N	Colorectal Cancer, Screening, African American, Culture	N	Non-experimental *[exploratory]*	Convenience	N/A	-**Greater** perception of CRCS benefits was found among individuals who perceived high group susceptibility to CRC,	-**Increased** expressed intention to **complete** CRCS was associated with perceiving high group CRC susceptibility while being	N/A	-This secondary analysis study was exploratory in nature and therefore did **not** proceed from a priori	Y

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	and intentions in African Americans. *Journal of Behavioral Medicine.*		ve strategy, group-based medical mistrust, physician ethnicity, and group-level perceptions of susceptibility) and perceived benefits, perceived barriers, and CRCS intentions among African Americans							regardless of the level of traditional cultural orientation or medical mistrust. -Among individuals who perceived low group susceptibility to CRC, however, perceptions of the b**enefits** of CRCS were **increased** if they had a high versus a low traditional cultural orientation.	more culturally traditional, -**Increased** CRCS intention was associated with having an African American physician and l**ow** medical mistrust.		hypotheses regarding the relationships under investigation. -Participants were a **convenience** sample of African Americans *from two large Midwestern cities, who may differ from African Americans in other communities.* -A **majority** of study participants was female and **more** information may be **necessary** before drawing conclusions regarding	

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													African American men -Sample is **limited** by its primary inclusion of individuals who belong to social and/or religious groups, who may differ in important ways from individuals who are not so affiliated. -Participants had a **relatively high** socioeconomic status and access to health care, and the rate of CRCS completion was **above** the rate reported nationally.	

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													-**No** time frame was attached to the intention items used as outcomes in their analyses, making it difficult to ascertain exactly when individuals intended to complete CRCS.	
3324	**Sheikh, R. A., Kapre, S., Calof, O. M., Ward, C., & Raina, A.** Screening preferences for colorectal cancer: A patient demographic study. *Southern Medical Journal.*	2004	-To identify the attitudes, beliefs, and demographics of adult patients in a community hospital outpatient setting and recognize personal and demograp	N	Colorectal Cancer, Fecal Occult Blood Testing, Patient Choice, Screening	N	Cross-sectional	Convenience	Catholics, Hispanics, and individuals with less education and at lower income levels were more likely to **not** want screening.		-Ex-smokers in their survey were more likely than all others, including smokers and nonsmokers, to **prefer** screening.	-The majority of their patients **preferred** annual FOBT (43%), followed by colonoscopy every 10 years (40%). -There was a **strong** preference for colonoscopy among patients who had previously	N/A	Y

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			hic parameters that may be amenable to change through public education and targeted interventions.									undergone screening with colonoscopy (53 versus 25%) or sigmoidoscopy (53 versus 27%). - Sigmoidoscopy was the screening test of **choice** for the majority of patients who answered our survey. Sigmoidoscopy was also the screening test of **choice** for those who had not had past colorectal cancer screening. Over 90% would recommend their personal preferences to a family member or friend.		
2	**Tseng et**	2	-To	N	Colorec	N	Cross-sectional	Convenience	-	-N/A	-Colonoscopy	-N/A	-	Y

						SAMPLE/POPULATION			FINDINGS					
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520	**al.** Predictors of Colorectal Cancer Knowledge and Screening Among Church-Attending African Americans and Whites in the Deep South. *Journal of Community Health.*	09	understand the relationship between CRC knowledge, risk factors and the use of recommended CRCS tests among a church-based sample of African American and White men and women.		tal Cancer, Knowledge, Cancer Screening, African American, Church-Based				Participants appeared to have **adequate** knowledge levels in areas focusing on definition of CRC and risk factors, but **lower** knowledge of CRC epidemiology, prognosis, and treatment. -Knowledge about what age to start screening was **low**. -Unlike Green and Kelly's study, knowledge score		and FOBT were reported to be used at **higher** rates than flexible sigmoidoscopy and barium enema. -Ethnicity, education level and family history of CRC were **important** factors associated with screening behaviors. -Participants who had a family history of CRC would **more likely** have FOBT and DCBE (double contrast barium enema). -Except for FOBT, Whites were **more likely** to report screening behaviors than African		**Convenience sampling** approach for both churches and participants. -Church members who participated in this study might be those members who are **more active** or those who were interested in health or CRC. -Use of a self-report questionnaire **without** verification through medical records or other sources. *Thus, screening rates may be **over** or **under***	

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									was **not** significantly **different** by gender. -~40% of participants had **never** heard of FOBT and barium enema. *There were **many more** participants who had **not** heard of flexible sigmoidoscopy than colonoscopy.* -Those who had heard of or participated in screening reported **higher** knowledge scores than		Americans.		*reported.* -The response rate about household income was **low** *(20% of participants did **not** answer this question)*.	

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									those who had not heard of the screening tests.					
2191	**Winterich et al.** Men's knowledge and beliefs about colorectal cancer and 3 screenings: Education, race, and screening status. *American Journal of Health Behavior*.	2011	-To compare how education, race, and screening status affect men's knowledge about colorectal cancer, and their attitudes and experiences with 3 types of screening: the FOBT, sigmoidoscopy, and colonoscopy	N	Colorectal Cancer, Colorectal Cancer Screening, Health Disparities, African-American	N	Cross-sectional	Convenience	-Men in this study had **low** levels of knowledge about the colon, rectum, and sigmoidoscopy, **regardless** of education, race, or screening status -Differences by educational attainment were found for **most** topics *including the colon and rectum, colorecta*	-The men did **not** differ in their beliefs by race within the same educational attainment groups. -Men's attitudes about the FOBT, sigmoidoscopy, and colonoscopy exams varied with education; as education increased so did men's negative views. - -	--Screening status **played a role** in **high**-educational-attainment men's **knowledge** of the colon, rectum, and colorectal cancer **causes** and their **knowledge** and **experiences** with sigmoidoscopy and colonoscopy *(i.e., **high**-educational-attainment men who have been screened **retain** knowledge about colorectal cancer and screening from their interactions*	-The men had **partial** and **fragmented** explanatory models of colorectal cancer. -In contrast to other research, this study did **not** find **differences** in knowledge by race. *More than likely a result of sampling issues.* - -	-Men in the **low**-educational-attainment group are **predominantly** African American because interviewers had **difficulties** locating white men with low educational attainment. -Findings can be generalized to the Southeast from which the sample was recruited, but they **cannot** be	Y

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									l cancer, colorectal cancer causes, effects of colorectal cancer, and screening knowledge and attitudes. -Men's explanatory models of colorectal cancer, causes, effects, and screening exams i**mproved** with education, -Education, not race, is the **key factor** for knowledge about colorectal cancer and screening.		*with their doctors).* -Screening status **was related** to overall FOBT **knowledg**e over **all** education groups.		generalized to the whole population. -Researchers did **not** examine other socioeconomic factors *like income or access to health care, which may be factors that also affect colorectal cancer screening knowledge*.	

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25155	**Yim, M., Butterly, L. F., Goodrich, M. E., Weiss, J. E., & Onega, T. L.** Perception of Colonoscopy Benefits: A Gap in Patient Knowledge? *Journal of Community Health.*	2012	-To examine the relationship between specific patient characteristics and colonoscopy results to their perceptions of having reduced their risk of dying of CRC following a colonoscopy.	N	Colonoscopy, Colorectal Cancer, Screening, Patient Perception	N	Cross-sectional	Random/Not Nationally Representative	-Patients without personal history of polyps and/or a family history of CRC, *which was approximately two-thirds of the study population,* did **not** initially **fully** understand (or were not being adequately informed) that having a colonoscopy had the potential to **reduce** their risk of dying from CRC through the	-Personal history of polyps and family history of CRC are **moderately strong** predictors of patients' **positive** perception of the benefits of colonoscopy. -Patients who had a polypectomy at the time of their current colonoscopy were **not** any more likely than those who did not have a polyp to agree that having a colonoscopy had reduced their chances of dying from CRC.	-N/A	-The perceived benefit of colonoscopy varied despite the general consensus of its effectiveness. - - -	-Some subjects **may** have based their answers on the general effectiveness of colonoscopy, unintentionally **misrepresenting** the data collected	Y

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									removal of polyps.					

APPENDIX C

Survey Instrument Construct Matrix

Question	**Demographic Characteristics**	***Construct:* Male Role Norms**	**Construct: CRC & Screening Knowledge**	***Construct:* Attitudes toward CRC Screening**	***Construct:* Perceived Subjective Norms**	***Construct:* Perceived Barriers**
1 What race do you self-identify as?	**X**					
2 Gender	**X**					
3 Age	**X**					
4 Current Residence	**X**					
5 Marital Status	**X**					
6 Sexual Orientation	**X**					
7 What is your highest education level completed?	**X**					
8 Are you currently pursuing or already have a degree in Health Education, Public Health, Community Health, or any health related field (e.g., Nursing, Allied Health)?	**X**					
9 Household income per year:	**X**					

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
10 Do you currently work?	X					
11 Do you currently have health insurance?	X					
15 Religious Preference:	X					
16 How often do you attend church?	X					
17 Family History of Cancer	X					
18 Family History of Colorectal Cancer (CRC)?	X					
19 How did you learn about this study?	X					
20 Homosexuals should never marry.		X				
21 The President of the US should always be a man.		X				
22 Men should be the leader in any group.		X				
23 Men should watch football games instead of soap operas.		X				

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
24 All homosexual bars should be closed down.		X				
25 Men should have home improvement skills (e.g., sawing without splintering the wood, drilling pilot holes).		X				
26 Men should be able to fix most things around the house.		X				
27 A man should prefer watching action movies to reading romantic novels.		X				
28 Men should always like to have sex.		X				
29 Boys should prefer to play with trucks rather than dolls.		X				
30 A man should not turn down sex.		X				
31 A man should always be the boss.		X				
32 Homosexuals should never kiss in public.		X				
33 A man should know how to repair his car if it should break down.		X				

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
33 A man should know how to repair his car if it should break down.		X				
34 A man should never admit when others hurt his feelings.		X				
35 Men should be detached in emotionally charged situations.		X				
36 It is important for a man to take risks, even if he might get hurt.		X				
37 A man should always be ready for sex.		X				
38 When the going gets tough, men should get tough.		X				
39 I think a young man should try to be physically tough, even if he's not big.		X				
40 Men should not be too quick to tell others that they care about them.		X				
41 Colorectal cancer is a cancer of the colon or rectum.			X			

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
42 Colorectal cancer is the leading cause of cancer death in the United States.			X			
43 Colorectal cancer is a disease that affects only older, white men.			X			
44 Colorectal cancer is the third most common cancer in African Americans.			X			
45 The risk of developing colorectal cancer is greater as a person gets older.			X			
46 Both men and women are at risk for getting colorectal cancer.			X			
47 There are no known causes of colorectal cancer.			X			
48 Most colorectal cancers begin as a growth in the colon or rectum.			X			
49 Bleeding from the rectum, blood in your stool, or blood in the toilet after a bowel movement may be symptoms of colorectal cancer.			X			

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
50 Symptoms such as bleeding from the rectum, blood in your stool, or blood in the toilet after a bowel movement should be reported to the doctor immediately.			X			
51 You should see your doctor if you have a change in your bowel habits such as having stools that are narrower than usual.			X			
52 There is nothing anyone can do about getting colorectal cancer.			X			
53 Colorectal cancer is usually fatal.			X			
54 There are several screening tests for colorectal cancer.			X			
55 A Fecal Occult Blood Test (FOBT) is an appropriate test to screen for colorectal cancer.			X			
56 A Sigmoidoscopy is an appropriate test to screen for colorectal cancer.			X			

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
57 A Colonoscopy is an appropriate test to screen for colorectal cancer.			X			
58 Men and women should begin screening for colorectal cancer soon after turning 50 years of age.			X			
59 African-American men should start screening at age 45.			X			
60 Screening tests for colorectal cancer are not necessary for individuals who do not have symptoms.			X			
61 Screening tests for colorectal cancer are not covered under most health insurance plans.			X			
65 Colorectal cancer is a hopeless disease.			X			
69 Problems I would experience from colorectal cancer would last a long time.			X			
62 The thought of getting colorectal cancer scares me.				X		

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
63 If I had colorectal cancer, my career/life would be over.				X		
64 When I think of colorectal cancer my heart beats faster.				X		
66 My feelings about myself would change if I got colorectal cancer.				X		
67 I am afraid to even think about colorectal cancer.				X		
68 My financial security would be endangered if I got colorectal cancer.				X		
70 If I got colorectal cancer, my whole life would change.				X		
71 Having colorectal cancer screening will help me find colorectal cancer early.				X		
72 If colorectal cancer is found early through screening, my treatment for colorectal cancer may not be as bad.				X		

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
73 Having colorectal cancer screening is the best way to find a small cancer if I have one.				**X**		
74 Having colorectal screening will decrease my chances of dying from colorectal cancer.				**X**		
75 When I have colorectal screening, I am doing something to take care of myself.				**X**		
76 Colorectal screening is embarrassing to me.				**X**		
77 I am afraid to find out there is something wrong when I have colorectal cancer screening.				**X**		
78 I am afraid to have colorectal cancer screening because I don't understand what will be done.				**X**		
81 Colorectal screening exams would be painful.				**X**		
83 I have other problems more important than getting colorectal screening.				**X**		

Question	**Demographic Characteristics**	***Construct:* Male Role Norms**	**Construct: CRC & Screening Knowledge**	***Construct:* Attitudes toward CRC Screening**	***Construct:* Perceived Subjective Norms**	***Construct:* Perceived Barriers**
14 Are you currently active/ participate in any type of male dominant social group (e.g., AAU basketball, fraternity, bowling league, Bible study group)?					**X**	
85 The important people in my life believe colorectal cancer screening can help prevent colorectal cancer.					**X**	
86 It is important for me to do what important people in my life think is appropriate.					**X**	
87 My parents believe colorectal cancer screening is an appropriate way to detect colorectal cancer early.					**X**	
88 It is important for me to do what my parents think is appropriate.					**X**	
89 My "significant other" believes colorectal cancer screening is an appropriate way to detect colorectal cancer early.					**X**	

Question	**Demographic Characteristics**	***Construct:* Male Role Norms**	**Construct: CRC & Screening Knowledge**	***Construct:* Attitudes toward CRC Screening**	***Construct:* Perceived Subjective Norms**	***Construct:* Perceived Barriers**
90 It is important for me to comply with what my "significant other" believes in.					**X**	
91 My siblings believe colorectal cancer screening is an appropriate way to detect colorectal cancer early.					**X**	
92 It is important for me to comply with what my siblings believe in.					**X**	
93 My close friend believes colorectal cancer screening is an appropriate way to detect colorectal cancer early.					**X**	
94 It is important for me to comply with what my close friend believes in.					**X**	
13 Do you have one doctor who you continually connect with (i.e., primary care/family physician)?						**X**
79 I don't know how to go about scheduling colorectal cancer screening.						**X**

Question	Demographic Characteristics	*Construct:* Male Role Norms	Construct: CRC & Screening Knowledge	*Construct:* Attitudes toward CRC Screening	*Construct:* Perceived Subjective Norms	*Construct:* Perceived Barriers
80 Having colorectal screening could take too much time.						**X**
82 Having colorectal screening would expose me to too much radiation.						**X**
84 Having colorectal screening costs too much money.						**X**

APPENDIX D

Male Role Norms, Knowledge, Attitudes, and Perceptions

Associated with CRCS Survey

Part I: ***Demographics***

(1) What race do you self-identify as?
1. African American 2. Other

(2) Gender:
1. Male 2. Female

(3) Age (p*lease enter your age*): _____

(4) Current Residence:
City: _____ State: _____

(5) Marital Status:
1. Single 2. Unmarried in a relationship 3. Married 4. Divorced
5. Separated 6. Widowed

(6) Sexual Orientation:
1. Straight 2. Gay 3. I am struggling with my sexual orientation.

(7) What is your highest education level completed?
1. Partial High School
2. GED or Equivalent
3. High School Diploma
4. Partial College *(at least one year)*
5. Two Year College/Associate Degree
6. Bachelor's Degree
7. Master's/Advanced Degree

(8) Are you currently pursuing or already have a degree in Health Education, Public Health, Community Health, or any health related field (e.g., Nursing, Allied Health)?
1. Yes 2. No

If Yes, which field? _____

(9) Household income per year:

1. Less than $15,000
2. $15,000-$24,999
3. $25,000-$34,999
4. $35,000-$49,999
5. $50,000-$74,999
6. More than $75,000

(10) Do you currently work (p*lease select all that apply*)?

1. No
2. Yes, part-time job
3. Yes, full-time job
4. Student

(11) Do you currently have health insurance?

1. Yes
2. No

(12) Have you ever been diagnosed with colorectal cancer?

1. Yes
2. No

(13) Do you have one doctor who you continually connect with (i.e., primary care/family physician)?

1. Yes
2. No

(14) Are you currently active/ participate in any type of male dominant social group *(e.g., AAU basketball, fraternity, bowling league, Bible study group)?*

1. Yes
2. No

(15) Religious Preference:

1. Christian
2. Muslim
3. Jehovah's Witness
4. Atheist
5. Other

(16) How often do you attend church?

1. Never
2. Occasionally
3. Regularly

(17) Do you have a family history of cancer?

(1) Yes (2) No (3) Unsure

(18) Do you have a family history of colorectal cancer?

(1) Yes (2) No (3) Unsure

(19) How did you learn about this study?

1. List-serve 2. Facebook/Twitter 3. Barbershop
4. Fraternity Member 5. Church 6. African-American Male Initiative
7. Friend(s) 8.Other:

Part II: ***Male Role Norms***

Directions: Select the number which indicates your level of agreement or disagreement with each statement. Give only one answer for each statement.

Strongly Disagree	**Disagree**	**Slightly Disagree**	**No Opinion**	**Slightly Agree**	**Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**	**6**	**7**

---

(20) Homosexuals should never marry.
1 2 3 4 5 6 7

(21) The President of the U.S. should always be a man.
1 2 3 4 5 6 7

(22) Men should be the leader in any group.
1 2 3 4 5 6 7

(23) Men should watch football games instead of soap operas.
1 2 3 4 5 6 7

(24) All homosexual bars should be closed down.
1 2 3 4 5 6 7

(25) Men should have home improvement skills.
1 2 3 4 5 6 7

(26) Men should be able to fix most things around the house.
1 2 3 4 5 6 7

(27) A man should prefer watching action movies to reading romantic novels.
1 2 3 4 5 6 7

(28) Men should always like to have sex.
1 2 3 4 5 6 7

Strongly Disagree 1	Disagree 2	Slightly Disagree 3	No Opinion 4	Slightly Agree 5	Agree 6	Strongly Agree 7

(29) Boys should prefer to play with trucks rather than dolls.
1 2 3 4 5 6 7

(30) A man should not turn down sex.
1 2 3 4 5 6 7

(31) A man should always be the boss.
1 2 3 4 5 6 7

(32) Homosexuals should never kiss in public.
1 2 3 4 5 6 7

(33) A man should know how to repair his car if it should break down.
1 2 3 4 5 6 7

(34) A man should never admit when others hurt his feelings.
1 2 3 4 5 6 7

(35) Men should be detached in emotionally charged situations.
1 2 3 4 5 6 7

(36) It is important for a man to take risks, even if he might get hurt.
1 2 3 4 5 6 7

(37) A man should always be ready for sex.
1 2 3 4 5 6 7

(38) When the going gets tough, men should get tough.
1 2 3 4 5 6 7

(39) I think a young man should try to be physically tough, even if he's not big.
1 2 3 4 5 6 7

Strongly Disagree	Disagree	Slightly Disagree	No Opinion	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

(40) Men should not be too quick to tell others that they care about them.
1 2 3 4 5 6 7

Part III

Section I: *Knowledge about CRC & Early Detection Screening Knowledge*

Directions: Select true if you think the statement is true & false if you think the statement is not true.

(41) Colorectal cancer is a cancer of the colon or rectum.

1. True 2. False

(42) Colorectal cancer is the leading cause of cancer death in the United States.

1. True 2. False

(43) Colorectal cancer is a disease that affects only older, white men.

1. True 2. False

(44) Colorectal cancer is the third most common cancer in African Americans.

1. True 2. False

(45) The risk of developing colorectal cancer is greater as a person gets older.

1. True 2. False

(46) Both men and women are at risk for getting colorectal cancer.

1. True 2. False

(47) There are no known causes of colorectal cancer.

1. True 2. False

(48) Most colorectal cancers begin as a growth in the colon or rectum.

1. True 2. False

(49) Bleeding from the rectum, blood in your stool, or blood in the toilet after a bowel movement may be symptoms of colorectal cancer.

1. True 2. False

(50) Symptoms such as bleeding from the rectum, blood in your stool, or blood in the toilet after a bowel movement should be reported to the doctor immediately.

1. True 2. False

(51) You should see your doctor if you have a change in your bowel habits such as having stools that are narrower than usual.

1. True 2. False

(52) There is nothing anyone can do about getting colorectal cancer.

1. True 2. False

(53) Colorectal cancer is usually fatal.

1. True 2. False

(54) There are several screening tests for colorectal cancer.

1. True 2. False

(55) A Fecal Occult Blood Test (FOBT) is an appropriate test to screen for colorectal cancer.

1. True 2. False

(56) A Sigmoidoscopy is an appropriate test to screen for colorectal cancer.

1. True 2. False

(57) A Colonoscopy is an appropriate test to screen for colorectal cancer.

1. True 2. False

(58) Men and women should begin screening for colorectal cancer soon after turning 50 years of age.

1. True 2. False

(59) African-American men should begin screening for colorectal cancer at age 45.

1. True 2. False

(60) Screening tests for colorectal cancer are not necessary for individuals who do not have symptoms.

1. True 2. False

(61) Screening tests for colorectal cancer are not covered under most health insurance plans.

1. True 2. False

Section II: *Beliefs and Values about CRC & Early Detection Screening*

Directions: Select the number which indicates your level of agreement or disagreement with each statement. Give only one answer for each statement.

1. Strongly Disagree 2. Disagree 3. Neither Disagree nor Agree 4. Agree 5. Strongly Agree

	Strongly Disagree **(1)** **(2)**	*Disagree* **(2)**	*Neither D/A* **(3)**	*Agree* **(4)**	*Strongly Agree* **(5)**
CRC Severity					
62. The thought of getting colorectal cancer scares me.	1	2	3	4	5
63. If I had colorectal cancer, my career/life would be over.	1	2	3	4	5
64. When I think of colorectal cancer my heart beats faster.	1	2	3	4	5
65. Colorectal cancer is a hopeless disease.	1	2	3	4	5
66. My feelings about myself would change if I got colorectal cancer.	1	2	3	4	5

	Strongly Disagree **(1)**	*Disagree* **(2)**	*Neither D/A* **(3)**	*Agree* **(4)**	*Strongly Agree* **(5)**
67. I am afraid to even think about colorectal cancer.	1	2	3	4	5
68. My financial security would be endangered if I got colorectal cancer.	1	2	3	4	5
69. Problems I would experience from colorectal cancer would last a long time.	1	2	3	4	5
70. If I got colorectal cancer, my whole life would change.	1	2	3	4	5
Screening Benefits					
71. Having colorectal cancer screening will help me find colorectal cancer early.	1	2	3	4	5
72. If colorectal cancer is found early through screening, my treatment for colorectal cancer may not be as bad.	1	2	3	4	5
73. Having colorectal cancer screening is the best way to find a small cancer if I have one.	1	2	3	4	5
74. Having colorectal cancer screening will decrease my chances of dying from colorectal cancer.	1	2	3	4	5
75. When I have colorectal cancer screening, I am doing something to take care of myself.	1	2	3	4	5
Screening Barriers					
76. Colorectal cancer screening is embarrassing to me.	1	2	3	4	5
77. I am afraid to find out there is something wrong when I have colorectal cancer screening.	1	2	3	4	5
78. I am afraid to have colorectal cancer screening because I don't understand what will be done.	1	2	3	4	5
79. I don't know how to go about scheduling colorectal cancer screening.	1	2	3	4	5

	Strongly Disagree **(1)**	*Disagree* **(2)**	*Neither D/A* **(3)**	*Agree* **(4)**	*Strongly Agree* **(5)**
80. Having colorectal screening could take too much time.	1	2	3	4	5
81. Colorectal screening exams would be painful.	1	2	3	4	5
82. Having colorectal screening would expose me to too much radiation.	1	2	3	4	5
83. I have other problems more important than getting colorectal screening.	1	2	3	4	5
84. Having colorectal screening costs too much money.	1	2	3	4	5

Perceived Subjective Norms

85. The important people in my life believe colorectal cancer screening can help prevent colorectal cancer.	1	2	3	4	5
86. It is important for me to do what important people in my life think is appropriate.	1	2	3	4	5
87. My parents believe colorectal cancer screening is an appropriate way to detect colorectal cancer early.	1	2	3	4	5
88. It is important for me to do what my parents think is appropriate.	1	2	3	4	5
89. My "significant other" believes colorectal cancer screening is an appropriate way to detect colorectal cancer early.	1	2	3	4	5
90. It is important for me to comply with what my "significant other"believes in.	1	2	3	4	5
91. My siblings believe colorectal cancer-screening is an appropriate way to detect colorectal cancer early.	1	2	3	4	5
92. It is important for me to comply with what my siblings believe in.	1	2	3	4	5

	Strongly Disagree **(1)**	*Disagree* **(2)**	*Neither D/A* **(3)**	*Agree* **(4)**	*Strongly Agree* **(5)**
93. My close friend believes colorectal cancer screening is an appropriate way to detect colorectal cancer early.	1	2	3	4	5
94. It is important for me to comply with what my close friend believes in.	1	2	3	4	5