

Copyright
by
Techsell Meshell McKnight
2008

The Capstone Committee for Techksell Meshell McKnight Certifies that this is the approved version of the following capstone:

**Interventions to increase colorectal cancer screening
among African Americans: A systematic review**

Committee:

Laura Rudkin, Ph.D., Supervisor

Susan C. Weller, Ph.D.

Navkiran K. Shokar, M. A., M.D., MPH

Dean, Graduate School

Interventions to increase colorectal cancer screening among African Americans: A systematic review

by

Techksell Meshell McKnight, B.S., M.D.

Capstone

Presented to the Faculty of the Graduate School of

The University of Texas Medical Branch

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Public Health

The University of Texas Medical Branch

August, 2008

Dedication

I would like to dedicate this body of work to my loving parents, Katherine and Roderick Stephenson, who instilled the value of hard work and for believing in me. I also dedicate this capstone to my loving fiancé, Rema O. Washington.

Acknowledgements

I thank Alex Bienkowski, a brilliant librarian, who went above and beyond to help me organize and complete my literature search. I also extend special thanks to Yvette Schulz, the wonderful and efficient program coordinator for the Preventive Medicine Residency Program, who has continued to support me in every academic endeavor. And last but not least, I thank Carlos Martinez for his sincere friendship.

Interventions to increase colorectal cancer screening among African Americans: A systematic review

Publication No. _____

Tecshkell Meshell McKnight, M.P.H.

The University of Texas Medical Branch, 2008

Supervisor: Laura L. Rudkin

Colorectal cancer (CRC) continues to affect African Americans disproportionately. Despite medical advances and widely accepted screening recommendations, African Americans are less likely to get appropriate CRC screening, and consequently, are more likely to die from colorectal cancer than their white counterparts. Appropriate communication between the patient and the provider and the need for increased patient education may be a part of the solution to this discouraging problem. Increasing provider education and cultural awareness may increase CRC screening among African Americans. The objective of this Capstone was to perform a systematic review of the published literature to assess the effectiveness of interventions aimed to increase participation in colorectal cancer screening among African Americans. Seven online databases were systematically searched for articles published between January 2000 and December 2007, using subject terms taken from the Medical Subject Headings (MeSH), the list of standardized descriptors used by the National Library of Medicine (NLM), to standardize the search. Studies that measured CRC screening rates and met the inclusion/exclusion criteria were selected. Data was extracted and independently reviewed by three reviewers. Study design, population characteristics, experimental intervention, control intervention and outcomes were extracted from the selected articles. Of the 392 studies identified, seven articles were selected for this review. Four articles reported the use of culturally tailored interventions and three articles did not use culturally tailored interventions. Two studies had interventions aimed at physician education. Three articles reported statistically significant results. Because of the limited number of quality studies, no conclusive recommendations can be made regarding the contribution of culturally tailored interventions towards increasing CRC screening among African Americans.

Table of Contents

LIST OF TABLES	VIII
LIST OF FIGURES	IX
CHAPTER 1: BACKGROUND	1
CHAPTER 2: METHODS	6
Study selection.....	6
Main outcome measures	7
Data Extracted.....	18
CHAPTER 3: RESULTS	19
Study Selection	19
Study Design and Setting.....	19
Study Populations	21
Interventions	22
Interventional results.....	25
Analysis according to evidence quality	26
CHAPTER 4: DISCUSSION	28
CHAPTER 5: IMPLICATIONS AND CONCLUSIONS	31
Implications for Research and Practice.....	31
Conclusions.....	31
REFERENCES	33
VITA	37

List of Tables

Table 1: Grades of Evidence for the Professed Quality of a Study Design.....	7
Table 2: Extracted Data From the Reviewed Articles	8

List of Figures

Figure 1: Flow diagram showing how relevant articles were selected for the review process.....	20
--	----

CHAPTER 1: BACKGROUND

According to the American Cancer Society (ACS), colorectal cancer (CRC) is the third most common cause of cancer death in both men and women (ACS, 2008). Death rates from colorectal cancer have decreased since 1990. However, the decline has been less among African Americans than among non-Hispanic whites (0.8% vs. 1.9% per 100,000/yr) (ACS, 2006). Only eighteen percent of the population enrolled in Medicare has undergone CRC screening during the prior two years, but in comparison with whites, the odds of being screened are 0.52 for non-white population (Ananthakrishnan et al., 2007). Since 1987, CRC screening rates have increase from 4% to 44.3 % in 2004. However, the screening rate among African Americans, even among those who have Medicare, remains less that 50% (ACS, 2007). In 2006, the ACS CRC screening recommendations for individuals over 50 included the following:

- Yearly Fecal Occult blood Test (FOBT) or Fecal Immunochemical Test (FIT)
- Flexible sigmoidoscopy every 5 years
- Yearly FOBT or FIT, plus flexible sigmoidoscopy every 5 years (combined testing preferred over either test alone)
- Colonoscopy every 10 years
- Double-contrast barium enema every 5 years.

Inadequate patient education and poor communication with their health care provider may explain some of the racial differences in the CRC screening rate. The aims of this review were the following:

1. To identify and describe culturally relevant or non-culturally relevant interventions targeting African Americans that have been shown to effectively increase colorectal cancer screening.
2. To identify elements in the provider-patient relationship, such as communication, trust, patient education, and provider recommendations, that are associated with increased CRC screening among African Americans

Because of the advent of new screening tests and increased knowledge of current screening limitations, the ACS made changes in their recommendations in 2008. There are now two categories for screening: tests for cancer only and tests for cancer and pre-cancerous lesions (Levin et al., 2008). Virtual computed axial tomography (virtual CT) has been added, along with colonoscopy, flexible sigmoidoscopy, and the double-contrast barium enema as tests used to find cancer and pre-cancerous lesions (Levin et al., 2008). Stool deoxyribonucleic acid (stool DNA) has now been placed into the same category as FOBT and FIT, as a test that finds cancer only (Levin et al., 2008). Since previous testing modalities are still in the current recommendations as accepted methods of screening for colorectal cancer, this review is not affected by the 2008 changes.

Earlier literature on colorectal cancer attributed the higher colorectal cancer death rates in the African American population to a higher proportion of advanced disease at diagnosis (Day et al., 1987). In more recent studies, however, investigators concluded that this was most likely not the case. A study of 703 newly diagnosed patients with invasive colon adenocarcinoma, blinded to age, race, and sex, showed that blacks were less likely to have poorly differentiated grade 3 tumors and lymphoid reaction compared to whites (Chen et al., 1997). Despite the fact that

screening would give a more favorable histological prognosis for their tumor if colorectal cancer was present, African Americans may be less likely to undergo screening for earlier diagnosis because of decreased access to care (Palmer and Schneider, 2005). Although white women have a higher cancer incidence rate, black women are more likely to die of cancer (US Cancer Statistics Working Group, 2005). The high cancer mortality in the black population may be related to blacks being diagnosed at later stages (Mayberry et al., 2005; Doubeni et al., 2007) or to racial differences in socio-economic status (SES) (Du et al., 2007; Chu et al., 2007) and lack of definitive treatment (Du et al., 2007). Poverty, racial bias, and stereotyping may play a critical role in the willingness of African Americans to seek screening for colorectal cancer. The provider-patient interaction may be negatively affected by racial discrimination and social disparities resulting in barriers in access to high quality care (ACS, 2006).

When attempting to advise patients regarding CRC screening, it is important that providers understand the cultural norms and beliefs in the population they serve. This is of greater significance if that population is mostly of a different ethnic group.

“Limited knowledge as to how CRC may personally affect the individual, adverse attitudes towards ‘manhood-depriving’ procedures such as digital or instrumental rectal examinations, and beliefs or skepticism about the underlying intent of white physicians for patients of different ethnic background may be unspoken barriers to screening within the African American communities” (Agrawal et al., 2005 p519).

Patient education may also influence an individual to seek CRC screening. It has been observed that African Americans may be less likely to get CRC screening because of lack of knowledge, understanding or the ability to distinguish a screening test from any other test, when compared to whites, even when controlling for education levels (Shokar et al., 2005). Provider-patient communication is a critical part of primary prevention, and patient education has proven to be an important factor in a patient’s willingness to seek CRC screening. A CRC education

and screening program in a diverse low-income, uninsured population located in the state of Maryland's largest county was able to raise the screening rates in the uninsured from 13% to 52% over a two-year period (Sarfaty and Shibo, 2006). Provider recommendations for CRC screening have also been shown to increase screening rates in African Americans. In a cohort of 1599 veterans in the Veterans Administration (VA) system, when CRC screening was recommended equally among African American and white non-hispanic patients (71.0% vs. 68.2%, $p=0.44$), the African American patients were 1.3 times more likely than whites to receive CRC screening when recommended (36.3% vs. 28.9%, $p=0.03$) (Dolan et al., 2005).

There is a general distrust in the African American community of what might be called "official medicine." This has been called the "Tuskegee phenomenon" a reference that stems from the 40-year study that denied syphilis treatment to a group African American men from 1932 to 1972, even after there was a known cure (Jones, 1993). Distrust of physicians often leads African Americans to refuse needed procedures and, sometimes, to reject care (Jacobs et al., 2006). It is important that providers understand the attitudes of African American towards the health care community and try to develop a relationship of trust, honesty, and open discussions. A study conducted in New Orleans compared African Americans of lower socioeconomic status to members of the Oschner Health Plan (OHP), who were approximately 80% white, and noted the difference in attitudes and beliefs about cancer and health care (Scroggins et al., 1999). Socioeconomically disadvantaged African Americans agreed 35% of the time, versus 12% of the time ($p<0.001$) for the OHP group to the statement, "I sometimes find it difficult to talk to doctors." The African American group agreed 35% versus 26% ($p<0.001$) to the statement "I sometimes do not trust what doctors tell me" (Scroggins et al., 1999).

Cultural competence and efforts to understand the background and history of patients are especially important when attempting to risk-stratify African Americans. Family history is

important in risk stratification; unfortunately, African Americans may be less likely to know sufficient family history. A study conducted between 1995 and 2004 at the University of Chicago, High Risk Colon Cancer Clinic in a cohort of 139 patients showed that 21.6% of blacks lacked knowledge of family cancer history versus 10.8% of whites. The black patients knew less about paternal family history than maternal family history (Kupfer et al., 2006).

Lack of understanding of black culture may lead to distrust and patient resistance to preventive health care such as CRC screening. Increased provider competency and increased patient knowledge and awareness may strengthen the provider-patient relationship, which could possibly lead to increased CRC screening in African Americans. In efforts to increase CRC screening in African Americans, there have been several studies that address different aspects of the provider-patient relationship, and how it can influence a patient's willingness to seek CRC screening. It is important to identify interventions in the provider-patient relationship paradigm that have proven to be effective in increasing CRC screening in African Americans.

CHAPTER 2: METHODS

Several online databases were used to identify relevant literature. These included Medline (via PUBMED, OvidMedline, and the National Library of Medicines Gateway search engine), the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Database of Systematic Reviews, Web of Science (including both the Science Social Science Citation and Science Citation Index), and PsycINFO. A search was done for articles published between January, 2000 and December, 2007 using the Medical Subject Heading (MeSH) database, and the U.S. National Library of Medicine's controlled terminology (used for indexing articles for MEDLINE/PubMed). Terms and fragments found in the MeSH database that are relevant to the topic of this capstone were 'professional-patient relationship' 'attitude', 'attitude to health', 'health knowledge', 'practice', 'cultural background', 'customs', 'social psychology', 'beliefs', 'cultural belief', 'communication barriers', 'African American/blacks' and 'colorectal neoplasm'. The MeSH terms allowed a more systematic way to search different databases for articles that use different terminology for the same concepts. Abstracts and articles from the reference lists of the chosen articles were reviewed to identify other articles that may be relevant. The quality of the articles were assessed using a modified version of the U.S. Preventive Services Task Force Hierarchy of Research Design (S. Weller, Personal communication 6/21/08). As shown in table 1, randomized control trials were assigned the highest score of 1.

STUDY SELECTION

The following were the inclusion criteria for the selected studies: (a) studies whose sample population was greater than 50% African American, whose interventions addressed specific factors in the patient-provider relationship as it relates to communication, education, or

trust (whether or not this was culturally relevant); (b) studies using the ACS-endorsed guidelines for CRC screening; (c) and studies measuring the rate of completed CRC screening by self report or chart review. Exclusion criteria were: (a) studies in which the sample population was less than 50% African American, and (b) studies that did not stratify results by race. Seven articles were identified, published between January, 2000 and December, 2007, that fit these criteria. These seven studies are described in detail in table 2.

Table 1: Grades of Evidence for the Professed Quality of a Study Design*

Category / Study Design	SCORE
A. Randomized controlled trials: in these studies individuals are randomized into study groups. This is the strongest type of study design. (These studies may or may not be double-blinded.)	1
B. Community trials: in these studies, communities and not individuals are randomized to treatment and control groups. There must be a control group.	2
C. Pre-post with a single group: in these studies because a control group is lacking, this is the weakest study design.	3

*The grades are those in a modified version of the U.S. Preventive Services Task Force Hierarchy of Research Design (S. Weller, personal communication, 6/21/08)

MAIN OUTCOME MEASURES

The primary outcome measure was rates of CRC screening. Other areas of interest were the specific elements of each intervention, including the type of population, type of study, mode of delivery of the intervention(s), use of theory, intervention tailoring, and the identification of elements that were associated with positive outcomes.

Table 2: Extracted Data From the Reviewed Articles

Study Design	Sample Description	Experimental Full Intervention(s)	Control Intervention(s)	Outcome	Design Score
<p>1. Powe (2002)</p> <p>Randomized community trial</p> <p><i>Setting:</i> senior citizen centers</p> <p><i>Type of control:</i> Tradition Group (standard treatment)</p> <p><i>Intervention(s):</i> Culturally relevant video, calendar, poster, brochure, FOBT Flier</p> <p><i>Assessments:</i> Baseline and 12 mos.</p> <p>Type: CAI</p> <p>Theory: NR</p>	<p><i>Target Population:</i> A A/Black, Elderly</p> <p>N=106</p> <p>Mean age: 75</p> <p>AA/Blacks: 100% Whites: 0%</p> <p>Female: 100%</p>	<p>Videotape: Shown before initial data collection.</p> <p><i>“Telling the Story...To Live is God’s Will”</i></p> <ul style="list-style-type: none"> 20- min. culturally similar person discussion CRC screening. Person also demonstrates how to use the FOBT kit <p>Calendar: <i>“Telling the Story”</i></p> <ul style="list-style-type: none"> Educational calendar that addresses key points about CRC each month using pictures <p>Brochure: <i>“Telling the Story...about Bowel Cancer”</i></p> <ul style="list-style-type: none"> Tri fold brochure expressing the importance of early CRC screening and a picture of FOBT kit and the words “getting checked.” <p>Poster: <i>“Can We Talk...About Bowl Cancer.”</i></p> <ul style="list-style-type: none"> Still pics from the video, picture of a FOBT kit, and signs and symptoms of CRC <p>Flier: <i>“Doing the Kit”</i></p> <ul style="list-style-type: none"> 1 page color flier with 	<p>Traditional Group: ACS Videotape: Shown before initial data collection.</p> <p><i>“Colorectal cancer. The Cancer No One Talks About.”</i></p> <ul style="list-style-type: none"> 13 min video on the signs and symptoms of CRC and reasons for FOBT 	<p>Initial Data Collection:</p> <p>Experimental Full Intervention(s) Group 65% participated in FOBT</p> <p>Modified Intervention(s) Group 43% participated in FOBT</p> <p>Control Group 4% participated in FOBT</p> <p>1 Year Follow-Up Data Collection</p> <p>Experimental Full Intervention(s) Group 63% participated in FOBT</p> <p>Modified Intervention(s) Group 34% participated in FOBT</p> <p>Control Group 7% (n=5) participated in FOBT</p>	<p>2</p>

		<p>FOBT kit.</p> <p>Modified Intervention(s) Group Videotape: <i>"Telling the Story...To Live is God's Will"</i></p> <ul style="list-style-type: none">• 20- min. culturally similar person discussion CRC screening. Person also demonstrates how to use the FOBT kit			
--	--	---	--	--	--

Table 2 continued

Study Design	Sample Description	Experimental Full Intervention(s)	Control Intervention(s)	Outcome	Design Score
<p>2. Powe et al. (2004)</p> <p>Randomized community trial</p> <p><i>Setting:</i> senior citizen centers</p> <p><i>Type of control:</i> Tradition Group (standard treatment)</p> <p><i>Intervention(s):</i> Culturally relevant video, calendar, poster, brochure, FOBT Flier</p> <p><i>Assessments:</i> Baseline, 6 and 12 mos.</p> <p>Type: CAI</p> <p>Theories: NR</p>	<p><i>Target Population:</i> A A/Black, Elderly</p> <p>N=134</p> <p>Mean age: 73.8</p> <p>AA/Blacks: 84% Whites: 16%</p> <p>Female: 88%</p> <p>CAI</p>	<p>Videotape: <i>“Telling the Story...To Live is God’s Will”</i></p> <ul style="list-style-type: none"> 20- min. culturally similar person discussion CRC screening. Person also demonstrates how to use the FOBT kit <p>Calendar: <i>“Telling the Story”</i></p> <ul style="list-style-type: none"> Educational calendar that addresses key points about CRC each month using pictures <p>Brochure: <i>“Telling the Story...about Bowel Cancer”</i></p> <ul style="list-style-type: none"> Tri fold brochure expressing the importance of early CRC screening and a picture of FOBT kit and the words “getting checked.” <p>Poster: <i>“Can We Talk...About Bowl Cancer.”</i></p> <ul style="list-style-type: none"> Still pics from the video and of a FOBT kit <p>Flier: <i>“Doing the Kit”</i></p> <ul style="list-style-type: none"> 1 page color flier with FOBT kit. <p>Modified Intervention(s) Group</p>	<p>Traditional Group: ACS Videotape: Shown before initial data collection.</p> <p><i>“Colorectal cancer. The Cancer No One Talks About.”</i></p> <ul style="list-style-type: none"> 13 min video on the signs and symptoms of CRC and reasons for FOBT 	<p>1 Year Follow-Up Data Collection</p> <p>Experimental Full Intervention(s) Group 61% (n=33) participated in FOBT</p> <p>Modified Intervention(s) Group 46% (n=15) participated in FOBT</p> <p>Control Group 15% (n=5) participated in FOBT</p>	<p>2</p>

		<p>Videotape: <i>"Telling the Story...To Live is God's Will"</i></p> <ul style="list-style-type: none">• 20- min. culturally similar person discussion CRC screening. Person also demonstrates how to use the FOBT kit			
--	--	--	--	--	--

Table 2 continued.

Study Design	Sample Description	Experimental Full Intervention(s)	Control Intervention(s)	Outcomes	Design Score
<p>3. Campbell et al. (2004)</p> <p>Randomized community trial</p> <p><i>Setting:</i> rural North Carolina churches</p> <p><i>Type of control:</i> Educational speakers on non related topics</p> <p><i>Intervention(s):</i> (WATCH) Wellness for AA Through Churches</p> <ol style="list-style-type: none"> 1. Tailored print and video, (TPV) 2. Lay health advisor (LHA) 3. Both <p><i>Assessments:</i> Baseline and 12 mos.</p> <p>Type: CAI</p> <p>Theory: SCT The stage of change transtheoretical framework HBM SSM</p>	<p><i>Target Population:</i> A A/Black</p> <p>N=587</p> <p>Mean age: 52</p> <p>AA/Blacks: 99%</p> <p>Other: 1%</p> <p>Female: 74%</p>	<p>TPV</p> <p>Newsletters:</p> <ul style="list-style-type: none"> • Computer-tailored newsletters mailed to participants homes at 2, 4 ,6 and 9th months. • Newsletters were personalized with the participants’ name, pastor, and church. • Newsletters contained information on food, screening, spiritual messages and community resources <p>Videotape</p> <ul style="list-style-type: none"> • 4 videotapes tailored to compliment the newsletters. Community member and pastors were featured on the tapes giving testimonials. • Pastor also delivered a sermon <p>LHA</p> <ul style="list-style-type: none"> • Indigenous member of the community whom others come to for help. • They were picked by members of the church and then asked to participate in a 16 hr training course over 7 months. • Each of 62 HLV (47 women) were trained to deliver information about eating healthy, exercise and 	<p>Control Churches:</p> <ul style="list-style-type: none"> • Control churches were offered health education and speakers on subjects not related to study. • Each church could chose from the following topics: HIV/AIDS, adolescent health, child care and health, prostate cancer awareness and elderly health issues. 	<p>Initial Data Collection: (FOBT and other CRC screening test in past year) Control: (30.4% and 20.3%) LHA: (23.5% and 16.6%) TPV: (19.7% and 23.7%) Combined: (19.5% and 26.4%)</p> <p>1 Year Follow-Up Data Collection</p> <p>Control: (21.7% and 27.5%) LHA: (33.3% and 25.5%) TPV: (36.8% and 21.1%) Combined: (31.0 and 14.9%)</p> <p>No significance difference for FOBT and of other CRC screening after 1 year ($p=.08$ and ns)</p>	<p>2</p>

		<p>the importance of CRC. They also included some Biblical passages</p> <ul style="list-style-type: none">• The HLV was also expected to host church-wide activities to promote the above topics.• Funds were provided for refreshments but the HLV received no monetary incentives.			
--	--	---	--	--	--

Table 2 continued.

Study Design	Sample Description	Experimental Full Intervention(s)	Control Intervention(s)	Outcomes	Design Score
<p>4. Basch et al. (2006)</p> <p>Randomized control trial.</p> <p><i>Setting:</i> New York City metropolitan area</p> <p><i>Type of control:</i> mailed printed materials about CRC screening</p> <p><i>Intervention(s):</i> Tailored telephone interventions</p> <p><i>Assessments:</i> Baseline and 6 mos.</p> <p>Type: NCAI</p> <p>Theory: NR</p>	<p><i>Target Population:</i> A A/Black</p> <p>N=456</p> <p>Mean age: 75</p> <p>AA/Blacks: 63.2% Whites: 16.2% Other 19.7</p> <p>Female: 71.1%</p>	<p>Tailored telephone call: N=226</p> <ul style="list-style-type: none"> • Tailed base on behavior and educational theory (Granz, et al., 2002). • 2 weeks after randomization. • Attempts were made to establish a rapport with the participant while addressing fear, beliefs and misconceptions • Emphasis was placed on positive reinforcement while proving emotional and social support. • Median number of calls 5 per recipient and the median number of minutes was 23.5 min total per recipient 	<p>Mailed printed material: N=230</p> <p>Letter:</p> <ul style="list-style-type: none"> • Mailed 1 week after randomization • The letter welcomes the person to the program <p>Brochure: “<i>Lets Break the Silence</i>” *</p> <ul style="list-style-type: none"> • Tri-fold brochure that discusses what CRC is and who is at risk. It expresses the importance of early CRC screening and it explains each screening modality. 	<p>Initial Data Collection: At baseline everyone was called. Subjects were excluded from the study if they had had recent CRC screening</p> <p>6 month Follow-Up Data Collection: Any CRC screening modality.</p> <ul style="list-style-type: none"> • Control group: 6.1% (14) • Intervention group: 27% (61) • Screening rates 4.4 times higher (95% CI= 2.2, 7.7) in the controls 	<p>1</p>

Table 2 continued.

Study Design	Sample Description	Experimental Full Intervention(s)	Control	Outcome	Design Score
<p>5. Khankari et al. (2007)</p> <p>Single arm, pretest-posttest design</p> <p><i>Setting:</i> Urban federally qualified health center</p> <p><i>Intervention(s):</i> Mailing letters and brochures, training to improve physician in-pt communication</p> <p><i>Assessments:</i> Baseline and 1 year.</p> <p>Type: NCAI</p> <p>Theory: NR</p>	<p><i>Target Population:</i> Low-income and racial/ethnic minorities</p> <p>N=154</p> <p>Mean age: 60.1y/o</p> <p>AA/Blacks: 51.7% Hispanics: 44.8%</p> <p>Female: 67.8%</p>	<p>Tracking Patients:</p> <ul style="list-style-type: none"> Chart review of pt over 50 who had been to the clinic 3 times between 1-1-02 and 1-28-05 who did not receive CRC screening <p>Letter and Brochure:</p> <ul style="list-style-type: none"> Before each visit a physical letter and brochure from the “<i>Screen for Life</i>” campaign developed by the CDC were mailed to the pt. The letter and brochure explained why the pt needed CRC screening. <p>Physician communication training:</p> <ul style="list-style-type: none"> 8 physicians went through a 1 hour educational session which review current CRC screening guidelines and communication skills to reduce medical jargon and improve pt understanding. <p>Feedback loop:</p> <ul style="list-style-type: none"> Designed to monitor screening recommendations and completion rates. 	<p>No controls</p>	<p>Initial Data Collection:</p> <p>11.5% CRC screening</p> <p>1 Year Follow-Up Data Collection</p> <p>27.9% CRC screening</p> <p>P=<0.001</p>	<p>3</p>

Table 2 continued

Study Design	Sample Description	Experimental Full Intervention(s)	Control Intervention(s)	Outcome	Design Score
<p>6. Katz et al. (2007)</p> <p>Nonrandomized community-based intervention study</p> <p><i>Setting:</i> Eleven cities in North and South Carolina with subsidized housing.</p> <p><i>Type of control:</i> Tradition Group (standard treatment)</p> <p><i>Intervention(s):</i> Culturally relevant brochures, direct mailing, posters, newspaper and local radio ads.</p> <p><i>Assessments:</i> Baseline and 12 mos.</p> <p>Type: CAI</p> <p>Theory: SLT HBM TTM</p>	<p><i>Target Population:</i> Low income women in North and South Carolina</p> <p>N=2098</p> <p>Age: 62% >65y/o</p> <p>AA/Blacks: 78% Other: 22%</p> <p>Female: 100%</p>	<p>Mass Media Campaign: Local newspaper ads: Radio announcements</p> <p>Focus groups:</p> <ul style="list-style-type: none"> Randomly selected participants from the selected study community were selected to participate in a focus group to evaluate the materials used in the intervention (brochures, poster, etc.) <p>Brochure: details not provided</p> <p>Poster: details not provided.</p>	<p>Traditional Group: Communities serve as their own control group with baseline measures of CRC screening rates.</p>	<p>Initial Data Collection:</p> <p>49.3% (95% CI 46.%, 52.6%) CRC screening rate</p> <p>1 Year Follow-Up Data Collection</p> <p>55.6% (95% CI, 47.9%, 63.0%) CRC screening rate</p>	<p>2</p>

Table 2 continued.

Study Design	Sample Description	Experimental Intervention(s)	Controls	Outcome	Design Score
<p>7. Freidman and Borum (2007)</p> <p>Quasi experimental pretest-posttest design</p> <p><i>Setting:</i> Internal medicine clinic</p> <p><i>Type of control:</i> none</p> <p><i>Intervention(s):</i> Physician-directed educational intervention</p> <p><i>Assessments:</i> 6 months pre-test and 6months post-test.</p> <p>Type: NCAI</p> <p>Theory: NR</p>	<p><i>Target Population:</i> A A/Black,</p> <p>N=116 pre-intervention N= 132 post-intervention</p> <p>Mean age: did not specify</p> <p>AA/Blacks: 100% Whites: 0%</p> <p>Female: did not specify</p>	<p>Didactic Seminars: Lead by attendings</p> <ul style="list-style-type: none"> Case-base didactic seminars on surveillance recommendations Observation of colonoscopies and flexible sigmoidoscopies 25 question pre- and posttest <p>Required charting:</p> <ul style="list-style-type: none"> Cancer screening summary forms that were charted in the medical records 	<p>No controls</p>	<p>Initial Data Collection Pre-intervention</p> <p>Rectal Exam n=48 (41.4%)</p> <p>FOBT n=46 (33.7%)</p> <p>Endoscopic procedure n=31 (26.7%)*</p> <p>Initial Data Collection Post-intervention</p> <p>Rectal Exam n= 51 (38.6%)</p> <p>FOBT n=50 (39.7%)</p> <p>Endoscopic procedure n=78 (59.1%)*</p> <p>There was no statistical difference in the pre- and post- intervention screening rate using rectal exam (p=0.6605) or FOBT (p=0.7748)</p> <p>*There was a significant difference in pre- and post-intervention screening with an endoscopic procedure (p=0.0001)</p>	<p>3</p>

CAI= culturally appropriate intervention(s)

NCAI= Non-Culturally appropriate intervention(s)

* <http://www.cdc.gov/Cancer/colorectal/pdf/CCSilencebrochure.pdf>

NR= Not reported

SLT=Social learning theory

HBM= Health belief model

TTM= Transtheoretical Model

SCT= Social cognitive theory

SSM=Social Support model

DATA EXTRACTED

Once articles were selected for review, and abstraction forms were developed by two reviewers, T. McKnight (TM) and N. Shokar (NS) discussed what data should be extracted. The data was initially extracted by TM and the completed tables were checked by NS. These reviewers assessed the eligibility of the chosen articles based on the exclusion and inclusion criteria described above. Each reviewer independently reviewed the articles and decided on the accuracy of the extracted data. The data that was extracted included the following: study design, setting, detailed descriptions of the intervention(s)/methods, whether the intervention was culturally tailored, number of participants, average age of the participants, percentage of African Americans, percentage of women, number of patients in each arm of the intervention, length of study and follow up, theory used if any, and outcome.

CHAPTER 3: RESULTS

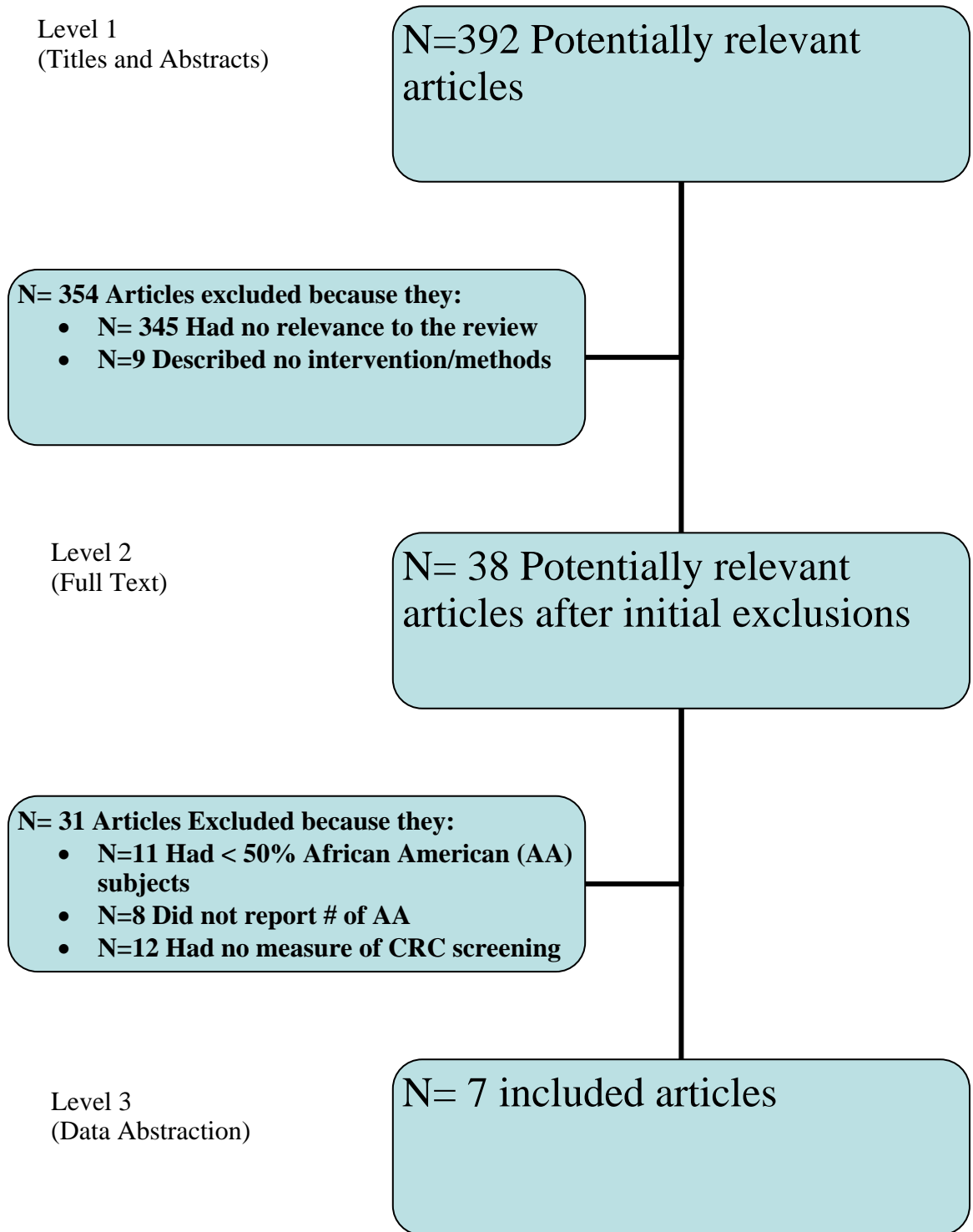
STUDY SELECTION

Overall, 392 articles were initially identified by titles and abstracts and were screened. Thirty-eight remained after the initial screening. Full-text reports of these articles were reviewed by TM and only 7 articles met the inclusion criteria (Powe, 2002; Powe et al., 2004; Campbell et al., 2004; Basch et al., 2006; Friedman and Borum, 2007; Kahnkari et al., 2007; Katz et al., 2007;) Of the original articles, 354 were excluded because they were not relevant to the review (n=345) or because the article did not have an intervention or did not describe an intervention in the methods section (n=9). Thirty-one were excluded because of one of more of the following: they reported less than 50% African American participation (n=11); or they did not stratify their data by race and, therefore, did not report the number of African Americans (n=8), or they did not measure rates of CRC screening at the end of their intervention (n=12), (See Figure 1).

STUDY DESIGN AND SETTING

One of the included studies was a randomized control trial (RCT) (Basch et al., 2006) three of the studies were randomized community trails (Powe, 2002; Powe et al., 2004; Campbell et al., 2004;), one study used a single-arm, pretest-posttest design (Khanhari et al., 2007), one study was a nonrandomized community-based intervention study (Katz et al., 2007) and one study was a pre- and post-intervention (Friedman and Borum, 2007). The setting for the studies was varied: two studies were done in nursing

Figure 1: Flow diagram showing how relevant articles were selected for the review process.



homes (Powe, 2002; Powe et al., 2004). Two studies were set in North Carolina. Of those, one was done in churches in African American communities (Campbell et al., 2004) and one was a community-wide study (Katz et al., 2007). One study was done in South Carolina (Katz et al., 2007). Two studies were located in urban areas (Basch et al., 2006; Khankari et al., 2007), and one study was set in a rural area (Campbell et al., 2004). The others did not specify a rural or urban location. One study was set in an internal medicine clinic (Friedman and Borum, 2007), but a specific location for the clinic was not given. The strongest evidence comes from the single study by Basch et al. (2006), followed by the community trials.

STUDY POPULATIONS

The study populations ranged from as large as 2098 subjects (Katz et al., 2007) to as small as 106 (Powe, 2002). The strongest study design (Basch et al., 2006) had an adequate sample size (n=456). Six studies had a majority of female participants (see Table 2), and of those, two studies targeted only females (Powe, 2002; Katz et al., 2007). The mean ages of the study subjects ranged from 52 years (Campbell et al., 2007) to 75 years (Basch et al., 2006). Friedman and Borum's (2007) study was done with a population that was 100% African American but gender or average age was not specified. Two studies targeted elderly African Americans (Powe, 2002; Powe et al., 2004); the other studies followed the screening age recommended by the ACS of ≥ 50 years old. Two studies targeted low-income populations (Khankari et al., 2007; Katz et al., 2007) while others did not specify an income target.

INTERVENTIONS

All but one study incorporated patient educational materials such as posters, brochures, or letters. This was done either in the controls, in the intervention, or in both populations. Three studies used videos (Powe, 2002; Campbell et al., 2004; Powe et al., 2004) but four studies did not use any videos (Basch et al., 2006; Friedman and Borum, 2007; Khankari et al. 2007; Katz et al., 2007). Katz (2007) and his team embarked upon the task of educating entire communities by launching a community-wide, mass media campaign for 12 months using newspaper advertisements, radio announcements, and focus groups to develop culturally tailored brochures and posters. Katz et al. (2007) used social learning theory (SLT) and the health belief model (HBM) and the trans-theoretical model (TTM) learning theories in the design of the intervention. For a one year period, Khankari (2007) and his colleagues focused on educating individual patients and improving physician communication skills. Patients were mailed a brochure (*Screen for life*) and a letter explaining the importance of CRC screening just before their scheduled visit, while the physicians prepared for the visit by attending a one hour educational session to review the CRC screening guidelines and to improve their communication skills. The Friedman and Borum (2007) study was the only one whose intervention was entirely focused on education for the physicians. Using a quasi-experimental before-and-after study design, Friedman and Borum (2007) incorporated didactic seminars and case-based learning sessions to educate internal medicine residents on appropriate screening recommendations.

Basch and associates (2007) educated their study participants by delivering tailored telephone interventions. During a 12-month period, an average of five calls were made to selected members in a New York City community, while simultaneously mailing a brochure (*Lets Break the Silence*) and a letter to the controls welcoming them to the study. Instead of randomizing individual subjects, Campbell (2004) and his associates decided to randomize and offer education to different African American churches to implement an intervention termed, “Wellness for African Americans Through Churches (WATCH)”.

Campbell et al. (2004) divided the participating churches into four different groups. For some churches the intervention involved printed newsletters and videos (TPV) every 2nd, 4th, 6th, and 9th month. Some churches were given a lay health advisor, and other churches received both interventions. The control churches were offered health education on a variety of subjects other than CRC screening. The HBM, social cognitive theory (SCT) model and social support model (SSM), plus the stage-of-change, and the trans-theoretical framework were learning theories used by Campbell (2004) and his associates. The TPV groups also received newsletters that were personalized with the participant’s name and their pastor’s name. The letter incorporated the gospel by using spiritual messages to educate individuals about the importance of CRC screening, and recommended foods to help decrease their risk of developing CRC. The newsletters also contained community resources to help facilitate efforts to seek CRC screening. The lay health advisor for this study was a respected member of the community and church who received theory-based training about CRC and screening recommendations. These

individuals also organized church activities that emphasized a healthy diet and CRC screening.

Powe (2002, 2004) and her associates used the same 12-month, multicomponent, educational intervention in both studies, targeted towards educating elderly African Americans in senior citizen centers. The senior citizen centers were randomized into three groups. The first groups of centers received a culturally tailored video (*Telling the Story...To Live is God's Will*) that discussed CRC prevention from a spiritual prospective. A calendar, (*Telling the Story*), a brochure (*Telling the Story...About Bowel Cancer*), and a poster (*Can We Talk...About Bowl Cancer*) and a flier (*Doing the Kit*) were also used. Another group of centers received a modified intervention which was just the culturally tailored video (*Telling the Story...To Live is God's Will*). The control group of centers was shown a non-culturally specific video developed by the ACS (*Colorectal cancer. The Cancer No One Talks About*). Each component of the intervention used images, language, food, dress, and customs that were familiar to the study population (Table 2).

All seven studies had multiple components to the interventions that were offered to the experimental groups. Five of the studies had baseline data collection, the intervention and then follow-up data collection one year after the baseline collection (Powe, 2002; Campbell et al., 2004; Powe et al., 2004; Friedman and Borum, 2007; Kahnkari et al., 2007; Katz et al, 2007), and one study had baseline data collection, the intervention, and then a six-month follow-up data collection (Basch et al., 2006). The intervention for one study included communication training and education for the participating physicians (Khankari et al., 2007). Four studies required community

cooperation to deliver the proposed intervention(s) (Powe, 2002; Campbell et al., 2004; Powe et al., 2004; Katz et al., 2007). The Campbell group's (2007) intervention was the only study that used telephone outreach as the primary intervention, while Katz and his group of researchers were the only ones who used a mass-media campaign to get the message across to their target population. Two studies used specific theories to guide the delivery of their interventions (Campbell et al., 2004; Katz et al., 2007). Four studies were culturally tailored (Powe, 2002; Campbell et al., 2004; Powe et al., 2004; and Katz et al., 2007) and the remaining three were not culturally tailored.

INTERVENTIONAL RESULTS

In all of the studies there appeared to be an increase in the percentage of subjects undergoing CRC screening in the intervention groups compared to the control groups. Three had statistically significant results (Khankari et al., 2007; Friedman and Borum, 2007; Basch et al., 2006), with screening between intervention groups and controls ranging from 16.4% to 32.4%. In neither of the Powe studies (2002, 2004) were p-values reported. Although CRC screening participation was low after the intervention in the experimental group (27%), Basch (2006) and his colleagues reported that the participants who received the telephone intervention had CRC screening rates that were 4.4 times higher than the controls (95% CI 2.2, 7.7) after one year. Both studies by Powe and associates (2002, 2004) had many parts to the intervention and they both seemed to show an increase in CRC from the baseline, however without statistical analysis this could have been by chance. The Friedman and Borum study (2007) showed no

statistically significant differences in the pre-and post-intervention percentages of subjects receiving screening rectal exams (41.4%, n=48 vs. 38.6%, n=51; p=0.6605) or FOBT (33.7%, n=46 vs. 39.7%, n=50; p=0.7748). However, there was a significant difference in pre- and post-intervention CRC screening using the endoscopic procedure (26.7%, n=31 vs. 59.1%, n=78; p=0.0001). The Wellness for African Americans Through Churches (WATCH) project reported an apparent increase in CRC screening; however, there was not a statistically significant difference between the control groups and the intervention groups (Campbell et al., 2004). Katz (2007) and his team also reported an increase in CRC screening, but there was no statistical difference from baseline (baseline=49.3%) (95% CI 46%, 52.6%) vs. a one year follow-up of 55.6% (95% CI, 47.9%, 63.0%). In the four of the culturally tailored interventions, none of the investigators reported statistically significant increases in CRC screening (Powe, 2002; Powe et al., 2004; Campbell et al., 2004; Katz, et al., 2007). In all of the non-culturally tailored interventions statistically significant increases were reported in CRC screening (Friedman and Borum, 2007; Khankari et al., 2007; Basch et al., 2006). It is important to note that these studies only used insured participants.

ANALYSIS ACCORDING TO EVIDENCE QUALITY

The Basch et al. (2006) tailored telephone out-reach study was the only randomized control trial. This study had the best design since individuals were randomized into study groups and control groups. It showed a significant increase in CRC screening among African Americans and it was not culturally tailored. This Basch

et al. study received the highest design score of 1 (See Table 1), although it was not double-blinded. Three culturally tailored studies, classified as community trials, used randomized locations instead of individuals (Powe, 2002; Campbell et al., 2004; Powe et al., 2004). All three studies showed an increase in CRC screening. However, they did not report a statistically significant difference in screening rates between the intervention groups and the control groups. These studies were assigned a design score of 2. The failure to find a significant difference in the two (Powe 2002; Powe et al., 2004) studies may be due to the small sample sizes and insufficient statistical power to detect a difference. These studies had control group, and results suggest an increase in screening. The designs for the other three studies (Friedman and Borum, 2007; Khankari et al., 2007; Katz et al., 2007) had the lowest study design score of 3, the weakest category, as they did not have a control group. Two were not culturally tailored. These two showed a significant increase in CRC screening (Friedman and Borum, 2007; Khankari,et al., 2007). One was culturally tailored but did not show a significant difference in CRC screening, pre-test versus post-test (Katz et al., 2007). However, it is impossible to interpret these findings due to a lack of a control group. The apparent increase may have also occurred in a control group.

CHAPTER 4: DISCUSSION

Some investigators have suggested that increased knowledge and a realistic perception of the need for CRC screening among African Americans could increase CRC screening rates (O'Malley et al., 2004; Lipkus et al., 2000). Others authors have suggested that culturally tailored educational interventions may be more successful at increasing the rate of CRC screening in African Americans compared to traditional outreach (Hamlyn, 2008; Chin et al., 2007). However, there does not appear to have been a thorough review of the effectiveness of interventions whose aim is to increase CRC screening in the African American population. The current capstone is a review of recent studies whose interventional aims were to increase CRC screening in African Americans. Individual-centered educational interventions (tailored or non-tailored) were found to be more successful than the interventions focused on educating entire communities. This current review suggests that increased provider education and training in communication skills play an important role in elevating CRC screening rates in African Americans, since this resulted in greater increases in CRC screening rates than community-based interventions. These results support the idea that increased knowledge and awareness are important determining factors in African American CRC screening rates, although the best way to deliver the intervention, and if it has to be or not be culturally tailored, remains unclear.

Community-wide intervention may play a role in efforts to increase awareness in African American communities; however, awareness may not immediately translate to increased CRC screening participation (Pinsky et al., 2008). The lower success of

community intervention trials, compared with individual-centered provider-education interventions could be explained by several different factors. One could be that community-wide interventions may lack the inter-personal communication and interaction needed to properly inform someone about their individual risk and need for CRC screening. Also, the community intervention in the analyzed studies did not always provide an avenue for individuals who were interested in CRC screening but did not have the means. The interventions aimed at increasing physician awareness may have been successful for several reasons. One reason for their success could possibly be that these studies used chart reviews to identify patients who had not been previously screened for CRC but were eligible for screening and had the means to get screened. Most importantly, several other authors have documented the importance of the recommendations by physicians for CRC screening in African American patients (Palmer et al, 2008; Lasser, 2008; Brenes and Paskett, 2000).

A limitation of this current review is that the participants in the selected studies were mostly women. Because of decreased participation of African American men, the benefit of these interventions may be limited to African American females. Another limitation is that the interventions that could be evaluated were heterogeneous, and each one had multiple components; a fact that limits any conclusion about what part of the intervention was the most effective, or if one component was not effective at all. Another limitation is that some of the reviewed studies measured the rate of CRC screening using just one accepted screening modality. Because of the inferior quality of the study designs and poor methodological quality of most of the studies available for review, it is difficult

to make any definitive assumptions about the effectiveness of recent interventions designed to increase CRC screening in African Americans.

CHAPTER 5: IMPLICATIONS AND CONCLUSIONS

IMPLICATIONS FOR RESEARCH AND PRACTICE

The need to increase CRC screening in African Americans has not been ignored. Community out-reach has been an important avenue for increasing community awareness, but there may also be a role for community-based interventions that provide access for those patients who are willing but do not have the means to get CRC screening. More research is needed on the effect of culturally tailored interventions on African American CRC screening. There is also a need for collaborative research involving the community and health care providers. Community-based efforts coupled with increased provider awareness may lead to increased CRC screening in African Americans. Further research is needed to identify the role (if any) of standardized education interventions for patient and primary care providers.

CONCLUSIONS

Studies concerning the provider-patient relationship role in the willingness of African Americans to accept colorectal cancer screening have focused on surveying the general attitudes, beliefs, and perception of care that seem to serve as barriers to CRC screening. This capstone reviewed both culturally relevant and non-culturally relevant interventions used to improve CRC screening in African Americans. The review does not

eliminate or support the need to continue to develop more culturally tailored interventions to increase CRC screening in African Americans; however it does suggest that educational and communication gaps may be wider than the cultural gap. Because of the limited amount of relevant research that has been done, no strong recommendations can be made for specific interventions to increase CRC screening in African Americans. However, although racial disparities in primary care may be on a decline, there continue to be inadequacies in the health care provided to many African Americans. The problems and barriers have been well documented, and the time to identify and implement innovative methods to end these health care disparities is now.

References

- American Cancer Society, *Cancer Facts & Figures for African Americans 2007-2008*. Atlanta, GA: American Cancer Society, 2007.
- American Cancer Society, *Cancer Facts & Figures 2006*. Atlanta, GA: American Cancer Society, 2006.
- American Cancer Society, *Cancer Facts & Figures for African Americans 2005-2006*. Atlanta, GA: American Cancer Society, 2005.
- Ananthakrishnan AN, Schellhase KG, Sparapani RA, Laud PW, Neuner JM. Disparities in colon cancer screening in the medicare population. *Archives of Internal Medicine* 167:258-264, 2007.
- Agrawal S, Bhupinderjit A, Bhutani MS, Boardman L, Nguyen C, Romero Y, Srinivasan R, Figueroa-Moseley C. Colorectal cancer in African Americans. *American Journal of Gastroenterology* 100:515-523, 2005.
- Basch CE, Wolf RL, Brouse CH, Shmukler C, Neugut A, DeCarlo LT, Shea S. Telephone out reach to increase colorectal Cancer Screening in an urban minority population. *American Journal Public Health* 96:2246-53, 2006.
- Brenes GA, and Paskett ED. Predictors of stage of adoption for colorectal cancer screening. *Preventive Medicine* 31:410-416, 2000.
- Campbell MK, James A, Hudson MA, Carr C, Jackson E, Oakes V, Demissie S, Farrell D, Tessaro I. Improving multiple behaviors for colorectal cancer prevention among African American church members. *Health Psychology* 23:492-502, 2004.
- Chen VW, Fenoglio-Preiser CM, Wu XC, Coates RJ, Reynolds P, Wickerham DL, Andrews P, Hunter C, Stemmermann G, Jackson JS, Edwards BK. Aggressiveness of colon carcinoma in blacks and whites. *Cancer Epidemiology Biomarkers Prevention* 6:1087-1093, 1997.
- Chin MH, Walters AE, Cook SC, Huang ES. Interventions to reduce racial and ethnic disparities in health care. *Medical Care Research Review* 64:7S-28S, 2007.
- Chu KC, Miller BA, Springfield SA. Measures of racial/ethnic health disparities in cancer mortality rates and the influence of socioeconomic status. *Journal of the National Medical Association* 99:1092-1104, 2007.
- Coughlin SS, Costanza ME, Fernandez ME, Glanz K, Lee JW, Smith SA, Stroud L, Tessaro I, Westfall JM, Weissfeld JL, Blumenthal DS. CDC-Funded Intervention

- Researched Aimed at Promoting Colorectal Cancer Screening in Communities. *Cancer* 107:1196-1204, 2006.
- Day H, Polissar L, Yang CY, Dahlberg S. Race, Socioeconomic status, and other prognostic factors of survival from colorectal cancer. *Journal of Chronic Disease* 40:857-864, 1987.
- Dolan NC, Ferreira MR, Fitzgibbon ML, Davis TC, Rademaker AW, Liu D, Lee J, Wolf M, Schmitt BP, Bennett CL. Colorectal Cancer Screening Among African-American and White Male Veterans. *American Journal of Preventive Medicine* 28:479-482, 2005.
- Du XL, Fang S, Vernon SW, El-Serag H, Shih YT, Davila J, Rasmus ML. Racial disparities and socioeconomic status in association with survival in a large population-based cohort of elderly patients with colon cancer. *Cancer* 110:660-669, 2007.
- Doubeni CA, Field TS, Buist DS, Korner EJ, Bigelow C, Lamerato L, Herrinton L, Quinn VP, Hart G, Hornbrook MC, Gurwitz JH, Wagner EH. Racial differences in tumor stage and survival for colorectal cancer in an insured population. *Cancer* 109:612-620, 2007.
- Friedman M, and Borum ML. Colorectal cancer screening of African Americans by internal medicine resident physicians can be improved with focused educational efforts. *Journal of the National Medical Association* 99:1010-1012, 2007.
- Hamlyn, Susan MS. Reducing the incidence of colorectal cancer in African Americans. *Gastroenterology Nursing* 31:39-42, 2008.
- Harris RP, Helfand M, Woolf SH, Lohr KN, Mulrow CD, Teutsch SM, Atkins D. Current methods of U.S Preventive Services Task Force. A review of the process. *American Journal of Preventive Medicine* 20:21-35, 2001.
- Jacobs EA, Rolle I, Ferrans CE, Whitaker EE, Warnecke RB. Understanding African Americans' Views of the Trustworthiness of Physicians. *Journal of General Internal Medicine* 21:642-647, 2006.
- Jones JH. *Bad Blood: The Tuskegee Syphilis Experiment*. Simon & Schuster Adult New York, NY: Publishing Group, 1993.

- Katz ML, Tatum C, Dickinson SL, Murray DM, Long-Foley K, Cooper MR, Daven M, Paskett ED. Improving colorectal cancer screening by using community volunteers: results of the Carolinas cancer education and screening (CARES) project. *Cancer* 110:1602-1609, 2007
- Khankari K, Eder M, Osborn CY, Makoul G, Clayman M, Skripkauskas S, Diamond-Shapiro L, Makundan D, Wolf MS. Improving colorectal cancer screening among the medically underserved: a pilot study within a federally qualified health center. *Journal of General Internal Medicine* 22:1410-1414, 2007.
- Kupfer SS, McCaffrey S, Kim KE. Racial and Gender Disparities in Hereditary Colorectal Cancer Risk Assessment: The Role of Family History. *Journal of Cancer Education* 21:S32-S36, 2006.
- Lasser KE. Barriers to colorectal cancer screening in community health centers: a qualitative study. *BMC Family Practice* 9:15, 2008
- Levin B, Lieberman DA, McFarland B, Andrews KS, Brooks D, Bond J, Dash C, Giardiello FM, Glick S, Johnson D, Johnson CD, et al. Screening and Surveillance for the Early Detection of Colorectal Cancer and Adenomatous Polyps, 2008: A Joint Guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *Gastroenterology* 134:1570-1595, 2008.
- Lipkus I.M, Lyna P.R, Rimer BK. Colorectal cancer risk perceptions and screening intentions in a minority population. *Journal of the National Medical Association* 92:492-500, 2000.
- Mayberry RM, Coates RJ, Hill HA, Click LA, Chen VW, Austin DF, Redmond CK, Fenoglio-Preiser CM, Hunter CP, Haynes MA, et al. Determinants of black/white differences in colon cancer survival. *Journal of the National Cancer Institute* 87:1686-1693, 1995.
- O'Malley AS, Sheppard VB, Schwartz M, Mandelblatt J. The role of trust in use of preventive services among low-income African-American women. *Preventive Medicine* 38:777-785, 2004.
- Palmer CR and Schneider CE. Social disparities across the continuum of colorectal cancer: a systematic review. *Cancer Causes and Control* 16:55-61, 2005.
- Palmer RC, Midgette LA, Dankwa I. Colorectal cancer screening and African Americans: findings from a qualitative study. *Cancer Control* 15:72-79, 2008.
- Pignone M, Rich M, Teutsch S, Berg A, Lohr K. Screening for colorectal cancer in adults at average risk: A summary of the evidence for the U.S. preventive services

- task force. *Annals of Internal Medicine* 137:132-141, 2002.
- Pinsky PF, Ford M, Gamito E, Higgins D, Jenkins V, Lamerato L, Tenorio S, Marcus PM, Gohagan JK. Enrollment of racial and ethnic minorities in the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial. *Journal of the National Medical Association* 100:291-298, 2008
- Powe BD. Promoting Fecal Occult Blood Testing in Rural African American Women. *Cancer Practice* 10:139-146, 2002.
- Powe BD, Ntekop E, Barron M. An Intervention Study to Increase Colorectal Cancer Knowledge and Screening Among Community Elders. *Public Health Nursing* 21:432-442, 2004.
- Preventive Services Task Force. *Guide to clinical preventive services: report of the U.S. Preventive Services Task Force*. 2nd ed. Williams & Wilkins, Baltimore, MA, 1996.
- Sarfaty M, and Peng S. Choice of Screening Modality in a Colorectal Cancer Education and Screening Program for the Uninsured. *Journal of Cancer Education* 21:43-49, 2006.
- Scroggins TG Jr, Bartley TK. Enhancing cancer control: Assessing cancer knowledge, attitudes and beliefs in disadvantaged communities. *Journal of the Louisiana State Medical Society* 151:202-208, 1999.
- Shokar N, Vernon S., Weller S. Cancer and Colorectal Cancer: Knowledge, Beliefs, and Screening Preferences of diverse patient populations. *Family Medicine* 37:341-347, 2005
- U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2002 Incidence and Mortality Web-based Report*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute, 2005.

Vita

Techksell Meshell McKnight was born on August 29, 1978, in Shreveport, Louisiana, to Katherine and Roderick Stephenson. She attended Fair Park High School where she graduated, Salutatorian, in 1996. She went on to college at Louisiana State University (LSU) in Baton Rouge, Louisiana, where she majored in Microbiology and minored in Chemistry. While attending college she worked as a substitute teacher for the Caddo Parish School Board. She attained her Bachelors in Science at LSU in December, 2000. She was accepted into medical school at Howard University College of Medicine (HUCM) in Washington, D.C, in 2001. She graduated from HUCM in 2005. After graduating from HUCM, Dr. McKnight was accepted into a combined Internal Medicine and General Preventive Medicine Residency Program at the University of Texas Medical Branch in Galveston. The family of Dr. McKnight has resided at 2519 West College, Shreveport, Louisiana, for more than 20 years.

Permanent address: 2519 West College, Shreveport, Louisiana 71109

This capstone was typed by Techksell Mechsell McKnight