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Increasing Colorectal Cancer Screening among African Americans, Linking Risk Perception to Interventions Targeting Patients, Communities and Clinicians

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Abstract

Colorectal cancer (CRC) screening remains significantly underutilized by African Americans despite their increased risk compared to. whites. The purpose of this article is to review recent research on patterns of screening, perceptions of CRC screening methods and outcomes of seven intervention trials specifically designed to increase screening among African Americans in light of the recommendation of the American College of Gastroenterologists to make colonoscopy the screening method of choice for this population. This review shows that progress has been made in understanding the complexity of perceived barriers to CRC screening among African Americans. Interventions that used community-based education targeting individuals and clinically based education targeting clinicians showed modest increases in screening rates. Targeting entire communities did not show significant results. However, because intervention studies use not only different types of interventions but different screening outcome measures, results are not easily comparable. While there is growing evidence that interventions can increase the use of fecal occult blood test (FOBT), it is not yet known if similar interventions can increase rates of screening colonoscopy. Clinicians, patients and policymakers also need to consider the array of social, cultural and financial issues associated with CRC screening in African-American communities.

Keywords

colorectal; cancer; African Americans; screening

BACKGROUND

In 2005, the American College of Gastroenterology (AGA) Committee of Minority Affairs and Cultural Diversity recommended that African Americans should begin colorectal cancer (CRC) screening at age 45, with colonoscopy as the preferred first line for screening. As

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compared to whites, African Americans have earlier onset of CRC, greater mortality and more proximal lesions, which are not visualized by other, accepted screening methods.[1] The AGA recommendation, however, differs from that of the U.S. Preventive Services Task Force (USPSTF), which recommends regular screening beginning at age 50 with any one of five screening methods at various intervals.[2] In 2002, the USPSTF concluded that data were insufficient to determine the most effective or cost-effective strategy for screening, and all major methods have favorable cost-effectiveness ratios compared with no screening.[3]

The purpose of this article is to review research on African Americans' perceptions of CRC screening methods and to summarize what has been learned from intervention studies designed specifically to increase screening among African Americans. This article discusses the results of these studies in relation to what is known about cancer risk perception among African Americans, ongoing Centers for Disease Control and Prevention (CDC) and National Cancer Institute (NCI) research designed to improve screening rates and recent recommendations on how to improve screening in primary care.

METHODS

To clarify patterns of CRC screening for African Americans, we summarized key findings from the NCI Surveillance, Epidemiology and End Results (SEER) Program and recent studies from the Behavioral Risk Factor Surveillance System (BRFSS) and the National Health Interview Survey (NHIS). Next, we located studies of African Americans' perceptions of CRC and screening methods through a Medline search from January 2000 to August 2007 using the following Medical Subject Headings (MeSH): colorectal neoplasms and African Americans and prevention and control or psychology. Three additional studies addressing African Americans' perceptions of CRC screening published in January 2008 were included during the review process.

To locate interventions designed to increase CRC screening specifically among African Americans, in January 2007, we undertook a comprehensive search for intervention studies published between 2002–2006 using the following databases: 1) Academic Search Premier; 2) Biological Abstracts; 3) CAB Abstracts; 4) CINAHL (multiple versions); 4) Communication & Mass Media Complete; 5) Education Abstracts; 6) ERIC; 7) Library, Information Science & Technology Abstracts; 8) MEDLINE; 9) PsycARTICLES; 10) PsycINFO; 11) Pubmed and 12) Social Sciences Abstracts. To make the search comprehensive, the following synonyms were used for CRC and for interventions: 1) screening interventions, 2) early detection, 3) randomized trials, 4) interventions; 5) screening, 6) intervention, 7) FOBT, 8) fecal occult blood test, 9) colonoscopy, 10) sigmoidoscopy, 11) endoscopy, 12) decision-making, and 13) cancer prevention along with "African Americans." Details of the full search are available on request. Through the comprehensive database search, we located seven intervention studies published between 2002–2007. Finally, we conducted a Google Scholar search in September 2007 using the terms: 1) African American, 2) colorectal cancer, and 3) screening to find interventions published in 2007 after the comprehensive search was completed in January. We added one additional intervention study, published in October 2007, that was identified during the review process.

Importance of Colorectal Cancer Screening for African Americans

Data from the SEER Program of the NCI show that overall colorectal cancer incidence rates for African Americans from 2000–2003 were approximately 22% higher than for whites (19% higher for men, 26% higher for women).[4] On average, African Americans also present with CRC earlier (age 66.4 years) compared to whites (age 69.7 years).[5] A higher proportion of African Americans present before the age of 50 compared to any other racial/ethnic group.[1] African Americans also have more proximal or right-sided adenomas and colon cancers, and more stage-IV disease at the time of diagnosis than members of other racial/ethnic groups.[5] Between 1992–2002, the mortality rate from CRC decreased 1.9% per year for whites but only 0.8% per year for African Americans. Overall, population-based studies suggest a 20–40% increased risk of death in African-American patients compared to whites after controlling for known prognostic factors at the time of diagnosis.[5] Given this pattern of incidence and mortality, screening is particularly important for African Americans.

Because of the complexity of recommended screening options, comparing adherence to screening guidelines across studies is difficult. Additionally, studies using medical record databases often fail to differentiate between screening and diagnostic colonoscopy, making interpretation difficult. Data from the 2004 BRFSS, however, do show lower self-reported CRC screening rates in African Americans compared to whites and in women versus men.[6] Data from NHIS show similar patterns.[7,8] A multivariate analysis of NHIS data showed that African Americans were 18% less likely than whites to be screened after controlling for age, sex, education and income level.[8] Smaller studies in clinics or small local areas, both rural and urban, show that only about one-third of African-American respondents >age 50 self-report having been screened.[9,10]

Finally, African Americans' use of endoscopic screening methods is low. A study of Medicare recipients found that black men had 25% lower use of colonoscopy compared with white men and a 50% lower use of flexible sigmoidoscopy.[11] A recent study of racial differences in CRC screening practices found that African-American women were half as likely to have undergone colonoscopy for CRC screening as white women by self-report.[12] Similarly, Cooper examined Medicare data for colorectal procedures and found that African Americans were less likely to have screening indications recorded for FOBT, flexible sigmoidoscopy and colonoscopy compared to whites.[13] Furthermore, current research suggests that the lower rate of endoscopic procedures in African Americans is attributable entirely to lower use of colonoscopy (OR=0.89 and 0.70 for African-American men and women, respectively, as compared to white men and women.[14] These differences are important factors in the disparity in CRC mortality.

Risk Perceptions of Colorectal Cancer

Risk perception is a driving force in a patient's decision to undertake preventive health action. The concept of risk perception, one's belief about the likelihood of personal harm, is based on beliefs about disease risk and severity and is central to many health behavior theories, including the Health Belief Model (HBM) and Social Cognitive Theory.[15,16] When Vernon synthesized the research on risk perception and risk communication related to cancer screening in 1999, she identified only one study of CRC risk perception that used

African-American subjects.[17] Here, we summarize key findings on the following dimensions of African Americans' perceptions of CRC screening and risk: estimation of risk, perception of need for screening, fatalistic beliefs, fears, perceived benefits and barriers, and mistrust of the healthcare system (Table 1).

Estimation of risk.—Studies show that African Americans consistently underestimate their CRC risk. Lipkus et al. report that at baseline, 36% of African Americans at a community health center rated their risk below average, while 37% did not know their risk.[18] At two-year follow-up, 58% of respondents were only slightly concerned or not at all concerned about developing colorectal cancer. A significant proportion of the population (20%) was unable to state whether their risk was average or above or below average.[19] Taylor et al. found that only 16% of African Americans accurately believe that they are more likely to get colon cancer than their white counterparts. Furthermore, only 53% thought colon cancer could be prevented.[10] Other studies have also found low awareness of risk for CRC.[20–22] Paskett et al. found that among low-income African-American women, even high perceived risk of CRC was unrelated to recent flexible sigmoidoscopy.[23] In sum, African Americans often misperceive themselves to be at low risk of developing colorectal cancer or, if they perceive the risk, are unaware they can do anything about it. A key to addressing this health disparity is to inform African Americans of their increased risk. A recent study comparing African Americans who underwent CRC screening and those who did not found that study participants who self-identified as being at higher risk due to either their race or family history had undergone screening, while those who did not appreciate the increased risk had not completed screening.[24]

Low perceived need for screening.—African Americans tend not to believe in the need for CRC screening. For example, Taylor et al. found that some African Americans believe that CRC screening should be performed only if symptoms are present.[10] More recently, Palmer et al. confirmed that African Americans who had not completed screening commonly reported that they would get screened only if symptoms such as blood in the stool were present.[24]

Key perceptions.—Studies of African Americans show distinct patterns of perceptions of CRC and CRC screening.[17] Through an in-depth qualitative study with 55 urban, low-income African Americans age >40, Greiner et al. identified six major themes in screening perceptions that are consistent with HBM constructs of barriers and facilitators to screening.[25] The key barriers identified were fear and knowledge—specifically, fear of cancer, the system and screening procedures, and lack of knowledge about screening. Other barriers included fatalism and mistrust. Key facilitators were hope and perceived accuracy, including perceptions of being hopeful about positive screening outcomes along with getting accurate tests (those perceived as most thorough). Greiner et al. emphasize that the hope and accuracy themes could be used to increase awareness with tailored educational messages and interventions designed to overcome perceived barriers.[25] These findings parallel findings on barriers, in particular, reported by other investigators as noted below.

Fears.—Fears are often cited and include fears of embarrassment, pain and finding abnormalities.[10,12,14,22,24–27] Greiner et al. also reported that some members of the African-American community often adopt a passive role and avoid medical care out of fear something might be wrong. They also noted a "culture of silence and avoidance" around cancer.[25]

Fatalistic beliefs.—African Americans reportedly have fatalistic beliefs that reduce likelihood of screening[17,28] Greiner et al. found two primary fatalistic beliefs: 1) once cancer has developed, there are no options for treatment or cure, and 2) surgery can spread the cancer.[25] McAlearney et al. found that while about one-quarter of African Americans believed that CRC is not curable, many more (58%) perceived that people have no control over detecting the cancer early.[12]

Mistrust of healthcare system.—Some African Americans mistrust the healthcare system. Greiner et al. found that some African Americans perceive physicians' failure to offer CRC screening or recommendations for what are perceived to be less-effective methods as subtle forms of racial discrimination.[25] Some report fear of being used as "guinea pigs" to test unproven procedures. In comparing beliefs about CRC in African Americans who had undergone screening and those who had not, Palmer et al. found that the theme of distrust of the medical system emerged only in groups that had not completed CRC screening.[24] Managed care, with its physician time limitations and reduced focus on patient wellness, has also been shown to be perceived by African Americans as a factor related to poor CRC screening rates. While African-American patients feel the need to be an advocate for their own care, without the appropriate knowledge base, this task can prove difficult.[25]

Finally, the issues of cost and access to care have been identified in the literature as potential barriers to CRC screening among African Americans. In one study, the most commonly cited reason for not being screened after lack of a physician recommendation was cost.[14] Lack of health insurance and difficulty accessing screening services, including referrals, copayments, transportation and time constraints, have emerged as further barriers to CRC screening among African-American patients.[12,24]

Beliefs supportive of screening.—Motives for having CRC screening included a desire to set a good example for family members, following a religious belief of taking care of one's body because it is God's holy temple; taking control over one's health, following a physician's advice and worrying less.[24,26] Indeed, a recommendation from a physician is repeatedly cited in the literature as one of the most powerful facilitators to completing screening among African Americans.[14,24] These findings parallel Greiner et al.'s finding that there are positive perceptions of screening that can be used to overcome perceived barriers.[25]

Perceived benefits versus barriers.—The complexity of CRC screening perceptions is underscored by findings from James, Campbell and Hudson's study of perceived benefits and barriers to CRC screening among African Americans.[26] This study of 850 older African-American church members showed that perceptions of sigmoidoscopy and colonoscopy may differ from FOBT in terms of the relative importance of perceived benefits

versus barriers. In this cross-sectional study, when a combination of tests was considered, both barriers and benefits were associated with rates of screening. But only perceived barriers were associated with FOBT, whereas only perceived benefits were associated with being screened with colonoscopy. However, at the time of data collection, colonoscopy was rarely used as a screening test.[26]

Because African Americans often rely heavily on physician recommendations for making medical decisions, physician communication about CRC screening methods is particularly important. Greiner et al. reported that given three CRC screening options (FOBT, sigmoidoscopy and colonoscopy), the largest proportion preferred colonoscopy (33%) or home FOBT (26%); one refused screening and the remaining 39% were unsure or stated that they would do what their physician recommended.[25] Despite the well-documented importance of physicians' recommendations to African Americans, they reported a significant proportion of patients (33%) do not remember ever receiving a physician recommendation for FOBT, sigmoidoscopy or colonoscopy.[25]

In sum, African Americans tend not to perceive themselves at particular risk for CRC and have many fears and concerns about undergoing tests when they do not have symptoms of disease. Efforts to increase screening need to take perceptions of both barriers and facilitators into account in designing and implementing screening initiatives.

Interventions to Increase Colorectal Cancer Screening among African Americans

The eight intervention studies designed to increase CRC screening of African Americans that we located used one of three strategies: 1) targeting entire communities,[29,30] 2) providing individual patient education or counseling in an outpatient[31] or community setting,[32–34] or 3) educating physicians.[35,36] Given the small number of studies specifically targeting African Americans, all were included in this review. Key design features and results are summarized in Table 2.

Interventions Targeting Communities

Blumenthal et al. studied the use of historically black medical schools to deliver health information about all forms of cancer screening to local communities.[29] Culturally sensitive messages were developed and delivered through a variety of strategies over 18 months in predominantly black census tracts in Nashville, TN, and Atlanta, GA. Chattanooga, TN, and Decatur, GA, served as comparison cities. Results were evaluated by pre- and postintervention random-digit-dial telephone surveys. The intervention cities showed an increase in knowledge of the project but little or no effect on knowledge of or attitudes about cancer screening. In analyses of actual screening following the intervention, Atlanta did show a higher percentage of age-appropriate populations receiving digital rectal exams (65% pre to 74.3% post in Atlanta compared to 72.8% pre to 78.8% post in Decatur) and FOBT (54.3% pre to 56.6% post in Atlanta compared to 64.9% pre and 54.9% post in Decatur).[29]

Katz et al. designed a community-based intervention which used trained volunteers to deliver a variety of outreach materials designed to address barriers to and increase awareness of the benefits of CRC screening.[30] The outreach strategies included educational classes, direct mailings, brochures and media campaigns by local newspapers and radio stations.

Results were evaluated by pre- and postintervention written survey of women at five time points during the study. The odds of being compliant with CRC screening guidelines for women residing within the intervention areas were not significantly higher than for women outside the intervention area (OR=1.27; p=0.172). However, when examining intent to be screened within the next 12 months, women residing in intervention areas had 1.56 times the odds of intent to screen compared to women residing outside intervention areas (P=0.053), and positive beliefs about CRC screening in general increased in the intervention areas (P=0.010).[30]

Interventions Targeting Individuals in Outpatient or Community Settings

Basch et al. conducted a series of educational telephone outreach calls to primarily African-American members of a health benefit fond (n=456).[32] In this randomized clinical trial (RCT), the intervention group received tailored telephone outreach aimed at establishing a positive and trusting rapport, reinforcing accurate beliefs and correcting misconceptions about CRC screening. Each recipient received on average five phone calls, lasting 23 minutes. The control group was mailed a cover letter and CRC screening brochure. Although the rate of completed FOBT or colonoscopy screening was 4.4 times higher for the intervention group than controls, the absolute rate of screening was only 27%.[32]

Powe, Ntekop and Barron developed a five-part multimedia RCT intervention for predominately African-American members of senior centers that took a cultural approach.[33] Fifteen senior centers were randomly assigned to one of three groups: a cultural and self-empowerment group, which received a video entitled “Telling the Story … To Live Is God’s Will,” a calendar designed to address key points about CRC and provide key spiritual messages each month, a poster outlining the importance of getting checked for CRC, a brochure that went with the video and a flier on the FOBT procedure, all distributed over a nine-month period; a modified cultural group, which received a CRC video only; and a control group. Participants (n=134) were primarily African-American females with a mean age of 73. Those who received the intervention in the cultural and self-empowerment group were most likely to complete FOBT screening (61%) at the end of 12 months compared to those in the modified intervention group (46%) and controls (15%).[33]

An ambitious intervention conducted by Campbell et al. called WATCH (Wellness for African Americans Through Churches) was aimed at improving nutrition, physical activity and CRC screening.[26,34] The 12 predominantly African-American rural churches (with a total of 587 participants) in eastern North Carolina were randomized into four groups. Congregants: 1) received a series of four custom-tailored, personalized newsletters and videotapes using testimonials from community members and pastors emphasizing the importance of dietary changes, physical activity and CRC screening; 2) had 62 lay health advisors chosen from the congregations who were trained to counsel other congregants; 3) had a combined intervention of both the personalized education and lay health advisors or 4) were part of a control church which received health talks unrelated to CRC screening. All intervention groups increased their rates of FOBT screening. The video/newsletter intervention group increased screening from 19.7% at baseline to 36.8% at follow-up, an 87% increase. Changes in other groups were a59% increase in the combined group, a 42%

increase in the lay health advisor group and a 29% decrease in the control group. These differences were only marginally significant at follow-up.[34]

Friedman et al. evaluated the efficacy of a videotaped intervention using peer educators and a health professional to increase compliance with FOBT screening among minority, low-income clients of an outpatient clinic compared to a control group randomized to receive usual care.[31] While 41% (n=160) of intervention subjects completed FOBT screening, this was not statistically significantly different from the control group.[31]

Interventions Targeting Clinicians

Zubarik et al. conducted a pre–post test study of an educational intervention designed to increase use of flexible sigmoidoscopy among low-income, predominantly uninsured urban minority patients.[35] Gastroenterology physicians and nurses at an academic hospital in Washington, DC, educated other attending physicians, residents and nurses through monthly lectures and informal weekly morning reports about the importance of CRC screening and the availability of flexible sigmoidoscopy in the center. In addition, clinicians were provided with a questionnaire to use to identify patients appropriate for flexible sigmoidoscopy screening. At five-month follow-up, there was a 42% increase in flexible sigmoidoscopy in the clinic, although the absolute number of patients screened (71) was modest. Of those whose results indicated need for a follow-up colonoscopy, 44% did not have the test.[35]

Friedman and Borum conducted a medical record review to evaluate CRC screening of African Americans for six months prior to (n=116) and following an educational intervention (n=132) targeting resident physicians.[36] The intervention included didactic sessions, observation of colonoscopies and flexible sigmoidoscopies, a pre- and posttest questionnaire and required charting of cancer screening on forms in the medical record. There were no statistically significant differences in performance of rectal exams or FOBT performed before compared to after the intervention. There was, however, a statistically significant difference in endoscopic assessments (p=0.0001).[36]

DISCUSSION

Because of differences in study design and study populations, it is difficult to compare the effectiveness of intervention strategies. While the efforts to target entire communities with information on CRC screening have not produced significant increases in screening, it is too soon to know what effect raising overall awareness may have over time in terms of African Americans' perceptions of CRC screening or their willingness to be screened.[29,30] In addition, all of the interventions discussed promoted different screening modalities, not necessarily colonoscopy. The findings do suggest that a focused, targeted educational intervention that is culturally sensitive and uses a multimedia format is promising. Powe et al. and Campbell et al. showed that the use of multimedia interventions that address the specific risk perceptions of CRC in African-American populations can be effective at increasing knowledge and screening behaviors.[33,34] Similarly, interventions aimed at clinicians to increase their comfort in discussing CRC screening with African-American patients were also successful in increasing the rates of screening in these patients.[35,36] These two strategies, one community based aimed at addressing risk perceptions of

African Americans and the other clinic based aimed at increasing comfort of clinicians to recommend CRC screening, might be replicated in larger randomized studies. Because risk perceptions of CRC and screening modalities are major barriers in African-American populations, designing interventions to address perceptions directly will be key to increasing screening.

The position of the AGA that colonoscopy should be the procedure of choice for African Americans warrants consideration in light of the findings of Zubarik et al.[35] These investigators showed that education targeting resident physicians increased the use of endoscopic procedures, but a high proportion of patients who received flexible sigmoidoscopy and had indications for colonoscopy were referred but did not complete the procedure. While community-based culturally sensitive interventions such as those investigated by Powe et al. and Campbell et al. successfully increased use of FOBT, clinicians and policymakers must weigh whether pursuing the gold standard of colonoscopy rather than other endoscopic procedures is warranted and what the role of FOBT should be given the entire array of social, cultural and financial issues associated with CRC screening.[33,34]

Ongoing research may clarify elements of interventions that increase screening. The CDC is currently funding eight projects aimed at increasing CRC screening rates, two of which directly target African Americans or have substantial African-American populations. One in Atlanta is recruiting 500 African-American men and women aged ≥50 years from community sites to individual or small-group counseling or financial incentives or a control group. An intervention in Georgia and Florida targets both patients and physicians using a videotape-based decision aid with patients. The physician education component includes organizing healthcare practices to make it easier for patients to obtain CRC screening.[37] Two of the 34 CRC studies being funded in 2006 by the NCI specifically focus on increasing CRC screening of African Americans. One, a randomized trial of 1,248 men and women who are nonadherent to CRC screening guidelines, will test the efficacy of a tailored, interactive computer intervention compared to and combined with physician recommendations. The other will test the feasibility of having women undergoing mammography being offered CRC screening for themselves and their spouses.[37]

CONCLUSION

Despite the fact that CRC screening has been shown to decrease mortality, it remains the least used screening tool in the United States and is particularly underutilized by African Americans. A meta-analysis of intervention studies has shown that cancer screening activities increase with interventions that target either the physician or the patient, or both simultaneously. When physicians are targeted, a discrete number of interventions that serve as behavioral cues or increase awareness appear optimal.[38] Since physician recommendations and trust play critical roles in motivating African-American patients to complete preventive health services, factors that enhance trust need to be investigated.[39] Because physician–patient communication is critical in the screening decision for African Americans, interventions should be culturally appropriate and sensitive to the patients' literacy and knowledge levels. Patient-directed interventions should focus on reducing

primary barriers to screening—specifically, lack of knowledge, trust and fear, in addition to cost and access to medical care. Also, efforts to increase knowledge should begin at an earlier age, to have a positive impact on preventive health behavior and beliefs.

CRC screening is an important part of preventive healthcare and, as such, complements education and counseling on exercise, nutrition, smoking cessation and screening for other types of cancer. Clinicians and researchers must find more effective ways to communicate CRC risk to African-American patients, in both clinical and community settings, to fully implement national recommendations for screening.

While education and greater attention to perceptions are important, screening disparities are also associated with access to medical care. African Americans are less likely than whites to undergo surgery, chemotherapy or radiation therapy.[1,5] There are far fewer disparities in populations with equal access to healthcare access. For example, among patients in the Veterans Affairs heath-care system, there were no differences in CRC screening recommendations by race.[40–42] Similarly, in studies of patients participating in randomized trials of adjuvant therapy for CRC, there were no significant differences in mortality rates.[43,44] African-American and low-income women enrolled in health maintenance organizations (HMOs) have been shown to be more adherent with FOBT than those in non-HMO plans.[45] The extent to which selection bias affects these findings is unknown but must be considered. Overall, however, these finding support the position taken by members of an NCI conference on “Improving Colorectal Cancer Screening Delivery, Utilization and Outcomes: the State of the Science” that more attention needs to be directed to structural factors in low rates of screening.[46] In our view, structural factors, risk perception and education as well as cultural barriers and facilitators to screening of African Americans warrant greater attention.

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Table 1.

Perceptions of colorectal cancer screening among African Americans

Barriers to Completing Screening	Facilitators for Completing Screening
Lack of Knowledge Underestimation of risk of CRC Lack of understanding that screening can prevent development of cancer Lack of knowledge that CRC is Treatable Type of screening tests available	Hope Positive screening outcome
Low Perceived Need for Screening Belief that screening is only needed if symptoms are present	Accuracy Thorough and accurate test results
Fear Embarrassment Pain Detection of cancer Culture of silence regarding cancer	Physician recommendation
Fatalism No option for treatment or cure of CRC	Religious Caring for the body as “God’s Holy temple”
Mistrust Surgery for CRC could spread cancer Being used as “guinea pigs” for unnecessary or unproven procedures	Active healthcare seeking Take control over one’s own health
Financial Cost of screening Lack of insurance	Peace of mind Decreased worrying
Access Logistics of scheduling and referral Time available	

Table 2.

Summary of interventions to increase colorectal cancer screening in predominately African-American populations

Author and Study Title	Target Audience	Study Strategy	Number in Study	Methodology and Evaluation	Results
Interventions Targeting Communities					
Blumenthal et al. Impact of a two-city community cancer prevention intervention on African Americans. *J Notl Med Assoc*. 2005;97(11): 1479–1488	African-American census tracts in Tennessee and Georgia	Use of a historically black medical school to deliver culturally sensitive cancer screening messages.	Not stated. All residents in census tracts in Nashville, TN, and Atlanta, GA, compared to similar census tracts in Chattanooga, TN, and Decatur, GA	Residents exposed to culturally appropriate messages on TV and radio, print and transit ads as well as community-based education. Evaluation included measures on knowledge and attitudes about cancer screening, actual reported use of cancer screening techniques using pre- and postintervention random-digit-dial telephone surveys.	Increase in knowledge about project. No differences in actual cancer knowledge and behavior about screening. Atlanta showed increase in CRC screening and mammograms.
Katz et al. Improving colorectal cancer screening by using community volunteers. *Cancer*. 2007;110:1602–1610	Low-income women in subsidized housing in 11 North and South Carolina cities.	Education classes, mailings, multimedia, in-clinic messages	All residents in areas; evaluation based on 2283 random surveys	Volunteer educators provided community education and directed mailings to women, and provided radio and community newspaper advertising; also did outreach in medical clinics used by participants. Evaluation included pre- and postintervention surveys.	CRC screening increased 1.27 times compared to before intervention, but this was not statistically significant.
Interventions Targeting Individual Patients in Outpatient or Community Settings					
Basch et al. Telephone outreach to increase colorectal cancer screening in an urban minority population. *Am J Public Health*. 2006:96(12) :2246–2252	Urban patients age ≥50 who were members of a health benefit fund.	Educational telephone outreach	226 in intervention group; 230 in control group	Randomized trial. Intervention group received tailored telephone educational intervention; control received mailed printed materials about CRC screening. Evaluation measures looked at documented CRC screening within six months of randomization.	27% of intervention group had documented CRC screening compared to 6.1% of control; intervention group was 4.4 times more likely to receive CRC screening within six months of randomization.
Campbell et al. Improving multiple behaviors for colorectal cancer prevention among African-American church members. *Health Psychol*. 2004;23 (5) :492–502	Rural North Carolina adults	Use of tailored print and video materials; lay health advisors	587 participants in 12 randomly selected African-American churches in rural North Carolina, participants	Four study groups with three churches randomized to each; tailored print and video materials utilizing faith-based messages; lay health advisors providing education with participants; combination; control. Evaluation measures included pre- and postintervention surveys.	The tailored print and video group significantly improved fruit and vegetable consumption, recreational physical activity and FOBT screening.
Friedman et al. Compliance with fecal occult blood test (FOBT) screening among low-income medical outpatients: a randomized controlled trial using a videotaped intervention. *J Cancer Educ*. 2001 ;16(2):85–88	Minority outpatient clinic patients age >50	Videotaped intervention and peer educators.	160 patients, randomized to intervention and control groups	Patients randomized into two conditions: videotape shown to patients by a trained peer education or health professional, or a control group. Evaluation measure was actual use of FOBT after the intervention.	The difference in compliance rates was not significant.
Powe, Ntekop & Barron. An intervention study to increase colorectal cancer knowledge and screening among community elders. *Public Health Nurs*. 2004;21 (5):435–442	Members of senior centers	Multimedia materials, including videos, a calendar, a poster and a brochure.	15 senior centers randomized to three groups; a total of 134 participants	Three study groups: five-part multimedia intervention, CRC video only and a control group. Evaluation measures included pre- and postintervention surveys on CRC knowledge as well as use of available fecal occult blood test kits.	The multimedia group had significantly greater increase in CRC knowledge and showed a greater likelihood of using FOBT.

Author and Study Title	Target Audience	Study Strategy	Number in Study	Methodology and Evaluation	Results
Interventions Targeting Physicians, Healthcare Professionals					
Friedman M & Borum M. Colorectal cancer screening of African Americans by internal medicine residents physicians can be improved with focused educational efforts. *J Natl Med Assoc*. 2007:99 (9): 1010–1012	Internal medicine physicians in large urban teaching hospital	Formal education of physicians about the need for CRC screening; change in policy requiring a summary form in each patient's medical record.	The number of physicians not discussed; 116 patients prior to intervention and 132 patients postintervention were assessed.	Physicians educated using seminars moderated by attendings; observations of colonoscopies and flexible sigmoidoscopy; five-question pre- and posttest and required charting of the performance of cancer screening. Evaluation measures included chart review of patients receiving rectal exams, FOBT and endoscopic exams before and after intervention.	There was a statistically significant difference in the rate at which endoscopic assessments were performed before and after the intervention.
Zubarik et al. Education improves colorectal cancer screening by flexible sigmoidoscopy in an inner city population. *Am J Gastroenterol*. 2000; 95(2) ;509–512	Healthcare practitioners and patients of inner-city hospital	Education of hospital physicians and nurses about the need for flexible sigmoidoscopy testing; reminder letters and phone calls to eligible patients	Number of participants not discussed; 121 patients were evaluated for flexible sigmoidoscopy use prior to and after the intervention.	Staff educated using monthly lectures and weekly morning reports in GI rotations. Education materials sent to all clinics, questionnaire designed to identify patients appropriate for flexible sigmoidoscopy. GI nurses contacted patients due for repeat flexible sigmoidoscopy by phone and mail. Evaluation measures included chart review of patients receiving flexible sigmoidoscopy before and after intervention.	Modest increase in flexible sigmoidoscopy from pre- to postintervention.