

# SOCIODEMOGRAPHIC CORRELATES OF STAGE OF ADOPTION FOR COLORECTAL CANCER SCREENING IN AFRICAN AMERICANS

**Objectives:** African Americans have the highest incidence and mortality rates from colorectal cancer in the United States. Endoscopic screening, while effective in reducing both, is greatly underutilized. This research sought to understand sociodemographic factors related to stage of readiness for endoscopic screening.

**Design:** One hundred fifty nine African American women (76.1%) and men (mean age=57.0 years) who were non-adherent to endoscopic screening guidelines were recruited and asked to complete semi-structured interviews.

**Setting:** Participants were all being seen for a non-acute primary care medical visit at one of two urban hospitals. The theoretical framework that informed this study was the Trans-theoretical Model (TTM) and the emphasis on Stage of Change or intention for undergoing endoscopic screening.

**Main Outcome and Measures:** Based on their stage of readiness to undergo screening, 67 (42%) were categorized as precontemplative (Has no plans to have a colonoscopy) while 92 were categorized as being in a contemplative or preparation stage. Using chi-square and Student t-tests, differences were examined between the two groups.

**Results:** No sociodemographic variables distinguished the two groups. However, people in the contemplative/preparation group were more likely to: have a regularly seen healthcare professional (63.7% vs 36.3%;  $P=.005$ ), have had a previous recommendation for screening (65.7% vs 34.3%;  $P=.003$ ); had heard of a colonoscopy (63.6% vs 36.4%;  $P=.000$ ) and have been told by a healthcare professional that they needed a colonoscopy (73.1% vs 26.9%;  $P=.000$ ).

**Conclusions:** This study helps us to better understand the relevance of sociodemographic characteristics that may be associated with completing endoscopic colorectal cancer screening. In addition, we confirm that physician recommendation and individual awareness of the procedure are significant factors in readiness to get screened. (*Ethn Dis.* 2009; 19:323-329)

**Key Words:** Colorectal Cancer Screening, African Americans, Cancer Prevention

Jennifer Christie, MD; Lina Jandorf, MA; Steven Itzkowitz, MD; Ethan Halm, MD, MPH; Kim Freeman, MPH; Sheba King; Rayhana Dhulkifl, MPH; Michelle McNair, MA; Linda Thelemaque; Catalina Lawsin, PhD; Katherine Duhamel, PhD

## INTRODUCTION

Colorectal cancer (CRC) has the second highest cancer-related mortality rate in the United States.<sup>1</sup> In 2007, an estimated 52,180 people died from CRC.<sup>2</sup> Unfortunately, African Americans have the highest incidence and mortality rates of CRC than any other ethnic group in the United States.<sup>1</sup> In fact, African American men and women have a 72.6 and 55.0, respectively, incidence rate per 100,000 population per year. This is compared to an incidence rate of 60.4 and 44.0 per 100,000 for White men and women, respectively.<sup>3</sup> Moreover, African Americans have an 83% estimated 5-year survival rate for CRC compared to 91% for Whites with localized disease.<sup>4</sup> The reasons for these disparities in CRC incidence and morbidity are perhaps due to biological differences in tumor development and behavior, or more importantly due to socioeconomic and cultural factors that compromise access to quality health care and CRC screening rates in minorities, particularly among those with low incomes.<sup>5</sup>

Endoscopic screening for CRC is effective because pre-cancerous polyps

can be removed during the procedure (polypectomy) thus preventing the development of colon cancer.<sup>6</sup> As CRC is often asymptomatic, particularly in its early stages when the chance for cure is highest, screening and early detection is crucial. Current federal consensus recommendations for CRC screening for average risk individuals (eg, those without a family history of CRC or personal history of inflammatory bowel disease) include annual fecal occult blood test (FOBT) and flexible sigmoidoscopy (FS) or barium enema every five years, or colonoscopy every ten years, beginning at age 50.<sup>7</sup> However the American College of Gastroenterology more recently designated colonoscopy as the "preferred strategy" based on research that suggests that the combination of FOBT and FS will miss up to 25% of polyps found on colonoscopy.<sup>8,9</sup> Colonoscopy with polypectomy decreases mortality from CRC by 90%.<sup>10</sup> Furthermore, there is evidence to suggest that African Americans have a higher prevalence of right-sided polyps, which are not detected by flexible sigmoidoscopy.<sup>11</sup> As such, colonoscopy is becoming the procedure of choice for CRC screening, and may be critical for African Americans.

Rates of CRC screening are increasing only slightly in the United States, despite compelling evidence that CRC screening saves lives. According to CDC data from the 2006 Behavioral Risk Factor Surveillance System (BRFSS), 57.1% of respondents, regardless of ethnicity, aged >50 years reported ever having had a sigmoidoscopy or colonoscopy.<sup>12</sup> In 2004, the State of New York reported that 54.8% of Whites, 51.0% of African Americans, and

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From Emory University School of Medicine (JC), and the Mount Sinai School of Medicine (SK, MM, LT, CL), Department of Medicine (JC, SI, EH) and the Department of Oncological Sciences (LJ, KF, RD).

Address correspondence and reprint requests to Jennifer Christie, MD; Emory University School of Medicine; 1365 Clifton Rd, Rm 1264; Atlanta, GA 30322; 404-778-4594; 404-778-2958 (fax); Jennifer.Christie@emory.edu

49.2% of Hispanics had ever had a colonoscopy.<sup>13</sup> In East Harlem (a predominantly low-income community of minorities), 43% of the residents aged >50 years reported having had a colonoscopy in the past 10 years compared to 54% of overall Manhattan residents.<sup>14</sup>

The reasons for the disparities in CRC screening are multifaceted. Socioeconomic, cultural, patient, physician, and organizational barriers contribute to the disparate rates for CRC screening in underrepresented minorities, compared to Whites. Patient-related barriers include fear, medical mistrust, lack of knowledge of the screening test, and poor communication with a primary care physician (PCP) due to primary language and cultural differences. Yet, physician recommendation universally has been found to be associated with compliance with cancer screening.<sup>15–18</sup> Unfortunately, even with physician recommendation, compliance with CRC screening (including colonoscopy) remains low. In order to better understand what factors may affect screening rates, this study examined sociodemographic characteristics, based on the stage of readiness to undergo a screening colonoscopy, as predictors.

### Barriers in African Americans

As mentioned previously, African Americans have the highest incidence and death rates from CRC in the United States. Therefore, we chose to target our study to increase CRC screening in this group. In addition, the current literature suggests that there are cultural factors that affect adherence to cancer screening in African Americans such as cancer stigma, medical mistrust, fatalism, and spirituality (eg, religious beliefs).<sup>19–21</sup> Thus, we hypothesized that the development and administration of culturally sensitive (CS) tailored educational materials that focused on the barriers to CRC screening specific to African Americans would enhance the stage of adoption for CRC

screening over existing standard educational material and physician recommendation. The current study is a sub-study of an ongoing longitudinal print intervention study to increase CRC endoscopic screening. Sociodemographic factors such as age, sex, marital status, education, employment status, income, and health insurance status have been linked to compliance with CRC screening recommendation. Previous studies have associated age <65 years, being single, low income and education, and being uninsured with a low use of colorectal cancer screening tests.<sup>22,23</sup> However, even when controlling for age, sex, income, and access to care, African Americans have been shown to be less likely to have had colonoscopy or sigmoidoscopy compared to Whites.<sup>24</sup> Therefore, we initially wanted to determine if these and/or other sociodemographic factors (eg, education) correlated with the initial stages of readiness for CRC screening in African Americans.

In this article, we describe our findings from a sub-study analysis of the sociodemographic correlates to stage of change for screening colonoscopy. While it is difficult to directly affect socioeconomic factors that affect access to health care, we can strive to change public policy as it relates to health insurance coverage, improving health literacy and education, and focusing on special populations within low-income minorities. In addition, given the strong role that physician recommendation for cancer screening has played in mammography and CRC screening, we also examined healthcare factors such as having a regular health care provider, having had a healthcare provider recommend CRC screening and having heard of colonoscopy.<sup>25</sup>

### Patient Educational Interventions

Studies reviewing the impact of interventions to increase FOBT compliance reveal a 10%–30% adherence rate.<sup>26</sup> Of the few studies focusing on

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colonoscopy, studies that use standard educational interventions are disappointingly unsuccessful.<sup>27,28</sup> However, theory-based interventions such as that used by Rakowski and colleagues based on the Transtheoretical Model (TTM),<sup>29</sup> found a stage-matched (SM) and tailored intervention increased adherence to mammography.<sup>30</sup> The TTM proposes that individuals move through a series of stages in the process of deciding whether to adopt a particular preventive health behavior and a SM or tailored intervention is designed to match a person's stage or readiness to undergo a behavior. The TTM also proposes that behavioral change strategies called Process of Change (POC) such as Commitment to Screening and Thinking Beyond Oneself are factors associated with a person's stage of adoption. Furthermore, our group previously found support for the Transtheoretical Model (TTM) and CRC screening compliance.<sup>29</sup> Therefore, we have employed the TTM constructs (eg, POC) in the development of stage-matched (SM) educational materials to assess the impact they have on readiness to undergo CRC screening in African

**Table 1. Stages of Change Definitions**

Stage-of-Adoption	Guidelines for Staging
Stage 1: Pre-contemplation	The person is unaware of CRC risk or has never heard of a colonoscopy.
Stage 2: Pre-contemplation	The person is aware of the CRC risk or has heard of a colonoscopy, but has never considered having a colonoscopy.
Stage 3: Pre-contemplation	The person is aware of the CRC risk and has considered having a colonoscopy but decided against it.
Stage 4: Contemplation	The person is considering undergoing colonoscopy screening in the next year.
Stage 5: Preparation	The person has an appointment scheduled for colonoscopy screening.

Americans. The five stages of change used to describe the process of deciding to undergo a change in behavior as it relates to health care are outlined in Table 1.

## METHODS

The parent study is an IRB-approved prospective randomized clinical trial designed to investigate the effectiveness of print educational interventions in reducing African Americans' barriers to screening and increasing their adherence with CRC screening recommendations. The focus of this article is to describe the sociodemographic characteristics of our patient population at time of enrollment and to determine the sociodemographic correlates of stage of readiness to undergo CRC screening. All clinical investigations were conducted in accord with the guidelines of the Declaration of Helsinki.

Recruitment began July 1, 2005 and was completed February 29, 2008. Eligible patients included African American men and women aged >50 years, who were asymptomatic for gastrointestinal symptoms, were in need of screening, and had a primary care physician (PCP). Individuals who need screening are defined as those patients who 1) have not had an FOBT within the past year; or 2) have not had an FS within the past 5 years; or 3) have had neither an FOBT within the past year or an FS within the past 5 years; or 4) colonoscopy within the past 10 years. Although initially the study eligibility included individuals who were aged

≥51 years, on August 15, 2007, the minimum age requirement was reduced from 51 to 50 years of age in order to facilitate recruitment.

Patients were recruited from the Mount Sinai Hospital and North General Hospital internal medicine clinics. The research staff reviewed the charts of scheduled patients for eligibility at each clinic prior to the patient visit and identified eligible patients (based on the criteria described above) for CRC screening. The research staff flagged the charts of eligible patients and the internal medicine staff distributed flyers to these patients. The RA then approached the patients to discuss the study. If the patient was interested and agreed to participate, informed consent and HIPAA were obtained for participation in the study. One year after initiating recruitment, we also received IRB permission to mail letters that described the study to scheduled patients. After the letters were mailed, a follow-up telephone call was made to remind the patient about the study and to ask them if they were interested in participating. If they were interested, they were met at the clinic by a member of the research staff and informed consent and HIPAA were obtained prior to their medical visit with their PCP. Participants received \$20 after completing the interview.

### Baseline Assessment

The 45-minute baseline interview was conducted immediately before the patient's PCP visit. Variables included sociodemographic information (eg, age, sex, marital status, education, employ-

ment status, income, health insurance, personal and family health history), as well as readiness to undergo CRC screening. Based on the participants' responses to the readiness to undergo change questions, they were categorized into one of five stages as defined in Table 1: Pre-contemplation 1, Pre-contemplation 2, Pre-contemplation 3, Contemplation, or Preparation.

Because there was not a significant difference on the characteristics to be examined, within the precontemplation stages and between contemplation and preparation, we created two groups. Group 1 participants staged in the three precontemplation categories and Group 2 staged as contemplation or in preparation.

During the office visit, the PCP recommended screening colonoscopy to the participant and handed the patient a sealed envelope which contained educational materials on CRC screening and specifically, colonoscopy. After the participant completed the office visit, any uncompleted sections of the initial interview were completed.

### Statistics

Our analysis described the sociodemographic correlates to stage of adoption for CRC screening in 159 African Americans assessed at the baseline interview. After completion of each interview, the data were entered (by someone other than the interviewer) into SPSS (SPSS, Chicago, Ill.). A second entry was also completed (in a separate data set), by a third person. Data files were then compared and all errors were corrected. The data were

then analyzed using the SPSS software package. All categorical data was analyzed by Chi-square analysis. The Student's t-test was used to analyze continuous data. All tests of significance are two-sided using a  $P < .05$ .

## RESULTS

Two hundred and thirty seven individuals were informed about the study. Sixty-eight percent of eligible patients agreed to participate in the study (the agreement rate was 72% Mount Sinai Hospital and 38% at North General). Across sites, 56 individuals did not want to participate. Non-participants were similar to participants regarding sex (77.1% female vs 76.1% among participants), but were significantly older than participants (65.1 [sd=10.6] vs 47.9 [7.0] years of age,  $P < .000$ ). Thirty-two people were "not interested" (had other medical problems or believed it was not beneficial). Nineteen people "did not want to participate" and gave reasons including having too many other tests, and not wanting to answer any questions. Five people gave "other" reasons, including being a full-time caretaker, having a colonoscopy already scheduled, and not being comfortable with access to the consent and personal history information.

One-hundred and fifty-nine patients were interviewed. The sociodemographic characteristics of the participants are presented in Table 2. The average age was 57.0 (SD=7.04), 76.1% were women, we found an even distribution of educational levels (less than high school, high school, and college), most were unemployed (85.5%), and all were low-income. Based on the baseline assessment, 67 participants were in Group 1 (precontemplation) and 92 in Group 2 (contemplation or preparation stages). As shown in Table 2, none of the sociodemographic variables we assessed were significantly different be-

tween the two stages. However, we found a trend for education to be associated with increased readiness to undergo screening. Level of education did not reach statistical difference between the two groups ( $P = .122$ ). Patients in the preparation or contemplation stage were more likely to have a usual source of care ( $P = .005$ ); their provider was more likely to recommend CRC screening ( $P = .003$ ) and colonoscopy ( $P = .000$ ), as well as having heard of a colonoscopy ( $P = .000$ ), compared to patients in the precontemplation stages.

## DISCUSSION

CRC has the second highest cancer-related mortality rate in the United States.<sup>1,2</sup> Perhaps most importantly for African Americans, they have the highest incidence and mortality rates of CRC than any other ethnic group in the United States.<sup>1</sup> Understanding the factors that may be associated with African American's adoption of colonoscopy may be critically important not only because of their high CRC incidence and mortality rate, but because there is evidence to suggest that African Americans have a higher prevalence of right-sided polyps, which are detected by colonoscopy, but not detected by flexible sigmoidoscopy.<sup>12</sup>

This is one of the few studies to assess sociodemographic factors that may be associated with stage of readiness to undergo screening colonoscopy among African Americans at average risk for CRC. However, none of the sociodemographic factors we assessed (age, sex, marital status, education, employment, or income) were found to be associated with stage of readiness. Previous studies have shown that many of the demographic factors mentioned above are associated with an advanced cancer stage diagnosis and a worse prognosis.<sup>31</sup> Furthermore, uninsured and Medicaid-insured patients have been found to be

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significantly more likely to present with advanced-stage cancer compared with privately insured patients.<sup>31</sup> Thus the findings of this study support the need to assess screening adherence and provide education regarding CRC screening particularly among individuals from these socioeconomic backgrounds as they may be more vulnerable to non-adherence and in turn, worsened prognosis of the disease.

Many studies have found that minority race, lower educational levels, unemployment, and low-income status are associated with lower screening rates. However, few studies assessed stage of readiness in those African Americans who have agreed to participate in an intervention trial seeking to improve CRC screening. We recruited a population that was previously unscreened for CRC (by colonoscopy), insured, and had a PCP and staged them based on readiness to undergo screening. Forty-two percent were in one of the precontemplation stages for undergoing colonoscopy at baseline vs 58% in the contemplation or preparation stage. We evaluated the sociodemographic differences between the two groups to understand what may be important in moving patients out of each group and closer to completing cancer screening. We have learned that

**Table 2. Sociodemographics and Health Care Correlates of Stage of Adoption**

	Overall	Stage of Adoption				p-value (by Stage of Adoption)
		Precontemplation <i>n</i> =67		Contemplation or Preparation <i>n</i> =92		
		<i>n</i>	%	<i>n</i>	%	
Age	Mean=57.00, S.D.=7.041					.493
50–55	50.59%	32	39.5%	49	60.5%	
56 and up	49.1%	35	44.9%	43	55.1%	
Sex						.448
Female	76.1%	53	43.8%	68	56.2%	
Male	23.9%	14	36.8%	24	63.2%	
Marital Status						.224
Married or living with partner	22.6%	12	33.3%	24	66.7%	
Single	77.4%	55	44.7%	68	55.3%	
Education						.122
Less than high school	30.2%	25	52.1%	23	47.9%	
High school or GED or vocational	31.4%	22	44.0%	28	56.0%	
Some college or greater	38.4%	20	32.8%	41	62.7%	
Employment Status						.219
Employed	14.5%	7	44.1%	16	55.9%	
Not employed	85.5%	60	30.4%	73	69.6%	
Income						.970
Less than 10,000	46.8%	31	42.5%	42	57.5%	
10,000 or greater	53.2%	35	42.2%	48	57.8%	
Do you have a health professional or doctor you see most often?						.005
Yes	78%	45	36.3%	79	63.7%	
No	22%	22	62.9%	13	37.1%	
Doctor or health professional recommended CRC screening?						.003
Yes	67.9%	37	34.3%	71	65.7%	
No	32.1%	30	58.8%	21	41.2%	
Ever heard of a colonoscopy?						.000
Yes	88.1%	51	36.4%	89	63.6%	
No	11.9%	16	84.2%	3	15.8%	
Have you been told by a doctor or health professional you need a colonoscopy?						.000
Yes	49.1%	21	26.9%	57	73.1%	
No	50.9%	46	56.8%	35	43.2%	

the process of planning educational interventions must consider where people are in the decision-making process. This is particularly important with regard to creating interventions for target subgroups. Therefore, in our study of patients with access to usual care, we have to incorporate other

factors besides access to care into our educational materials designed to increase CRC screening. We must continue to tailor public health interventions to specific groups based on multiple factors such as sociodemographic, healthcare access, spiritual and psychosocial factors.

The lack of statistical difference in sociodemographic factors between stages in our study may be related to many factors. First, our population was mostly low-income, African Americans. Therefore, in many ways they were sociodemographically similar. Secondly, the numbers may have been too small to

detect a difference between the two groups. Education was the sociodemographic variable most closely associated with stage of readiness to undergo CRC screening. Furthermore, there was a trend for more college educated patients to be in the preparation stage. Studies have shown that having less than a high school education is associated with underuse of CRC screening.<sup>32</sup> The exact impact of lower education levels on under utilization is unclear. However, low education levels may confound the impact of income, health insurance status, and access to healthcare on colon cancer screening rates. In our study, patients have similar health insurance status and access to care. Therefore, we would not see this effect.

Importantly, our patient's knowledge specific to colon cancer screening as well as recommendation for CRC screening differed significantly between the two stages. Patients in the contemplation or preparation stage were more likely to have heard of colonoscopy and had a physician recommend CRC screening. This reflects the importance of patients having usual care and physician recommendation in a patient's decision to undergo screening. While receiving a physician recommendation has been identified by prior studies as one of the most important factors associated with CRC screening it is not the only factor.<sup>15,33</sup> Therefore, although, we did not find a difference in sociodemographic factors in this analysis, we will analyze other factors that may affect stage of readiness in patients with a usual source of care as well as with their physician recommendation.

One of the limitations to this study is the relatively small sample size. One may argue that larger numbers might yield a statistical difference in sociodemographic factors between the two stages. However, the *P* value for all the factors with the exception of education is quite high suggesting that no difference would have been found despite

larger numbers. Another limitation is that the study population was too sociodemographically homogenous to detect a difference. Perhaps had we had slightly higher income levels as well as differences in insurance status, a difference in stage of readiness could have been detected. On the other hand, this study contributes to our understanding the need and ways to increase CRC screening among African Americans who have disproportionate incidence and mortality, potentially related to lower levels of screening.

Despite not demonstrating a difference in sociodemographic factors between the pre-contemplation and contemplation stages, this study has several strengths. The population studied, low-income African Americans, are understudied with regard to factors that influence colon cancer screening. Indeed, low-income African Americans are significantly under-screened. As such, our patients are a representative sample of this group. The current study helps us to better understand the relevance of demographic as well as other factors that may be associated with completion of CRC screening. Certainly, we confirmed that physician recommendation plays a significant role in cancer screening. These data suggest the importance of including physician recommendation in interventions designed to increase CRC screening. In a relatively homogenous group such as ours, other factors such as spirituality, psychosocial factors such as fatalism may also have a significant impact on whether a patient decides to be screened. Using the educational materials we created, we will explore how these other factors affect stage of adoption in future analysis.

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**AUTHOR CONTRIBUTIONS**

*Design concept of study:* Christie, Jandorf, Itzkowitz, Halm, Duhamel  
*Acquisition of data:* Christie, Jandorf, Itzkowitz, Halm, Freeman, King; Dhulkifl, McNair, Thelemaque; Duhamel  
*Data analysis and interpretation:* Christie, Jandorf, Thelemaque, Lawsin, Duhamel  
*Manuscript draft:* Christie, Jandorf, Duhamel  
*Statistical expertise:* Jandorf, Duhamel  
*Acquisition of funding:* Christie, Jandorf, Itzkowitz, Halm, Duhamel  
*Administrative, technical, or material assistance:* Jandorf, Freeman, King; Dhulkifl, McNair, Thelemaque; Lawsin, Duhamel  
*Supervision:* Jandorf, Duhamel