



Associated Factors with Colorectal Cancer (CRC) Screening Awareness in the Black Belt Region of Alabama: a Comparison among Three Types of CRC Screening

Journal of Health Disparities Research and Practice

Volume 16 | Issue 1

Article 4

© Center for Health Disparities Research, School of Public Health, University of Nevada, Las Vegas

2023

Associated Factors with Colorectal Cancer (CRC) Screening Awareness in the Black Belt Region of Alabama: a Comparison among Three Types of CRC Screening

Hee Yun Lee , *The University of Alabama*, hlee94@ua.edu

Yan Luo , *The University of Alabama*, yluo30@crimson.ua.edu

Chiahung Chou , *Auburn University*, czc0109@auburn.edu

See next page for additional authors

Follow this and additional works at: <https://digitalscholarship.unlv.edu/jhdrp>



Part of the [Community Health and Preventive Medicine Commons](#), [Health and Physical Education Commons](#), and the [Public Health Education and Promotion Commons](#)

Recommended Citation

Lee, Hee Yun; Luo, Yan; Chou, Chiahung; Lee, Mi Hwa; and Bennett, Marion (2023) "Associated Factors with Colorectal Cancer (CRC) Screening Awareness in the Black Belt Region of Alabama: a Comparison among Three Types of CRC Screening," *Journal of Health Disparities Research and Practice*: Vol. 16: Iss. 1, Article 4.

Available at: <https://digitalscholarship.unlv.edu/jhdrp/vol16/iss1/4>

This Article is protected by copyright and/or related rights. It has been brought to you by Digital Scholarship@UNLV with permission from the rights-holder(s). You are free to use this Article in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/or on the work itself.

This Article has been accepted for inclusion in Journal of Health Disparities Research and Practice by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact digitalscholarship@unlv.edu.

Associated Factors with Colorectal Cancer (CRC) Screening Awareness in the Black Belt Region of Alabama: a Comparison among Three Types of CRC Screening

Abstract

Objective: The present study aims to assess the levels of awareness of three types of CRC screening tests (FIT or FBOT, sigmoidoscopy, and colonoscopy) among African Americans living in the Black Belt area, and examine the factors associated with awareness of CRC screening tests among this population.

Methods: The current study utilized a survey research design. Univariate analysis was used to assess the awareness of three types of colorectal cancer screening: FIT or FOBT, sigmoidoscopy, and colonoscopy. Three sets of logistic regression analyses were conducted to examine the factors associated with the awareness level of each of the three colorectal cancer screening types among study participants.

Results: More than half of study participants heard of FOBT/FIT. Only one third of participants heard of sigmoidoscopy. The majority of study participants heard of colonoscopy. Participation in socializing groups was found to be positively associated with awareness of all three types of CRC screening. Employment and having a primary care physician were positively associated with FOBT/FIT and colonoscopy. Study participants with a primary care physician demonstrated awareness of FOBT/FIT and colonoscopy

Conclusion: Health education on different types of CRC screening especially FOBT/FIT and sigmoidoscopy is needed for the study population. CRC screening awareness among rural African Americans is likely to be improved by removing barriers of accessing primary physicians or other healthcare resources. Health education intervention in community setting or socializing groups such as clubs or religious group can potentially improve awareness of CRC screening.

Keywords

Colorectal cancer screening; African American; Black Belt region; participation in socializing group; primary care physician

Authors

Hee Yun Lee, Yan Luo, Chiahung Chou, Mi Hwa Lee, and Marion Bennett



Journal of Health Disparities Research and Practice
Volume 16, Issue 1, Spring 2023, pp. 51-64

© School of Nursing
University of Nevada, Las Vegas

Associated Factors with Colorectal Cancer Screening Awareness in the Black Belt Region of Alabama: A Comparison among Three Types of Colorectal Cancer Screening

Hee Yun Lee, The University of Alabama

Yan Luo, University of Hawaii

Chiahung Chou, Auburn University

Mi Hwa Lee, East Carolina University

Marion Bennett, University of Arkansas

**Corresponding Author: Yan Luo, yanluo@hawaii.edu*

ABSTRACT

Objective: The present study aims to assess the levels of awareness of three types of CRC screening tests (FIT or FBOT, sigmoidoscopy, and colonoscopy) among African Americans living in the Black Belt area, and examine the factors associated with awareness of CRC screening tests among this population.

Methods: The current study utilized a survey research design. Univariate analysis was used to assess the awareness of three types of colorectal cancer screening: FIT or FOBT, sigmoidoscopy, and colonoscopy. Three sets of logistic regression analyses were conducted to examine the factors associated with the awareness level of each of the three colorectal cancer screening types among study participants.

Results: More than half of study participants heard of FOBT/FIT. Only one third of participants heard of sigmoidoscopy. The majority of study participants heard of colonoscopy. Participation in socializing groups was found to be positively associated with awareness of all three types of CRC screening. Employment and having a primary care physician were positively associated with FOBT/FIT and colonoscopy. Study participants with a primary care physician demonstrated awareness of FOBT/FIT and colonoscopy.

Conclusion: Health education on different types of CRC screening especially FOBT/FIT and sigmoidoscopy is needed for the study population. CRC screening awareness among rural African Americans is likely to be improved by removing barriers of accessing primary physicians or other healthcare resources. Health education intervention in community setting or socializing groups such as clubs or religious group can potentially improve awareness of CRC screening.

Keywords: Colorectal cancer screening; African American; Black Belt region; participation in socializing group; primary care physician

INTRODUCTION

Colorectal cancer (CRC) has been recognized as the second leading cause of cancer death in the United States (U.S.) (Siegel et al., 2020). A recent report estimated 104,270 diagnosed cases and 52,980 deaths in the U.S. due to colorectal cancer in 2021 (Howlader et al., 2021). African Americans have the highest incidence and mortality rate of colorectal cancer in the U.S. (42.6/100,000 and 18/100,000, respectively) compared to other racial/ethnic groups (e.g., 37.4/100,000 and 13.4/100,000 for non-Hispanic whites) (Howlader et al., 2021).

African Americans are more likely to be diagnosed with end-stage CRC and experience the lowest overall five-year survival rate (Siegel et al., 2020). Based on 2014-2018 data, the incidence and mortality cases per 100,000 adults were 42.6 and 18.0 for African Americans, 37.4 and 13.4 for non-Hispanic whites, and 37.8 and 13.7 for all racial/ethnic groups (Howlader et al., 2021).

While CRC screening is an effective way to decrease colorectal cancer mortality (US Preventive Services Task Force, 2021), only 68.8% of adults ages 50 to 75 years were current with CRC screenings as of 2018. In addition, official reports indicate that one-quarter of adults still had not been screened for CRC as recommended (Centers for Disease Control and Prevention [CDC], 2021). Further, African Americans have been found to have lower CRC screening rates than non-Hispanic white Americans (Khajuria, 2016; Rutter, Knudsen, Lin, & Bouskill, 2021). This despite having the highest incidence and mortality rates for the disease.

CRC screening awareness is crucial to improving screening rates and ultimately disease outcomes (Brandt, Dolinger, Sharpe, Hardin, & Berger, 2012; Gimeno Garcia, Hernandez Alvarez Buylla, Nicolas-Perez, & Quintero, 2014). A recent national study of 1,595 adults ages 40-75 years indicated that 90.5% of participants were familiar with the colonoscopy procedure, and 67.1% were familiar with the fecal immunochemical test (FIT) or guaiac fecal occult blood test (gFOBT) (Zhu et al., 2021). However, African American study participants were found to have lower awareness of CRC screening than their white counterparts (Ford, Coups, & Hay, 2006).

While there is a dearth of empirical research examining factors associated with CRC screening awareness among African Americans, prior research suggests that awareness of CRC screening procedures (e.g., FIT or FBOT, sigmoidoscopy or colonoscopy) are positively associated with health literacy (Arnold et al., 2012; Guerra, Dominguez, & Shea, 2005) and education (Ford et al., 2006; Geiger et al., 2008). Moreover, chronological age appears to be a mitigating factor in CRC knowledge and awareness outcomes. That is, study participants between the ages of 18-49 were found to have greater knowledge and awareness of CRC screening procedures than study participants over the age of 70 (Ford et al., 2006; Geiger et al., 2008).

Income, education, health insurance, and access to primary care are positively correlated with receipt of CRC screening (Cole, Jackson, & Doescher, 2013). Racial / ethnic minorities living in rural areas experience higher rates of poverty, are more likely to be uninsured, and have limited access to care compared to their urban minority counterparts or non-Hispanic white rural residents. Further, White and Itzkowitz (2020) cite fear and mistrust of the medical establishment as a significant barrier to CRC screening (White & Itzkowitz, 2020). Empirical evidence suggests that these social, economic, and cultural factors have led to even greater disparities in receipt of CRC screening (Cole et al., 2013; White & Itzkowitz, 2020).

CRC Knowledge and Awareness in the Alabama Black Belt Region

The Black Belt region of Alabama is an 18-county wide contiguous section of southern Alabama along the boundary between two major cultural areas in the state: (1) the Midland culture region, which has an agricultural heritage that later developed into middle-class family farms, and (2) the Lower South traditional culture region characterized by a plantation system of agriculture (Prior & Wong, 2020; Winemiller, 2019). The legacy of slavery and plantation heritage has left the Black Belt region with a depressed economy characterized by low employment, and poor social services (Winemiller, 2019). In addition, as home to a majority African American population, the Black Belt region is also challenged by high rates of poverty, low-achieving schools, high rates of migration, and health disparities (Hirschfield, 2019; Webster & Samson, 1992; Winemiller, 2019; Zekeri, 2004). The social and economic challenges, and the disparate outcomes in the Black Belt region, are thought to be due in part to a legacy of racial discrimination. According to Hirschfield (2019) racism has contributed to the unequal distribution of resources and limited access to health services (Hirschfield, 2019).

Prior research has noted racial and geographic disparities in CRC incidence and mortality rates (Howlader et al., 2021; Siegel et al., 2020). However, there are no studies that assess knowledge and awareness of CRC screening procedures among African Americans residing in Alabama's Black Belt region. To be sure, more research is necessary in order to explore factors that may account for increased CRC incidence and mortality among African Americans. This includes assessing levels of access to, and availability of health care (Bibbins-Domingo et al., 2016). The present study aims to (1) assess the levels of awareness of three types of CRC screening tests (FIT or FBOT, sigmoidoscopy, and colonoscopy) among African Americans living in the Black Belt area, and (2) examine the factors associated with awareness of CRC screening tests among this population.

METHODS

Research Method and Data Collection

The current study utilized a survey research design. With approval from the University of Alabama's Institutional Review Board, a survey of cancer screening and health behaviors in Alabama's Black Belt region was conducted. A convenient sample was recruited by a community liaison who previously worked as a health professional in Black Belt Region of Alabama. The liaison recruited participants through personal social networks and announced survey events to participants who were interested through email and phone calls. Self-administered surveys were completed by participants aged 18 years or older at the survey events in Dallas County and Livingston County in the Black Belt. In those instances where study participants had difficulty reading, survey items were read to participants and researchers recorded their responses. Due to the limited technological literacy of participants, a paper survey was used, and responses were entered into software by researchers using the Qualtrics digital platform. Upon completion of the survey, a \$15 gift card was provided to each participant as a token of appreciation for their time. The final sample size of the survey was N=257. African Americans comprised 98.83% of the sample n=254 which is the population group of interest in the current study.

Measurements

Dependent variables. The current investigation evaluated study participants' awareness of three types of colorectal cancer screening: FIT or FOBT, sigmoidoscopy, and colonoscopy. This was done through the use of three dichotomous variables with response selections ranging

from 0 = no, 1 = yes. Participants were asked “*Have you heard of FOBT or FIT?*” “*Have you heard of sigmoidoscopy?*” and “*Have you heard of colonoscopy?*”

Independent Variables. Items related to socio-demographics, healthcare resources, participation in socializing groups, and health-related factors were utilized as independent variables in the current study.

Socio-demographics. Five socio-demographic factors were included and analyzed as dichotomous variables: Age (0=18-49 years old, 1=50 years old and over), gender (0=male, 1=female), educational attainment (0=below bachelor’s degree, 1=bachelor’s degree or above), marital status (0=single, separated, widowed, or divorced, 1=married or partnered), and employment status (0=unemployed, 1=employed).

Healthcare resources. Three items in the survey explored participants’ perception of how race affects quality of health care (“*Do you think your race affects the quality of healthcare that you receive?*”), whether participants have a regular place for receiving health care (“*Do you have a regular place for healthcare?*”), and whether they routinely see a primary-care physician (“*Do you regularly see a primary physician?*”). The response selections for each of the aforementioned items ranged from 0 = no to 1 = yes.

Participation in socializing groups. To assess participation in socializing groups, study participants were asked “*Do you attend any socializing group such as a social club or religious group?*” Once again, response selections ranged from (0=no, 1=yes).

Health-related factors. In an effort to explore additional health related factors that may affect knowledge and awareness outcomes, study participants were asked to report on their health status, family history of cancer, and the number of medical conditions they may be currently dealing with. Self-reported health status was initially assessed using a five-point Likert scale ranging from “1=very poor,” “2=poor,” “3=fair,” “4=good,” or “5=excellent or very good.” The final variable was obtained by dichotomizing the original variable: 0=very poor/poor/fair, 1=good/excellent or very good. For family cancer history, participants were asked, “Have any of your family (parents, grandparents, siblings, or close relatives) ever had cancer of any kind?” (0=no, 1=yes). For medical conditions, participants were asked, “What types of disease do you suffer from: high blood pressure/diabetes/cardiac disorder/stroke/arthritis/asthma and lung disease/gastrointestinal disorders?” The number of diseases that participants reported was treated as the number of medical conditions and analyzed as a continuous variable ranging from 0 to 7.

Statistical Analysis

Univariate analysis was conducted to describe the independent variables and rates of awareness for the three types of colorectal cancer screening. Bivariate analyses were employed to examine the unadjusted association between each independent variable and awareness of three types of CRC screening, respectively. Lastly, three sets of logistic regression analyses were conducted to examine the factors associated with the awareness level of each of the three colorectal cancer screening types among study participants.

RESULTS

Description of Independent Variables

As stated previously, a series of independent variables were devised to assess socio-demographics, healthcare resources, participation in socializing groups, and health-related factors. Once again, the size of the sample population was $N = 254$. As presented in Table 1, 60.4% of study participants were over 50 years of age ($n = 151$). Approximately 75% of the

sample population identified as female (n = 190). One-quarter of respondents reported having obtained bachelor's degree or higher (n = 59). Thirty-nine percent of study participants reported being married or in a domestic partnership (n = 95). Approximately 37% of respondents reported being employed (n = 90). Forty-three percent of study participants indicated that they believed race adversely affected the quality of healthcare they received (n = 106). Eighty-two percent of study participants reported having a regular place to receive health care (n = 205). Eighty-seven percent reported having a primary care physician (n = 220). Eighty-eight percent of respondents indicated that they had health coverage (n = 222). Fifty-nine percent of respondents reported participation in a socializing group (n = 140). Approximately 69% reported a family history of cancer (n = 172). Finally, 65.2% reported their health status as good/very good/excellent (n= 162). The average number of medical conditions reported by study participants was 1.49 out of 7.

Table 1 Descriptive Information of Independent Variables (N=254^a)

		n (%) ^b	Mean (SD) ^b
Age	<50 years old	99 (39.6)	
	>=50 years old	151 (60.4)	
Gender	Male	63 (24.9)	
	Female	190 (75.1)	
Education	Under bachelor's degree	171 (74.3)	
	Bachelor's degree or above	59 (25.7)	
Marital status	Single, separated, widowed, or divorced	149 (61.1)	
	Married or partnered	95 (38.9)	
Employment	No	151 (62.7)	
	Yes	90 (37.3)	
Perceived race affecting healthcare quality	No	140 (56.9)	
	Yes	106 (43.1)	
Having usual place for healthcare	No	45 (18.0)	
	Yes	205 (82.0)	
Having primary physician	No	32 (12.7)	
	Yes	220 (87.3)	
Health insurance coverage	No	29 (11.6)	
	Yes	222 (88.4)	
Participation in socializing group	No	97 (40.9)	
	Yes	140 (59.1)	
Family cancer history	No	78 (31.2)	
	Yes	172 (68.8)	
Self-reported health status	Very poor/poor/fair	88 (35.2)	
	Good/very good/excellent	162 (65.2)	
Number of medical conditions (range 0-7)			1.49 (1.32)

^a The total sample size of the study may not be the same as the total sample size of the survey due to missing values.

^b Means (SD) for continuous variables and n (%) for categorical variables.

Colorectal Cancer Screening Awareness

As it pertains to CRC knowledge and awareness presented in Table 2, more than half of study participants were familiar with FOBT/FIT (53.4%, n = 119). However, only one third of participants heard of sigmoidoscopy (36.7%, n = 79). The vast majority of study participants were familiar with colonoscopy (82.4%, n = 197). The independent variables *age*, *having a usual place for healthcare*, *having a primary physician*, and *participation in socializing groups* were significantly correlated with awareness of three types of CRC screening. Further, female gender was significantly correlated with awareness of FOBT/FIT and colonoscopy ($p < 0.05$).

Table 2 Colorectal Cancer Screening Awareness (N=257^a)

		Heard of FOBT or FIT		Heard of Sigmoidoscopy		Heard of Colonoscopy	
		n (%) ^b	p-value ^c	n (%)	p-value ^c	n (%)	p-value ^c
Total		119 (53.4)		79 (36.7)		197 (82.4)	
Age	<50 years old	43 (44.8)	0.025	24 (25.0)	0.001	75 (76.5)	0.035
	>=50 years old	75 (60.0)		54 (46.2)		121 (87.1)	
Gender	Male	23 (41.1)	0.033	15 (26.8)	0.072	41 (70.7)	0.007
	Female	96 (57.5)		64 (40.3)		156 (86.2)	
Education	<= bachelor's degree	75 (51.4)	0.233	51 (36.4)	0.304	130 (80.7)	0.143
	>=bachelor's degree	34 (60.7)		24 (44.4)		50 (89.3)	
Marital status	Single, separated, widowed, or divorced	73 (56.6)	0.538	53 (43.1)	0.029	117 (83.6)	0.833
	Married or partnered	45 (52.3)		23 (28.0)		77 (84.6)	
Employment	No	65 (51.6)	0.606	49 (41.5)	0.087	113 (80.1)	0.228
	Yes	48 (55.2)		26 (29.9)		76 (86.4)	
Perceived race affecting healthcare quality	No	62 (50.8)	0.261	37 (33.3)	0.278	105 (81.4)	0.413
	Yes	55 (58.5)		39 (40.6)		88 (85.4)	
Having usual place for healthcare	No	16 (36.4)	.010	8 (20.0)	0.014	26 (60.5)	0.000
	Yes	102 (58.0)		70 (40.7)		167 (87.0)	
Having primary physician	No	7 (22.6)	0.000	3 (10.3)	0.002	15 (48.4)	0.000
	Yes	111 (58.4)		75 (40.8)		180 (87.4)	
Health insurance	No	11 (44.0)	0.328	7 (28.0)	0.332	19 (76.0)	0.391
	Yes	106 (54.4)		71 (38.0)		175 (82.9)	
Participation in socializing group	No	32 (36.8)	0.000	21 (25.0)	0.003	71 (76.3)	0.014
	Yes	78 (63.9)		54 (45.4)		117 (88.6)	
Family cancer history	No	31 (45.6)	0.109	21 (31.8)	0.313	56 (78.9)	0.380
	Yes	87 (57.2)		57 (39.0)		138 (83.6)	
Self-reported health status	Very poor/poor/fair	36 (46.2)	0.122	27 (35.5)	0.725	65 (79.3)	0.320
	Good/very good/excellent	81 (57.0)		52 (38.0)		130 (84.4)	
		Mean (SD) ^b	p-value ^c	Mean (SD) ^b	p-value ^c	Mean (SD) ^b	p-value ^c

58 Associated Factors with Colorectal Cancer Screening Awareness in the Black Belt Region of Alabama
Lee, et al.

Number of medical conditions (range 0-6, Mean=1.49)	1.50 (1.33)	0.337	1.57 (1.45)	0.264	1.53 (1.36)	0.036
---	-------------	-------	-------------	-------	-------------	--------------

- ^a The total sample size of the study may not be the same as the total sample size of the survey due to missing values.
^b Means (SD) for continuous variables and n (%) for categorical variables.
^c T-test for continuous variables and χ^2 for categorical variables.

Associated Factors with Colorectal Cancer Screening Awareness

Table 3 shows factors associated with awareness of three types of CRC screening, respectively. Only *participation in socializing groups* was found to be associated with awareness of all three types of CRC screening. This would seem to indicate that study participants who participate in socializing groups were more likely to be aware of FOBT/FIT ($OR=5.03$, $95\% CI=2.28-11.10$, $p<0.001$), sigmoidoscopy ($OR=2.49$, $95\% CI=1.15-5.37$, $p<0.05$), and colonoscopy ($OR=3.67$, $95\% CI=1.14-11.83$, $p<0.05$). *Employment* and *having a primary care physician* were significantly associated with FOBT/FIT and colonoscopy. Participants who were employed had a greater likelihood of awareness of FOBT/FIT ($OR=3.62$, $95\% CI= 1.42-9.27$, $p<0.01$) and colonoscopy ($OR=9.56$, $95\% CI=1.76-52.04$, $p<0.01$). Study participants with a primary care physician demonstrated an awareness that was also statistically significant; FOBT/FIT ($OR=7.94$, $95\% CI= 1.37-45.97$, $p<0.05$) and colonoscopy ($OR=7.80$, $95\% CI=1.26-48.54$, $p<0.05$).

Table 3 Binary Logistic Regression on Predictors of Colorectal Cancer Screening Awareness

	Odds Ratio (95% CI)		
	FOBT or FIT	Sigmoidoscopy	Colonoscopy
Age (ref=<50 years old)	1.54	2.52*	1.91
>=50 year old	(0.65, 3.63)	(1.07, 5.93)	(0.50, 7.26)
Gender (ref=male)	1.22	1.30	1.28
Female	(0.45, 3.31)	(0.50, 3.46)	(0.32, 5.11)
Education (ref=under bachelor's degree)	0.70	1.22	3.30
Bachelor's degree or above	(0.28, 1.71)	(0.52, 2.87)	(0.66, 16.47)
Marital status (ref=single, separated, widowed, or divorced)	0.52	0.31**	0.48
Married or partnered	(0.22, 1.21)	(0.13, 0.73)	(0.14, 1.70)
Employment (ref=no)	3.62**	1.33	9.56**
Yes	(1.42, 9.27)	(0.56, 3.17)	(1.76, 52.04)
Perceived race affecting healthcare quality (ref=no)	1.71	1.46	0.92
Yes	(0.81, 3.64)	(0.70, 3.02)	(0.30, 2.82)
Having usual place for healthcare (ref=no)	1.59	0.87	1.56
Yes	(0.48, 5.33)	(0.22, 3.50)	(0.36, 6.81)
Having primary physician (ref=no)	7.94*	7.76	7.80*
Yes	(1.37, 45.97)	(0.82, 73.92)	(1.26, 48.54)
Health insurance coverage (ref=no)	1.50	2.12	0.80
Yes	(0.43, 5.25)	(0.60, 7.5347)	(0.14, 4.69)
Participation in socializing group (ref=no)	5.03***	2.49*	3.67*
Yes	(2.28, 11.10)	(1.15, 5.37)	(1.14, 11.83)
Family cancer history (ref=no)	2.39	1.64	0.82
Yes	(1.00, 5.76)	(0.69, 3.88)	(0.23, 2.97)
Self-reported health status (ref=very poor/poor/fair)	3.11*	1.57	1.35
Good/very good/excellent	(1.25, 7.73)	(0.66, 3.73)	(0.30, 6.16)
Number of medical conditions	1.13	0.87	1.52
	(0.81, 1.58)	(0.63, 1.20)	(0.85, 2.72)
Number of observation	162	156	176
Nagelkerke R Square	0.347	0.262	0.308
Hosmer and Lemeshow Test	0.142	.057	0.07

*p<0.05; **p<0.01; ***p<0.001.

Lastly, *self-reported health status* positively predicted awareness of FOBT/FIT ($OR=3.11$, $95\% CI=1.25-7.73$, $p<0.05$). Age was positively related to awareness of sigmoidoscopy ($OR=2.52$, $95\% CI=1.07-5.93$, $p<0.05$). However, *marital status* was negatively associated with awareness of sigmoidoscopy ($OR=0.31$, $95\% CI=0.13-0.73$, $p<0.05$).

DISCUSSION

Once again, to better understand the factors potentially related to increased CRC incidence and mortality among African Americans in rural communities, we assessed levels of awareness for three types of CRC screening tests (FIT or FBOT, sigmoidoscopy, and colonoscopy) among a sample population of African Americans living in the Black Belt region of Alabama. Overall, the majority (82.4%) of study participants were aware of colonoscopy as an option for CRC screening. Yet only 53.4% were familiar with FOBT/FIT and only 36.7% were familiar with sigmoidoscopy. A previous study using a nationally representative data yielded similar results. That is, 61% of participants were familiar with FOBT/FIT and 30% were familiar with sigmoidoscopy, while 80% were aware of colonoscopy (Geiger et al., 2008). Variation in levels of awareness for each of the aforementioned procedures may be a function of the type of health insurance, physician preference, and efficacy of a given screening procedure. Further, the CRC screening procedures vary in terms of the level of invasiveness. The FOBT/FIT is a stool-based test that is recommended for adults 50 to 75 years old annually and is the least invasive. Sigmoidoscopy is a direct visualization test that is used to visualize the lower third of the rectum and is recommended for adults 50 to 75 years old every five years (Smith et al., 2019; US Preventive Services Task Force, 2021). The colonoscopy is the most invasive procedure and is a direct visualization of the entire colon. It should also be noted that colonoscopy may also be used as a follow-up should anything unusual be found during one of the other screening tests. This would seem to suggest that colonoscopy is the most definitive screening procedure and therefore may account for greater awareness.

These findings should be considered in context. That is, over half of the study population was over the age of 50 and the American Cancer Society (ACS) recommends that CRC screening start at the age of 45 years in those with average risk factors by using non-colonoscopy methods (FOBT/FIT or sigmoidoscopy tests) (Smith et al., 2019).

Participation in socializing groups was a significant factor associated with awareness of all types of CRC screening procedures. Prior research has shown an association between social support and favorable health behaviors and outcomes (Jensen, Pedersen, Andersen, & Vedsted, 2015), including obtaining different types of cancer screenings (Curry, Byers, & Hewitt, 2003). Knowledge and awareness of a screening method is directly related to actually obtaining said screening. As such, support from social groups may then be associated with knowledge of different types of screening methods (Smith et al., 2019).

The current study also indicated that *employment status* was associated with CRC screening awareness. Study participants who are employed had a higher likelihood of being aware of FOBT/FIT and colonoscopy. According to Curry (2003), reducing anxiety and job instability problems in employment may help improve knowledge and participation in cancer screening programs, which would align with our results (Curry et al., 2003).

Further, *age* was significant predictor of CRC cancer screening awareness. That is, being over the age of 50 was also a factor that reflected an increased likelihood for awareness of the sigmoidoscopy procedure. This finding is supported by previous research which suggests that CRC screening rates increase significantly for patients from ages 50-75 (Jerant, Franks, Jackson, & Doescher, 2004). This is reflected by the positive association with knowledge about sigmoidoscopy among study participants over the age of 50. The negative association between marital status and sigmoidoscopy knowledge runs counter to prior research studies that suggest married individuals demonstrate higher adherence to CRC screenings and knowledge of test options (El-Haddad, Dong, Kallail, Hines, & Ablah, 2015).

The current study also revealed associations between healthcare resources and health-related factors. That is, having a healthcare provider resulted in more respondents being aware of FOBT/FIT (58.4%), sigmoidoscopy (40.8%) and colonoscopy (87.4%). Individuals who visit healthcare providers less frequently were found to have lower screening rates (Wools, Dapper, & Leeuw, 2015). However, those who are ill or have other comorbid conditions will have greater physician interaction and hence may be more knowledgeable of screening procedures. This may be a function of a greater likelihood that a healthcare provider will provide screening recommendations. Additionally, patients who reported *good/very good/excellent health* were found to be more aware of all three CRC screening options and are likely recognize the perceived benefit of CRC screening. There is an overall lower percentage of respondents reporting awareness of the sigmoidoscopy exam. This may be due in part to physicians recommending FOBT/FIT or colonoscopy over other methods (Zapka et al., 2011).

Limitations of the Study

There are some limitations in the current study. First, the study population was predominantly female (75.1%). Second, because screening recommendations typically begin between the ages of 45 and 50, persons younger than age 45 may not be aware of the need for CRC screening simply because their healthcare provider(s) has not informed them. With the age groups of this study being separated into <50 years and ≥50 years and no way to discern the individual ages of respondents, it is possible that the data for those <50 years of age may be skewed by younger persons who have not yet been informed of CRC screening options by a healthcare provider. Third, input of data into a Qualtrics survey by researchers instead of respondents entering their responses could result in inaccuracies and potential bias in the data entered. Moreover, reading the questions and potential responses to those with low literacy may have led to verbal misunderstanding and the study participant selecting an unintended response

Implication for Health Practice and Policy

The current study of CRC screening knowledge and awareness among African Americans in the Black Belt region of Alabama adds important detail to the CRC screening literature. It extends knowledge of cancer screening awareness in underserved rural communities. The study found a low awareness of FOBT/FIT and sigmoidoscopy, which may indicate that health education on different types of CRC screening especially FOBT/FIT and sigmoidoscopy is needed for African Americans in the Black Belt region of Alabama. While it remains unclear as to why there are varying levels of awareness among the three types of CRC screening, Zhu and colleagues conducted a national survey and found a broad preference for stool-based tests over colonoscopy among participants (Zhu et al., 2021). This may suggest that greater awareness of FOBT/FIT screenings could help improve CRC screening receipt rates.

Racial disparities in CRC screening rates have been well documented (Rutter et al., 2021; White & Itzkowitz, 2020). These disparate outcomes are thought due in large part to limited resources and limited access to care. For example, current study found that having a primary physician was a significant factor associated with the awareness of FOBT/FIT and colonoscopy. Primary care physicians are predominant source of knowledge and information about cancer screening. As such, CRC screening awareness among rural African Americans is likely to be improved by removing barriers of accessing primary care physicians or other healthcare resources.

Additionally, the study found that participants who were employed were more likely to be familiar with CRC screening. Health education intervention in a community setting that is able to reach the unemployed population may too increase the rate of general CRC screening awareness. Moreover, the study found that participants attending socializing groups were more likely to be aware of CRC screening. This is perhaps an indication that CRC screening awareness occurring in socializing groups such as clubs or religious groups can potentially improve CRC screening rates.

REFERENCES

- Arnold, C. L., Rademaker, A., Bailey, S. C., Esparza, J. M., Reynolds, C., Liu, D., . . . Davis, T. C. (2012). Literacy barriers to colorectal cancer screening in community clinics. *Journal of Health Communication, 17*(sup3), 252-264.
- Bibbins-Domingo, K., Grossman, D. C., Curry, S. J., Davidson, K. W., Epling, J. W., García, F. A., . . . Krist, A. H. (2016). Screening for colorectal cancer: US Preventive Services Task Force recommendation statement. *Jama, 315*(23), 2564-2575.
- Brandt, H. M., Dolinger, H. R., Sharpe, P. A., Hardin, J. W., & Berger, F. G. (2012). Relationship of colorectal cancer awareness and knowledge with colorectal cancer screening. *Colorectal Cancer, 1*(5), 383-396.
- Centers for Disease Control and Prevention [CDC]. (2021). *Use of Colorectal Cancer Screening tests: 2018 Behavioral Risk Factor Surveillance System*. Retrieved from <https://www.cdc.gov/cancer/colorectal/statistics/pdf/colorectal-cancer-screening-tests-h.pdf>
- Cole, A. M., Jackson, J. E., & Doescher, M. (2013). Colorectal cancer screening disparities for rural minorities in the United States. *Journal of primary care & community health, 4*(2), 106-111.
- Curry, S. J., Byers, T., & Hewitt, M. (2003). Improving Participation in Cancer Screening Programs. In *Fulfilling the Potential of Cancer Prevention and Early Detection*: National Academies Press (US).
- El-Haddad, B., Dong, F., Kallail, K., Hines, R., & Ablah, E. (2015). Association of marital status and colorectal cancer screening participation in the USA. *Colorectal disease, 17*(5), O108-O114.
- Ford, J. S., Coups, E. J., & Hay, J. L. (2006). Knowledge of colon cancer screening in a national probability sample in the United States. *Journal of Health Communication, 11*(S1), 19-35.
- Geiger, T. M., Miedema, B. W., Geana, M. V., Thaler, K., Rangnekar, N. J., & Cameron, G. T. (2008). Improving rates for screening colonoscopy: Analysis of the health information national trends survey (HINTS I) data. *Surgical endoscopy, 22*(2), 527-533.
- Gimeno Garcia, A. Z., Hernandez Alvarez Buylla, N., Nicolas-Perez, D., & Quintero, E. (2014). Public awareness of colorectal cancer screening: knowledge, attitudes, and interventions for increasing screening uptake. *International Scholarly Research Notices, 2014*.
- Guerra, C. E., Dominguez, F., & Shea, J. A. (2005). Literacy and knowledge, attitudes, and behavior about colorectal cancer screening. *Journal of Health Communication, 10*(7), 651-663.
- Hirschfield, J. (2019). *FROM SOIL TO STRUGGLE*:

- A Qualitative Study Of Health In Alabama's Black Belt*. Retrieved from https://6fe7d215-3267-4c00-bed8-ab265d198184.filesusr.com/ugd/f2df11_916bdccdc756443f80b6947db34510bd.pdf
- Howlander, N., Noone, A., Krapcho, M., Miller, D., Brest, A., Yu, M., . . . Cronin, K. (2021). *SEER cancer statistics review, 1975–2018*. Retrieved from Bethesda, MD: https://seer.cancer.gov/csr/1975_2018/
- Jensen, L. F., Pedersen, A. F., Andersen, B., & Vedsted, P. (2015). Social support and non-participation in breast cancer screening: a Danish cohort study. *Journal of Public Health, 38*(2), 335-342. doi:10.1093/pubmed/fdv051
- Jerant, A. F., Franks, P., Jackson, J. E., & Doescher, M. P. (2004). Age-related disparities in cancer screening: analysis of 2001 Behavioral Risk Factor Surveillance System data. *The Annals of Family Medicine, 2*(5), 481-487.
- Khajuria, H. S. (2016). Colorectal Cancer Screening Among Adults Aged 50-75 Years, by Race/Ethnicity-National Health Interview Survey, United States, 2000-2015. In: CENTERS DISEASE CONTROL 1600 CLIFTON RD, ATLANTA, GA 30333 USA.
- Prior, J. W., & Wong, D. W. (2020). Exploring different dimensions in defining the Alabama Black Belt. *GeoJournal, 1*-18.
- Rutter, C. M., Knudsen, A. B., Lin, J. S., & Bouskill, K. E. (2021). Black and White Differences in Colorectal Cancer Screening and Screening Outcomes: A Narrative Review. *Cancer Epidemiology Biomarkers & Prevention, 30*(1), 3-12. doi:10.1158/1055-9965.Epi-19-1537
- Siegel, R. L., Miller, K. D., Goding Sauer, A., Fedewa, S. A., Butterly, L. F., Anderson, J. C., . . . Jemal, A. (2020). Colorectal cancer statistics, 2020. *CA: A Cancer Journal for Clinicians, 70*(3), 145-164.
- Smith, R. A., Andrews, K. S., Brooks, D., Fedewa, S. A., Manassaram-Baptiste, D., Saslow, D., & Wender, R. C. (2019). Cancer screening in the United States, 2019: A review of current American Cancer Society guidelines and current issues in cancer screening. *CA: A Cancer Journal for Clinicians, 69*(3), 184-210. doi:<https://doi.org/10.3322/caac.21557>
- US Preventive Services Task Force. (2021). Screening for Colorectal Cancer: US Preventive Services Task Force Recommendation Statement. *jama, 325*(19), 1965-1977. doi:10.1001/jama.2021.6238
- Webster, G. R., & Samson, S. A. (1992). On defining the Alabama Black Belt: Historical changes and variations. *Southeastern Geographer, 32*(2), 163-172.
- White, P. M., & Itzkowitz, S. H. (2020). Barriers driving racial disparities in colorectal cancer screening in African Americans. *Current Gastroenterology Reports, 22*(8), 1-7.
- Winemiller, T. L. (2019). Black Belt Region in Alabama. In: THE ENCYCLOPEDIA OF ALABAMA.
- Wools, A., Dapper, E. A., & Leeuw, J. R. J. d. (2015). Colorectal cancer screening participation: a systematic review. *European journal of public health, 26*(1), 158-168. doi:10.1093/eurpub/ckv148
- Zapka, J. M., Klabunde, C. N., Arora, N. K., Yuan, G., Smith, J. L., & Kobrin, S. C. (2011). Physicians' colorectal cancer screening discussion and recommendation patterns. *Cancer Epidemiology and Prevention Biomarkers, 20*(3), 509-521.
- Zekeri, A. A. (2004). The causes of enduring poverty in Alabama's Black Belt. *In the Shadows of Poverty: Strengthening the Rural Poverty Research Capacity of the South*.

64 Associated Factors with Colorectal Cancer Screening Awareness in the Black Belt
Region of Alabama
Lee, et al.

*Mississippi State, MS: Mississippi State University. Rural Policy Research Institute's
Rural Poverty Research Center.*

Zhu, X., Parks, P. D., Weiser, E., Fischer, K., Griffin, J. M., Limburg, P. J., & Rutten, L. J. F.
(2021). National Survey of Patient Factors Associated with Colorectal Cancer
Screening Preferences. *Cancer Prevention Research, 14*(5), 603-614.