Understanding Racial and Ethnic Disparities in Colorectal Cancer Screening: Behavioral Risk Factor Surveillance System, 2002 and 2004

Natalie D. Crawford, MPH; Camara P. Jones, MD, PhD; Lisa C. Richardson, MD, MPH

Introduction: Racial/ethnic disparities in colorectal cancer (CRC) screening exist. The literature suggests that differential treatment by race may influence health behaviors and health outcomes.

Objective: We examined the impact of *Reactions to Race*-based treatment on being up-to-date with colorectal cancer screening with endoscopy or fecal occult blood testing (FOBT) among non-Hispanic White, non-Hispanic Black, and Hispanic men and women aged ≥50 years.

Design: Secondary data analysis of the *Reactions to Race* Module on the 2002 and 2004 Behavioral Risk Factor Surveillance System (BRFSS) was performed. Using logistic regression, we examined the strength of association between *Reactions to Race*-based treatment variables with up-to-date CRC screening tests after adjusting for demographic and access variables.

Main Outcome Measures: CRC screening tests were analyzed independently as FOBT within 2 years (n=30,134) and endoscopy (colonoscopy or sigmoidoscopy) within 5 years (n=30,210).

Results: Among Whites, 34% reported FOBT, compared with 30.6% of Blacks and 15.3% of Hispanics (P<.05). Forty-five percent of Whites reported endoscopy, compared with 40.7% of Blacks and 32.1% of Hispanics (P<.05). After adjusting for sociodemographic characteristics, Hispanics who always thought about their race were 73% (OR=.27; 95% CI: .13–.57) less likely to receive FOBT.

Conclusions: While screening disparities were largest among persons without insurance and a usual source of care, more research is needed to understand the influence of *Reactions to Race*-based treatment as an additional barrier to CRC screening. (*Ethn Dis*. 2010;20:359–365)

Key Words: Colorectal Cancer Screening, Racial/ethnic Disparities, Race-based Treatment, Access to Care

From Department of Epidemiology, Mailman School of Public Health, Columbia University (NDC) and Division of Adult and Community Health (CPJ) and Division of Cancer Prevention and Control (LCR), National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

Background

Non-Hispanic Blacks experience a higher incidence and mortality from colorectal cancer (CRC) compared to non-Hispanic Whites.[1,2] Colorectal cancer screening reduces CRC incidence and mortality through prevention, early detection, and subsequent treatment, and lower rates of CRC screening contribute to the reported racial/ ethnic disparities seen in CRC incidence and mortality.[3,4] In an attempt to understand how to improve CRC screening among racial/ ethnic minorities several studies have assessed factors associated with decreased CRC screening which include lack of a usual source of care, lack of health insurance, lower socioeconomic status, not being married, and lower frequency of other screening tests.[5,6] Racial/ethnic differences in financial status, healthcare access, and knowledge that result in CRC screening disparities may be a result of institutional barriers and differential treatment that systematically disadvantage minorities resulting in poorer health outcomes and health behaviors.[7] Polite and colleagues suggested that CRC screening barriers for African Americans might also be due to mistrust of the healthcare system, differences in cancer beliefs, and disparities in the quality of cancer care.[8]

Mounting evidence has shown that racism or systematic differential treatment targeted towards minority groups through interpersonal relationships and within institutions is associated with both mental and physical health outcomes and health behaviors.[5,9–14] For example, individuals who report experiences of racism are more likely to have elevated blood pressure, and students who experience racial/ethnic harassment are more likely to use tobacco.[10,12,14] Inherent in the complexity of the relationship between racism and health is the notion that persons experiencing racism are able to identify and label differential treatment based on race.[9,15] Further, they are able to link negative treatment based on race with consequential health behaviors and health outcomes. Given the availability of the *Reactions to Race* module on the Behavioral Risk Factor Surveillance System (BRFSS), which assesses an individuals' experience and response to differential treatment based on race, we examined if questions about *Reactions to Race* variables were associated with CRC screening practices. We hypothesized that measures of *Reactions to Race* are negatively associated with being up-to-date with CRC screening tests; fecal occult blood tests (FOBT) and endoscopy. Further, we hypothesized that the association between *Reactions to Race* and CRC varies among non-Hispanic Black, non-Hispanic White and Hispanic persons.

We hypothesized that measures of Reactions to Race are negatively associated with being up-to-date with CRC screening tests; fecal occult blood tests (FOBT) and endoscopy.

Address correspondence to Lisa C. Richardson, MD, MPH; 4770 Buford Highway, NE, MS-K57; Atlanta, GA 30341; 770-488-4351; lfr8@cdc.gov

Table 1. Prevalence (standard error) of endoscopy (within 5 years) and FOBT (within 2 years) for selected characteristics, BRFSS respondents (aged ≥50 years), 2002 and 2004*

	Colorectal cancer screening practices							
	Endoscopy†				FOBT			
Characteristics	Non-Hispanic Black (*n*=3,092)	Hispanic (*n*=1,490)	Non-Hispanic White (*n*=25,628)	Total (*n*=30,210)	Non-Hispanic Black (*n*=3,146)	Hispanic (*n*=1,487)	Non-Hispanic White (*n*=25,501)	Total (*n*=30,134)
Overall prevalence	40.7 (2.14)	32.1 (2.83)	45.2 (.60)	43.2 (.62)	30.6 (2.02)	15.3 (2.07)	33.9 (.57)	31.3 (.56)
Age (years)								
50–64	41.2 (2.77)	23.7 (2.87)	38.6 (.80)	36.9 (.80)	27.1 (2.36)	11.3 (2.02)	29.0 (.76)	26.4 (.71)
65+	39.9 (3.38)	46.1 (5.52)	52.6 (.87)	51.0 (.95)	35.9 (3.49)	22.1 (4.38)	39.5 (.86)	37.5 (.90)
Sex								
Male	43.1 (2.70)	31.8 (3.85)	47.3 (.95)	44.6 (.97)	36.1 (2.78)	15.4 (2.71)	34.6 (.91)	31.4 (.73)
Female	37.5 (3.47)	32.4 (4.18)	43.4 (.75)	42.0 (.80)	23.3 (2.63)	15.1 (3.19)	33.2 (.73)	31.3 (.88)
Marital status								
Married/ unmarried couple	43.2 (3.47)	30.9 (3.55)	47.3 (.77)	45.1 (.82)	28.8 (2.98)	17.5 (2.91)	35.2 (.74)	32.6 (.75)
Divorced/ separated	38.5 (4.12)	28.6 (4.94)	36.1 (1.42)	35.5 (1.37)	29.5 (4.01)	13.2 (4.12)	27.6 (1.34)	26.7 (1.28)
Widow	39.9 (4.30)	45.3 (9.28)	44.7 (1.28)	44.2 (1.41)	39.8 (4.77)	10.9 (3.20)	34.6 (1.27)	33.0 (1.28)
Single	35.0 (5.44)	26.6 (8.55)	42.5 (2.91)	38.6 (2.64)	23.4 (4.50)	-	30.1 (2.60)	25.0 (2.11)
Region								
South	39.3 (1.85)	39.1 (3.57)	44.7 (0.68)	43.6 (0.64)	26.7 (1.73)	18.2 (2.53)	35.2 (0.66)	33.5 (0.61)
Northeast	55.0 (9.56)	43.6 (5.41)	49.2 (0.93)	49.2 (0.91)	27.9 (7.63)	28.6 (4.82)	37.8 (0.90)	37.4 (0.88)
Midwest	47.5 (6.50)	61.5 (12.21)	50.8 (1.35)	50.9 (1.32)	25.2 (5.06)	-	28.5 (1.23)	28.4 (1.20)
West	43.9 (6.66)	29.4 (3.60)	44.1 (1.25)	41.0 (1.26)	33.6 (6.32)	14.1 (2.64)	32.9 (1.18)	28.9 (1.13)
Education								
≤High school	37.5 (2.71)	28.8 (3.57)	41.0 (0.89)	38.4 (0.97)	26.6 (2.36)	10.4 (2.17)	32.3 (0.87)	27.5 (0.83)
Some college	38.8 (4.51)	37.6 (6.34)	43.8 (1.16)	42.9 (1.16)	36.5 (4.68)	26.3 (6.30)	33.9 (1.12)	33.5 (1.13)
Complete college or higher	54.5 (5.11)	38.9 (5.86)	51.1 (1.08)	50.7 (1.06)	36.5 (5.19)	25.8 (5.31)	35.6 (1.04)	35.2 (1.01)
Income								
<$25,000	35.3 (2.84)	29.9 (3.77)	39.8 (1.17)	37.2 (1.17)	27.1 (2.68)	10.6 (2.31)	32.9 (1.15)	27.6 (1.03)
$25,000–$34,999	47.5 (6.69)	41.0 (8.73)	45.3 (1.62)	45.2 (1.66)	33.7 (6.62)	18.1 (6.04)	33.4 (1.55)	32.1 (1.56)
≥$35,000	48.9 (4.71)	31.4 (5.29)	47.5 (0.91)	46.5 (0.92)	35.1 (4.55)	25.0 (5.18)	33.5 (0.86)	33.0 (0.88)
Don't know	35.5 (4.06)	34.5 (8.30)	45.5 (1.35)	42.9 (1.61)	29.4 (3.80)	12.5 (4.88)	36.8 (1.31)	32.7 (1.40)
Employment status								
Employed	35.9 (3.54)	25.0 (3.90)	39.5 (0.93)	37.4 (0.94)	25.8 (2.96)	13.5 (3.29)	28.6 (0.86)	25.5 (0.84)
Unemployed	40.3 (4.33)	41.0 (10.96)	36.9 (2.10)	38.3 (2.45)	26.8 (3.83)	-	29.2 (2.05)	25.9 (1.96)
Retired	45.4 (3.51)	42.1 (5.03)	52.2 (0.89)	50.7 (0.93)	36.6 (3.52)	21.5 (3.67)	39.6 (0.87)	37.7 (0.88)
Homemaker/ student	41.2 (11.37)	22.1 (6.45)	42.0 (2.33)	37.8 (2.44)	32.7 (11.2)	-	33.8 (2.27)	28.1 (2.17)
Smoking status								
Current	32.6 (5.12)	18.8 (5.69)	31.5 (1.43)	30.3 (1.45)	25.6 (4.84)	-	25.9 (1.37)	23.5 (1.29)
Former	42.8 (4.04)	34.7 (5.14)	50.8 (0.97)	48.6 (1.02)	34.1 (3.93)	19.6 (4.00)	36.9 (0.94)	35.0 (0.95)
Never	42.7 (2.89)	34.0 (3.94)	44.6 (0.88)	43.0 (0.92)	30.2 (2.64)	15.7 (2.95)	33.7 (0.84)	30.9 (0.82)
Usual source of care								
Yes	43.6 (2.31)	38.4 (3.39)	47.9 (0.62)	46.6 (0.64)	33.5 (2.22)	18.4 (2.55)	35.7 (0.60)	33.8 (0.60)
No	19.0 (5.40)	15.6 (4.10)	21.4 (1.72)	19.7 (1.65)	9.2 (2.24)	-	17.6 (1.84)	14.1 (1.52)
Insurance								
Yes	43.3 (2.38)	35.9 (3.31)	46.7 (0.62)	45.3 (0.65)	32.3 (2.26)	17.6 (2.54)	34.9 (0.60)	32.9 (0.60)
No	23.4 (4.23)	17.5 (4.70)	19.6 (1.75)	19.6 (1.82)	18.7 (3.43)	6.6 (2.24)	17.5 (1.55)	14.4 (1.28)
Race consciousness								
Never	39.5 (3.01)	36.5 (4.03)	45.4 (0.69)	44.4 (0.70)	33.6 (3.03)	23.5 (3.83)	34.3 (0.67)	33.4 (0.67)
Sometimes	33.1 (5.92)	20.9 (5.55)	46.9 (1.84)	42.8 (1.79)	28.0 (5.89)	17.3 (5.64)	32.3 (1.67)	30.2 (1.60)

Table 1. Continued

Characteristics	Colorectal cancer screening practices							
	Endoscopy†				FOBT			
	Non-Hispanic Black (*n*=3,092)	Hispanic (*n*=1,490)	Non-Hispanic White (*n*=25,628)	Total (*n*=30,210)	Non-Hispanic Black (*n*=3,146)	Hispanic (*n*=1,487)	Non-Hispanic White (*n*=25,501)	Total (*n*=30,134)
Always	44.4 (4.28)	31.8 (4.99)	40.0 (2.10)	38.0 (2.26)	28.4 (3.71)	6.3 (1.53)	34.4 (2.05)	22.9 (1.56)
Don't know	43.9 (4.33)	14.9 (5.32)	43.7 (2.00)	41.9 (1.88)	25.0 (3.59)	-	31.0 (1.90)	28.4 (1.67)
Emotional symptoms								
Yes	38.9 (5.59)	42.5 (12.79)	38.4 (3.78)	39.6 (4.11)	33.2 (5.77)	11.0 (5.30)	27.5 (3.50)	24.8 (2.94)
No	40.6 (2.49)	31.7 (2.86)	45.5 (0.63)	43.5 (0.65)	31.0 (2.34)	16.0 (2.27)	34.1 (0.60)	31.8 (0.60)
Don't know/ refused/missing	44.2 (5.38)	-	41.8 (2.24)	40.1 (2.11)	22.7 (4.00)	-	31.7 (2.13)	28.4 (1.86)
Physical symptoms								
Yes	37.6 (7.20)	44.9 (14.44)	48.2 (5.39)	44.4 (5.87)	39.0 (7.94)	-	19.4 (3.55)	22.1 (3.88)
No	41.2 (2.40)	31.5 (2.83)	45.2 (0.62)	43.3 (0.64)	30.9 (2.25)	15.6 (2.22)	34.1 (0.60)	31.7 (0.59)
Don't know/ refused/missing	38.2 (5.63)	-	42.5 (2.24)	39.9 (2.15)	21.3 (3.97)	-	31.6 (2.13)	28.1 (1.87)
Health care treatment								
Worse	49.8 (6.45)	41.6 (11.91)	36.0 (4.45)	42.0 (4.13)	36.3 (6.58)	-	26.0 (4.09)	23.6 (3.34)
Same	40.3 (2.86)	31.8 (3.21)	44.1 (0.77)	42.3 (0.78)	31.2 (2.67)	19.5 (2.94)	33.3 (0.74)	31.4 (0.73)
Better	39.5 (4.56)	33.4 (6.65)	50.0 (1.08)	47.4 (1.23)	28.6 (4.47)	9.1 (2.46)	36.6 (1.05)	32.9 (1.07)
Don't know/ refused/missing	53.1 (10.77)	-	36.7 (3.92)	36.1 (3.74)	35.4 (10.19)	-	37.6 (3.92)	34.4 (3.63)
Survey year								
2002	40.7 (3.09)	31.7 (3.04)	44.6 (0.81)	42.3 (0.82)	33.6 (2.92)	14.9 (2.22)	36.2 (0.78)	32.8 (0.76)
2004	40.7 (1.37)	37.1 (3.09)	46.5 (0.56)	45.5 (0.52)	24.2 (1.17)	19.7 (2.47)	28.0 (0.51)	27.3 (0.46)

FOBT, fecal occult blood testing.
* Unstable estimates not shown where standard errors exceed more than 40% of the estimate.
† Endoscopy includes sigmoidoscopy and colonoscopy in the past 5 years.
All *P* for the total population of persons eligible for endoscopy and FOBT <.05 except for emotional/ physical symptoms among persons eligible for endoscopy.

MATERIALS AND METHODS

Behavioral Risk Factor Surveillance System (BRFSS) Survey Design

The BRFSS is a state-level, random-digit dialed, multistage-cluster sampling survey of US non-institutionalized adults (≥18 years) in the civilian population.[16] In brief, the BRFSS includes three sections (the core section, optional modules, and questions added by the states) to obtain self-reported demographics, health behaviors, and preventive health practices, including CRC screening practices. In the 2002 and 2004 surveys, the *Reactions to Race* module was offered as an optional module to capture reports of *Reactions to Race*-based treatment in the general population. Data from 2002 have not been publicly released since 2002 was the first year the Reactions to Race module was administered. The module was administered in 13 states, plus the District of Columbia, including California, Delaware, Florida, New Hampshire, New Mexico, and North Carolina in 2002; Arkansas, Colorado, Delaware, District of Columbia, Mississippi, Rhode Island, South Carolina, and Wisconsin in 2004. According to US Census data, these states represent 22.7% of the US population in 2002 and 7.7% of the US population in 2004.[17] Overall response rates from states using the *Reactions to Race* module were similar in both years of data used, ranging from 28.2% to 56.4%.

Sample Population

The sample included Hispanics, non-Hispanic Blacks and non-Hispanic Whites aged ≥50 years who responded to the *Reactions to Race* module. For the remainder of this report, we will refer to non-Hispanic Whites and non-Hispanic Blacks as Whites and Blacks. Due to small sample sizes, individuals who self-identified as Asian (*n*=184), Native Hawaiian, or other Pacific Islander (*n*=16), American Indian or Alaska Native (*n*=344), other race (*n*=177), or as multiracial (*n*=299) were excluded from this analysis.

Definition of Variables

Colorectal cancer screening practices are represented as a dichotomous outcome based on the up-to-date 2008 screening recommendations of the US Preventive Services Task Force.[4] Individuals who reported receipt of endoscopy (either sigmoidoscopy or colonos-

copy) within the 5 years preceding the survey (n=30,210) or receipt of FOBT within the 2 years preceding the survey (n=30,134) were included in the analytic dataset.

For endoscopy, sigmoidoscopy and colonoscopy were combined to examine receipt of screening in the previous 5 years. The question for endoscopy was ambiguous; therefore, we used 5 years as a cutoff for endoscopy, which may underestimate actual use by excluding persons with colonoscopy in the past 5 to 10 years.[18] The difference in the proportion of individuals up-to-date with endoscopy within 5 years (43.2%) compared with to those up-to-date with endoscopy within 10 years (47.6%) was small (n=1,366).

The main independent variables of interest were measured using four questions from the *Reactions to Race* module: experience of differential treatment when seeking health care, frequency of thinking about one's race (race consciousness), experience of physical symptoms due to race-based treatment, and experience of emotional upset due to race-based treatment. These variables have been described in detail elsewhere.[9] Response categories for differential treatment when seeking health care included being treated worse than people of other races, same as people of other races, better than people of other races, and don't know. Those who responded that they only encountered people of the same race only or did not seek health care within the 12 months preceding the survey were excluded from the analysis (n=536). Racial consciousness (How often do you think about your race?) was categorized as always (constantly, once an hour, or once a day), sometimes (once a week or once a month), never (once a year or never), and don't know. Race-based physical symptoms and race-based emotional upset were considered separately and were categorized as yes, no, and don't know/refused.

The conceptual framework for the *Reactions to Race* questions has been described elsewhere.[9] In brief, the racial consciousness variable serves as a proxy of the salience of race to an individual in their daily interactions in society. Therefore, we expect that persons who report thinking about their race more frequently are likely to make decisions and choices based on their race which may or may not promote healthy behaviors. The remaining variables (emotional upset, physical symptoms and perception of differential treatment in health care) will assess how the perception of and psychological processing of race-based treatment influences health behaviors.

Previous literature has shown that the following characteristics, which are included in this analysis, are associated with CRC screening: race/ethnicity, age, sex, marital status, education, income, employment, health insurance, usual source of care and smoking status.[6,18] Race/ethnicity was categorized into mutually exclusive categories including Hispanic, Black, and White. The lower age limit for this analysis was determined by recommendations for when CRC screening should begin (50 years of age and older) and age was dichotomized as 50–64 and ≥65.[19] Sex was analyzed as collected (male and female). Marital categories were classified as married (married or living as married), divorced and separated, widowed, and never married. Educational attainment was collapsed into three categories: less than or equal to high school, some college, and college or more. Income levels included those earning ≤$25,000, between $25,000–$34,999, ≥$35,000, and unknown. Employment status included five categories: employed (defined as employed for wages, self-employed, and out of work for <1 year), unemployed (out of work for >1 year, unable to work), retired, homemakers, and students. Health insurance and usual source of care were categorized as yes or no. Cigarette smoking status was categorized as current smokers, former smokers, and those who never smoked. To account for differences across the two years of data (2002 and 2004) combined, a variable for survey year was created.

Statistical Analysis

The prevalence of screening by endoscopy and FOBT were calculated for selected socio-demographic characteristics and *Reactions to Race* measures for the total population and by race/ethnicity. Statistically significant differences (P<.05) among characteristics and screening outcome were determined by using chi-square statistics to assess suitability for inclusion in the adjusted multivariable models. Multivariable logistic regression models were constructed to assess the strength of associations between *Reactions to Race* measures and receipt of CRC screening tests after adjusting for selected characteristics. Interaction terms between race and the *Reactions to Race* measures were assessed. All analyses were performed using SAS version 9.1.3 with SUDAAN version 10.0 to account for the complex sampling design.[20]

RESULTS

Table 1 shows the prevalence of endoscopy and FOBT by race/ethnicity and for the total population. Overall, 43.2% of respondents reported receiving endoscopy within 5 years (n=13,727) and 31.3% reported receiving FOBT within 2 years (n=9,460). Blacks and Hispanics had a lower screening prevalence with endoscopy and FOBT compared to Whites. Forty-five percent of Whites reported endoscopy screening, compared with 40.7% of Blacks and 32.1% of Hispanics. Similarly, 33.9% of Whites, 30.6% of Blacks, and 15.3% of Hispanics reported having a FOBT. For both screening tests, persons aged >65; those

Table 2. Adjusted odds ratios and 95% confidence intervals of endoscopy (within 5 years) and FOBT (within 2 years) for selected characteristics, BRFSS respondents (aged ≥50 years), 2002 and 2004

	Colorectal cancer screening practices			
	Endoscopy*		FOBT*	
Characteristics	OR	95% CI	OR	95% CI
Race/ethnicity				
White	1.00		1.00	
Black	1.07	.83–1.38	1.14	.88–1.46
Hispanic	.91	.69–1.20	.55†	.38–.79
Race consciousness				
Never	1.00		1.00	
Sometimes	.94	.79–1.12	.92	.77–1.10
Always	.88	.70–1.10	.71†	.57–.89
Emotional upset				
Yes	-	-	.94	.64–1.37
No	-	-	1.00	
Physical symptoms				
Yes	-	-	.97	.57–1.65
No	-	-	1.00	
Health care treatment				
Worse	1.40	.91–2.17	.85	.59–1.24
Same	1.00		1.00	
Better	1.18†	1.01–1.38	1.12	.96–1.31

FOBT, fecal occult blood testing.

* Analysis adjusted for age, sex, marital status, region, education, income, employment status, smoking status, usual source of care, insurance, and survey year.

† Significant at $P<.05$.

with some college education or more; income of ≥$25,000; retirees and former smokers; persons with a usual source of care; and individuals with health insurance were more likely to be screened across all racial/ethnic groups. Differences in screening by region and marital status were seen by racial/ethnic group.

Reactions to Race measures among the total population showed that persons who always thought about their race, had emotional upset and physical symptoms due to race-based treatment and perceived worse treatment compared to other races had lower use of endoscopy and FOBT. These findings were significant among the total population except emotional upset and physical symptoms were not important for endoscopy receipt. Since few within race differences were seen among the *Reactions to Race* measures, the adjusted analysis was not stratified by race.

After adjusting for selected characteristics and *Reactions to Race* measures, being up-to-date with endoscopy was not significantly different by race/ethnicity. However, those who reported receiving better treatment than people of other races in health care compared to those who received the same treatment as people of other races were significantly more likely (OR:1.18; 95% CI: 1.01–1.38) to have endoscopy (Table 2). For FOBT, significant racial/ethnic disparities persisted after adjustment for selected characteristics and *Reactions to Race* measures. Specifically, Hispanics were significantly (OR: .55; 95% CI: .38–.79) less likely to be screened compared to Whites. Those who always thought about their race remained less likely to be screened with FOBT (OR=.71; 95% CI: .57–.89) compared with those who never thought about their race. A significant interaction between race and racial consciousness was present ($P<.01$), where Hispanics who always thought about their race were 63% (OR=.27; 95% CI: .13–.57) less likely to receive a FOBT compared to Whites who never thought about their race (Table 3). Emotional upset and physical symptoms due to race-based treatment and worse healthcare treatment were not associated with FOBT receipt in the adjusted analysis.

It is important to note that while *Reactions to Race* measures were important, usual source of care and insurance were the largest predictors for endoscopy and FOBT receipt (data not shown). Persons without a usual course of care were 50–58% less likely to be screened by endoscopy or FOBT and those without insurance were 34–41% less likely to be screened by endoscopy or FOBT after adjusting for selected characteristics.

DISCUSSION

Colorectal cancer disparities persist even after taking into account important demographic characteristics, healthcare access and *Reactions to Race* measures. But, race-based treatment may offer an important understanding of how CRC disparities occur and persist. For example in this study, Hispanics who always thought about their race were significantly less likely to be screened for CRC using FOBT. So, it may be that Hispanics who are aware of their social and cultural differences are less willing to obtain CRC screening through FOBT or there is a barrier among physicians' perceptions of Hispanics willingness to comply with CRC screening with FOBT. Lillie-Blanton and colleagues have found that racial/ethnic minorities experience the healthcare system differently compared with Whites, and that perceived racism is a

Table 3. Adjusted odds ratios (95% confidence intervals) of interactions between race and selected race consciousness for FOBT (within 2 years), BRFSS respondents (aged ≥50 years) 2002 and 2004*

	Colorectal cancer screening practices		
	FOBT*		
Characteristics	Non-Hispanic Black	Hispanic	Non-Hispanic White
Race consciousness			
Never	1.0	1.0	1.0
Sometimes	.79 (.40–1.57)	.79 (.45–1.39)	1.0
Always	.92 (.37–2.31)	.27 (.13–.57)†	1.0

FOBT, fecal occult blood testing.

* Analysis adjusted for age, sex, marital status, region, education, income, employment status, smoking status, usual source of care, insurance, and survey year.

† Significant at P<.05.

barrier to accessing healthcare services for racial minorities.[21] In a California state-wide survey, Crawley and colleagues showed that discrimination also has a negative impact on receipt of healthcare services for CRC screening and breast and cervical cancer screening.[22] They found that persons who perceived medical discrimination were significantly less likely to receive CRC screening by FOBT or endoscopy. This study was not consistent with Crawley in that no differences in receipt for endoscopy were found. This inconsistency could be due to our study representing findings from more states or it could suggest that physicians are more inclined to perform endoscopy, a more invasive procedure rather than FOBT in these populations. Several studies in breast cancer research have noted that racial/ethnic minorities tend to experience more invasive diagnostic and treatment procedures and therefore this should be explored in CRC screening practices.[23,24]

It is important to note that Lillie-Blanton and Crawley show that access to health care plays an important role in receipt of healthcare services, regardless of experiences of racial discrimination.[21,22] The findings of this study are consistent with this and existing reports that show that health insurance and usual source of care have the highest association with CRC screening across racial/ ethnic groups.[5,22,25–27] As Hispanics are more likely to be poor, uninsured, lack a usual source of care, and have lower educational attainment, this might explain differences noted between Whites and Hispanics in CRC screening.[28] Socioeconomic position may also serve as a pathway explaining the relationship between race, race-based treatment, and disparities in health care across the lifespan.[29,30] Therefore, to reduce CRC screening disparities, increases in health insurance and a regular source of care is needed for racial/ethnic minorities.

This study has several limitations. For example, due to the cross-sectional nature of this analysis, we are unable to determine causality between any of the variables we have examined, including race consciousness (how often one thinks about their race). Self-report bias of screening tests outcomes and low response rates are challenges for all surveys of this nature.[31] Also, this analysis used data from the limited number of states that administered the BRFSS *Reactions to Race* module in 2002 and 2004, therefore results may not be generalizable to other states.

These findings should be used for hypothesis generation for future studies that delve deeper into cultural differences among Hispanics by addressing acculturation, nativity (being born outside the United States) and language differences. The BRFSS did not collect information on these factors consistently in both years of data, therefore we were unable to assess these factors. Due to small sample sizes we were unable to explore the role of *Reactions to Race* on CRC screening for other racial/ethnic groups. Pilot-testing of the *Reactions to Race* module showed good face-validity (ie, ability to capture what is meant to be measured) of the module (personal communication with C. Jones), but the reliability of the measures may be a limitation, since findings of this study have not been replicated in another sample.

…we found that persons who constantly thought about their race were less likely to be screened for CRC using FOBT, particularly among Hispanics.

Despite the limitations, persistent disparities shown in CRC screening mainly resulting from socioeconomic and healthcare access factors is supportive of previous findings. Further, we found that persons who constantly thought about their race were less likely to be screened for CRC using FOBT, particularly among Hispanics. This study contributes to a growing body of literature that shows that differential treatment by race influences health services utilization.[5,9–13] Structural and individual level interventions to address institutional barriers (ie, employment with health insurance benefits in disadvantaged populations) and individual barriers (ie, interpersonal communications and experiences with health care providers) in the healthcare system are critical to improving access and to providing culturally sensitive care for medically underserved populations.

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AUTHOR CONTRIBUTIONS

Design concept of study: Crawford, Jones, Richardson
Acquisition of data: Jones, Richardson
Data analysis and interpretation: Crawford, Jones, Richardson
Manuscript draft: Crawford, Jones, Richardson
Statistical expertise: Crawford, Jones, Richardson
Acquisition of funding: Jones, Richardson
Administrative: Jones, Richardson
Supervision: Jones, Richardson