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Colonoscopy Utilization in the Black Women's Health Study

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Abstract

Cancer screening is important for health promotion and is a key element in reducing the disparities in cancer morbidity and mortality. Mortality rates for colorectal cancer are more than 40% higher among African Americans than among other ethnic populations in the United States. The primary objective of the present study is to determine correlates of colonoscopy utilization in the Black Women's Health Study. Our study sample comprised 10992 black women from the Black Women's Health Study whose ages ranged from 50 to 72 years at baseline in 1997; colonoscopy use in the subsequent 8 years was ascertained. The strongest correlate of colonoscopy use was mammography use: women who utilized mammography had 2.5 times the odds of having a colonoscopy, compared with those who never screened for breast cancer. Women who reported having health insurance had 2 times the odds of having a colonoscopy compared with women who did not have health insurance. Higher level of education was also associated with colonoscopy screening. Concurrent promotion of cancer screenings, ie, mammography and colonoscopy, may be a good approach to increasing colonoscopy utilization among women.

Keywords

colonoscopy; screening; African Americans; women's health

INTRODUCTION

African Americans have a higher incidence of colorectal cancer than US whites.¹ Furthermore, mortality rates for colorectal cancer are more than 40% higher among African American men and women than among other ethnic populations in the United States.^{1,2} The disparities observed for colorectal cancer may be attributed to lower participation in colorectal cancer prevention and control activities, including screening by fecal occult blood testing, flexible sigmoidoscopy, and colonoscopy.^{3–5}

Cancer prevention behavior patterns such as mammography screening use may serve as a marker for colorectal cancer screening patterns. It has been demonstrated that adherence to screening mammography guidelines is associated with increased rates of colorectal cancer screening, although the link between these screening behaviors is unknown.^{6–8}

The primary objective of the present study is to determine risk factors for colonoscopy utilization in a national prospective cohort, the Black Women's Health Study (BWHS). The

study examines colonoscopy utilization over an 8-year period by selected variables, including behaviors such as mammography screening; indicators of health consciousness, such as smoking, alcohol consumption, and body mass index; access to health care; and socioeconomic status.

MATERIALS AND METHODS

Study Population

Fifty-nine thousand black women aged 21 to 69 years were enrolled in the BWHS in 1995 through questionnaires consisting of 54 self-report items that included demographics, medical history, health behaviors, and use of medical care. The questionnaires were mailed to subscribers of *Essence* magazine (whose readership is predominantly black women), members of selected black women's professional organizations, and friends and relatives of respondents. The respondents were from all regions of the mainland United States, with the largest number from California, Georgia, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Michigan, New Jersey, South Carolina, Virginia, and the District of Columbia. Follow-up questionnaires were sent every 2 years to update risk factors of interest and ascertain newly diagnosed diseases. Completion rates in each questionnaire cycle have averaged approximately 80%.

Values for independent variables in this analysis were obtained from the 1995 (education and region) and 1997 (age, body mass index, marital status, mammography, smoking, drinking, health insurance, hormone use, and vigorous exercise) questionnaires. Among items in the 1999 questionnaire was the question, "In the past 2 years, have you had a colonoscopy?" Responses were no; yes, for screening; and yes, for symptoms. In the 2003 and 2005 questionnaires, participants were asked to check yes for each method of screening they had undergone in the previous 2 years—colonoscopy, sig-moidoscopy, and mammography. Only women aged at least 50 years were included in these analyses, reflecting the recommended starting age for colorectal cancer screening. Women who indicated that they had a screening colonoscopy on the 1999, 2003, or 2005 questionnaire represented the positive colonoscopy category.

Logistic regression models were used to estimate odds ratios (ORs) and the corresponding 95% confidence interval (CI) for the association between each selected sample characteristic and colonoscopy usage, adjusted for all the other variables in the analysis. The variables included were age, region, years of education, marital status, body mass index (BMI), strenuous physical activity, smoking, alcohol consumption, health insurance status, mammography use, and menopausal female hormone use. Variables were considered to be significant predictors at significance level $p = .05$.

RESULTS

The study sample comprised 10992 black women whose ages ranged from 50 to 72 years at baseline in 1997. Between 1997 and 2005, colonoscopy utilization rates were fairly uniform across age groups, but slightly lower among women aged 50 to 54 years (Table 1).

In multivariable models, age, education, geographic region, hormone use, health insurance, alcohol consumption, smoking status, mammography use, and strenuous physical activity were significant predictors of colonoscopy (Table 1). Women who utilized mammography had a 2.64 times the odds of colonoscopy use compared with those who never screened for breast cancer. Women who reported having health insurance had 1.98 times the odds of having a colonoscopy compared with women who did not have health insurance. The next strongest correlate of colonoscopy use was geographic region: the OR for colonoscopy in the west versus northeast was 0.65. Other factors strongly associated with colonoscopy were current female

hormone use, with an OR of 1.53, and strenuous physical activity more than 2 per hours a week, with an OR of 1.36. Cigarette smoking was associated with reduced colonoscopy use.

When we examined colonoscopy use within strata of age (50–59, ≥60) education (≤12, 13–15, and ≥16 years), and geographic region (northeast, midwest, south, west), we found that mammography utilization was the strongest predictor in each stratum and health insurance was the second strongest in most strata (Tables 2–4).

DISCUSSION

Cancer screening is important for health promotion and a key element in reducing the disparities in cancer morbidity and mortality. African Americans lag behind other race/ethnic groups for colonoscopy, mammography, and Pap test utilization.^{9–12} The results of the current study revealed that approximately 60% of the BWHS participants aged 50 and older had undergone colorectal cancer screening during an 8-year period. The high colorectal screening rates observed in the BWHS may be due to the relatively high rates of health insurance coverage as well as to high socioeconomic status of the study population.

Shapiro et al¹³ analyzed data from the Behavioral Risk Factor Surveillance Survey and found that the reported uses of colorectal cancer screening tests increased with each decade of age from 50 to 80 years and with increasing educational level and income. Similar findings were observed in the current study with respect to education. The colonoscopy rates were 55.9% and 64.5% for educational level less than or equal to 12 years and greater than or equal to 16 years, respectively.

Mammography utilization was the strongest predictor of colonoscopy utilization in the BWHS participants, which is consistent with the literature.^{7–9} With increased education and awareness regarding screening and early detection, concurrent promotion of multiple cancer screenings (ie, mammography and colonoscopy) may be a good approach to increasing colonoscopy utilization among women. Having health insurance was the next strongest predictor of colonoscopy use, underscoring the need for full coverage of this screening procedure. As might be expected, indicators of health consciousness (more physical activity, nonsmoking) were also associated with colonoscopy use. We are unable to explain the regional differences in colonoscopy use observed in our study.

A strength of the present study is that the data on risk factors were collected prospectively relative to the reporting of colonoscopy use. The sample size was large, and the women were from all areas of the country. In addition, associations were examined within levels of education, which has not been done previously. A limitation is that reports of colonoscopy use were not validated. Misclassification, if random, would have weakened associations.

The participants in the BWHS were recruited largely from subscribers to a general readership magazine targeted to African American women. Although the study participants were from all regions of the United States, the BWHS was a convenience sample. The study underrepresented women who had less than a high school education. However, the associations with colonoscopy use were present within strata of education and region, suggesting that the findings are applicable to African American women aged 50 and older.

The lower colonoscopy screening rates in African Americans, compared to whites, nationally undoubtedly contribute to the disparities observed in colorectal cancer incidence and mortality. The present data imply that continued efforts are needed to give access to colonoscopy screening and educate adults on the benefits of tests available for colorectal cancer screening. Among the most educated women, only 64% had had a colonoscopy in the past 8 years. These

efforts may help reduce the disparities associated with the colon cancer burden among African American women.

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Table 1Colonoscopy Use Between 1997 and 2005 by Selected Study Characteristics for Women Aged ≥ 50 Years

Characteristics	N	Ever Had a Colonoscopy, %	Adjusted OR (95% CI)
Age, y			
50–54	4200	59.9	1.00
55–59	2636	62.7	1.14 (1.02–1.27)
60–64	1589	63.8	1.28 (1.12–1.45)
≥ 65	1168	61.4	1.20 (1.03–1.38)
Education, y			
≤ 12	2402	55.9	1.00
13–15	2258	61.2	1.19 (1.05–1.35)
≥ 16	4849	64.5	1.26 (1.13–1.41)
Marital status			
Single	741	57.6	1.00
Married/living as married	4383	63.8	1.13 (0.95–1.34)
Separated/divorced/widowed	4450	59.8	1.05 (0.88–1.24)
Region			
Northeast	2638	63.6	1.00
South	2482	64.4	0.98 (0.87–1.11)
Midwest	2406	59.6	0.79 (0.70–0.90)
West	2063	57.5	0.65 (0.57–0.74)
Body mass index (kg/m ²)			
<25	2211	62.2	1.00
25–29	3715	62.8	1.02 (0.90–1.14)
≥ 30	3530	60.0	0.98 (0.87–1.10)
Current hormone use			
No	4578	56.9	1.00
Yes	4257	68.4	1.53 (1.39–1.69)
Health insurance			
No	440	37.3	1.00
Yes	8458	63.4	1.98 (1.60–2.45)
Alcohol (No. of drinks/week)			
<1	3609	60.4	1.00
1–6	4430	63.1	1.06 (0.96–1.17)
≥ 7	1056	51.0	1.18 (1.01–1.37)
Smoking status			
Never	7881	62.9	1.00
Ever	1702	55.2	0.84 (0.74–0.94)
Mammography			
No	867	36.7	1.00
Yes	8010	65.2	2.64 (2.27–3.08)
Strenuous physical activity(hours/week)			
None	5839	60.0	1.00

Characteristics	N	Ever Had a Colonoscopy, %	Adjusted OR (95% CI)
≤2	2509	62.6	1.07 (0.96–1.19)
>2	1093	68.8	1.36 (1.17–1.57)

Abbreviations: CI, confidence interval; OR odds ratio.

Table 2

Estimated Odds Ratios of Women Aged 50–59 and ≥ 60 Years Reporting Colonoscopy Screening by Selected Study Characteristics

Characteristics	Adjusted OR (95% CI)	
	Age, 50–59 y	Age, ≥ 60 y
Education, y		
≤ 12	1.00	1.00
13–15	1.24 (1.07–1.44)	1.10 (0.84–1.44)
≥ 16	1.30 (1.13–1.48)	1.09 (0.87–1.36)
Marital status		
Single	1.00	1.00
Married/living as married	1.14 (0.94–1.37)	1.40 (0.90–2.16)
Separated/divorced/widowed	1.04 (0.86–1.26)	1.33 (0.86–2.05)
Region		
Northeast	1.00	1.00
South	0.99 (0.85–1.14)	0.80 (0.62–1.04)
Midwest	0.77 (0.66–0.89)	0.78 (0.61–0.99)
West	0.66 (0.56–0.77)	0.50 (0.38–0.65)
Body mass index (kg/m ²)		
<25	1.00	1.00
25–29	1.00 (0.87–1.14)	1.08 (0.85–1.36)
≥ 30	0.94 (0.81–1.08)	1.01 (0.79–1.30)
Current hormone use		
No	1.00	1.00
Yes	1.56 (1.40–1.75)	1.46 (1.20–1.77)
Health insurance		
No	1.00	1.00
Yes	2.15 (1.67–2.75)	1.30 (0.79–2.14)
Alcohol (No. of drinks/week)		
<1	1.00	1.00
1–6	1.10 (0.98–1.24)	0.95 (0.78–1.15)
≥ 7	1.20 (1.01–1.45)	1.16 (0.85–1.57)
Smoking status		
Never	1.00	1.00
Ever	0.82 (0.71–0.94)	1.22 (0.93–1.59)
Mammography		
No	1.00	1.00
Yes	2.49 (2.08–2.98)	2.71 (1.84–3.99)
Strenuous physical activity (hours/week)		
0	1.00	1.00
≤ 2	1.07 (0.95–1.21)	1.09 (0.87–1.36)
>2	1.45 (1.22–1.72)	1.00 (0.73–1.36)

Abbreviations: CI, confidence interval; OR, odds ratio.

Table 3

Estimated Odds Ratios of Women Reporting Colonoscopy Screening by Selected Study Characteristics and Level of Education

Characteristics	Adjusted OR (95% CI)		
	Education, ≤12 y	Education, 13–15 y	Education, ≥16 y
Age, y			
50–54	1.00	1.00	1.00
55–59	0.94 (0.76–1.16)	1.27 (1.03–1.57)	1.21 (1.04–1.41)
60–64	1.32 (1.04–1.69)	1.23 (0.94–1.61)	1.27 (1.06–1.53)
≥65	1.32 (1.01–1.72)	1.25 (0.91–1.70)	1.11 (0.90–1.36)
Marital status			
Single	1.00	1.00	1.00
Married/living as married	0.87 (0.61–1.24)	0.91 (0.63–1.33)	1.41 (1.12–1.76)
Separated/divorced/widowed	0.88 (0.62–1.26)	0.86 (0.59–1.24)	1.24 (0.99–1.55)
Region			
Northeast	1.00	1.00	1.00
South	0.84 (0.67–1.06)	1.05 (0.80–1.37)	1.04 (0.87–1.24)
Midwest	0.64 (0.50–0.80)	0.80 (0.62–1.03)	0.89 (0.74–1.06)
West	0.85 (0.65–1.11)	0.62 (0.48–0.80)	0.63 (0.52–0.75)
Body mass index (kg/m ²)			
<25	1.00	1.00	1.00
25–29	0.88 (0.68–1.12)	1.27 (0.99–1.61)	0.99 (0.84–1.16)
≥30	0.82 (0.64–1.04)	1.17 (0.91–1.49)	0.98 (0.83–1.15)
Current hormone use			
No	1.00	1.00	1.00
Yes	1.78 (1.47–1.15)	1.54 (1.26–1.86)	1.43 (1.25–1.63)
Health insurance			
No	1.00	1.00	1.00
Yes	2.07 (1.49–2.85)	2.40 (1.52–3.78)	1.80 (1.24–2.61)
Alcohol (No. of drinks/week)			
<1	1.00	1.00	1.00
1–6	1.02 (0.84–1.24)	1.09 (0.89–1.33)	1.09 (0.95–1.25)
≥7	1.08 (0.80–1.47)	1.30 (0.95–1.78)	1.18 (0.94–1.46)
Smoking status			
Never	1.00	1.00	1.00
Ever	0.78 (0.62–0.97)	0.75 (0.59–0.95)	0.92 (0.77–1.11)
Mammography			
No	1.00	1.00	1.00
Yes	2.34 (1.74–3.13)	2.74 (1.99–3.79)	2.77 (2.22–3.45)
Strenuous physical activity (hours/week)			
None	1.00	1.00	1.00
≤2	1.08 (0.86–1.34)	1.01 (0.81–1.25)	1.11 (0.96–1.28)

Characteristics	Adjusted OR (95% CI)		
	Education, ≤12 y	Education, 13–15 y	Education, ≥16 y
>2	1.39 (0.99–1.95)	1.19 (0.87–1.62)	1.45 (1.19–1.76)

Abbreviation CI, Confidence interval; OR odds ratio.

Table 4

Estimated Odds Ratios of Women Reporting Colonoscopy Screening by Selected Study Characteristics and Region of Residence

Characteristics	Adjusted OR (95% CI)			
	Northeast	South	Midwest	West
Age, y				
50–54	1.00	1.00	1.00	1.00
55–59	1.15 (0.93–1.41)	1.05 (0.84–1.29)	1.08 (0.87–1.33)	1.31 (1.05–1.64)
60–64	1.25 (0.97–1.60)	1.26 (0.96–1.63)	1.41 (1.09–1.81)	1.17 (0.90–1.53)
≥65	1.22 (0.92–1.60)	1.06 (0.79–1.42)	1.31 (0.98–1.74)	1.13 (0.84–1.52)
Education, y				
≤12	1.00	1.00	1.00	1.00
13–15	1.13 (0.89–1.44)	1.35 (1.04–1.75)	1.41 (1.11–1.79)	0.86 (0.65–1.14)
≥16	1.16 (0.94–1.41)	1.37 (1.11–1.69)	1.56 (1.25–1.93)	0.92 (0.71–1.20)
Marital status				
Single	1.00	1.00	1.00	1.00
Married/living as married	1.15 (0.86–1.53)	1.27 (0.90–1.79)	0.85 (0.58–1.24)	1.22 (0.83–1.78)
Separated/divorced/widowed	1.18 (0.89–1.57)	1.03 (0.73–1.45)	0.73 (0.50–1.06)	1.28 (0.87–1.87)
Body mass index (kg/m ²)				
<25	1.00	1.00	1.00	1.00
25–29	1.02 (0.82–1.27)	0.84 (0.66–1.07)	1.15 (0.91–1.45)	0.98 (0.77–1.24)
≥30	1.01 (0.81–1.28)	0.56 (0.29–1.08)	0.98 (0.77–1.25)	1.05 (0.82–1.34)
Current hormone use				
No	1.00	1.00	1.00	1.00
Yes	1.78 (1.46–2.17)	1.59 (1.32–1.92)	1.58 (1.31–1.90)	1.26 (1.03–1.53)
Health insurance				
No	1.00	1.00	1.00	1.00
Yes	2.27 (1.49–3.44)	2.92 (1.31–2.80)	2.17 (1.39–3.37)	1.74 (1.05–2.85)
Alcohol (No. of drinks/week)				
<1	1.00	1.00	1.00	1.00
1–6	1.10 (0.91–1.33)	1.22 (1.01–1.48)	0.97 (0.80–1.18)	1.00 (0.81–1.23)
≥7	1.30 (0.97–1.73)	1.04 (0.75–1.44)	1.26 (0.91–1.73)	1.08 (0.79–1.46)
Smoking status				
Never	1.00	1.00	1.00	1.00
Ever	0.79 (0.63–0.99)	0.90 (0.71–1.15)	0.69 (0.54–0.86)	1.00 (0.77–1.30)
Mammography				
No	1.00	1.00	1.00	1.00
Yes	3.13 (2.32–4.20)	2.48(1.86–3.30)	2.13 (1.59–2.86)	3.25 (2.21–4.78)
Strenuous physical activity hours/week)				
0	1.00	1.00	1.00	1.00
≤2	1.09 (0.88–1.33)	1.04 (0.84–1.28)	1.24 (1.01–1.52)	0.95 (0.77–1.19)
>2	1.28 (0.96–1.70)	1.52 (1.11–2.07)	1.28 (0.95–1.72)	1.41 (1.05–1.88)

Abbreviations: CI, confidence interval; OR, odd ratio.