

Cancer Screening Behaviors of African American Women Enrolled in a Community-Based Cancer Prevention Trial

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Abstract

Background: African American women have increased mortality rates for cervical, breast, and colorectal cancers, yet not all receive the recommended screening tests for these cancers. We characterized the cancer screening behaviors of African American women enrolled in a community-based cancer prevention trial.

Methods: We examined cross-sectional data from 1123 African American customers aged ≥ 18 years from 37 beauty salons in North Carolina who completed the North Carolina BEAUTY and Health Project baseline survey. Mixed logistic regression models were used to identify correlates of receiving cervical, breast, and colorectal cancer screening tests within recommended screening guidelines.

Results: Overall, 94% (1026 of 1089) of women aged ≥ 18 years reported receiving a Pap smear test within the last 3 years, 70% (298 of 425) of women aged ≥ 40 years reported receiving a mammography within the last year, and 64% (116 of 180) of women aged ≥ 50 years were considered to be within recommended screening guidelines for colorectal cancer. Age was correlated with recent Pap smear testing and mammography. Women who reported receiving a recent Pap smear test were more likely to report a mammogram in the last year, and women with a recent mammogram were more likely to be within recommended screening guidelines for colorectal cancer. Many women reported multiple barriers to getting recommended cancer screening tests.

Conclusions: Almost all women reported receiving a Pap smear test within the last 3 years. Future interventions should focus on increasing breast and colorectal cancer screening among African American women.

Introduction

THREE OF THE MOST COMMONLY DIAGNOSED cancers among women in the United States are breast, colorectal, and cervical cancers.¹ Compared to white women, African American women have higher mortality rates for all three of these cancers.² An estimated 6020 deaths from breast cancer, 3660 deaths from colorectal cancer, and 700 deaths from cervical cancer were expected to occur among African American women in the United States during 2009.²

The American Cancer Society (ACS) currently recommends Pap smear testing and mammograms for the early detection of cervical and breast cancer, respectively. The ACS recommends that women begin receiving Pap smear tests at age 21 or 3 years after having sexual intercourse, whichever comes first. Women should receive yearly tests up to age 30, after which testing may be done every 2–3 years if a woman has three consecutive normal test results.³ The ACS currently recommends women receive yearly mammograms starting at age 40.³ Screening tests for colorectal cancer include the fecal

occult blood test (FOBT), flexible sigmoidoscopy, and colonoscopy. Starting at age 50, the ACS recommends men and women receive either an annual FOBT test, a flexible sigmoidoscopy every 5 years, or a colonoscopy every 10 years.³

Despite African American women suffering disproportionately high mortality from cervical, breast, and colorectal cancers, many do not receive these recommended screening tests. According to 2008 Behavioral Risk Factor Surveillance System (BRFSS) data, about 87% of African American women aged ≥ 18 years in the United States had received a Pap smear test within the past 3 years, and 79% of African American women aged ≥ 40 years had received a mammogram in the last 2 years.⁴ Approximately 24% of African Americans aged ≥ 50 years reported an FOBT test in the last 2 years, and 59% reported ever having a flexible sigmoidoscopy or colonoscopy.⁴

Although various studies have examined the cancer screening behaviors of African American women,^{5–16} few were drawn from community-based samples. Community-based interventions address health disparities by reaching

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women where they live, work, and socialize. Beauty salons are unique and important institutions within the African American community,¹⁷ and they represent a potentially valuable setting for reaching and promoting health among these women.^{18,19} Although there have been a few community-based interventions in beauty salons,^{20,21} little is currently known about the cancer screening behaviors of African American women attending these salons. Research has shown that less than half of African American women attending beauty salons report having a mammogram in the last year,^{21,22} but Pap smear testing and colorectal cancer screening behaviors among such women have not yet been examined. Given the ubiquitous nature of beauty salons in all communities and the potential to reach large numbers of African American women in these salons, it is important to better understand the cancer screening behaviors and barriers to screening of women attending these salons. Such information is needed if future interventions that address health disparities are to be realized in this setting.

This article characterizes the cancer screening behaviors of African American women who enrolled in a community-based intervention study in North Carolina beauty salons. We identify key correlates of having received cervical, breast, and colorectal cancer screening tests within recommended guidelines and examine barriers to getting recommended cancer screening tests. Results not only shed light on the current cancer screening behaviors of these women but also provide information that will be useful for planning future interventions designed to increase the use of these lifesaving cancer screening tests.

Materials and Methods

The North Carolina BEAUTY and Health Project (BEAUTY Project) has been described in great detail elsewhere and is described briefly here.²³ The overall goal of the intervention study was to test different cancer prevention strategies among African American women attending North Carolina beauty salons. This article focuses on baseline data from customers that were collected before randomization or intervention implementation.

Salon and customer recruitment

Eligible beauty salons were (1) located within a 75-mile radius of Chapel Hill, North Carolina, (2) not part of a franchise, and (3) served at least 75 customers who were primarily African American. After an extensive recruitment substudy to test different methods of salon recruitment,²⁴ we successfully recruited 62 interested and eligible salons. These salons were part of a run-in period during which they were asked to try to recruit at least 55 customers to join the project using a standardized customer recruitment protocol. Ultimately, 40 salons were invited and agreed to participate. We report data on participants from 37 of these salons, excluding 3 salons that withdrew from the study (1 closed, 1 owner was seriously ill, and 1 owner decided she was "too busy" to participate).

From previous work,²⁵ we knew that customers were more likely to join the study if invited by their stylist. Therefore, we held a study kickoff event where participating salon owners and stylists received an orientation to the study and customer recruitment materials and were asked to encourage their customers to join the study. Recruitment materials included a

colorful, engaging display for the salon, posters/banners that contained owner/stylist pictures endorsing study participation, and small giveaways. Salon customers were then recruited during enrollment events held in each participating salon. Female customers were encouraged to join the study if they were African American, at least 18 years old, and regular customers of the shop (vs. a one-time, walk-in appointment). Potential participants signed an informed consent and completed an eligibility form that included a Physical Activity Readiness Questionnaire (PAR-Q).²⁶ We required anyone who answered "yes" to any of the PAR-Q items to get physician permission to participate.

After determining eligibility, project staff mailed eligible customers the baseline questionnaire to complete. We used Dillman methods to help maximize response rates,²⁷ including (1) a postcard reminder, (2) second mailing of the survey to nonrespondents, and (3) a telephone interview among nonrespondents using a shorter version of the mailed questionnaire. A total of 1123 customers from the 37 salons completed the baseline customer questionnaire (673 mailed surveys and 450 telephone interviews). All baseline surveys were completed in 2003, and the response rate among customers who were interested and eligible was 70%. Women received \$2 for completing the baseline survey. The average number of customers completing the baseline survey per salon was 30 (range 8–55). The Institutional Review Board at the University of North Carolina approved this study.

Measures

We examined three separate cancer screening outcome variables: adherence to recommended guidelines for (1) cervical cancer screening (Pap smear testing), (2) breast cancer screening (mammography use), and (3) colorectal cancer screening (use of FOBT and flexible sigmoidoscopy/colonoscopy). For each screening test, the questionnaire first provided a brief informative statement about the test and then asked participants if they had ever had it. If participants had a previous test, they were then asked when their last test occurred. Response options included within the past year, within the past 2 years, within the past 3 years, within the past 5 years, and >5 years ago. Flexible sigmoidoscopy and colonoscopy screening were combined on the questionnaire, so we were not able to examine colonoscopy screening within the last 10 years, the recommended ACS screening interval.³

We used the ACS screening recommendations in place at the time of data collection in determining adherence to guidelines.²⁸ These recommendations are highly similar to current ACS recommendations. Women aged ≥ 18 years self-reporting a Pap smear test within the last 3 years were considered adherent to cervical cancer screening guidelines. We chose to examine this timeframe (as opposed to Pap smear testing within the last year) because many women were older than 30 years of age, and we did not have information about history of abnormal Pap smears, which may necessitate more frequent testing. For breast cancer screening, we classified women (aged ≥ 40 years) as adherent if they self-reported a mammogram within the last year. For colorectal cancer screening, we considered women (aged ≥ 50 years) adherent if they self-reported FOBT screening in the last year or a flexible sigmoidoscopy/colonoscopy screening within the last 5 years.

The survey asked women about their intentions to receive their next Pap smear test, mammogram, FOBT screening, and flexible sigmoidoscopy/colonoscopy. Response options included within the next year, the next 2 years, the next 3 years, the next 5 years, and >5 years. We examined each woman's intentions to get a mammogram in the next year, a Pap smear test in the next 3 years, an FOBT screening in the next year, and a flexible sigmoidoscopy/colonoscopy screening within the next 5 years. We chose to examine the same timeframes for all women, regardless of their screening histories, as we did not have exact dates of their most recent screening tests.

We examined women's confidence in getting a Pap smear test, mammogram, and colorectal cancer screening test if recommended by a physician. We dichotomized responses into confident (women indicated they were very or extremely confident) or not confident (women indicated they were not at all, slightly, or moderately confident). The survey also asked women about 16 potential barriers to getting recommended cancer screening tests (items assessed general screening test barriers and were not test specific). For each potential barrier, we classified women as having the barrier (women indicated agree or strongly agree) or not having it (women indicated disagree or strongly disagree). For women who provided data on all 16 potential barriers, we counted the total number of barriers and classified each woman having high barriers (indicated 4 [median number of reported barriers] or more barriers) or low barriers (indicated 3 or fewer barriers) to getting cancer screening tests. Because of survey length and time restrictions, confidence and barrier items were not asked during telephone interviews.

The questionnaire collected information on various customer demographic and health-related variables (Table 1). Customers estimated their height and weight, which we used to calculate body mass index (BMI) and classify each customer as underweight (BMI <18.5), normal weight (BMI 18.5–24.9), overweight (BMI 25.0–29.9), or obese (BMI ≥30.0). Because of small numbers, we combined underweight and normal into one category. We assessed whether women were currently physically active with the item: I am currently physically active (response options of yes and no).

Data analysis

We used logistic regression models to examine bivariate correlates of each screening outcome. Statistically significant bivariate predictors (*p* < 0.05) were then entered into a multivariate logistic regression model. We used this same model-building procedure to identify multivariate correlates of having barriers to cancer screening tests (high barriers vs. low barriers). Because women were clustered within beauty salons, mixed logistic regression models were fit to the data. We also examined descriptive statistics for women's cancer screening intentions and confidence in getting tests. We analyzed data using SAS version 9.1 (Cary, NC), and all statistical tests were two-tailed, using a critical alpha of 0.05.

Results

Participant characteristics

Most women were employed (82%), reported an annual household income of <\$50,000 (62%), and did not have any children <18 years of age in their household (55%) (Table 1).

TABLE 1. DEMOGRAPHIC AND HEALTH CHARACTERISTICS OF WOMEN IN NORTH CAROLINA BEAUTY AND HEALTH PROJECT (*n* = 1123)

	n (%)
Demographic characteristics	
Age, years	
18–29	288 (27)
30–39	332 (31)
40–49	252 (24)
50+	188 (18)
Marital status	
Other (divorced, widowed, separated, never married)	567 (52)
Married/member of unmarried couple	520 (48)
Number of children <18 years of age in household	
0	587 (55)
1+	480 (45)
Education level	
High school diploma or less	163 (15)
Some college	410 (38)
College degree or more	520 (48)
Annual household income	
<\$50,000	632 (62)
\$50,000+	388 (38)
Employment status	
Other (not employed, homemaker, student, retired)	202 (18)
Currently employed for wages/self-employed	921 (82)
Attends church or religious services	
Less frequently	544 (52)
At least once every week	504 (48)
Health-related characteristics	
Health insurance	
No	112 (10)
Yes	977 (90)
General health	
Good/fair/poor	587 (56)
Excellent/very good	468 (44)
BMI	
Underweight/normal	282 (27)
Overweight	299 (29)
Obese	460 (44)
Smoked at least 100 cigarettes in lifetime	
No	820 (75)
Yes	274 (25)
Currently physically active	
No	695 (64)
Yes	390 (36)

Totals may be less than stated sample size due to missing data. BMI, body mass index.

Less than half were currently married or a member of an unmarried couple (48%). The mean age of women in this study was 38.5 years (standard deviation [SD] 12.0 years), with a fairly equal distribution across the four created age groups. Most women indicated they either had some college education (38%) or a college degree (48%), and just under half reported attending church or religious services at least once a week (48%).

Cervical cancer screening

Data about Pap smear testing were provided by 1089 women, of which 1026 (94%) reported their most recent Pap

smear test was within the last 3 years. In bivariate analyses, women who reported an annual household income of at least \$50,000, were employed, had health insurance, or self-reported being in excellent or very good health were more likely to have received a Pap smear test within the last 3 years (Table 2). Women who were older, had some college education, or were obese were less likely to report a Pap smear test within the last 3 years. In multivariate analyses, age was the only variable correlated with receipt of a Pap smear test

within the last 3 years. Women aged 40–49 years were less likely to report receiving a Pap smear test within the last 3 years compared to women aged 30–39 years (odds ratio [OR] 0.28, 95% confidence interval [CI] 0.12–0.67).

Breast cancer screening

Among women ≥ 40 years of age ($n=440$), 425 provided information about mammography use. Overall,

TABLE 2. CORRELATES OF REPORTING PAP SMEAR TEST WITHIN LAST 3 YEARS ($n=1089$)

	No. of women reporting a Pap smear test within last 3 years/total no. of women in category (%)	Bivariate OR (95% CI)	Multivariate OR ^a (95% CI)
Total	1026/1089 (94)	—	—
Demographic characteristics			
Age, years			
18–29	270/287 (94)	0.45 (0.20–1.02)	0.57 (0.23–1.44)
30–39	320/329 (97)	Ref	Ref
40–49	228/249 (92)	0.31 (0.14–0.68)**	0.28 (0.12–0.67)**
50+	174/184 (93)	0.40 (0.17–0.98)*	0.46 (0.17–1.29)
Marital status			
Other (divorced, widowed, separated, never married)	523/561 (93)	Ref	—
Married/member of unmarried couple	489/512 (95)	1.54 (0.91–2.63)	—
Number of children <18 years of age in household			
0	540/579 (93)	Ref	—
1+	452/475 (95)	1.42 (0.84–2.42)	—
Education level			
High school diploma or less	151/159 (95)	0.80 (0.35–1.85)	1.13 (0.41–3.12)
Some college	373/406 (92)	0.48 (0.27–0.85)*	0.71 (0.37–1.39)
College degree or more	493/514 (96)	Ref	Ref
Annual household income			
<\$50,000	580/624 (93)	Ref	Ref
\$50,000+	368/382 (96)	1.99 (1.07–3.68)*	1.47 (0.71–3.06)
Employment status			
Other (not employed, homemaker, student, retired)	158/175 (90)	Ref	Ref
Currently employed for wages/self-employed	868/914 (95)	2.02 (1.13–3.62)*	1.63 (0.76–3.47)
Attends church or religious services			
Less frequently	510/541 (94)	Ref	—
At least once every week	464/493 (94)	0.98 (0.58–1.65)	—
Health-related characteristics			
Health insurance			
No	99/111 (89)	Ref	Ref
Yes	915/964 (95)	2.26 (1.16–4.40)*	2.05 (0.93–4.52)
General health			
Good/fair/poor	534/579 (92)	Ref	Ref
Excellent/very good	447/462 (97)	2.51 (1.38–4.57)**	1.89 (0.95–3.74)
BMI			
Underweight/normal	269/277 (97)	Ref	Ref
Overweight	278/294 (95)	0.52 (0.22–1.23)	0.60 (0.24–1.49)
Obese	423/452 (94)	0.43 (0.20–0.96)*	0.61 (0.26–1.45)
Smoked at least 100 cigarettes in lifetime			
No	768/809 (95)	Ref	—
Yes	249/270 (92)	0.63 (0.37–1.10)	—
Currently physically active			
No	643/687 (94)	Ref	—
Yes	364/382 (95)	1.39 (0.79–2.44)	—

Totals may be less than stated sample size because of missing data.

^aMultivariate model included 907 women because of missing data. The multivariate model did not include variables with dashes (—).

* $p < 0.05$; ** $p < 0.01$.

CI, confidence interval; OR, odds ratio; Ref, referent.

70% (298 of 425) reported their most recent mammography was within the last year. Women who were aged ≥ 50 years, had health insurance, self-reported excellent or very good health, or reported a Pap smear test within the last 3 years were more likely to report having a mammogram within the last year in bivariate analyses (Table 3). In multivariate analyses, mammography use within the last year was more common among women aged ≥ 50 years (OR 4.97, 95% CI 2.90-8.51) or those who reported a Pap smear test within the last 3 years (OR 4.21, 95% CI 1.82-9.75).

Colorectal cancer screening

Among women ≥ 50 years of age ($n = 184$), colorectal cancer screening data were available for 180 women. Of these women, 64% (116 of 180) were considered to be within recommended screening guidelines for colorectal cancer, with 25 women reporting an FOBT screening within the last year, 54 women reporting flexible sigmoidoscopy/colonoscopy screening within the last 5 years, and 37 women reporting both an FOBT screening and flexible sigmoidoscopy/colonoscopy screening within recommended guidelines.

TABLE 3. CORRELATES OF REPORTING MAMMOGRAM WITHIN LAST YEAR AMONG WOMEN AGED ≥ 40 YEARS ($n = 425$)

	No. of women reporting mammogram within the last year/total no. of women in category (%)	Bivariate OR (95% CI)	Multivariate OR ^a (95% CI)
Total	298/425 (70)	—	—
Demographic characteristics			
Age, years			
40–49	140/242 (58)	Ref	Ref
50+	158/183 (86)	4.61 (2.81–7.55)**	4.97 (2.90–8.51)**
Marital status			
Other (divorced, widowed, separated, never married)	113/171 (66)	Ref	—
Married/member of unmarried couple	182/248 (74)	1.42 (0.93–2.17)	—
Number of children <18 years of age in household			
0	189/262 (72)	Ref	—
1+	95/147 (65)	0.71 (0.46–1.09)	—
Education level			
High school diploma or less	56/75 (75)	Ref	—
Some college	103/154 (67)	0.66 (0.37–1.28)	—
College degree or more	138/194 (71)	0.84 (0.46–1.54)	—
Annual household income			
<\$50,000	144/219 (66)	Ref	—
\$50,000+	121/165 (73)	1.43 (0.92–2.24)	—
Employment status			
Other (not employed, homemaker, student, retired)	58/75 (77)	Ref	—
Currently employed for wages/self-employed	240/350 (69)	0.64 (0.36–1.15)	—
Attends church or religious services			
Less frequently	108/164 (66)	Ref	—
At least once every week	172/236 (73)	1.40 (0.90–2.16)	—
Health-related characteristics			
Health insurance			
No	20/38 (53)	Ref	Ref
Yes	274/382 (72)	2.28 (1.16–4.49)*	1.65 (0.74–3.65)
General health			
Good/Fair/Poor	143/218 (66)	Ref	Ref
Excellent/Very Good	140/186 (75)	1.60 (1.03–2.48)*	1.57 (0.97–2.52)
BMI			
Underweight/normal	49/69 (71)	Ref	—
Overweight	76/112 (68)	0.86 (0.45–1.66)	—
Obese	157/216 (73)	1.09 (0.60–1.98)	—
Smoked at least 100 cigarettes in lifetime			
No	172/255 (67)	Ref	—
Yes	123/164 (75)	1.45 (0.93–2.25)	—
Currently physically active			
No	177/261 (68)	Ref	—
Yes	114/155 (74)	1.32 (0.85–2.06)	—
Pap smear test within last 3 years			
No	13/32 (41)	Ref	Ref
Yes	284/390 (73)	3.92 (1.86–8.23)**	4.21 (1.82–9.75)**

Totals may be less than stated sample size because of missing data.

^aMultivariate model included 398 women because of missing data. The multivariate model did not include variables with dashes (—).

* $p < 0.05$; ** $p < 0.01$.

TABLE 4. CORRELATES OF BEING WITHIN RECOMMENDED SCREENING GUIDELINES FOR COLORECTAL CANCER AMONG WOMEN AGED ≥ 50 YEARS ($n = 180$)

	No. of women within recommended screening guidelines ^a /total no. of women in category (%)	Bivariate OR (95% CI)	Multivariate OR ^b (95% CI)
Total	116/180 (64)	—	—
Demographic characteristics			
Age, years			
50–59	77/126 (61)	Ref	—
60+	39/54 (72)	1.59 (0.76–3.32)	—
Marital status			
Other (divorced, widowed, separated, never married)	51/77 (66)	Ref	—
Married/member of unmarried couple	62/100 (62)	0.81 (0.42–1.58)	—
Number of children <18 years of age in household			
0	95/148 (64)	Ref	—
1+	13/22 (59)	0.74 (0.28–1.92)	—
Education level			
High school diploma or less	29/43 (67)	Ref	—
Some college	40/63 (63)	0.90 (0.38–2.15)	—
College degree or more	47/74 (64)	0.89 (0.38–2.07)	—
Annual household income			
<\$50,000	61/94 (65)	Ref	—
\$50,000+	39/65 (60)	0.82 (0.42–1.63)	—
Employment status			
Other (not employed, homemaker, student, retired)	42/56 (75)	Ref	—
Currently employed for wages/self-employed	74/124 (60)	0.50 (0.24–1.04)	—
Attends church or religious services			
Less frequently	41/71 (58)	Ref	—
At least once every week	68/99 (69)	1.60 (0.82–3.12)	—
Health-related characteristics			
Health insurance			
No	7/11 (63)	Ref	—
Yes	108/168 (64)	1.11 (0.30–4.17)	—
General health			
Good/fair/poor	59/94 (63)	Ref	—
Excellent/very good	51/77 (66)	1.14 (0.59–2.22)	—
BMI			
Underweight/normal	15/26 (58)	Ref	—
Overweight	31/44 (70)	1.94 (0.67–5.64)	—
Obese	64/98 (65)	1.50 (0.59–3.83)	—
Smoked at least 100 cigarettes in lifetime			
No	61/98 (62)	Ref	—
Yes	54/81 (67)	1.24 (0.65–2.37)	—
Currently physically active			
No	65/104 (63)	Ref	—
Yes	46/70 (66)	1.09 (0.56–2.11)	—
Pap smear test within last 3 years			
No	6/12 (50)	Ref	—
Yes	109/167 (65)	2.09 (0.60–7.25)	—
Mammogram within last year			
No	9/24 (38)	Ref	Ref
Yes	104/153 (68)	3.25 (1.28–8.28)*	3.25 (1.28–8.28)*

Totals may be less than stated sample size because of missing data.

^aWomen were considered within recommended screening guidelines if they self-reported a fecal occult blood test (FOBT) within the last year or a flexible sigmoidoscopy/colonoscopy within the last 5 years.

^bMultivariate model included 177 women because of missing data. The multivariate model did not include variables with dashes (—).

* $p < 0.05$.

Mammography screening within the last year was the only variable associated with colorectal cancer screening in bivariate analyses (Table 4). Therefore, the resulting multivariate model contained only this variable. Women who reported a mammogram within the last year were more likely to be within recommended colorectal cancer screening guidelines (OR 3.25, 95% CI 1.28–8.28).

Potential barriers to cancer screening tests

The most frequently reported barriers to getting recommended cancer screening tests were not knowing which tests to have (54%), lack of a physician recommendation (51%), not knowing when to have tests (51%), not knowing anyone who talks about screening tests (40%), not thinking

about getting screening tests (37%), and worrying that screening tests may find cancer (35%) (Table 5). Other common barriers were cost (32%), believing tests are painful (26%), believing tests are embarrassing and/or uncomfortable (26%), and lack of cancer history in family members (26%).

Among women who provided data on all 16 potential barriers, 248 of 471 (53%) were considered to have high barriers to getting cancer screening tests. In multivariate analyses, women who were ≥50 years of age (compared to those aged 18–29 years [OR 0.39, 95% CI 0.18-0.87]) or had a college degree (compared to those with a high school diploma or less [OR 0.37, 95% CI 0.14-0.95]) were less likely to have high barriers. Women who reported being physically active (OR 0.40, 95% CI 0.25-0.64) or self-reported as being in very good/excellent health (OR 0.53, 95% CI 0.33-0.84) were also less likely to have high barriers. We did not examine receipt of cancer screening tests as potential correlates of having barriers because the tests are recommended for different age groups.

Cancer screening intentions and confidence in getting screening tests

For Pap smear testing, 99% (1041 of 1054) of women indicated intent to get one in the next 3 years, and 95% (610 of 641) were confident they would get a Pap smear test if a physician recommended it. Among women ≥40 years of age, 91% (349 of 384) reported intent to get a mammogram within the next year, and 91% (250 of 274) were confident they would get a mammogram if recommended by a physician. Among women ≥50 years of age, 69% (74 of 108) intended to get an FOBT screening in the next year, and 88% (83 of 94) intended to get a flexible sigmoidoscopy/colonoscopy screening within the next 5 years. Most women (85%, 94 of 111) were confident they would get a colorectal cancer screening test if recommended by a physician. Women who were within recommended screening guidelines for a screening test reported higher levels of intent and confidence to get that test compared to women not within guidelines (all *p* < 0.05), with the

exception of women’s intentions to get a future flexible sigmoidoscopy/colonoscopy.

Discussion

Compared to white women, African American women have higher mortality rates from cervical, breast, and colorectal cancers,² yet not all African American women receive screening tests within recommended guidelines for these cancers.⁴ Beauty salons represent a promising yet underexplored setting for reaching African American women and examining their cancer prevention behaviors. To our knowledge, our study represents the most comprehensive examination of cancer screening behaviors and barriers to cancer screening among African American women attending beauty salons. We found that almost all African American women recruited from North Carolina beauty salons were within cervical cancer screening guidelines, whereas much lower percentages were within screening guidelines for breast and colorectal cancer. The screening levels observed in this study are similar to those reported elsewhere for African American women.^{5–16} Interestingly, a survey of African American women from California beauty salons found a much lower percentage of women reported a mammogram in the past year (43%).²¹ Many women in our study reported multiple barriers to getting recommended cancer screening tests.

Our results suggest that beauty salons may be an effective community-based setting for recruiting African American women to participate in a wide range of cancer prevention screening and education programs. We were able to successfully recruit more than 1000 African American women into this study, many of whom did not meet recommended screening guidelines. Thus, beauty salons are a promising community-based setting for reaching African American women with interventions designed to improve informed decision making about cancer screening. Efforts focused on breast and colorectal cancer screening may be particularly

TABLE 5. POTENTIAL BARRIERS TO RECEIVING CANCER SCREENING TESTS (*n* = 673)

<i>Barrier</i>	<i>No. of women reporting barrier/total (%)</i>
I do not know which cancer screening tests I should have	337/629 (54)
My doctor has not recommended cancer screening tests to me	295/577 (51)
I do not know when to have cancer screening tests	316/625 (51)
No one I know talks about getting cancer screening tests	244/611 (40)
I do not think about getting cancer screening tests	227/616 (37)
I worry the screening tests may find cancer	214/609 (35)
Cancer screening tests cost too much	193/600 (32)
Cancer screening tests are painful	151/575 (26)
Cancer screening tests are embarrassing and/or uncomfortable	154/589 (26)
Cancer has not affected my family	161/617 (26)
I do not think I need to have cancer screening tests	85/606 (14)
I forget to schedule cancer screening tests	69/599 (12)
It takes too long to get an appointment for cancer screening tests	59/594 (10)
I do not want to know if I have cancer, so I avoid cancer screening tests	34/611 (6)
I do not have time to have cancer screening tests	32/622 (5)
I am too busy to get cancer screening tests	30/615 (5)

Totals may be less than stated sample size because of missing data. For each potential barrier, we classified women as having the barrier (women indicated agree or strongly agree) or not having it (women indicated disagree or strongly disagree). Because of survey length and time restrictions, these items were asked only of those women who completed mailed surveys.

important, as these screening rates were much lower in the current study compared to that for cervical cancer.

Women who were within recommended guidelines for one recommended cancer screening test examined in this study were often more likely to be within recommended guidelines for other screening tests (e.g., receipt of a Pap smear test within the last 3 years was correlated with mammography use within the last year). This finding is logical, in that women who receive one type of cancer screening test are likely to be more accepting of screening tests in general and to use health services more frequently. However, a considerable number of women who reported receiving one type of recommended cancer screening test had not received others. For example, 32% of women aged ≥ 50 years who reported a mammogram in the last year were not within recommended screening guidelines for colorectal cancer. This suggests possible missed opportunities for public health practitioners and healthcare providers to educate women about the importance of receiving all appropriate cancer screening tests, according to recommended guidelines. Future programs offering one-stop shopping for cancer screening tests may help ensure that women receive all appropriate cancer screening tests. Until such programs are widely available, interventions that increase the use of provider and client reminders, provider assessment and feedback, small media, or one-on-one client education can be effective in increasing cancer screening, as can those that decrease structural barriers.^{29–32}

Age was correlated with both recent Pap smear testing and mammography use. Although $>90\%$ of women overall had received a Pap smear test within the last 3 years, screening was most common among women aged 30–39 years. It is important that women outside of this age group also receive regular screening, as $>20\%$ are likely infected with human papillomavirus (HPV) and are, therefore, at higher risk for cervical disease.³³ Mammography use was more common among women aged ≥ 50 years in this study compared to those aged 40–49 years, a finding similar to a previous study among African American women.¹¹ This may be partly attributable to evidence suggesting the net benefit of mammography use among women <50 years of age may be small.³⁴ In fact, the United States Preventive Services Task Force (USPSTF) recently updated its mammography screening recommendations and now suggests biennial screening only for women aged 50–74 years.³⁴ The ACS, however, continues to recommend yearly mammograms for all women aged ≥ 40 years despite this controversy.³ Mammography use among younger women may be particularly relevant for African Americans, as breast cancer incidence rates among women <40 years of age are higher for African Americans compared to whites.³⁵ Among older women, however, whites continue to have higher breast cancer incidence rates than African Americans.³⁵

Socioeconomic status (SES) and health insurance were not correlated, in multivariate analyses, with any of the cancer screening outcomes examined. This is a somewhat surprising result but also encouraging, as cancer mortality rates among African Americans tend to be higher for those with lower SES and no health insurance.² These findings are in contrast to other studies conducted among African American women, where cancer screening was often less common among women with less education, lower income, and no health insurance.^{10,11,13,36–38} It is also noteworthy that screening rates did

not differ across BMI categories in multivariate analyses. Obesity increases the risk of both breast cancer and colorectal cancer,¹ and some evidence exists that healthcare generally and cancer screening specifically are less common among obese women.³⁹ The inverse association between obesity and cancer screening has been, however, less apparent among African American women compared to white women,³⁹ possibly explaining the lack of multivariate associations observed in this study.

Most women intended to get cancer screening tests in the near future and were confident they would get these tests if recommended by a physician. Over half of women, however, reported at least four barriers to getting recommended cancer screening tests. Commonly reported barriers were similar to those found in previous research and included lack of doctor's recommendation to get screened, lack of knowledge about which screening tests to get, cost, and embarrassment.^{9,40,41} In addition to increasing women's awareness and knowledge about recommended cancer screening tests, our results suggest that continued efforts are also needed to ensure that women receive doctors' recommendations and referrals for these tests.

Women who were younger, less educated, not physically active, or self-reported poorer general health were more likely to have high levels of barriers to getting recommended cancer screening tests. Thus, our results not only identify which barriers to cancer screening are prevalent among African American women but also which women may be particularly vulnerable to having these barriers. Such findings are important to future interventions designed to decrease barriers to cancer screening among African American women.

Our study has several important strengths: a large sample of African American women, recruitment of women from an underexplored community-based setting, and examination of screening behaviors and their correlates for three common cancers. Limitations include the lack of available data on some variables that may be important to screening behaviors (e.g., personal or family history of cancer, history of hysterectomy, and previous doctor's recommendation to get screening tests) and not examining all recommended screening tests for these three cancers (e.g., double-contrast barium enema as a colorectal cancer screening option). We did not ask women the reason for their most recent screening tests, so some women may have received them in response to symptoms. Lastly, all beauty salons were located in North Carolina, and screening histories were self-reported, although most women can accurately recall their cancer screening histories.^{42–44}

Conclusions

Almost all African American women recruited from North Carolina beauty salons reported receiving a Pap smear test within the last 3 years, while much lower percentages reported use of mammography and colorectal cancer screening tests within recommended screening guidelines. Age and receipt of other cancer screening tests were important correlates of being within recommended screening guidelines. Many women reported multiple barriers to getting recommended cancer screening tests. Beauty salons represent a promising setting for reaching African American women, many of whom are not within recommended screening guidelines. Interventions in beauty salons to increase cancer screening rates among African

American women are an appropriate next step for reducing cancer disparities based on these results.

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