Short Communication

Breast Cancer Risk Reduction Options: Awareness, Discussion, and Use among Women from Four Ethnic Groups

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Abstract

Background: **With recent advances in breast cancer risk reduction practices, it is increasingly important to assess both the breadth of and disparities in use across different racial/ethnic groups.**
Methods: **We conducted telephone interviews with 1,700 women ages 40 to 74, from four racial/ethnic groups, without prior history of breast cancer, who received mammograms at one of five mammography facilities in San Francisco. Main outcomes measured included recognition of tamoxifen, raloxifene, genetic testing, and prophylactic surgery. Global indicators (recognition of any therapy, discussion of breast cancer risk) were developed from original outcome measures and analyzed using logistic regression.**
Results: **Multivariate analyses indicate that race/ethnicity and interview language affected recognition of therapies and discussion of risk. White women were more likely than all other women to recognize any therapy and more likely than Asian-Americans to discuss risk. Women at high risk, who had a prior abnormal mammogram, who perceived themselves to be at high risk, or who were exposed to breast health information were more likely to discuss risk.**
Conclusions: **Women are aware of preventive therapies, although discussion and use is limited. Interventions to increase use of therapies should focus on those at high risk.** (Cancer Epidemiol Biomarkers Prev 2006;15(1):162–6)

Introduction

Among women in the U.S., breast cancer is a leading health concern, with a lifetime risk of ~11% (1). Advances in breast cancer genetic predisposition screening (2, 3), chemoprevention therapies (3), and surgical procedures (4) have led to recommendations in general clinical practice. Although the gap between breast cancer screening for minority populations and Whites has been narrowed in recent years (5), for many decades, Whites have benefited from higher screening rates (6, 7). Several factors have been linked with the dissemination of breast screening practices, including demographic characteristics (8), health coverage (9), risk perception (10), risk factors for breast cancer (8), and media exposure (11). Therefore, it is increasingly important to assess whether risk reduction developments reach patients of different racial/ethnic groups to the same extent and what factors are associated with their knowledge and use. This study attempts to fill this knowledge gap by surveying a sample of women from four ethnic groups (Asian-American, African-American, Latino, and White). Our goals are 3-fold: to measure awareness of risk reduction therapies, discussion of breast cancer risk, and use of therapies; to determine if racial/ethnic differences exist in these areas; and to examine factors associated with recognition of therapies and discussion of risk.

Materials and Methods

Sample Selection and Eligibility. Potential participants were identified through the San Francisco Mammography Registry (http://mammography.ucsf.edu/SFMR/), one of seven population-based registries participating in the National Cancer Institute Breast Cancer Surveillance Consortium (12). For the present study, data were collected from five mammography facilities within the registry. Patients provide health information to the registry at the time of their mammogram.

Women who received mammograms between June 2001 and January 2003 were eligible for participation if they (*a*) agreed to have breast health information in the registry for research purposes and to be contacted for possible participation in health research studies, (*b*) had no personal history of breast cancer or a breast abnormality at the time of most recent mammogram, (*c*) were ages 40 to 70, (*d*) self-identified as Asian-American, African-American, Latina, or White, and (*e*) spoke English, Spanish, or Cantonese.

We stratified our sample by race/ethnicity and level of 5-year breast cancer risk (high versus low). Using results from preliminary power calculations, we targeted 580 White women

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(360 low risk and 220 high risk) and 290 each of African-Americans, Asian-Americans, and Latinas (180 low risk and 110 high risk). A woman was considered high-risk if her 5-year Gail score was 1.67% or higher (13), or if she had at least one first-degree relative with a history of breast cancer, or a personal history of breast biopsy irrespective of overall Gail score. All others were considered low-risk. All high-risk Latina, African-American, and Asian-American women were considered potential participants. A random sample of all participants at low risk and Whites at high risk were selected for participation.

Of the 13,433 eligible participants, 2,800 were sent study letters. Eighty-five of these were deemed ineligible at the time of interview. Of the remaining 2,715 eligible women, 1,711 completed a telephone survey, 398 refused participation, and 606 were unreachable after 4 months of call attempts, yielding a response rate of 63.0%. A detailed discussion of recruitment procedures can be found elsewhere (14). Due to missing information, the number of surveys analyzed was 1,700. The number of African-American and Latino participants at high risk based on actual survey data was lower than expected due to the overall younger age of the sample.

Procedures. Each potential participant was sent study information and a postage-paid return postcard that allowed her to refuse participation. Participants provided verbal informed consent and chose their preferred interview language. Recruitment and telephone interviews were conducted from March 2002 to July 2003. University of California, San Francisco's Committee on Human Research and the participating mammography sites approved all procedures.

Measures. Demographic variables included race/ethnicity, age, relationship status (married or living with a partner versus not), education (grade school, high school or vocational school, college education), median neighborhood household income, country of birth (U.S. or foreign), and language of interview (English, Spanish, or Chinese).

Ten health-related variables were measured. We assessed the specialty of the physician who discussed breast health (obstetrics/gynecology, other), type of health insurance (no insurance, government, private, or group model health plan), Gail score (recalculated using telephone interview information), prior abnormal mammogram, and perceived level of risk (below average, average, or above average). Frequency of worry was assessed using questions based on Lerman's scale (15). Women were asked how often they worried about getting breast cancer and how often during the past month their mood and daily functioning were affected by the fear of getting breast cancer. Responses to items were averaged into a single indicator, with values ranging from 1 to 4 (α 0.65). Additionally, we assessed Jewish heritage, reported comorbidity (diabetes, high blood pressure, chronic lung disease, heart disease, osteoporosis, kidney disease, stroke, liver disease, or cancer), body mass index [<25.0 kg/m^2 (normal), 25-29.9 kg/m^2 (overweight), and $\geq$30 kg/m^2 (obese)], and exposure to breast health issues via the Internet, television, radio, newspaper, or magazines (any media versus no media).

Main Outcomes. This study examined four risk reduction options: tamoxifen, raloxifene, genetic evaluation, and prophylactic surgery. Participants were given brief definitions of each therapy then asked if they had ever (*a*) discussed with a doctor, (*b*) heard of, for those who had not discussed, or (*c*) used any of these therapies, for those who had ever heard of or discussed. Due to low numbers of affirmative responses in categories (*a*) and (*c*), these were combined into a single indicator reflecting the participants' discussion of a therapy with their doctor or use of that therapy.

We defined three global indicators of therapy: recognition of any therapy, discussion of personal risk of breast cancer, and discussion/use of any therapy. Having heard of *any one* therapy constituted ''recognition.'' Discussion of risk was determined by whether participants had talked to their doctor about their personal risk of breast cancer. And finally, having ever discussed or used *any one* therapy constituted ''discussion/use.''

Analysis. Descriptive statistics were used to illustrate the characteristics of the sample and the women in each racial/ethnic group who reported awareness or discussion/use of risk reduction practices using χ^2. In addition, confidence intervals (CI) were calculated for each of the risk reduction practices and global indicators. Logistic regression models were fit to identify factors associated with two of the global measures: recognition of any therapy and discussion of risk. Variables for multivariate analysis were selected based on significant bivariate associations ($P < 0.20$) or on findings from the literature.

Results

Table 1 shows sample characteristics by race/ethnicity. The mean age of the sample was 54.4 years (SD, 7.9). The majority were married or living with a partner, and college-educated. Over one-third of the participants were foreign-born, and 11.2% completed the interview in a language other than English. About one-third of the sample were at high risk for breast cancer, and more than one-third reported a prior abnormal mammogram. Almost one-third of the sample perceived that they were at above average risk for breast cancer. Roughly 10% reported Jewish heritage. Almost half the women reported one or more comorbidities, and nearly half reported a ''normal'' body mass index. Roughly a third reported receiving breast health information from the media. Overall significant differences between racial/ethnic groups were found for all indicators.

With respect to each individual therapeutic option (Table 2), White women were more likely than other groups to report having heard of each option. White women also seemed to be more likely than other groups to discuss/use most therapies, although the CIs overlapped for a number of comparisons. Whites were also more likely to report recognition of *any* preventive therapy. Among women at both low risk and high risk, Whites were more likely than Asian-Americans to report discussion of breast cancer risk with a physician. Although CIs overlapped, Latinas also seemed to be less likely to discuss breast cancer risk with a physician.

Multivariate Analysis. As seen in Table 3, other groups were less likely to recognize any therapy than Whites. Compared with women with at least some college education, high school-educated women were less likely to have heard of any therapy. Foreign-born women and those who completed the survey in Spanish or Chinese were less likely to have heard of any therapy. Women whose physicians were obstetrician/gynecologists were more likely than women with physicians of other specialties to recognize any therapy. Those who received public insurance were significantly less likely than those with health maintenance organization, preferred provider organization, or other private insurance to recognize any therapies. Women at high risk were more likely to recognize any therapy than those at lower risk, as were women who reported a prior abnormal mammography result compared with those without the abnormality. Obese women were less likely to have heard of any therapy compared with women with normal body mass index.

Asian-Americans were less likely than Whites to report discussion of risk with physicians, as were older compared with

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Table 1. Sample characteristics by race/ethnicity, San Francisco, CA, 2001-2002

	Asian-American (n = 356) 21%	African-American (n = 326) 19%	Latina (n = 330) 19%	White (n = 688) 40%	Total (n = 1,700)	P*
Demographic factors						
Age mean (SD)	54.7 (8.0)	54.8 (7.8)	52.7 (7.6)	54.9 (7.8)	54.4 (7.9)	<0.001
Relationship status						
Married or living with partner	242 (69.1)	126 (39.4)	199 (61.2)	431 (63.1)	998 (59.5)	<0.001
Education level						
Grade school	15 (4.3)	3 (0.9)	44 (13.5)	1 (0.1)	63 (3.7)	
High school/vocational school	56 (15.9)	72 (22.4)	121 (37.1)	55 (8.0)	304 (18.0)	
College or higher	281 (79.8)	246 (76.6)	161 (49.4)	630 (91.8)	1,318 (78.2)	<0.001
Foreign born	269 (75.6)	14 (4.3)	229 (69.4)	89 (12.9)	601 (35.4)	<0.001
Spanish/Chinese language interview	67 (19.8)	0	124 (37.6)	0	191 (11.2)	<0.001
Health-related factors						
OB/GYN physician	127 (35.7)	113 (34.7)	117 (35.5)	307 (44.6)	64 (39.1)	0.002
Insurance type						
None	16 (4.5)	6 (1.9)	36 (11.0)	13 (1.9)	71 (4.2)	
Medicare/Medi-Cal/other government	37 (10.5)	54 (16.7)	38 (11.6)	41 (6.0)	170 (10.1)	
Health maintenance organization/preferred provider organization/other private	127 (36.0)	124 (38.4)	126 (38.5)	369 (53.6)	746 (44.1)	
Group model health plan	173 (49.0)	139 (43.0)	127 (38.8)	265 (38.5)	704 (41.6)	<0.001
Gail risk level						
Low risk	205 (57.6)	296 (90.8)	288 (87.3)	364 (52.9)	1,153 (67.8)	
High risk	151 (42.4)	30 (9.2)	42 (12.7)	324 (47.1)	547 (32.2)	<0.001
Prior abnormal mammogram	106 (30.2)	130 (40.5)	123 (37.5)	348 (50.7)	707 (41.9)	0.001
Breast cancer worries (range 1-4; Mean (SD))	1.22 (0.46)	1.22 (0.49)	1.37 (0.61)	1.15 (0.37)	1.22 (0.47)	<0.001
Perception of breast cancer risk						
Below average	134 (40.1)	76 (24.7)	76 (24.8)	161 (24.0)	447 (27.6)	
Average	128 (38.3)	149 (48.4)	151 (49.2)	257 (38.4)	685 (42.3)	
Above average	72 (21.6)	83 (26.9)	80 (26.1)	252 (37.6)	487 (30.1)	<0.001
Jewish heritage	1 (0.1)	11 (0.7)	10 (0.6)	146 (8.8)	168 (10.1)	<0.001
Comorbidities						
None	197 (55.3)	122 (37.4)	181 (54.8)	415 (60.3)	915 (53.8)	
One	108 (30.3)	125 (38.3)	103 (31.2)	178 (25.9)	514 (30.2)	
Two or more	51 (14.3)	79 (24.2)	46 (13.9)	95 (13.8)	271 (15.9)	<0.001
Body mass index						
Normal	245 (69.6)	84 (26.5)	93 (29.3)	376 (55.2)	798 (47.9)	
Overweight	85 (24.1)	93 (29.3)	110 (34.7)	188 (27.6)	476 (28.6)	
Obese	22 (6.3)	140 (44.2)	114 (36.0)	117 (17.2)	393 (23.6)	<0.001
Self-reported media exposure to breast health issues	94 (26.6)	135 (41.8)	118 (36.0)	208 (30.4)	555 (32.9)	<0.001

*χ^2, overall differences between racial/ethnic groups.

younger and those who completed the interview in Spanish or Chinese compared with those who did it in English. Women at high risk were more likely to discuss their risk of breast cancer, as were women with a prior abnormal mammogram. Women whose risk perception was below average or average were less likely to discuss risk. Self-reported media exposure to breast health issues was linked to increased discussion.

Discussion

Although breast cancer risk reduction practices are becoming available, little is known about women's awareness of therapies or whether individual risk is discussed with physicians. One goal of this study was to assess breast cancer risk discussion and awareness among a group of California women.

Although overall awareness of therapies was quite high among all participants, discussion and use of any therapy was quite low, even for high-risk participants. Reasons for lack of discussion or use are unclear. Physicians, who traditionally initiate discussion of preventive therapies (16), may have concerns about the potential adverse effects of tamoxifen (17), or are discouraged by the relatively small number of preventable breast cancers, even among tamoxifen-eligible patients (18). Other therapies showing a low rate of use, such as raloxifene, are not yet approved for the prevention of breast cancer and are associated with an increase in thrombotic events, even if the risk for endometrial cancer is not increased (19). Genetic testing, although increasingly available, has limited use and is expensive and is generally not covered by health insurance (20).

A second goal was to examine racial/ethnic differences in breast cancer risk reduction practices and reported risk discussion. Our findings suggest that whereas strong ethnic differences exist in awareness of therapies, these differences are reduced in the overall discussion of risk or eliminated in the discussion/use of individual therapies. Irrespective of risk level, White women were more likely to report recognition of individual therapies than other racial/ethnic groups. Research indicates that African-American women know significantly less about breast cancer and genetic testing than their White counterparts (21).

A third goal was to assess factors associated with recognition of therapies and discussion of risk. Discussion of risk may be associated with issues of language and communication. Multivariate analysis revealed limited discussions among women whose language preference was other than English—a group likely to have difficulty communicating or understanding complex information such as relative risk or the benefits and side effects of drugs in their non-native language. Low health literacy, which correlates with low socioeconomic status and older age, may play a role in obtaining information about breast cancer risk reduction.

Self-reported media exposure to breast health issues, which we conjectured would prompt participants to get information and discuss therapies with physicians, affected risk discussion, but not recognition of the individual therapies. Given recent media reports about tamoxifen evaluation, highlighting the need for women at high risk to weigh its risks and benefits (11), it is not surprising that this group was more likely to report risk discussion with physicians.

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Table 2. Breast cancer risk reduction practices by race/ethnicity, San Francisco, CA, 2001-2002

	Asian-American (*n* = 356)	African-American (*n* = 326)	Latina (*n* = 330)	White (*n* = 688)	Total (*n* = 1,700)
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Individual therapies					
Tamoxifen					
Heard of tamoxifen	36.2 (31.2-41.5)	48.5 (42.9-54.0)	25.8 (21.1-30.8)	79.1 (75.8-82.1)	53.9 (51.5-56.3)
Discussed/took tamoxifen	2.5 (1.2-4.7)	3.7 (1.9-6.3)	1.5 (0.5-3.5)	6.3 (4.6-8.3)	4.1 (3.2-5.1)
Raloxifene					
Heard of raloxifene	14.6 (11.1-18.7)	17.2 (13.2-21.7)	12.4 (9.1-16.5)	33.9 (30.3-37.5)	22.5 (20.5-24.5)
Discussed/took raloxifene	3.7 (2.0-6.2)	0.9 (0.2-2.7)	0.9 (0.2-2.6)	6.1 (4.4-8.2)	3.6 (2.8-34.5)
Genetic counseling/testing					
Heard of genetic testing	26.1 (21.6-31.0)	31.0 (26.0-36.3)	19.4 (15.3-24.1)	59.4 (55.7-63.1)	39.2 (36.9-41.6)
Discussed/had genetic testing	2.0 (0.8-4.0)	1.5 (0.5-3.5)	2.1 (0.9-4.3)	6.7 (4.9-8.8)	3.8 (3.0-4.8)
Prophylactic surgery					
Heard of prophylactic surgery	50.8 (45.5-56.2)	67.8 (62.4-72.8)	56.4 (50.8-61.8)	85.8 (82.9-88.3)	69.3 (67.0-71.5)
Discussed/had prophylactic surgery	3.4 (1.8-5.8)	4.9 (2.8-7.8)	5.2 (3.0-8.1)	6.5 (4.8-8.7)	5.3 (4.3-6.5)
Global indicators					
Recognition of any therapy					
Low risk	50.2 (43.2-57.3)	77.0 (71.8-81.7)	61.5 (55.6-67.1)	91.2 (87.8-93.9)	72.9 (70.2-75.4)
High risk	69.5 (61.5-76.8)	76.7 (57.7-90.1)	73.8 (58.0-86.1)	96.3 (93.6-98.1)	86.1 (82.9-88.9)
Discussion of breast cancer risk with physician					
Low risk	40.0 (33.2-47.1)	59.5 (53.6-65.1)	47.9 (42.0-53.9)	62.4 (57.2-67.4)	54.0 (51.1-56.9)
High risk	50.3 (42.1-58.6)	76.7 (57.7-90.1)	54.8 (38.7-70.2)	70.7 (65.4-75.6)	64.2 (60.0-68.2)
Discussion/use of any therapy					
Low risk	6.8 (3.8-11.2)	9.1 (6.1-13.0)	9.0 (6.0-12.9)	9.6 (6.8-13.1)	8.8 (7.3-10.6)
High risk	15.2 (9.9-22.0)	16.7 (5.6-34.7)	11.9 (4.0-25.6)	23.8 (19.2-28.8)	20.1 (16.8-23.7)

Perceived risk of breast cancer and perceived physical indicators of risk such as prior abnormal mammography were associated with increased discussion. Having an abnormal mammogram, even though not considered an independent risk for breast cancer, increases a woman's anxiety and may promote discussion with her provider (9). Given that perception of risk was associated with other breast cancer-preventive behaviors (10), the results of our study underscore the importance of the subjective aspects of the clinical encounter, and their need to be addressed by physicians in clinical practice.

Older participants were less likely to discuss breast cancer risk irrespective of their objectively higher risk of the disease. This finding makes sense in light of other research on cancer which has found that older adults are less likely to be screened for cancer, and more likely to have advanced cancer at presentation, and to suffer disproportionately high levels of cancer mortality (8). In addition, older age, despite being an objective risk factor, is not usually recognized by women as such; therefore, older women may not initiate discussion of risk with their physicians.

Table 3. Logistic regression analysis of breast cancer risk reduction related behaviors

	Recognition of any therapy		Discussion of breast cancer risk	
	OR (95% CI)	*P*	OR (95% CI)	*P*
Demographic factors				
Race/ethnicity (ref: White)				
Asian-American	0.18 (0.11-0.30)	<0.001	0.67 (0.46-0.96)	0.030
African-American	0.36 (0.22-0.59)	<0.001	1.00 (0.70-1.42)	0.993
Latina	0.45 (0.27-0.75)	0.002	1.20 (0.81-1.79)	0.371
Age (continuous)	1.00 (0.98-1.02)	0.948	0.98 (0.96-1.00)	0.019
Education level (ref: college)				
Grade school	1.02 (0.49-2.11)	0.954	0.60 (0.27-1.33)	0.208
High school/vocational school	0.64 (0.44-0.92)	0.015	0.85 (0.61-1.18)	0.325
Foreign born	0.51 (0.35-0.76)	0.001	1.32 (0.96-1.82)	0.089
Spanish/Chinese language interview	0.58 (0.35-0.96)	0.035	0.31 (0.18-0.52)	<0.001
Health-related factors				
OB/GYN physician	1.46 (1.08-1.97)	0.015	0.92 (0.73-1.16)	0.481
Insurance (ref: health maintenance organization/preferred provider organization/other private)				
None	0.62 (0.31-1.26)	0.188	0.63 (0.32-1.25)	0.185
Medicare/Medi-Cal/other government	0.59 (0.35-0.99)	0.045	0.68 (0.44-1.05)	0.081
Group model health plan	0.71 (0.36-1.40)	0.324	0.59 (0.33-1.05)	0.070
High-risk (Gail score of at least 1.67%)	1.79 (1.21-2.65)	0.004	1.40 (1.04-1.87)	0.025
Prior abnormal mammogram	1.37 (1.01-1.85)	0.042	1.43 (1.13-1.81)	0.003
Perception of risk (ref: above average)				
Below average	0.96 (0.64-1.43)	0.815	0.51 (0.37-0.70)	<0.001
Average	0.99 (0.69-1.42)	0.973	0.44 (0.33-0.58)	<0.001
Body mass index (ref: normal)				
Overweight	0.93 (0.65-1.32)	0.677	1.09 (0.83-1.43)	0.539
Obese	0.67 (0.45-0.98)	0.040	0.91 (0.67-1.25)	0.561
Self-reported media exposure to breast health issues	1.30 (0.96-1.75)	0.094	1.39 (1.09-1.77)	0.008

NOTE: Multivariate analysis also included where mammogram originated, median household income, married or living with a partner, worry about breast cancer, Jewish heritage, and number of comorbidities.

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Our study has several limitations. The Gail model may not accurately estimate true risk for an individual woman, particularly among minority or young women (22, 23). Because our sample came from a mammography registry, our findings may not be generalizable to women who have not had a mammogram or who reside in other regions. Women recruited from a registry may be more health conscious and in closer contact with a medical system; therefore, we would expect a higher level of awareness and discussion of breast cancer risk compared with the general population. Also, due to the cross-sectional nature of the data, we were unable to identify causal relationships. Despite these limitations, our data set is large, population-based, and racially/ethnically diverse.

Our study highlights that many women are aware of one or more of the individual preventive breast cancer therapies available to them, although discussion with their clinicians and use of therapies are limited. It is encouraging that therapeutic discussions seem to be determined in part by issues related to the needs and health of patients, as women at high risk report engaging in therapeutic discussions and treatments more frequently than women at low risk. However, the data suggest that interventions to increase discussion of preventive therapies among women at high risk are warranted.

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