Missed Opportunities: Family History and Behavioral Risk Factors in Breast Cancer Risk Assessment Among a Multiethnic Group of Women

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BACKGROUND: Clinician's knowledge of a woman's cancer family history (CFH) and counseling about health-related behaviors (HRB) is necessary for appropriate breast cancer care.

OBJECTIVE: To evaluate whether clinicians solicit CFH and counsel women on HRB; to assess relationship of well visits and patient risk perception or worry with clinician's behavior.

DESIGN: Cross-sectional population-based telephone survey.

PARTICIPANTS: Multiethnic sample; 1,700 women from San Francisco Mammography Registry with a screening mammogram in 2001–2002.

MEASUREMENTS: Predictors: well visit in prior year, self-perception of 10-year breast cancer risk, worry scale. Outcomes: Patient report of clinician asking about CFH in prior year, or ever counseling about HRB in relation to breast cancer risk. Multivariate models included age, ethnicity, education, language of interview, insurance/mammography facility, well visit, ever having a breast biopsy/follow-up mammography, Gail-Model risk, Jewish heritage, and body mass index.

RESULTS: 58% reported clinicians asked about CFH; 33% reported clinicians ever discussed HRB. In multivariate analysis, regardless of actual risk, perceived risk, or level of worry, having had a well visit in prior year was associated with increased odds (OR=2.3; 95% CI 1.6, 3.3) that a clinician asked about CFH. Regardless of actual risk of breast cancer, a higher level of worry (OR=1.9; 95% CI 1.4, 2.6) was associated with increased odds that a clinician ever discussed HRB.

CONCLUSIONS: Clinicians are missing opportunities to elicit family cancer histories and counsel about health-related behaviors and breast cancer risk. Preventive health visits offer opportunities for clinicians to address family history, risk behaviors, and patients' worries about breast cancer.

KEY WORDS: family history; breast cancer; risk assessment; multiethnic.
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BACKGROUND

Women with a family history of breast and/or ovarian cancer are at increased risk for breast cancer. Although only 5–10% of breast cancer cases result from known and testable genetic mutations, women at high risk for those mutations should be referred for genetic counseling and testing.[1] Without soliciting an adequate family history of cancer, primary care physicians cannot assess risk adequately and make these referrals.[1–5] For other women with a family history, an interaction of genetics and environment can increase their risk for breast cancer.[6] Fatty diet, high alcohol intake, low physical activity, and obesity are all modifiable environmental/behavioral risk factors for breast cancer.[7–10]

Patients' report of their family history of breast cancer is quite accurate.[11] Prior research in a largely White population suggests that physicians obtain some element of a family history during half of new patient visits and almost one-quarter of follow-up visits.[4,12] These relatively low rates may in part be explained by low self-efficacy in relation to genetic disease screening among primary care physicians.[3] However, physicians do appropriately tailor breast cancer risk reduction recommendations and refer for genetic counseling and testing when given standardized patient scenarios.[13,14] In contemporary busy practice settings, physician behavior may be more influenced by limited time and the patients' own concerns.[15–17]

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Research has demonstrated links among family history, disease-specific perceived risk, and disease-specific worry.[18] However, associations between the degree of cancer worry and clinicians' risk counseling behaviors are poorly understood, especially among women varying in risk. Clinicians may underestimate the degree to which patients worry about cancer, depending on their self-efficacy communicating about difficult issues.[19] A cross-sectional study among women at high risk of breast cancer found that solicitation of family history in a general medicine setting was associated with less cancer worry.[20]

This study adds to the current literature by assessing rates of family cancer history elicitation and counseling on modifiable behavioral risk factors for breast cancer among a multiethnic sample of women at both high and average breast cancer risk. It further investigates whether these activities were related to opportunities for delivering preventive health care and to patients' perceived risk or worry about breast cancer. Our hypothesis was that women who either had a well visit in the past year or who endorsed feeling worried about breast cancer would be more likely to report that their clinicians had elicited their family cancer histories and had counseled them on behavioral risk factors.

METHODS

Setting, Sample Selection, and Eligibility

This is a cross-sectional study of a telephone survey conducted between March and July 2003 about breast cancer risk reduction practices. Details of the survey are available elsewhere, and are described briefly here.[21–24] Participants were identified through the San Francisco Mammography Registry (SFMR), a population-based registry in the National Cancer Institute Breast Cancer Surveillance Consortium.[25] Patient data were gathered from 5 participating facilities. Women were eligible if they had a screening mammogram between 2001–2002, had completed the SFMR demographic and health information questionnaire, agreed to be contacted for possible participation in breast health research studies, had no personal history of breast cancer, were age 40–75, spoke English, Spanish or Cantonese, and self-identified as African American, Asian-Pacific Islander (API), Latina, or White. Based on information from the SFMR questionnaire, the sample was stratified by race/ethnicity and level of 5-year breast cancer risk according to the Gail Model with the goal of recruiting equal numbers in high versus average/low risk groups. The Gail model is a risk-prediction model for breast cancer; women were considered high risk if their score on the model was >1.7.[26,27] In addition, recruitment was stratified by ethnicity with target recruitment of equal numbers of women in each ethnic group. A total of 14,490 women were deemed eligible. Because of relatively small numbers, we recruited all high-risk minority women. We randomly sampled from among high-risk White women and from each low-risk race/ethnic group; further details of the recruitment and participation by ethnicity are available elsewhere.[21]

Of the 2,715 eligible women sent recruitment letters, 1,711 completed the survey, 398 refused participation, and 606 were unreachable (incorrect contact information, unresponsive), resulting in a response rate of 63%. Because of missing information, the number of completed surveys included in the analysis was 1,700.[21]

Table 1. Sociodemographic and Breast Cancer Risk-Related Factors among a Multiethnic Sample of Women Receiving Screening Mammography, San Francisco Bay Area 2001–2002 (*N*=1,700)

	Unweighted % (*N*)	Weighted %
Sociodemographic characteristics		
Age		
40–49	29.0 (493)	33.1
50–59	58.4 (993)	57.9
60–74	12.6 (214)	9.0
Jewish heritage		
Yes	10.1 (168)	11.6
Education		
Grade school or middle school	3.7 (63)	3.3
Completed high school or vocational school	18.1 (304)	16.3
College or higher	78.2 (1318)	80.3
Language of interview		
Chinese or Spanish	1.3 (192)	10.5
English	88.7 (508)	89.5
Access		
Insurance and mammography facility		
Academic hospital insured	35.7 (607)	37.2
Community hospital insured	13.5 (230)	12.5
Public hospital insured	3.1 (53)	3.0
Staff model HMO insured	42.6 (724)	42.5
Uninsured	4.2 (71)	4.0
Insurance information missing	0.9 (15)	0.8
At least one well-visit in past year		
Yes	87.6 (1464)	86.3
Breast cancer risk factors		
Self-reported history of breast biopsy or abnormal mammography		
Yes	52.9 (895)	48.9
Body mass index		
≤25	47.9 (798)	51.5
26–29	28.5 (476)	27.4
≥30	23.6 (393)	21.1
Risk perception and worry		
Self-perception of 10-year risk of breast cancer		
Higher than other same-age women	30.1 (487)	29.0
Same or lower than other same-age women	69.9 (1132)	71.0
Worry scale (mean, SD or SE) (Range 1–4)	1.3, SD=0.42	1.3, SE=0.011
Clinician risk assessment		
Clinician asked in the past year about general family cancer history		
Yes	58.0 (971)	58.0
Clinician ever discussed health-related behaviors in relation to breast cancer risk		
Yes	34.4 (582)	33.1

Predictor Measures: Demographic, Access, and Breast cancer Risk Factors

Demographic factors included age, any Jewish heritage (yes/no), education (grade school/high school or vocational school/college or higher), and language of interview (Cantonese or Spanish/English). Age was collected as a continuous variable and then collapsed into 3 age groups (40–49/50–64/65–74) to reflect differences in risk and/or screening recommendations for women in these age groups.[28] Access to medical care

Table 2. Association of Sociodemographic and Breast Cancer Risk-Related Factors with Report of Clinicians' Discussion of Cancer Family History (CFH) and Breast Cancer Health Related Behaviors (HRB) (*N*=1,700)

Predictor	Clinician asked in the past year about CFH (*N*=1,675)			Clinician ever discussed HRB (*N*=1,694)		
	Weighted %	Unadjusted odds ratios 95 % CI	*P* value	Weighted %	Unadjusted odds ratios 95 % CI	*P* value
Sociodemographic characteristics						
Age						
40–49	65.4		<.0001	27.5		.001
50–64	56.5	0.7 (0.5–.09)		37.1	1.6 (1.2–2.0)	
65–74	41.4	0.4 (0.3–0.5)		28.6	1.1 (0.7–1.6)	
Jewish heritage						
Yes	54.9	0.9 (0.6–1.3)	.46	25.8	0.7 (0.5–1.0)	.05
Education						
Grade school or middle school	60.8		.15	27.8		.71
Completed high school/vocational school	63.3	1.1 (0.6–2.0)		33.3	1.3 (0.7–2.4)	
College or higher	56.8	0.8 (0.5–1.5)		33.1	1.3 (0.7–2.3)	
Language of interview						
Chinese or Spanish	63.7		.12	28.6		.19
English	57.4	0.8 (0.5–1.1)		33.7	1.3 (0.9–1.8)	
Access						
Insurance and mammography Site						
Academic hospital insured	55.4	0.4 (0.1–1.9)	.13	36.5	1.4 (0.4–4.3)	.09
Community hospital Insured	54.2	0.4 (0.1–1.9)		34.9	1.3 (0.4–4.1)	
Public hospital insured	50.4	0.4 (0.1–1.7)		40.5	1.6 (0.4–5.8)	
Staff model HMO insured	60.8	0.6 (0.1–2.4)		28.9	1.0 (0.3–3.0)	
Uninsured	68.4	0.8 (0.2–3.6)		36.9	1.4 (0.4–4.8)	
Insurance information missing	73.9			29.8		
At least one well visit in past year						
Yes	60.4	1.9 (1.4–2.7)	.0001	33.9	1.3 (0.9–1.8)	.15
Breast cancer risk factors						
Self-reported history of breast biopsy or follow-up mammography						
Yes	58.5	1.0 (0.8–1.3)	.75	36.1	1.3 (1.0–1.7)	.003
Body mass index						
≤25	58.4		.2	29.2		.003
26–29	61.1	1.1 (0.9–1.5)		33.9	1.2 (0.9–1.6)	
≥30	54.0	0.8 (0.6–1.1)		40.3	1.6 (1.2–2.2)	
Risk perception and worry						
Self-Perception of 10-year risk of breast cancer						
Higher than other same-age women	61.4	1.2 (0.9–1.5)	.18	38.2		.02
Same or lower than other same-age women	57.2			31.2	1.4 (1.1–1.8)	
Worry scale (mean, SE)						
Yes	1.32; .016	1.5 (1.1–2.0)	.006	1.37; .021	2.0 (1.5–2.6)	<.0001

factors included a combined index of insurance and mammography facility because these 2 variables were highly correlated (academic hospital insured/community hospital insured/public hospital insured/staff model HMO insured/uninsured/insurance information missing); and, having had a well visit in the last year (yes/no). The well visit measure was based on a survey question, which asked if any of the woman's visits in the past year with a physician or nurse practitioner was "for a check-up, meaning a visit even when you were well?"

Breast cancer risk factors included the woman's body mass index calculated from self-report of height and weight using the formula kg/m^2 (≤25/26–29 overweight/≥30 obese) and a measure of past breast abnormality (yes/no). This last measure was assigned a "yes" if the woman answered yes to either having had a breast biopsy in the past or having had a mammogram result that required obtaining a follow-up mammogram afterward, and a "no" if she answered no to both questions.

Predictor Measures: Perceived Breast Cancer Risk and Worry

Breast cancer risk and worry factors included both the woman's self-perception of her 10-year risk of breast cancer (higher than other same-age women/same or lower than other same-age women),[22] and a woman's score on a scale of worry about getting breast cancer (range 1–4: rare or no worry to frequent worry). Based on Lerman's scale, the worry scale consisted of 3 questions about frequency of worry, thoughts about risk of getting breast cancer, and the effect of that worry on mood and functioning.[29,30] These 3 questions loaded on a single worry factor. Salient factor loadings ranged from 0.55 to 0.80, and the rotated factor resulted in a simple factor structure. Reliability for the worry scale was good (Cronbach alpha=0.65). In keeping with standard practice in psychometric analysis, we scored this as a unidimensional scale and analyzed it as a continuous variable.[31,32]

Outcome Measures: Clinician's Assessment of Family Cancer History and Counseling on Health-related Behaviors

Two outcome measures reflect physician–patient communication and information exchange vital to assessing breast cancer risk. First, the woman was asked to report whether or not a doctor or nurse had asked during the past year about her cancer family history (CFH-yes/no). Then the woman was asked whether a doctor or nurse had ever discussed with her the risks or benefits of health related behaviors (HRB)—fatty foods, alcohol, regular physical activity, or bodyweight—in relation to breast cancer (yes/no). For the second outcome, we created 1 variable based on the 5 questions, dichotomized into those women who responded yes to at least 1 of the 5 HRB questions versus those who answered no to all 5 items.

Weighting for Sampling Design

The sampling design was stratified by ethnicity and risk-level, resulting in 8 ethnicity-risk strata: African Americans of low/average (*n*=296) and high (*n*=30) risk; Asian-Pacific Islanders of low/average (*n*=204) and high (*n*=152) risk; Latinas of low/average (*n*=288) and high (*n*=42) risk; and Whites of low/average (*n*=364) and high (*n*=324) risk. The original goal of sampling equal numbers of women from each stratum was not realized, primarily because of the lower prevalence of high-risk non-White women. Sample weights for each stratum were calculated as the number of women within the stratum on the SFMR master list used for this study, divided by the stratum sample size. We then rescaled the weights so that they summed to the sample size in the pooled data. The rescaled weights were used in all analyses.

Data Analysis

Data were analyzed using the STATA statistical package survey design functions to account for the sampling design.[33] We performed descriptive statistics of the entire sample. We conducted bivariate analyses to compare women who reported that their clinicians did and did not ask about their CFH in the past year on demographic, access, breast cancer risk, perceived risk, and worry factors. Then we compared women who reported that their clinicians did and did not ever discuss at least 1 HRB in relation to breast cancer. We included demographic variables, such as language of interview and education, in the bivariate analyses because of their potential impact on the quality of patient–clinician communication. Likewise, we included Jewish heritage in the bivariate analyses because many of these women are at increased risk for breast cancer, potentially affecting both their degree of worry and communication with clinicians. Categorical predictors were evaluated using χ^2 tests, and continuous predictors were evaluated using *t* tests. We report weighted percentages and weighted statistics to account for the sampling design.

In addition, we tested 2 weighted multivariate logistic regression models, 1 for each of the 2 outcomes—assessment of cancer family history (CFH), and health-related behavior counseling (HRB). Both models included report of a well visit in the last year, perception of breast cancer risk, and worry about breast cancer as the predictors of primary interest. Age, language of interview, Jewish heritage, education, insurance-mammography facility, history of follow-up mammography, and body mass index were all forced into the models as potential confounders. We included all of the potential confounders in the multivariate models, regardless of their significance level in the bivariate analyses, to assess the impact of the predictor variables while simultaneously accounting for other factors which have face validity for potential influence on clinician–patient communication (e.g., language and education). We did not include the sampling stratification variables (race/ethnicity and risk level) in our models. We found no evidence of colinearity among the variables included in the final multivariate models.

Table 3. Odds that a Clinician Asked about Cancer Family History (CFH) or Discussed Breast Health-Related Behaviors (HRB) (*N*=1,700)*

Predictor	Clinician asked about CFH Weighted OR (95% CI) †	Clinician ever discussed breast cancer HRB Weighted OR (95% CI)†
Age		
40–49	Reference	Reference
50–64	**0.7 (0.5–0.9)**	**1.6 (1.2–2.1)**
65–74	**0.4 (0.3–0.6)**	1.1 (0.7–1.7)
Worry about breast cancer (continuous 1=lowest worry, 4=highest worry)	1.4 (1.0–1.9)	**1.9 (1.4–2.6)**
Perceived 10-year risk of breast cancer		
Low/Average	Reference	Reference
High	1.1 (0.9–1.5)	1.3 (1.0–1.7)
Well-visit in past year		
None	Reference	Reference
At least one	**2.3 (1.6–3.3)**	1.2 (0.8–1.8)
Jewish heritage		
No	Reference	Reference
Yes	1.0 (0.6–1.4)	**0.6 (0.4–0.9)**
Body mass index		
<25	Reference	Reference
25–29	1.1 (0.8–1.4)	1.2 (0.9–1.6)
≥30	0.8 (0.6–1.1)	**1.5 (1.1–2.1)**

**Adjusted for education, language of interview, insurance/mammography facility, ever having a biopsy or follow-up mammography.*

†Significant results are in bold.

RESULTS

Descriptive Results

In Table 1 we report unweighted percentages and counts and weighted percentages describing sociodemographic, breast cancer risk, and risk perception factors for the 1,700 women in the sample. Of the women who reported they were asked about CFH, 40% reported also having discussed HRB.

Bivariate Results

Table 2 shows bivariate associations of demographic, access, and breast cancer risk and worry variables with participant report that their clinicians asked in the past year about their CFH or ever discussed HRB in relation to breast cancer risk. We present these results as weighted percentages, as well as unadjusted, weighted odds ratios.

Multivariate Results

Women in the 50- to 64-year-old group had lower odds than women in their 40s of having been asked about their CFH in the last year; whereas women aged 65–74 were least likely to have been asked. Women aged 50–64 had 50% higher odds than women in their 40s of having discussed HRB in relation to breast cancer risk. Greater worry about breast cancer was associated with almost a twofold increase in the odds of reporting that clinicians had discussed HRBs. Although not significant for HRB, women reporting a well visit in the past year were 2 times as likely to report that a clinician had asked about their CFH of cancer compared to those with no well visit in the past year. Having an obese BMI—but not an overweight BMI—was associated with higher odds of having discussed HRBs and breast cancer risk. Conversely, being of Jewish heritage was associated with significantly lower odds of having discussed HRBs. Neither BMI nor Jewish heritage was associated with being asked about CFH. In these weighted, adjusted models, perception of risk was not significantly associated with either outcome (Table 3).

DISCUSSION

In this study, we evaluated the extent to which clinicians discuss women's family history and risk behaviors related to cancer, and whether these clinician behaviors were related to women having had a well visit and degree of cancer worry. We found that even among women who have been screened for breast cancer by mammography, clinicians appeared to be missing opportunities to elicit and update family cancer histories, and to counsel women about health-related behaviors and risk for breast cancer.

The low rates of family cancer history screening reported by women in our study are consistent with findings by Murff et al, which showed even lower rates (26%) of chart documentation about family history of breast cancer.[34] Their study found that White women were more likely to have documentation of a family breast cancer history assessment than minorities. Because our analyses were weighted for differential recruitment by ethnicity and breast cancer risk level, we did not include these sampling stratification variables in our models, and thus are not able to compare effects by ethnic group; however, we can conclude that our findings are valid across our very heterogeneous sample of women.

In our study, clinician elicitation of CFH was associated with women having had a well visit. This type of visit may be more likely to trigger attention to family history both because there are not as many competing concerns during the visit and because there is ample time to attend to preventive health care. Certainly, time limitations have been cited by physicians as a barrier to discussion of cancer risk reduction with patients.[35] Given increasing time pressures and patient acuity in ambulatory medicine,[36,37] this finding is of concern. The Center for Disease Control and Prevention's Office of Genomics and Disease Prevention has an ongoing Family History Public Health Initiative to facilitate both public and medical community understanding of the importance of family history to disease risk, including breast cancer risk.[38] As the medical community is presented with increasing opportunities for genetic testing, decisions about undergoing this testing should be guided by the patient's family history, as is the case in genetic testing for breast cancer.[39,40] Without this simple yet vital piece of information, clinicians will be less likely to identify families with strong genetic predispositions for breast cancer.

We found that women reported lower rates of counseling about HRB than CFH. This is consistent with results of a physician survey about lifestyle counseling conducted by our group, which found that only 56% of primary care physicians reported counseling women about physical activity, 55% about diet, and 45% about alcohol.[24]

When HRB counseling does occur, it is associated with the woman's worry about breast cancer. However, prospective studies are needed to determine whether HRB counseling elevates a woman's worry, or whether worry influences the clinician's counseling practices. If the former is true, patient education interventions may not be very effective in reducing cancer worry.[41] Regardless of the causal order between worry and physicians' risk counseling, targeted interventions to increase clinician sensitivity to patients' level of cancer worry appear indicated.[19]

We found that older women were less likely to report being asked about CFH, but—for those in the 50- to 64-year old age group—more likely to report being counseled on HRB. This may reflect the fact that clinicians' recommendations about mammogram screening for women 40–49 may be more strongly influenced by family history than for older women, thus leading them to be more likely to ask younger women about family history. An alternative explanation for the lower prevalence of CFH among older women is possible misclassification of visits for which CFH is indicated as we were unable to distinguish between initial visits and follow-up visits. It is possible that follow-up visits for chronic conditions, which will not require a review of CFH if one was recently done, may occur more frequently among older women. However, even if this relationship is attenuated, it is important for clinicians to revisit their patients' family history over time because even as a patient ages, so does her family. Thus, a woman's risk may increase not only because of her age, but because of changes in her family history as she ages. The clinician may not know about this change in family history unless s/he asks over time at follow-up visits.

In contrast, both physicians and patients may become more conscious of physical changes such as weight gain and the importance of exercise as women enter their 50s and 60s, prompting a discussion of the potential health advantages of behavioral change. It is also possible that clinicians counsel middle-aged women about HRB in relation to multiple disease states at once. This is consistent with our finding that obese women were more likely to report HRB counseling in relation to breast cancer; physicians may emphasize to these women the dangers of obesity and the importance of exercise and weight loss for risk reduction across a number of diseases at once, including breast cancer. We also found that women of Jewish heritage were less likely to have been counseled about HRB in relation to breast cancer, possibly reflecting a bias on the part of the physician, patient, or both that genetic factors greatly outweigh behaviors for breast cancer risk in this group.

There are several limitations to our study. First, it was conducted among women screened for breast cancer with mammography. These women are already in the health care system receiving preventive care. However, we expect these women are more likely than unscreened women to have discussed CFH and HRB with their clinicians. Thus, these results obtained in a screened population may actually overestimate clinician risk assessment behaviors in the general population.

Next, our information about clinician discussions was based on patient report, possibly leading to significant recall bias. This is perhaps most true for the influence of worry on the women's report of discussion about HRB; women who are more worried about their breast cancer risk may be more likely to recall the discussion. However, it remains striking that worry is strongly associated with counseling across ethnic and risk groups. Characteristics associated with inaccurate risk perception among this group of women have been published in detail already by our group.[22]

Lastly, we were unable to separate out general family history of cancer from family history of breast cancer as our survey question did not specify any type of cancer. By asking a more general question, which includes any type of cancer in the family, our results may overestimate how many women were asked about breast cancer history.

CONCLUSION

In conclusion, there appear to be substantial missed opportunities for clinicians to elicit family cancer histories and counsel about health-related behaviors and breast cancer risk. It may be that more time for preventive health visits would allow clinicians to address family history, risk behaviors, and patients' worries about breast cancer. Other system-based interventions could also be developed either to facilitate clinician breast cancer risk assessment and counseling, or to allow for tailored health education outside of the already overburdened clinician–patient encounter.

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