Intention to Pursue Genetic Testing for Breast Cancer among Women due for Screening Mammography

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Abstract

Because few studies have addressed the intention to pursue testing for breast cancer susceptibility among women in the general population, we examined whether women due for routine mammography would want such testing and what factors might impact on their decision to pursue testing. A questionnaire was mailed to women ≥50 years of age who had undergone a screening mammogram 12 to 14 months before the study. Univariate and multivariable analyses were conducted to identify factors associated with intention to pursue genetic testing. Approximately 41% of respondents probably or definitely intended to pursue testing. In univariate analysis, the intention to undergo testing was not significantly associated with age, education, marital status, potential effects on health or life insurance, or physician recommendation. Although significant in univariate analysis, family history of breast cancer and ethnicity were not significant in multivariable analysis. In both univariate and multivariable analysis, factors significantly associated with intention to undergo testing included awareness of genetic testing, cancer worry, and insurance coverage of testing cost. Intention also was associated with the respondent wanting to know whether she possessed the susceptibility gene, even if that knowledge would not impact on options for early detection or treatment. Given the relatively high level of interest in testing among women at average risk of breast cancer, these results may help health care professionals educate and counsel women regarding the appropriate use of genetic testing as well as breast cancer risk factors.

Introduction

An estimated 203,500 women in the United States will be diagnosed with breast cancer in the year 2002 with an estimated 39,600 women dying of the disease (1). Although a family history of breast cancer, particularly in a first-degree relative, has been identified as a risk factor for the development of breast cancer, the majority of women diagnosed with this disease do not have a family history (2–4). It is believed that ~5–10% of breast cancer cases can be attributed to the inheritance of rare, highly penetrant germ-line mutations, particularly the *BRCA1* and *BRCA2* gene mutations (5–7). Mutations of the *BRCA1* and *BRCA2* genes are thought to be rare in the general population and indeed Whittemore *et al.* (8) estimated the frequency of *BRCA1* mutations to be less than 0.1%.

The majority of studies examining interest or intention to pursue genetic testing for breast cancer susceptibility have focused on women known to be at increased risk either because they have a strong family history of breast and/or ovarian cancer or because they have already developed one or both of these malignancies, usually at a younger than average age (9–16). Fewer studies have examined the intention to pursue testing for breast cancer susceptibility among members of the general population (17–22). Interest in genetic testing has been reported to range from 58% in a sample of primary care patients at the University of Pennsylvania (18) to 93% of female respondents to an annual statewide telephone survey in Kentucky (17). Although demographic variables and other factors that could influence the intention to pursue genetic testing in the general population have been examined, the number of studies addressing such factors is small and their results are, at times, conflicting.

Because the majority of women who develop breast cancer will come from that segment of the population at average risk and because women over 50 years of age are far more likely than younger women to develop breast cancer, they may be more inclined to seek information about their breast cancer risk, including their genetic risk. We surveyed female patients of a large multispecialty clinic who were due for routine mammography screening to explore their interest in pursuing genetic testing for breast cancer susceptibility and associated factors. Factors associated with interest or intention to have genetic testing for breast cancer susceptibility were identified from the published literature on studies of women at high risk of having a genetic susceptibility and of women at average risk. The identification of such interest and the factors that influence it could help guide health care professionals who educate and counsel women with regard to the appropriate use of genetic testing as well as breast cancer risk factors. On the basis of these considerations, we explored factors that could potentially influence interest in genetic testing in women over 50 years of age who were at average risk of developing breast cancer.

Subjects and Methods

Study Population. As part of a cross-sectional, descriptive analytic study that sought to increase understanding of factors associated with the stage of readiness to obtain a repeat mam-

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mogram, interest in having testing for breast cancer susceptibility was explored. Women eligible to participate were 50 years of age or older, able to read and speak English, had no acute medical problems, no prior breast cancer history, no history of an abnormal mammogram, and no current symptoms or signs of breast cancer. Women requiring mammography more frequently than every year were excluded. No one was excluded on the basis of ethnicity. Women were patients of the KSC,[2] a large multispecialty clinic in Houston, TX; they had had a mammogram at the KSC 12–14 months before the survey. The KSC maintains a computerized database on women undergoing mammography, and this database was used to identify women eligible for the study.

Approximately 3500 women were eligible to participate in the larger study from which this analysis was derived. After approval was obtained from the Human Subjects Committees of the KSC and the University of Texas-Houston, a pretested questionnaire was mailed between May and June, 1996, to a random sample of 1222 eligible women following the methods outlined by Dillman (23) and Miller (24). Questionnaires not received by September 1, 1996, were not included in the analysis.

Measures of the Variables. The dependent variable was interest in pursuing genetic testing ("I plan to have a genetic test for breast cancer when it is available") and was measured using a five-point Likert format from "definitely not" to "definitely yes." Independent variables included demographic and medical history factors (*i.e.,* age, ethnicity, marital status, and family history of breast cancer); awareness of genetic testing; cancer worry; and a number of contingencies that could affect interest in pursuing genetic testing. A four-point Likert format from "almost nothing" to "a lot" was used to assess awareness of genetic testing for breast cancer susceptibility ("How much have you heard or read about genetic testing for breast cancer?"). Cancer worry was measured with a four-point Likert format from "not at all or rarely" to "almost all of the time" using three questions developed by Lerman *et al.* (25) to assess concern or worry about developing breast cancer and about whether concern interfered with mood or with ability to perform daily activities. Cronbach's α for the scale was 0.67. A five-point Likert format, like that used to measure interest in genetic testing, assessed the influence of the following contingencies: insurance coverage of testing cost, physician recommendation, effect on health or life insurance, and desire to pursue testing even if it would not impact on options for early detection or treatment. With the exception of cancer worry, all of the variables were measured with single items.

Data Analysis. Variables were dichotomized for univariate and multivariable analyses. Following Durfy *et al.* (11), interest in testing, the dependent variable, was categorized as "probably/definitely yes" or "definitely not/probably not/uncertain." Age was dichotomized to reflect Medicare eligibility: 50–64 years and ≥65 years. Ethnicity was grouped into Caucasian and other (*i.e.,* African American, Hispanic, and other). Family history of breast cancer was categorized as any family history (first degree and other) or none. Awareness of genetic testing was categorized as a "fair amount/a lot" or "almost nothing/relatively little." Cancer worry was analyzed as a continuous variable with scores ranging from 3 (low) to 12 (high). The four contingencies, *e.g.,* insurance coverage of testing cost, were dichotomized as "definitely/probably yes" or "definitely not/probably not/uncertain" to contrast positive responses with those that were more negative.

The data were analyzed using SPSS 10.0 for Windows. χ^2 analysis was used to determine the association between the intention to undergo testing for breast cancer susceptibility and the categorical independent variables. For the univariate analysis of the cancer worry score, the independent sample *t* test was used. Independent variables associated with interest in testing were further analyzed using backward stepwise logistic regression. A *P* of 0.25 was used to select variables from the univariate analysis to be included in the initial model (26). In subsequent steps, covariates with a *P* of >0.05 in the prior step were removed until all of the covariates were statistically significant at $P \leq 0.05$.

Results

Characteristics of the Study Population. Of the 1222 questionnaires mailed, 529 were completed and returned; of these, 518 were eligible for analysis (11 women who completed a questionnaire were found to have a personal history of breast cancer). For the 693 women who did not return a questionnaire, 238 surveys were returned undeliverable by the Post Office. Because women who did not receive a survey did not have an opportunity to participate in the study, they were excluded from the denominator for the calculation of the response rate. In addition, 16 women who were deceased and 3 who spoke only Spanish also were excluded from the denominator for calculating the response rate. The response rate for eligible women who had an opportunity to complete a survey was 54.3% (518 of 954).

The majority of survey respondents were less than 65 years of age (median age, 62 years; range, 52–91 years). The majority reported that they were married or living as married (68.2%). Others were widowed, divorced, separated, or single/never married (14.2, 13.2, 1.6, or 2.7%, respectively). Most respondents had no family history of breast cancer (66.1%), whereas 16.3% had at least one first-degree relative with breast cancer, and 17.7% had a non-first-degree relative with breast cancer. With regard to education, 70.2% had completed their education beyond high school, whereas ~21% had completed high school; the remaining 8.8% did not complete high school. Most women (74.2%) were Caucasian, 18.1% were African American, 5.9% were Hispanic, and 1.8% were of other ethnicities.

Univariate Analysis of Intention to Pursue Testing. Among survey respondents, 40.8% indicated that they would probably (26.4%) or definitely (14.4%) have a genetic test for breast cancer susceptibility when it became available. The majority of women (59.2%) did not wish to pursue testing (38.6% were uncertain, 15.2% answered probably not, and 5.4% answered definitely not).

As shown in Table 1, women interested in pursuing testing were less likely to be Caucasian. Ethnicity was significant whether examined as four (Caucasian, African-American, Asian, Other), three (Caucasian, African-American, Other) or two (Caucasian, Other) categories. Having any family history of breast cancer was positively associated with interest in genetic testing. When family history was examined as three categories (first-degree relative, any other relative, or no family history) results were similar. Education and marital status were not associated with interest in undergoing genetic testing. Compared with older women, there was a statistically nonsignificant trend for younger women (50–64 years) to express interest in testing.

[2] The abbreviation used is: KSC, Kelsey-Seybold Clinic.

Table 1 Univariate analysis of factors associated with intention to pursue genetic testing for breast cancer susceptibility

Independent variables	*n*	% definitely/probably intending to pursue testing	χ^2	*P*
Demographic and medical history				
Age				
50–64 yr	332	43.7	3.497	0.066
≥65 y	166	34.9		
Education				
High school or less	146	42.5	0.247	0.618
More than high school	347	40.1		
Ethnicity				
Caucasian	366	38.3	4.648	0.031
Other	126	49.2		
Marital status				
Married/living as married	329	41.0	0.047	0.454
Other	155	40.0		
Family history of breast cancer				
Any family history	165	49.7	8.855	0.003
None	322	35.7		
Awareness and contingencies				
Awareness of genetic testing for breast cancer				
Almost nothing/relatively little	356	37.6	5.435	0.023
A fair amount/a lot	134	49.3		
Pursue testing only if health insurance covers cost				
Probably yes/definitely yes	211	55.0	33.494	<0.001
Definitely not/probably not/uncertain	270	28.9		
Would pursue testing even if no effect on breast cancer detection or treatment				
Probably yes/definitely yes	332	52.7	60.559	<0.001
Definitely not/probably not/uncertain	155	15.5		
Would worry about effect of testing on health/life insurance				
Probably yes/definitely yes	130	38.5	0.461	0.534
Definitely not/probably not/uncertain	363	41.9		
Pursue testing only if physician recommends test				
Probably yes/definitely yes	280	41.8	0.483	0.517
Definitely not/probably not/uncertain	212	38.7		
Psychosocial				
Intention to pursue testing for breast cancer susceptibility				
Probably yes/definitely yes[a]	197			<0.001(*t* test)
Definitely not/probably not/uncertain[b]	293			

[a] Mean cancer worry score = 4.77.
[b] Mean cancer worry score = 4.17.

A greater interest in genetic testing for breast cancer risk was found among women who had read or heard a fair amount or a lot about such a test as opposed to those who said they had heard or read relatively little (Table 1). Women planning to pursue testing were approximately two and one-half times less likely to be tested if their health insurance would not cover the cost of the test. Women interested in testing would pursue it even if knowledge of susceptibility would not change their options for early breast cancer detection or treatment (Table 1). Interest in genetic testing for breast cancer risk was not significantly associated either with physician recommendation or with the effect such a test might have on health or life insurance. Women who expressed interest in genetic testing were more concerned about developing breast cancer as reflected by a higher mean score on the cancer worry scale compared with women who did not express interest in testing, although the actual difference in scores between the two groups was small.

Multivariable Analysis of Intention to Pursue Testing. Table 2 depicts the results of the backward stepwise logistic regression analysis. A higher breast cancer worry score, greater awareness of testing, insurance coverage of testing cost, and interest in pursuing testing regardless of its impact on future breast cancer detection or treatment were all independently associated with interest in testing for breast cancer susceptibility. Family history and ethnicity were not statistically associated with interest in pursuing testing when other variables were controlled.

Table 2 Backward stepwise logistic regression analysis of factors associated with intention to pursue genetic testing for breast cancer susceptibility

Variable	Odds ratio	95% confidence interval
Cancer worry score	1.38	1.18–1.62
Awareness of genetic testing for breast cancer susceptibility	1.88	1.14–3.08
Will only pursue testing if health insurance covers the cost	2.49	1.61–3.86
Will pursue testing even if no impact upon detection or treatment	6.74	3.83–11.87

Discussion

Most studies of interest in genetic susceptibility testing for breast cancer have been in families at high genetic risk for breast/ovarian cancer (Table 3), but there are a growing number

Table 3 Studies examining intention to pursue genetic testing for breast cancer susceptibility among women at higher-than-average risk of breast cancer

Study	Study population	No. of patients	Type of study	Intention to pursue testing	Knowledge or awareness of testing	Cancer worry	Insurance coverage
Lerman *et al.* (13)	First-degree relatives of breast cancer patients	105 (female)	Telephone interviews	91%	Not tested	Not tested	Not tested
Struewing *et al.* (16)	Breast-ovarian cancer family members	140 (male and female)	Structured interviews	95%	Not tested	Higher perceived risk associated with intention to be tested	Not tested
Richards *et al.* (15)	Ashkenazi Jewish men and women	309 (male and female)	Questionnaires at educational session for testing	94% requested testing	Not tested	Not tested	Not tested
Lipkus *et al.* (14)	African-American women with and without family history of breast cancer	266	Telephone interviews	72% with family history *vs.* 58% with no family history	Not tested	Higher perceived risk and concern associated with interest in testing	Not tested
Durfy *et al.* (11)	Women with family history of breast cancer	543	Telephone interviews	82.9–89.9% depending on study group	Not tested	Cancer worry similar among Caucasian, African-American, Ashkenazi Jewish, and lesbian/bisexual women	African Americans less interested if self-pay than Caucasians
Cappelli *et al.* (10)	Women with and without personal history of breast cancer	110	Structured interviews	72% with personal history; 46% from control group	No association	No association	Not tested
Kash *et al.* (12)	Women part of a high-risk registry	1007	Questionnaire (method of implementation not given)	72% would undergo testing	Inverse association	Increased perception of breast cancer risk associated with increased interest in testing	Not tested
Bottorff *et al.* (9)	Women with and without personal breast cancer history	1021	Telephone interviews	30.8% with personal history; 28.5% of control group	Positive association	Not tested	Not tested (Canadian study)

of studies of women at average risk (Table 4). Although genetic testing is most appropriate for women with a strong family history of breast/ovarian cancer (27), 41% of the women in our study, who were not known to be at high risk for breast cancer, definitely or probably would pursue testing. Only one other study used mail surveys (18), and only three (17, 18, 22) randomly sampled women from the study population. The lower level of interest in genetic testing in our study, compared with those shown on Table 4, is unlikely to be attributable to when the data were collected. Our data were collected in 1996, whereas data reported in other surveys were collected between 1994 and 1997 (17, 21, 22). The most recent survey (18) was conducted between 1997 and 1998 and reported that 58% of primary care patients were interested in undergoing genetic testing if it is convenient and affordable. It is more likely that the difference in prevalence of interest in genetic testing reflects methodological differences such as the populations studied, the manner in which the questions were asked, and the study methodology. A Harris Poll[3] in May 2002, of United States adults 18 years of age and older, found that 81% would be either very likely or likely to have a free genetic test for a disease if there were a treatment or other ways to greatly reduce risk. Of those polled, 49% would likely and 26% would very likely ask for a genetic test even if there were no known treatment or any other ways to reduce the risk of that disease.[3] Likewise, women in our study who planned to pursue genetic testing would have such a test even if the results would have no effect on their options for early detection or treatment.

In studies of high-risk breast cancer families, women cited a variety of reasons for their interest in testing, including increased screening, mastectomy, oophorectomy, or child-bearing decisions, planning for their future, learning their children's risk, and helping family members decide about testing (12, 16). Further study is required to determine why women at average risk are interested in pursuing genetic testing in the absence of an obvious benefit. Press *et al.* (21) found that women at average breast cancer risk were most interested in a genetic test that does not exist (high positive predictive value followed by effective, noninvasive therapy) and were least interested in the test that does exist (less than certain positive predictive value, low negative predictive value, and limited, invasive, and objectionable therapeutic options). Their study and ours suggest that women at average risk may not be aware of the limitations of genetic testing for breast cancer susceptibility.

Even among groups thought to be at higher-than-average breast cancer risk, actual participation in testing varied and did not always reflect the high level of interest initially expressed. As shown in Table 3, interest ranged from 72 to 95% among women at increased risk of breast cancer (11–16). Among women with and without a personal history of breast cancer surveyed by Cappelli *et al.* (10), 72% of women in the breast cancer group expressed an interest in genetic testing, but only 49% had actually contacted the genetic counselor about testing at follow-up 3–15 months later. Studies of women at increased genetic risk for breast cancer also found that expressed interest does not necessarily translate into requesting test results (28–31). Among unaffected individuals who were members of families with a known *BRCA1* or *BRCA2* mutation, 48% of women requested DNA testing (31). Of 110 women previously enrolled in a familial cancer study by the National Cancer Institute, 79% chose to undergo genetic testing for *BRCA1/2* mutations after

[3] Internet address: www.harrisinteractive.com.

Table 4 Studies examining intention to pursue genetic testing for breast cancer susceptibility among women at average risk for breast cancer

Study	Study population	No. studied	Type of study	Intention to pursue testing	Knowledge or awareness of testing	Cancer worry	Insurance coverage
Andrykowski *et al.* (17)	General population (male and female)	649 (55% female)	Telephone survey	93% of female respondents	Not tested	No association	Not tested
Tambor *et al.* (22)	Female HMO[a] members	473	Telephone survey	69%	Not tested	Not tested	Not tested
Mogilner *et al.* (20)	Female patients and family members	354	Convenience survey	66% (by age)	Not tested	Not tested	Not tested
Ludman *et al.* (19)	Female primary care patients	91	Convenience survey	Not given (except in relation to coverage of cost of testing)	Women who had heard or read of test more likely to want testing	Not tested	71% would undergo testing if it was covered by insurance
Press *et al.* (21)	African-, European-, Native-American and Ashkenazi Jewish women	246	Structured interviews	71%	Not tested	Not tested	Not tested
Armstrong *et al.* (18)	Female primary care patients	272	Mail survey	58% interested in affordable, convenient test	53% aware of testing	Not tested	Not tested
Gwyn *et al.* (this study)	Female HMO members	518	Mail survey	40.8%	Positive association	Positive association	Positive association

[a] HMO, health maintenance organization.

pretest education and counseling (28). The discrepancy between interest and actual pursuit of genetic testing also has been reported for Huntington's Disease and colorectal cancer (32–35). There are no published studies among women at average risk that followed women to ascertain whether or not those who expressed interest in genetic testing for breast cancer susceptibility went for genetic counseling and testing. As information about genetic testing is more widely disseminated and as testing becomes more available, it will be of interest to see whether women in the general population who state an intention to be tested actually contact a health care provider and whether those who contact a provider pursue testing.

In the limited number of studies of women at average risk for breast cancer, the association between ethnicity and interest in genetic testing was inconsistent (Table 4). Press *et al.* (21) found Caucasian women to be less interested in pursuing genetic testing for breast cancer susceptibility compared with women of other ethnicities. Consistent with these findings, others found that African American women who had a first-degree relative with breast cancer had more positive attitudes about the benefits of genetic testing compared with Caucasian women (36). In contrast, Durfy *et al.* (11) found no difference in interest in genetic testing for breast and ovarian cancer risk among Caucasian, African-American, Jewish, and lesbian/bisexual women who had some family history of breast cancer. Others, however, found that Caucasian women reported a greater interest in pursuing testing than women of other ethnicities. In our study as well as that by Armstrong *et al.* (18), ethnicity was not significantly associated with interest in pursuing genetic testing when other variables were statistically controlled. It is important to note that Caucasian women comprised a large proportion (over 80%) of those surveyed in these studies (17, 22). Given these conflicting results, more research is needed on diverse samples to clarify the association between interest in testing and ethnicity.

Similar to the results of Press *et al.* (21), we did not find that interest in testing varied with family history. Although Lipkus *et al.* (14) found an association between family history and interest in testing among African-American women, this factor was not significant in multivariable analysis. In a study by Armstrong *et al.* (18), a first-degree family history of breast cancer was inversely associated with interest in pursuing testing for breast cancer susceptibility among the primary care population that they studied. Thus, although it appears intuitive that a family history of breast cancer should heighten interest in pursuing genetic testing for breast cancer susceptibility, this has not been supported empirically in ours or other studies of women not already identified as being at increased risk. The lack of association between interest and family history indicates that women in the general population may not have adequate knowledge about the impact of family history on breast cancer risk. This finding also points to the need for health care providers to discuss breast cancer risk factors and, in particular, the importance of family history with their patients.

Unlike the results from the statewide survey by Andrykowski *et al.* (17), in which no significant associations were found between breast cancer concern and interest in determining one's genetic predisposition, we found that women with greater cancer worry were more interested in pursuing genetic testing. Our finding was consistent with most studies of higher-than-average risk women, which found that women who reported greater breast cancer worry or who perceived themselves to be at higher risk for breast cancer were more likely to express interest in genetic testing (11, 12, 14, 16). Because so few studies have addressed the association between cancer worry and intention to pursue genetic testing among women at average risk, further research is needed before drawing conclusions about this association.

Women in our study who were more aware of the existence of genetic testing for breast cancer susceptibility were more likely to be interested in pursuing testing. Using a convenience sample of female primary care patients at a health maintenance organization, Ludman *et al.* (19) found that women who were more aware of genetic testing were more interested in pursuing it. Armstrong *et al.* (18) reported that 31% of those responding to a survey were both aware of and interested in undergoing testing for breast cancer susceptibility. Collectively, these results are consistent with the view that knowing about breast cancer susceptibility testing does not

necessarily mean that women know when such testing is appropriate.

Similar to the results obtained in convenience surveys of women in hospital or private practice waiting rooms (19, 37), women in our survey who were interested in pursuing genetic testing were less likely to do so if the cost of testing were not covered by their health insurance. Ludman *et al.* (19) found that 71% of respondents planned to obtain genetic testing for breast cancer if their health insurance covered it, whereas only 44% planned to obtain testing if they had to pay for it themselves. Although the number of studies is limited, lack of insurance coverage for the cost of genetic testing appears to be a perceived barrier to the use of this test among women at average risk.

In our study, women interested in pursuing genetic testing were not worried that test results could affect their health or life insurance. This has not been reported elsewhere in studies of women at average risk. However, in studies of women at high risk of breast cancer, this possibility has been cited as one of the potential negative outcomes of susceptibility testing (12, 13). Perhaps women in the general population are less aware of the potential negative impact of genetic testing on insurance coverage. This contingency should be studied further to determine whether women at average risk are aware of this, and other, potential negative consequences.

We found no association between interest in genetic testing and physician recommendation; we are not aware of other studies of genetic testing that have examined this association. Our finding is in contrast to the literature on predictors of mammography screening in which physician recommendation is one of the most important factors associated with screening (*e.g.,* Refs. 38–40). Because of the important role physicians play in assessing breast cancer risk and in providing information about the appropriateness of genetic testing if it is requested, this finding requires further study.

Our findings should be interpreted in the context of several considerations. We studied women ages 50 years and older, who had recently had a mammogram, and who were members of a large multispecialty clinic. During the period of our study, most professional organizations recommended that women ages 50 and over have mammography screening annually. Data from the National Center for Health Statistics (NCHS; Ref. 41) show that at least 60% of women in the United States over the age of 40 in 1994 and 1998 had had a mammogram in the 2 years before being surveyed. In addition, NCHS data show that ~70% of women in the United States had private health insurance in 1996. Thus, women in our study sample may be representative of a fairly large segment of women in the United States. The fact that the women in our study population were relatively health conscious, as evidenced by their recent mammography behavior, may mean that they would be more likely to pursue other tests and procedures for the early detection or prevention of breast cancer.

Another potential limitation is that we did not have data on religious affiliation. The prevalence of *BRCA1* and *BRCA2* mutations in Ashkenazi Jewish women without a personal history of breast or ovarian cancer is believed to be higher than that in the general population (6, 42). Struewing *et al.* (42) estimated that >2% of their sample of Ashkenazi Jews carried a *BRCA1* or *BRCA2* mutation compared with <0.1% for *BRCA1* mutations in the general population (8). Although <2% of the over 4 million people who live in metropolitan Houston are Jewish, it is possible that this factor could have influenced our prevalence estimates of interest in testing or confounded our study results. Data from other studies, however, have not found differences in interest in genetic testing between Jewish women and women of other faiths (8, 20, 21).

The response rate to our mailed questionnaire (~54%), although within the acceptable range according to Dillman (23), has the potential for nonresponse bias. Age was the only variable on which we were able to compare respondents and nonrespondents. Although respondents were younger than nonrespondents, it is unclear how this difference may have affected our findings. Keeter *et al.* (43) found that despite two different methods of conducting telephone surveys (labeled "standard" and "rigorous"), which yielded response rates of 36 and 61%, respectively, both surveys produced similar results. Thus, it is possible that a lower response rate does not necessarily mean results cannot be generalized to the target population.

Few studies have examined interest in genetic testing for breast cancer susceptibility in a randomly selected sample from a defined population. Of these, ours is the first to examine a number of contingencies such as insurance coverage of testing cost and physician recommendation that may influence the intention to pursue testing breast cancer susceptibility testing. Our results may help guide health care professionals in educating and counseling women at average risk of breast cancer regarding the appropriate use of genetic testing as well as about the limitations and potential negative impact of such testing. Health care professionals also may be able to address factors such as cancer worry that may impact on interest in such testing.

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