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Sexual Orientation and Intentions to Obtain Breast Cancer Screening

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Abstract

Aims: This longitudinal study examined predictors of intentions to obtain breast cancer screening in two samples, one comprising self-identified lesbian/bisexual women ($n = 150$) and the other comprising heterosexual women ($n = 400$). We hypothesized that beliefs about mammography, cancer vulnerability, and attitudes toward the medical provider would mediate the relationship between sexual orientation and plans to obtain breast cancer screening.
Methods: Women in this study participated in one of two larger clinical trials of breast cancer risk counseling methods. All participants completed questionnaires about breast cancer screening attitudes at baseline and at a 6-month follow-up.
Results: Logistic regression analyses, controlling for age, education, and race, revealed that baseline negative beliefs about mammography, lower levels of provider trust, and less perceived risk of breast cancer significantly mediated the relationship between sexual orientation and 6-month intentions to obtain a clinical breast examination (CBE) and mammography.
Conclusions: These findings suggest that attitudes and beliefs about breast cancer, breast cancer screening, and medical providers impact lesbian/bisexual women's willingness to plan for CBE and mammography.

Introduction

A GROWING NUMBER OF STUDIES suggest that lesbian and bisexual women may have two to three times the risk of breast cancer compared with heterosexual women. The increased risk is believed to be due to a higher incidence of health behaviors associated with greater cancer risk, such as obesity, cigarette smoking, alcohol use, and nulliparity.[1–5] Despite this increased risk, in comparison to heterosexual women, lesbian and bisexual women appear to be less likely to obtain breast cancer screening.[1,6–8] Although several economic factors have been shown to contribute to lower screening rates, such as lower income[9–11] and not having healthcare coverage,[2,8] the psychological reasons underlying the observed difference in screening rates between lesbian and bisexual women and their heterosexual counterparts are not well understood. This study attempts to address this gap in the extant literature.

Prior research indicates that certain psychological variables make an important contribution to whether an individual seeks cancer screening.[12] Specifically, beliefs about the effectiveness and importance of mammography, perceived risk of and fears about breast cancer, and attitudes toward one's primary healthcare provider have all been shown to be significant psychological determinants of breast cancer screening. For example, women who believe that mammography has substantial advantages, such as the ability to detect cancer early and the potential to increase chances of being cured, are more likely to use mammography.[13] Mammography use is also associated with perceived risk of breast cancer, such that women who report higher levels of vulnerability are more screening adherent, as documented by a meta-analysis by McCaul et al.[14] Similarly, worry about breast cancer is well documented as a major psychological factor contributing to greater screening adherence in women.[15,16] Because breast cancer risk factors are believed to be more prevalent in lesbians, one could speculate that lesbians may feel more vulnerable to breast cancer and, therefore, might be more motivated to seek mammography than heterosexual women. Conversely, high levels of anxiety have been shown to deter women from obtaining breast cancer screening,[17] and, therefore, one could speculate that lesbians might be more avoidant of mammography. Data are lacking on the extent to which lesbians differ in their beliefs about breast cancer

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screening as well as their perceived risk of and fears about breast cancer compared with heterosexual women. The current study examines these important differences and their relationship to breast cancer screening intentions.

In addition to beliefs about mammography and breast cancer, the relationship between provider and patient appears to be paramount in the decision to obtain breast cancer screening.[5,18] One of the key roles of a provider is to supply patients with healthcare information and to motivate patients to undergo screening and treatment. Indeed, prior research suggests that compliance with mammography guidelines is influenced by providers who make strong and clear recommendations for cancer screening.[19,20] Unfortunately, many lesbian/bisexual women do not appear to possess positive relationships with their providers, which may affect their decision to follow recommendations for breast cancer screening. Reviews of lesbian healthcare research show that many providers, including physicians, nurses, and students, hold negative attitudes toward lesbians.[9,21,22] Lesbians report avoiding healthcare because of feared discrimination, and for some, avoidance is associated with previous experiences of hostile treatment, breached confidence, stereotyped comments, and even mental health referrals after coming out to their provider.[4] Moreover, poor communication and discomfort in discussing health issues with providers are associated with delay in seeking healthcare for lesbians.[23] Decreased healthcare use can lead lesbian and bisexual women to miss opportunities both to receive education about breast cancer risk and to obtain breast cancer screening.

The purpose of the current study was twofold: (1) to examine the extent to which lesbian/bisexual women and heterosexual women differ in their beliefs about breast cancer screening, perceived risk of breast cancer, fears about cancer, and attitudes toward their provider and (2) to identify mediators that might clarify differences in breast cancer screening intentions between lesbian/bisexual women and heterosexual women. We chose to focus on screening intentions, as they have been shown to be one of strongest and most consistent predictors of screening behaviors.[24] Specifically, we examined intentions to obtain a clinical breast examination (CBE) and mammography, as both types of breast cancer screening are recommended for women by the American Medical Association (AMA) and the American Cancer Society (ACS).[25,26] We hypothesized that greater negative beliefs about mammography, lower perceived risk of breast cancer, less fear about breast cancer, and greater negative attitudes toward providers—attitudes previously shown to be associated with decreased levels of breast cancer screening in the general population—would mediate the relationship between sexual orientation and breast cancer screening intentions. More specifically, we expected that once beliefs about breast cancer screening, perceived risk of and fears about breast cancer, and attitudes toward one's healthcare provider were accounted for, sexual orientation would not bear a significant relationship to breast cancer screening intentions.

Materials and Methods

Participants

Data reported in this study were collected as part of two larger clinical trials, the results of which have been reported previously.[11,27] Participants were recruited to participate in one of two randomized clinical trials of breast cancer risk counseling methods in the western Washington area between 1996 and 1997. Whereas main outcome variables in those trials were interest in obtaining genetic testing and judgment of being a good candidate for genetic testing, participants completed self-report questionnaires assessing several other psychological constructs, including attitudes about breast cancer screening. The first sample included 400 heterosexual women who were interested in breast cancer risk counseling. Participants were recruited from two sources. The first source was from local media outlets, such as public service announcements and news articles. The second source of participants was from letters to breast cancer patients, asking for contact information for their friends and relatives who might be interested in participating in a study (<10% of the sample). Recruitment and results are described in detail elsewhere.[11] The second sample included 150 self-identified lesbian (88%) or bisexual (12%) women who were interested in breast cancer risk counseling. Participants were recruited from local community and media sources serving the lesbian/bisexual women's community, such as newspapers and employer networks. Recruitment details and trial results have been previously reported.[27] Eligibility criteria for both of these samples included being female, being between 18 and 74 years of age, living within 60 miles of the research center, and consenting to participate in counseling and complete questionnaires. An additional requirement for the lesbian/bisexual sample was self-reported identification as lesbian, bisexual, or gay. Family history of breast cancer was not an eligibility requirement for either sample, and the two samples did not significantly differ on their familial risk of breast cancer.[28] Response and retention rates were similar across the two samples.[29]

Procedure

Data from questionnaires at baseline and the 6-month follow-up (i.e., after completion of the clinical trial) were used for this study. The baseline and 6-month follow-up questionnaires both contained questions on perceived cancer risk, fear of breast cancer, advantages and disadvantages of mammography, attitudes toward providers, and breast cancer screening intentions. We used the data from the baseline survey to examine perceived breast cancer risk, fear of breast cancer, advantages and disadvantages of mammography, and attitudes toward providers, and the 6-month follow-up data were used to examine breast cancer screening intentions. Only the baseline questionnaire contained the demographic, healthcare access, and insurance questions, as well as a question about whether the participant received a mammogram in the previous 2 years. In addition, the baseline questionnaire contained more extensive questions about estimated actual risk, family history of breast cancer, and views about genetic testing, which were not relevant to our main analyses. Participants were screened for eligibility and interest in the study by telephone. If eligible and interested (n = 561 for the heterosexual sample, n = 192 for the lesbian/bisexual sample), women were mailed a copy of the baseline questionnaire and a postage-paid return envelope. If study staff did not receive the questionnaire within 2 weeks, the woman re-

ceived a single reminder call. At baseline, response rates were 71.3% and 78.0% for the heterosexual and lesbian/bisexual samples, respectively. At 6-month follow-up, response rates were 95% and 93% for the heterosexual and lesbian/bisexual samples, respectively.

Measures

Perceived risk of breast cancer. Participants responded to one item: What do you think the chances are that you will have breast cancer someday? Responses ranged from 1 = No chance to 8 = 100% chance.

Fear of breast cancer. Participants responded to one item: How afraid are you of getting breast cancer? Would you say you are . . . Responses ranged from 1 = not at all afraid to 4 = very afraid.

Attitudes toward healthcare provider. Nine items assessed attitudes toward one's provider, with responses ranging from 1 = strongly disagree to 5 = strongly agree. Four items assessed the degree to which participants believed their provider to be an expert (e.g., I prefer to leave all decisions regarding medical tests to my doctor) and were averaged to form a scale (Provider Expertise Subscale: alpha = 0.54). Although the individual items were not highly correlated, using the individual items as predictors of screening intentions did not produce results different from those obtained with the composite measure. Five items assessed the degree to which participants trusted their provider (e.g., I feel I can trust my doctor's judgment) and were averaged to form a scale (Provider Trust Subscale: alpha = 0.89).

Advantages and disadvantages of mammography. Thirteen items assessed beliefs about mammography, with responses ranging from 1 = disagree strongly to 5 = agree strongly. Five items assessed participants' thoughts about the advantages of mammography (e.g., Mammograms can find breast cancer early) and were averaged to form a scale (alpha = 0.70). Eight items assessed participants' thoughts about the disadvantages of getting mammograms (e.g., Getting a mammogram is painful) and were averaged to form a scale (alpha = 0.77).

Intentions to obtain mammography. Participants were asked: Which of the following best describes you? I am . . . Responses were 1 = not planning to have a mammogram, 2 = thinking about having a mammogram, or 3 = definitely planning on having a mammogram. No time period was specified on this question. This variable was dummy-coded so that scores of 1 and 2 were coded as 0, and scores of 3 were coded as 1. Therefore, a dummy-coded score of 1 reflected greater intention to obtain a mammogram.

Intentions to obtain clinical breast examination (CBE). Participants were asked: Which of the following best describes you? I am . . . Responses were 1 = not planning to have a CBE, 2 = thinking about having a CBE, or 3 = definitely planning on having a CBE. No time period was specified for this question. As described for intentions to obtain mammograms, scores of 1 and 2 were dummy-coded as 0, and scores of 3 were coded as 1.

Intentions to follow routine recommendations for mammography. Participants responded to the statement: I intend to follow the routine recommendations regarding mammography for women my age, with responses ranging from 1 = strongly disagree to 4 = strongly agree. No time period was specified for this question. Scores ranging from 1 to 3 were dummy-coded as 0, and scores of 4 were coded as 1.

Data analysis

To compare participants on demographic variables, chi-square analyses were used for categorical data and *t* tests were used for continuous data. We examined three outcome variables, each of which was examined 6 months after baseline enrollment in the study: (1) intentions to obtain CBE, (2) intentions to obtain mammography, and (3) intentions to follow routine recommendations for mammography. As in the *Measures* section, each outcome variable was dichotomized so that 1 reflected being more likely to obtain breast cancer screening. As dependent variables were dichotomous, logistic regression analysis was used to examine the extent to which breast cancer screening intentions at 6 months were predicted by the following variables, all measured at baseline: sexual orientation, beliefs about breast cancer screening, perceived risk of breast cancer, fears of breast cancer, and attitudes toward one's healthcare provider.

Baron and Kenny's method[30] was used to test for mediation. In a mediational model, a statistically significant relationship exists between the main predictor variable (sexual orientation) and the outcome variable (breast cancer screening intentions), but the strength of that relationship is significantly attenuated once the effect of the mediator variable is added to the analytical model. The first step is to establish that there is a relationship between the main predictor (sexual orientation) and the putative mediators. Therefore, we examined the relationship between sexual orientation and the hypothesized mediators (i.e., advantages and disadvantages of mammography subscales, attitudes toward provider subscales, and perceived risk of and fears about breast cancer) by conducting multiple regression analyses for continuous mediators and logistic regression analyses for dichotomous variables, controlling for age, education, and race. (To examine the relationship of intervention effects on outcomes, regression models were used to examine whether the randomization arm (experimental vs. control) significantly predicted each of the three outcome variables. Because the randomization arm did not bear a statistically significant relationship to any of the three outcomes (p values ranged from 0.34 to 0.74), this variable was not controlled for in the analyses.)

Next, we examined sexual orientation as a predictor of breast cancer screening intentions at 6 months and subsequently examined the full mediational model. The predictor variables were entered in two separate models. Model 1 consisted of age, education, race, and sexual orientation (dummy-coded into 0 = lesbian/bisexual, 1 = heterosexual women). To test mediation, model 2 consisted of the following variables: demographic variables: age, education, race; mediator variables: advantages and disadvantages of mammography subscales, attitudes toward provider subscales, and perceived risk of and fears about breast cancer; main predictor: sexual orientation. Women of all ages were

included in the CBE screening intention model. However, because women under the age of 40 years are not recommended to have mammograms, we included only women aged >40 years in the mammogram screening intention models.

Results

Sample characteristics: Lesbian/bisexual women compared with heterosexual women

Table 1 displays the demographic differences and similarities between the two samples of women. Current mammography screening recommendations suggest that women begin obtaining mammograms at the age of 40.[26] The proportion of women under the age of 40 did not differ significantly between lesbian/bisexual women (48.7%) and heterosexual women (43%) [$\chi^2(1) = 1.4$, $p = 0.25$], but lesbian/bisexual women were significantly younger on average (mean = 39.7, SD = 8.1) than heterosexual women (mean = 42.4, SD = 12.1), [$t(548) = 2.5$, $p < 0.01$]. In addition, lesbian and bisexual women were more highly educated [$\chi^2(4) = 69.1$, $p < 0.001$]), less likely to be in a partnered relationship [$\chi^2(5) = 192.2$, $p < 0.01$], more likely to be employed full-time [$\chi^2(3) = 29.9$, $p < 0.001$], and more likely to be Caucasian [$\chi^2(5) = 12.9$, $p < 0.024$] than heterosexual women, although >90% of both samples were Caucasian. No significant differences were found between the two groups with regard to income level or health insurance status. Almost all (95% of the combined samples) participants had health insurance. Of those >age 40, lesbian and bisexual women reported at the baseline assessment that they were significantly less likely to have obtained a mammogram in the past 2 years (83.3%) than heterosexual women (91.3%) ($\chi^2 = 7.57$, $p = 0.006$).

Relationship between sexual orientation and hypothesized mediators

Table 2 displays the differences between heterosexual and lesbian/bisexual women on key study variables in multiple regression analyses reported below, each of which controlled for age, education, and race.

Perceived risk of breast cancer. Lesbian/bisexual women were significantly less likely than heterosexual women to believe they would have breast cancer someday, $\beta = -0.23$, $p < 0.001$. Lesbian/bisexual women's mean answer was reported as a "less than 25% but more than or equal to 10% chance" (mean = 4.6, SD = 1.4), whereas heterosexual women's mean answer was reported as a "less than 50% but more than or equal to 25% chance" (mean = 5.3, SD = 1.3).

Fear of breast cancer. Lesbian/bisexual women were significantly less likely to be afraid of getting breast cancer, $\beta = -0.15$, $p < 0.001$ (mean = 2.67, SD = 0.80), than heterosexual women (mean = 2.89, SD = 0.70).

Perceptions of provider expertise. Lesbian/bisexual women were significantly less likely to feel that their provider was an expert, $\beta = -0.16$, $p < 0.001$, (mean = 1.68, SD = 0.51), than heterosexual women (mean = 1.97, SD = 0.51).

Degree of trust in provider. Lesbian/bisexual women did not significantly differ in their degree of trust in their medical provider, $\beta = -0.06$, $p = 0.22$ (mean = 3.19, SD = 0.56), than heterosexual women (mean = 3.31, SD = 0.54).

Advantages and disadvantages of mammography. Lesbian/bisexual women endorsed significantly greater disad-

Table 1. Demographic Differences between Heterosexual and Lesbian/Bisexual Participants ($n = 550$)

Variable	*Heterosexual women* n = *400*	*Lesbian and bisexual women* n = *150*	p
Age	M = 42.4, SD = 12.1 (range 19–74 years)	M = 39.7, SD = 8.1 (range 24–66 years)	0.01
Race	93.5% Caucasian 6.5% Non-Caucasian	99.3% Caucasian 0.7% Non-Caucasian	0.024
Relationship status	65.5% Partnered or married 34.5% Single	52% Partnered or married 48% Single	0.01
Education	0.8% 9–11 grade 5.8% High school 28.8% Some college 42.3% College degree 22.5% Graduate/professional degree	0.0% 9–11 grade 0.0% High school 16% Some college 25.3% College degree 58.7% Graduate/professional degree	0.001
Employment status	72.3% Full or part time 19% Not employed 8.8% Retired	89.3% Full or part time 7.3% Not employed 3.3% Retired	0.001
Income	8.2% < $15,000 15.9% $15,000–$29,999 24.4% $30,000–$49,999 23.6% $50,000–$69,999 27.9% > $70,000	8.1% < $15,000 21.5% $15,000–$29,999 30.9% $30,000–$49,999 16.1% $50,000–$69,999 23.5% > $70,000	0.122
Health care insurance	95.5% Yes 4.5% No	94% Yes 6% No	0.507

TABLE 2. HETEROSEXUAL COMPARED WITH LESBIAN AND BISEXUAL WOMEN ON KEY STUDY VARIABLES, CONTROLLING FOR AGE, RACE, AND EDUCATION

Variable	*Heterosexual women* n = *400*	*Lesbian and bisexual women* n = *150*	*OR (95% CI)*	p
Perceived risk of breast cancer	M = 5.3, SD = 1.3	M = 4.6, SD = 1.4	—	0.001
Fear of breast cancer	M = 2.89, SD = 0.70	M = 2.67, SD = 0.80	—	0.001
Attitudes toward health providers: Perceptions of Expertise Scale	M = 1.97, SD = 0.51	M = 1.68, SD = 0.51	—	0.001
Attitudes toward health providers: Degree of Trust Scale	M = 3.31, SD = 0.54	M = 3.19, SD = 0.56	—	NS
Disadvantages of mammography scale	M = 2.14, SD = 0.59	M = 2.53, SD = 0.58	—	0.001
Advantages of mammography scale	M = 3.83, SD = 0.66	M = 3.64, SD = 0.64	—	0.004
Definitely planning to obtain mammography (future mammography intentions)[a]	94.9%	87.8%	0.43 (0.25–0.74)	0.001
Definitely planning to obtain CBE (future CBE intentions)	94.2%	84.1%	0.28 (0.14–0.56)	0.001
Definitely planning to follow routine mammography recommendations (routine mammography intentions)[a]	86.8%	81.1%	1.46 (0.81–2.64)	NS

[a]Only women > 40 years of age included.

vantages of mammography, $\beta = 0.25$, $p < 0.001$ (mean = 2.53, SD = 0.58), than heterosexual women (mean = 2.14, SD = 0.59). Additionally, lesbian/bisexual women endorsed significantly fewer advantages of mammography, $\beta = -0.13$, $p = 0.004$ (mean = 3.64, SD = 0.64), than heterosexual women (mean = 3.83, SD = 0.66), $F(4, 537)$.

Mediators of relationship between sexual orientation and breast cancer screening intentions

Intentions to obtain CBE. Table 3 shows the point-biserial correlations between intentions to obtain CBE and each of the predictor variables. Being heterosexual, perceiving fewer disadvantages of mammography, perceiving greater risk of breast cancer, greater fears about breast cancer, having more trust in one's provider, and perceiving one's provider as an expert were significantly related to greater intentions to obtain CBE.

Table 4 presents the results from the hierarchical logistic regression predicting intentions to obtain CBE. Model 1 showed that none of the demographic variables (age, education, race) were significant covariates of CBE intentions. Sexual orientation was a significant predictor of CBE intentions, such that lesbian/bisexual women reported being less likely than heterosexual women to intend to obtain CBE in the future ($p < 0.001$).

In model 2, sexual orientation was no longer a significant predictor of planning to obtain a CBE once the attitudes and

TABLE 3. PEARSON-PRODUCT MOMENT AND POINT-BISERIAL CORRELATIONS AMONG KEY STUDY VARIABLES ($n = 550$)

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1. Sexual orientation	—	−0.16***	−0.18***	0.02	−0.22***	−0.12**	−0.25***	−0.09*	0.29***	−0.12**
2. Future CBE intentions		—	0.31***	0.11*	0.17***	0.13**	0.10*	0.15***	−0.17***	0.02
3. Future mammogram intentions			—	0.00	0.10*	0.08*	0.08*	0.17***	−0.33***	0.05
4. Routine mammogram intentions				—	−0.09	−0.08	0.12**	0.02	−0.04	0.07
5. Breast cancer risk					—	0.43***	0.00	−0.01	−0.12**	−0.02
6. Breast cancer fear						—	0.01	−0.02	−0.03	−0.12**
7. Provider expertise							—	0.24***	−0.12**	0.01
8. Provider trust								—	−0.17***	0.07
9. Mammography disadvantages									—	−0.18***
10. Mammography advantages										—

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 4. Hierarchical Logistic Regression Predicting Intention to Obtain CBE or Mammography

	CBE intentions (n = *550*)			*Mammography intentions* (n = *224*)[a]		
	B	*OR*	*CI*	*B*	*OR*	*CI*
Model 1 predictors						
Age	0.01	1.01	0.98–1.04	—	—	—
Education	0.30	1.35	0.91–2.00	−0.14	0.87	0.59–1.28
Race	−0.28	0.76	0.96–6.01	−0.50	0.60	0.12–3.14
Sexual Orientation	−1.29	0.28***	0.14–0.56	−0.93	0.40**	0.21–0.75
Model 2 predictors						
Age	0.01	1.00	0.97–1.04	—	—	—
Education	0.49	1.63	1.05–2.52	−0.06	0.95	0.62–1.44
Race	−0.39	0.68	0.78–5.92	−0.45	0.64	0.11–3.54
Mammography advantges	−0.16	0.85	0.48–1.53	−0.07	0.93	0.57–1.54
Mammography disadvantages	−0.70	0.50*	0.25–0.98	−0.62	0.54*	0.30–0.95
Provider trust	0.77	2.17*	1.14–4.13	0.59	1.80*	1.02–3.15
Provider expertise	0.41	1.51	0.68–3.35	−0.06	0.94	0.50–1.78
Fear of breast cancer	0.15	1.16	0.70–1.95	0.35	1.42	0.89–2.28
Perceived risk of breast cancer	0.37	1.45***	1.09–1.93	−0.01	0.99	0.76–1.28
Sexual orientation	−0.55	0.58	0.26–1.31	−0.61	0.54	0.26–1.13

[a]Only women > 40 years of age were included in the mammogram intentions model.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

beliefs mediators were added to the model. Significant mediators of the relationship between sexual orientation and mammography intentions were perceiving fewer disadvantages of mammography ($p < 0.05$), reporting more trust in one's provider ($p < 0.05$), and greater perceived risk of breast cancer ($p < 0.001$). Mammography advantages, provider expertise, and fear of breast cancer did not add significantly to the model. In summary, fewer mammography disadvantages, greater levels of provider trust, and greater perceived risk of breast cancer were found to mediate the relationship between sexual orientation and greater intentions to obtain CBE.

Intentions to obtain future mammography. Table 3 shows the point-biserial correlations among intentions to obtain mammography and the predictor variables. Being heterosexual, perceiving fewer disadvantages of mammography, perceiving greater risk of breast cancer, greater fears about breast cancer, and having more trust in one's provider were significantly related to greater intentions to obtain mammography.

Table 4 displays the results from hierarchical logistic regression predicting intentions to obtain mammography. Model 1 showed that sexual orientation significantly predicted mammography intentions, such that lesbian/bisexual women reported being less likely than heterosexual women to intend to get a mammogram ($p < 0.01$).

Model 2 showed that sexual orientation no longer remained a significant predictor of mammography intentions once the attitudes and beliefs variables were added to the model. The model summary revealed that significant mediators of the relationship between sexual orientation and mammography intentions were perceiving fewer disadvantages of mammography ($p < 0.001$) and reporting more trust in one's provider ($p < 0.05$). Greater perceived risk of breast cancer approached significance as a mediator ($p = 0.054$). Mammography advantages, provider expertise, and fear of breast cancer did not add significantly to the model. In summary, fewer mammography disadvantages and greater levels of provider trust were found to mediate the relationship between sexual orientation and greater intentions to obtain mammography.

Intentions to follow routine recommendations for mammography. Table 3 also shows the point-biserial correlations between intentions to follow recommendations for mammography and each of the predictor variables. Except for perceptions of provider expertise, neither sexual orientation nor any of the predictor variables were significantly related to intentions to follow routine recommendations for mammography. As a result, we did not run any regression analyses to examine a mediational model.

Discussion

The purpose of this study was to examine the factors associated with breast cancer screening intentions for lesbian/bisexual women and heterosexual women. We did this by testing various sets of screening-related beliefs as mediators of the relationship between sexual orientation and breast cancer screening intentions: advantages of mammography, disadvantages of mammography, beliefs about breast cancer, and attitudes about the primary healthcare provider. In general, using standard mediational analyses, we found that beliefs about breast cancer risk and mammography mediated the relationship between sexual orientation and screening intentions. In other words, lesbian/bisexual women were more likely to endorse negative beliefs about breast cancer screening and to report lower perceived risk of breast cancer, which appears to influence the degree to which they plan to receive screening. These data suggest that we have identified at least part of the mechanism for the differences in screening rates between lesbian/bisexual women and heterosexual women. These

two groups of women hold differing understandings of breast cancer risk and the perceived advantages/disadvantages of breast cancer screening, and these differences are related to their motivations to pursue screening.

Another important component in understanding the relationship between sexual orientation and breast cancer screening intentions (for both mammography and CBE) was endorsement of trust in one's provider. Although our bivariate analyses showed that heterosexual women did not differ significantly from lesbian and bisexual women in provider trust, provider trust in our multivariate analyses was a significant mediator of the relationship between sexual orientation and breast cancer screening intentions. Our findings suggest that provider trust may influence whether one intends to obtain CBE or mammography in the future. Taken together, our data indicate that attitudes about breast cancer risk, the properties of the screening procedure itself, and the relationship with one's procedure provider are all involved in the motivation to obtain screening. This certainly is supported by previous research, which has demonstrated these clusters of variables to be important predictors of mammography.[13,18–20]

Prior research documents a greater prevalence of behavioral risk factors for breast cancer among lesbian/bisexual women, including obesity, nulliparity, alcohol consumption, and cigarette smoking.[1–3] It is interesting, then, that lesbian and bisexual women in the current study report lower perceived risk of breast cancer compared with their heterosexual counterparts. In contrast, another study of 1066 lesbians found that 73% believed they were at equal risk of breast cancer compared with heterosexual women; however, that study did not compare their beliefs directly with those of heterosexual women.[31] The lower perceived risk of breast cancer among lesbians found in the current study does not appear to be related to family history of breast cancer, as our two samples of women did not differ on this important factor.[28]

Our data also suggest that demographic differences, such as age or race, do not appear to explain these differences. Although lesbian and bisexual women were slightly younger on average compared with heterosexual women, they were not significantly different with regard to the proportion of women over the age of 40, which is the recommended age in the United States to initiate mammography.[26]

Lesbian and bisexual women were more highly educated than heterosexual women in this study. On one hand, lesbian and bisexual women may have accurately estimated their cancer risk compared with heterosexual women. On the other hand, it is also possible that lesbians and bisexual women are less likely to obtain needed information about breast cancer and breast cancer screening because of poor relationships and communication with their providers. Further, if these negative relationships create a barrier to making healthcare visits, lesbian and bisexual women would also miss opportunities both to receive information and to obtain the actual screening. Indeed, our data showed that at baseline, lesbian and bisexual women >age 40 reported being less likely to have obtained a mammogram in the last 2 years compared with heterosexual women. However, this study was not able to determine if lesbian and bisexual women possessed accurate information about breast cancer screening; therefore, we could not test whether lack of information predicted breast cancer screening intentions. Clearly, this is an empirical question that should be explored in future research.

Study limitations merit caution against overinterpretation of our results. These were self-selected samples, which may limit generalizability of the findings. The samples were mainly Caucasian, middle-aged, and well educated, and almost all had health insurance. As a result, the findings may not generalize to other types of women, regardless of sexual orientation. Lesbian and bisexual women were more educated and possibly had more information about breast cancer screening that led them to feel less worried about their risk or to have more skepticism about cancer screening. On the other hand, the recruitment methods may have produced a sample of heterosexual women who felt more vulnerable to breast cancer, as they may have been more likely to know a woman with breast cancer. It is also noteworthy that these data were collected in 1996–1997. Given the increase in information in our culture about breast cancer in general and the heightened awareness of breast cancer risk for lesbians, it will be important to replicate these findings with other cohorts of women. Another limitation is that both samples comprised women who were interested in breast cancer risk counseling, but recruitment for this study was not targeted at women who were at high risk for breast cancer. Therefore, our results may not generalize well to women who specifically are at high risk for breast cancer, who might report even higher levels of breast cancer-related worry and differing beliefs about breast cancer screening from the women in this study.

An additional limitation lies in the fact that we examined breast cancer screening intentions and not actual behaviors at the 6-month follow-up, although research supports intentions as a strong and reliable predictor of cancer screening.[24] Because of this strong link, it is important to understand the factors influencing screening intentions. In addition, our breast cancer screening questions were limited in their reliability and validity. Many of the screening questions were single item; longer scales with good reliability may have produced a different pattern of results. Interestingly, although we found differences between our two groups of women on intentions to obtain future CBE and mammography, no such differences were found for intentions to follow routine recommendations for mammography. No women indicated at baseline that they were unfamiliar with these recommendations, and one reason for this difference may lie in the vague wording of the routine recommendations for mammography question. Consequently, future research should aim to measure these constructs, if possible, with several items that can be evaluated for reliability or with empirically validated scales.

Conclusions

Two consistent messages emerge from this study. First, the ways that lesbian/bisexual women view breast cancer risk and screening procedures are associated with their intentions to obtain mammography and CBE. This is a critical step in the research process because we have identified, in part, some of the beliefs and attitudes that underlie the differences in screening intentions between lesbian/bisexual women and heterosexual women. Interventions are needed

that will improve screening rates in lesbian/bisexual women.

The second message is that beliefs about breast cancer risk, the properties of the screening procedure itself, and trust in one's healthcare provider are mediators of the sexual orientation-breast cancer screening relationship. This provides two very different directions for intervention to improve breast cancer screening. First, changing beliefs about breast cancer risk and the disadvantages to obtaining screening might be accomplished via several methods tested in population-based samples, such as barrier-specific counseling.[32] This type of counseling can be performed in person or over the telephone, individually or in groups, or even at the community level.[28,33] Research must be done to test these interventions in lesbian/bisexual women, but counseling models are available for changing ideas about the disadvantages of breast cancer screening to increase screening rates.

Another intervention lies in the area of improving relationships between healthcare providers and lesbian/bisexual women. As previously documented,[4,23] lesbian/bisexual women appear to have less positive relationships with their healthcare providers, and here we present evidence that this negative relationship could have effects on choices about preventive healthcare practices. Other research shows that lesbians who reported good experiences with breast cancer screening were more likely to obtain regular mammography.[31] Furthermore, a study of lesbians with cancer found that patient satisfaction was associated with rating one's physician more favorably on interpersonal behaviors, such as consideration and expressions of respect for themselves and their partners, as well as on physician medical expertise.[34] We need to design and test interventions to improve the relationship between lesbian/bisexual women and the provider (for discussion, see ref. 9). For example, it would be helpful to assist lesbian and bisexual women to negotiate their healthcare needs better. Furthermore, interventions are needed to increase open communication and supportive practices in healthcare providers who treat lesbian and bisexual women in a variety of healthcare settings. Both directions are important to address, given a goal of improving the experience of healthcare for all women.

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Disclosure Statement

The authors have no conflicts of interest to report.

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