

Screening Behaviors Among African American Women at High Risk for Breast Cancer: Do Beliefs About God Matter?*

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Abstract:

Purpose/Objectives: To examine the relationship between beliefs about God as a controlling force in health and adherence to breast cancer screening among high-risk African American women.

Design: Cross-sectional cohort.

Setting: In-person interviews in rural, southeastern Louisiana and telephone interviews conducted at the University of Utah.

Sample: 52 females who were members of a large kindred with a BRCA1 mutation; no subjects had breast cancer.

Methods: Survey through in-person or telephone interviews.

Main Research Variables: Belief in God as a controlling agent over health measured by the God Locus of Health Control (GLHC) scale; screening behaviors measured by self-report. Adherence was based on consensus-approved recommendations for BRCA1 carriers or women at risk of being carriers.

Findings: Bivariate analysis indicated that presence of a primary care provider and low GLHC scores were associated with seeking clinical breast examination (CBE) and mammography. With the variable "presence of a primary care provider" excluded, GLHC scores were inversely associated with seeking CBE and mammography.

Conclusions: African American women at increased risk for breast cancer and with high GLHC scores may have a decreased inclination to adhere to CBE and mammography recommendations.

Implications for Nursing: Assessing religious and spiritual beliefs and incorporating belief systems into education and counseling sessions may improve understanding and acceptance of presented material.

Article:

Breast cancer is the most common cancer among women in the United States. For all ages combined, African American women are diagnosed with breast cancer less frequently than Caucasian women (American Cancer Society [ACS], 2002). However, breast cancer mortality rates are substantially higher for African American women (ACS). The precise causal pathway for the disparate incidence and mortality rates between the two groups is unclear; however, African American women are diagnosed with advanced stages of breast cancer more often than Caucasian women of similar age (Newman & Alfonso, 1997). Furthermore, later stage at diagnosis was found to account for about 40% of the difference in mortality rates (Eley et al., 1994). Other possible reasons for this include biologically different cancers (Hunter, 2000), problems with access to healthcare (Lannin et al., 1998), and, of particular interest in this study, the influence of belief in God as a controlling force in one's health.

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Data indicate that religiosity and spirituality may have a greater influence on health behaviors among African Americans than among Caucasians (Bourjolly, 1998; Parks, 1998). However, few studies have explored the effects of such factors on breast cancer screening behavior among African American women, particularly those at high risk. The purpose of this exploratory, cross-sectional survey was to examine the effect of such beliefs on breast cancer screening behaviors in female members of a large African American family with a BRCA1 (breast cancer susceptibility gene 1) mutation. Relationships among belief in God as a controlling force in health and sociodemographic, psychosocial, and clinical variables as potential confounders of religious and spiritual beliefs also were explored. Enhanced understanding of these factors should lead to the development of culturally sensitive education and counseling and to optimal recognition and appreciation of beliefs that promote healthy behaviors or create barriers to breast cancer screening.

Literature Review

Religion and Health

The 1990s produced an increase in the holistic focus of health care, including renewed interest in the effects of religiosity and spirituality (Parks, 1998). Studies have shown that spirituality positively influences a person's health and psychological well-being through effects such as instilling positive associations with optimistic mood states and negative associations with depression (Chatters, Levin, & Ellison, 1998; Fehring, Miller, & Shaw, 1997; Koenig, McCullough, & Larson, 2001; Kune, Kune, & Watson, 1993). Spiritual faith also can buffer the effects of illness on patients' wellbeing and mental health by, for example, encouraging a focus on definitions of happiness that use nonphysical criteria, such as character traits and good works (Ellison & Levin, 1998; Idler, 1995; Strawbridge, Shema, Cohen, Roberts, & Kaplan, 1998). In addition, church attendance and similar indications of religiosity have been associated with increased participation in breast cancer screening (Fox, Pitkin, Paul, Carson, & Duan, 1998).

In contrast, religious and spiritual belief systems can have a negative impact on health-related behaviors. One study revealed that participants who deferred completely to God's will had lower levels of competence and self-esteem than those who were self-directed or viewed God as a collaborative partner (Pargament et al., 1988). In addition, spirituality has been inversely associated with participation in genetic testing for cancer susceptibility among average-risk women (Schwartz et al., 2000). These conflicting findings may be a result of a lack of specificity of measurement (Ellison & Levin, 1998; Jenkins & Pargament, 1995).

God locus of health control (GLHC) has been defined as the degree to which one believes that God has ultimate control over health (Wallston et al., 1999). People with an internal locus of control believe that they have control over situations and outcomes, whereas people with an external locus of control attribute control over situations to some other force, such as God. Studies have hypothesized that complete reliance on God with respect to health might lead to decreased screening and treatment-seeking behaviors, especially for women whose economic resources or knowledge about health is limited (Bourjolly, 1998). Conversely, evidence exists that people with an internal locus of control who view God as a collaborative partner in their lives have superior coping and problem-solving abilities when compared to those who deny the effects of God in their lives (Pargament et al., 1988, 1990).

African Americans and Religion

Estimates indicate that as many as 72% of African Americans are members of a church (Princeton Religion Research Center, 1997). Studies have shown that an appreciable number of African American women with breast cancer believe that the disease is God's will (Jennings, 1996; Lannin et al., 1998; Phillips, Cohen, & Moses, 1999). Other studies indicate that African Americans use their religious beliefs and practices to cope with and reduce illness-related psychological distress (Ferraro & Koch, 1994; Levin, Chatters, & Taylor, 1995).

Breast Cancer Screening and African Americans

Routine breast cancer screening is recommended for high-risk women age 18 and older. Specific recommendations for women at average risk include monthly breast self-examination (BSE) beginning at age

20, clinical breast examination (CBE) at least every three years for women ages 20–39 and yearly thereafter, and yearly mammograms beginning at age 40 (ACS, 2002) For high-risk women, beginning screening at an earlier age is recommended (Burke et al., 1997).

Although mammography use is increasing, African American women remain about half as likely as Caucasian women to report ever having had a mammogram (McCarthy et al., 1998; O'Malley, Earp, & Harris, 1997). On the other hand, CBE rates are similar among African American and Caucasian women when access to healthcare and socioeconomic status are considered. However, income and healthcare access issues inevitably have an impact on the use of breast cancer screening (Lannin et al., 1998).

Race has not been consistently associated with BSE adherence (Lauver, Kane, Bodden, McNeel, & Smith, 1999). Although many African American women report performing BSE, these women may delay seeking treatment because of a lack of access to health care, fatalistic attitudes, or distrust of traditional medicine (Facione, Dodd, Holzemer, & Meleis, 1997; Lannin et al., 1998; Phillips et al., 1999).

Age often is negatively associated with breast cancer screening adherence (Champion & Miller, 1996; Miller & Champion, 1996). However, one study reported that older African American women were more adherent to BSE and mammography recommendations than their younger counterparts (Frazier, Jiles, & Mayberry, 1996). Increased education, higher income, and access to and involvement in the medical system have been positively associated with screening adherence among African American women (Facione, 1999; Lauver et al., 1999; Mickey, Durski, Worden, & Danigelis, 1995; O'Malley et al., 2001). The presence of a primary care provider and provider recommendations have been shown to be powerful predictors of breast cancer screening adherence (Champion & Menon, 1997; Mickey et al.). Attitudinal and cultural factors also have been shown to influence mammography use (Dolan, Reifler, McDermott, & McGaghie, 1995; Phillips et al., 1999).

Women at High Risk

The discovery of the BRCA1 gene mutation associated with breast and ovarian cancer susceptibility has made it possible to offer clinical genetic testing to high-risk individuals (Miki et al., 1994). Offspring of BRCA1 carriers have a 50% risk of inheriting the gene from their biologic father or mother; thus, even if no maternal family history of breast or ovarian cancer exists, women can carry a BRCA1 mutation. Female mutation carriers have a lifetime risk of between 56%–87% for developing breast cancer (Grann et al., 1999; Struewing et al., 1997). A taskforce organized by the National Human Genome Research Institute developed surveillance guidelines for BRCA1 carriers and individuals from families in which a BRCA1 mutation is present or an autosomal dominant predisposition to early onset breast or ovarian cancer is identified (Burke et al., 1997). These guidelines include monthly BSE by age 18–21, CBE every six months or every year beginning at age 25–35, and annual mammography beginning between ages 25–35 or about five years earlier than the earliest age of onset of breast cancer in a patient's family.

Conceptual Framework

The Transactional Model of Stress and Coping was used to guide this exploratory study (Lazarus & Folkman, 1984). Although the theory, per se, was not being tested, the model was used to guide the selection of variables and the analysis. According to the Transactional Model, stress is caused by an interaction between a person and his or her environment. When a person is confronted by a potentially threatening event, he or she evaluates the significance of the event (i.e., primary appraisal) and ability to change the situation (i.e., secondary appraisal). During primary appraisal, a person determines if a particular event is relevant, challenging, stressful, negative, or positive. In secondary appraisal, a person evaluates available psychological, social, or cultural resources, such as the perception of ability to change the situation and manage emotional reactions. If a person determines that the given situation is threatening, coping efforts are employed in an attempt to reduce or eliminate the threat (Lazarus & Folkman).

When applying the Transactional Model to the case of women at high risk for developing breast cancer, primary appraisal may be conceptualized as having a familial history of breast cancer and, as a result, perceiving susceptibility to the disease. Concurrent psychological distress would be a potential stressor. In the current study, psychological distress was operationalized as cancer-specific distress. An adaptive secondary appraisal would involve hopeful perceptions of the outcomes of treatment if breast cancer were detected through screening. Locus of control (i.e., a generalized belief about one's ability to control events by virtue of one's own efforts) has theoretical relevance to coping with stress (Lerman & Glanz, 1997). Locus of control may thus have a direct or indirect (modifying) effect on screening. Based on their beliefs about God, women either may feel powerless in preventing disease or sustained and strengthened in their preventive efforts. In this study, the researchers used the Transactional Model as a guide in studying the influence of a GLHC scale score on breast cancer screening behaviors and the relationship of GLHC to sociodemographic and appraisal variables.

Methods

Sample

The participants of this study were adult (age 18 and older) female members of a large, African American kindred (K2099) with a BRCA1 mutation. Some members of K2099 participated in a prior linkage study to isolate BRCA1 (Miki et al., 1994). Although the specific mutation in BRCA1 was determined after completion of the linkage study, at the time of the current study, no further clinically approved genetic testing had been conducted in the Louisiana members of K2099. The Miki et al. study was not designed to reveal genetic test results to participants. To the researchers' knowledge, none of the participants had received clinical BRCA1 testing prior to participation in the current study. The majority of K2099 members live in southeastern Louisiana; they are diverse in income, location (rural versus urban), and education. The pedigree includes six generations (a total of 145 women and 102 men) with 27 known breast cancer cases, four ovarian cancer cases, four colorectal cancer cases, and one prostate cancer case. The youngest ages of onset of breast cancer and ovarian cancer were 28 and 54, respectively. Prior to conducting a study evaluating uptake and outcomes of genetic counseling and BRCA1 testing, a needs assessment of K2099 was conducted (Kinney et al., 2001). K2099 members were interviewed from July 1998–February 1999. The cross-sectional survey assessed information on sociodemographics, attitudes toward healthcare providers, breast cancer screening behaviors, and religious and spiritual beliefs. In addition, the survey evaluated psychological distress, beliefs, knowledge, and attitudes related to cancer genetics and genetic testing. Of the 121 K2099 members who were alive, eligible, and able to be contacted, 79% ($n = 95$) participated in the needs assessment. The analyses presented in this article included female members who had no prior history of breast or ovarian cancer and responded to the GLHC questions ($n = 52$).

Twenty-five of the 52 women had participated in a prior linkage study. The researchers specifically asked the participants if any of them had received clinical BRCA1 testing prior to participation in the present study; to the best of the researchers' knowledge, none reported having done so.

Procedure

Following institutional review board approval, eligible and locatable kindred members were sent an introductory letter, which stated that breast and ovarian cancer cases had been observed in the recipients' family. Those who indicated an interest in study participation subsequently were contacted by telephone to obtain informed consent and arrange a confidential interview. Prior to initiating the study, the researchers held a meeting with key informants of K2099; at that time, K2099 members indicated that they wished to be given a choice of telephone or in-person interview. Recognizing the importance of flexibility with this study population, the researchers gave subjects residing in southeastern Louisiana a choice regarding the interview method.

Measures

Outcome variables: Self-reported adherence to age-specific, Cancer Genetics Study Consortium screening recommendations for high-risk women was the outcome of interest. Categorical response items were used to measure the time since last mammogram and CBE; BSE frequency also was assessed. Women 18–24 years old

were considered adherent if they performed monthly BSE. Women 25 years and older were considered adherent if they performed monthly BSE and had had a mammogram and CBE within the past year.

God Locus of Health Control Scale: The independent variable of interest was the extent of belief that God exerts control over one's health state, as measured by the GLHC scale. This measure was developed as an adjunct to the Multidimensional Health Locus of Control (MHLC) scales to better understand cognitions about external sources of control over illness. The GLHC consists of six items with six response options: 1 = strongly agree, 2 = moderately agree, 3 = agree, 4 = disagree, 5 = moderately disagree, and 6 = strongly disagree. All are keyed in the same direction, with a high score indicating a high belief in God as a locus of control. The item scores are summed for a possible total of 6–36. The GLHC scale score is positively related to religiosity and generally not correlated with other MHLC subscales (Wallston et al., 1999). Internal consistency has been acceptable in prior studies, with scores ranging from 0.87–0.94 (Wallston et al.). The GLHC score had an acceptable internal consistency estimate in the current sample (Cronbach's alpha = 0.86).

Covariates: Potentially confounding variables were age, educational level (i.e., less than a high school diploma, high school or some college, or college graduate), annual household income before taxes (i.e., less than \$30,000 or greater than or equal to \$30,000), marital status (i.e., married or living as married or other), presence of a primary healthcare provider, number of first-degree relatives with breast cancer (i.e., none or one or more), participation in a prior linkage study, religion (i.e., Catholic or other), frequency of church attendance (i.e., never, sometimes, often, or routinely), perceived risk for breast cancer, cancer-specific psychological distress, and hopelessness about cancer. Perceived absolute lifetime risk was assessed by asking women to rate their chances of developing breast or ovarian cancer from 0–100%. This measure has demonstrated predictive validity in studies of interest in BRCA1 testing (Bluman et al., 1999; Jacobsen, Valdimarsdottir, Brown, & Offit, 1997; Struewing et al., 1997). The Intrusion Subscale of the Impact of Event Scale (IES) (Horowitz, Wilner, & Alvarez, 1979) was used to measure cancer-specific distress (i.e., the frequency and severity of intrusive thoughts about having cancer in the family history and personal risk of cancer or cancer recurrence). This subscale consists of seven Likert-style items (with response options of 0 = not at all, 1 = rarely, 3 = sometimes, and 5 = often), and total scores ranging from 0–35. The IES has been used to assess stress among high-risk women (Audrain et al., 1997; Lerman et al., 1997, 1999). The IES had good internal consistency in the current sample (Cronbach's alpha = 0.89). Fatalistic attitudes about breast cancer were measured with one five-point Likert-style item (1 = strongly agree and 5 = strongly disagree). Respondents rated level of agreement with the statement, "There is little hope for people with breast cancer." Scores were not distributed normally but were positively skewed, indicating low levels of hopelessness about cancer among the kindred members studied. Therefore, the variable measuring hopelessness about cancer was dichotomized (i.e., strongly agree or agree versus neither agree nor disagree, disagree, or strongly disagree).

Analysis

Data were analyzed using Statistical Package for the Social Sciences® [SPSS] base 9.0 (SPSS Inc., Chicago, IL) and SAS® Version 10 (SAS Institute, Cary, NC). Descriptive statistics (i.e., frequencies and means), including sociodemographic factors, clinical variables, psychological variables, and screening behaviors, were computed. A dichotomous outcome variable was created to determine overall age-specific adherence to breast cancer screening recommendations for high-risk women. Adherence also was examined with BSE separate from CBE and mammography. Bivariate analyses (i.e., chi-square and Fisher's exact tests for nominal data; independent t tests for continuous variables) examined the associations between GLHC and potential confounders and screening adherence. Pearson product-moment correlation coefficients measured associations between potential confounders and GLHC.

Stepwise logistic regression analysis was performed to determine if a woman's belief in God as a controlling agent over her health, as measured by GLHC, was independently associated with adherence to screening guidelines. Generalized estimating equations were used to control for possible correlated responses within families (Allison, 1999). Because generalized estimation equations and multiple logistic regression parameter

estimates did not differ significantly, the researchers presented estimates from the conventional logistic regression model. Predictor variables for logistic regression were grouped into demographic, clinical, and psychological variables. Variables with bivariate associations significant at the $p < 0.25$ level were entered into the logistic model (Hosmer & Lemeshow, 1989). Within each block, backward stepwise elimination identified predictors of adherence. Criteria for inclusion of variables in the final model were established a priori: association with the dependent variable at $p < 0.10$ or change in any odds ratio in the model by more than 10%. Results were summarized using odds ratios and 95% confidence intervals; p values less than 0.05 were considered statistically significant.

Results

Sociodemographic and Clinical Characteristics

As shown in Table 1, the mean age was 37 years ($SD = 12.6$, range = 18–78). Most participants (92%) were high school graduates; a small percentage (21%) had earned college degrees. Most (69%) were Catholic, and 50% of the total sample attended church routinely. The vast majority (87%) reported having primary healthcare providers.

Psychological Factors

The average GLHC score was 26 ($SD = 6.4$, range = 7–36). Eighty-seven percent of respondents disagreed with the statement, “There is little hope for people with breast cancer,” and 48% of respondents did not know (or accurately guess) their absolute lifetime risk of breast or ovarian cancer. However, of the 27 participants who reported their perceived risk, 74% felt that their chances of getting cancer were 50% or greater. Cancer-specific distress scores were positively skewed; the median score on the IES Intrusion Subscale was 6.0 (range = 0–30), indicating low levels of frequent intrusive thoughts about cancer. Because the responses were not normally distributed, the measure was divided into tertiles and dichotomized as either low/moderate distress (first and second tertiles) or high distress (third tertile). Likewise, the scores of the item measuring hopelessness were not normally distributed (median = 2.0).

Breast Cancer Screening Behaviors

Utilization of breast cancer screening in the previous year according to age group is presented in Figure 1. Adherence was low; many participants were not even adhering to guidelines for women at average risk. Overall, 36% of the participants were not adherent to breast cancer screening recommendations appropriate for women at high risk for BRCA1. Eighty-three percent of the sample reported performing BSE at least monthly; 39% were examining their breasts more than once a

Table 1. Sample Characteristics of African American Kindred K2099

| Characteristic | n | % |
|---|----|----|
| Age (years) | | |
| 18-24 | 10 | 19 |
| 25-49 | 38 | 73 |
| ≥ 50 | 4 | 8 |
| Education | | |
| ≤ High school | 4 | 8 |
| High school | 37 | 71 |
| College graduate | 11 | 21 |
| Income | | |
| < \$30,000/year | 26 | 50 |
| ≥ \$30,000/year | 21 | 40 |
| No response | 5 | 10 |
| Marital status | | |
| Married or living as married | 22 | 42 |
| Divorced, separated, widowed, or never married | 30 | 58 |
| Religion | | |
| Catholic | 36 | 69 |
| Not Catholic | 16 | 31 |
| Church attendance | | |
| Sometimes | 9 | 17 |
| Often | 17 | 33 |
| Routinely | 26 | 50 |
| Number of first-degree relatives with breast or ovarian cancer | | |
| None | 30 | 58 |
| ≥ 1 | 22 | 42 |
| Presence of a primary healthcare provider | | |
| Yes | 45 | 87 |
| No | 7 | 13 |
| Participation in a prior linkage study | | |
| Yes | 25 | 48 |
| No | 27 | 52 |

N = 52

month, with 19% performing BSE several times a week. Only 36% of participants ages 25 years and older were adherent to guidelines for CBE and mammography. Most of the younger participants were compliant with screening recommendations for the general population (ACS, 2002). Most women younger than age 40 (90%) were adherent to monthly BSE and the majority (93%) reported at least one CBE. Of the 21 women age 40 years and older, 29% were adherent to ACS recommendations for the general population for BSE, CBE, and mammography. Sixty-nine percent of women ages 40 years and older reported performing monthly BSE; 52% and 67% reported mammography and CBE within the previous year, respectively.

Bivariate Analyses

GLHC was negatively correlated with age ($r = -0.32$; $p = 0.02$) and positively correlated with marital status ($r = 0.39$; $p < 0.01$) but not significantly correlated with feelings of hopelessness about cancer, religious affiliation, education, or cancer-specific distress (see Table 2). Table 3 presents mean GLHC scores according to the screening outcomes. GLHC was not significantly associated with the overall adherence variable ($t[50] = 1.1$, $p = 0.26$) among all of the participants. When adherence to BSE was examined separately from CBE and mammography, GLHC was not significantly associated with BSE adherence ($t[50] = -1.2$, $p = 0.25$) among women ages 18 years and older. However, GLHC was significantly associated with adherence to CBE and mammography guidelines ($t[40] = -2.2$, $p = 0.04$) among women 25 years and older. The small sample precluded subgroup analyses of the effects of GLHC on breast cancer screening by age, income, and education.

Presence of a primary care provider was associated with adherence to CBE and mammography ($\chi^2[1] = 4.7, p = 0.04$) among women ages 25 years and older. For all participants, presence of a primary care provider was associated with overall screening adherence ($\chi^2[1] = 4.7, p = 0.04$), but not BSE adherence ($\chi^2[1] = 1.4, p = 0.35$). Number of first-degree relatives with breast or ovarian cancer, feelings of hopelessness about breast cancer, perceived risk, and other demographic background variables were not significantly associated with overall BSE, CBE, or mammography adherence.

Logistic Analysis

Logistic regression analysis was performed to determine whether GLHC was an independent predictor of adherence to CBE and mammography among women ages 25 years or older. The variable “presence of a primary healthcare provider” was excluded from the model because no variance existed; 100% of participants who reported nonadherence to guidelines for high-risk women regarding CBE and mammography reported not having primary providers. Variables that met inclusion criteria were entered in a hierarchical fashion: age and income in the first block, number of affected first-degree relatives in the second block, and GLHC in the third block. Backward stepwise elimination revealed that the only predictor of adherence to CBE and mammography was GLHC (odds ratio = 0.88, 95% CI = 0.77–1.00). This association was marginally significant ($p = 0.05$). GLHC scores were inversely related to breast cancer screening behaviors; each one-point increase in the GLHC score was associated with a

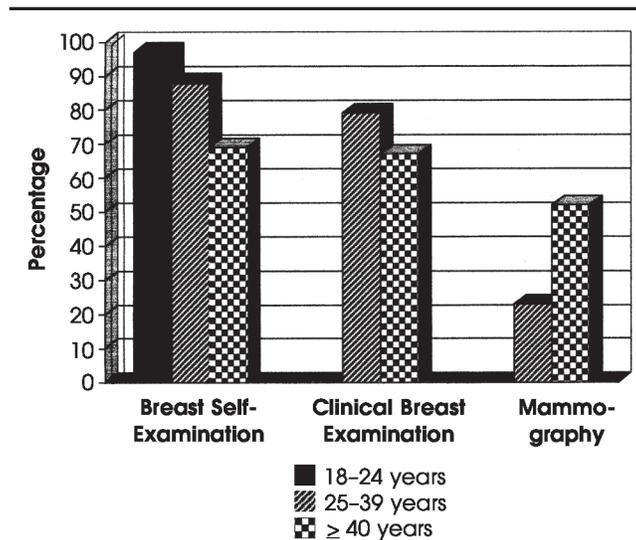


Figure 1. Utilization of Breast Cancer Screening Within the Previous Year by Age Group

Table 2. Bivariate Correlations Among God Locus of Health Control Scores and Potential Confounding Variables

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|--|---|----------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 1. Age | 1 | -0.40*** | -0.08 | 0.09 | 0.06 | -0.09 | 0.15 | 0.11 | 0.17 | -0.01 | -0.09 | -0.19 | -0.32** |
| 2. Education | | 1 | 0.16 | - | 0.15 | -0.21 | -0.15 | 0.10 | -0.10 | -0.03 | -0.21 | 0.19 | -0.05 |
| 3. Income | | | 1 | -0.35** | -0.10 | -0.08 | -0.07 | 0.02 | 0.18 | -0.13 | 0.24 | 0.09 | -0.22 |
| 4. Marital status | | | | 1 | -0.02 | 0.11 | 0.03 | 0.12 | -0.27 | 0.09 | - | -0.13 | 0.39*** |
| 5. Religion | | | | | 1 | -0.01 | 0.19 | -0.10 | 0.11 | -0.02 | -0.26 | 0.09 | -0.07 |
| 6. Church attendance | | | | | | 1 | 0.15 | -0.13 | -0.06 | -0.09 | -0.10 | 0.08 | 0.13 |
| 7. Number of affected first-degree relatives | | | | | | | 1 | -0.05 | 0.18 | -0.11 | -0.24 | - | -0.04 |
| 8. Presence of provider | | | | | | | | 1 | 0.04 | -0.03 | 0.16 | -0.05 | 0.23 |
| 9. Previous linkage study | | | | | | | | | 1 | 0.22 | 0.07 | 0.13 | -0.11 |
| 10. Cancer-specific distress | | | | | | | | | | 1 | -0.12 | -0.03 | 0.21 |
| 11. Feelings of hopelessness | | | | | | | | | | | 1 | -0.11 | 0.14 |

12. Perceived risk
13. God Locus of Health
Control score

1 -0,01

1

" p < 0,025 (2-tailed) "" p <
0,01 (2-tailed)

12% reduction in likelihood of adherence to CBE and mammography among participants age 25 and older.

Discussion

The results of this study suggest that women with high GLHC levels are less likely to adhere to CBE and mammography recommendations than those who have lower GLHC scores. However, this was not the case for adherence to BSE recommendations. The findings are consistent with results from other studies that indicate that adherence to CBE and mammography is affected by different factors than those that influence performance of BSE (Lauver et al., 1999).

GLHC scores were found to be negatively correlated with age and positively correlated with marital status. The researchers found no association between GLHC scores and education, feelings of hopelessness about breast cancer, cancer-specific distress, religious affiliation, or attendance at religious services. Correlations between GLHC and education have not been consistent among samples studied; positive correlations have been observed in previous studies involving other disease entities (Wallston et al., 1999). The reasons for the inconsistencies regarding GLHC scores and demographics are unclear but may reflect underlying population differences.

The current study found that the presence of a primary care provider had a significant influence on breast cancer screening adherence. Previous research has supported the positive impact of primary care provider recommendations on adherence to breast cancer screening among African American women (Facione, 1999; Mandelblatt, Traxler, Lakin, Kanetsky, & Kao, 1993; O'Malley et al., 1997).

Although enhanced surveillance with mammography for women at high risk for BRCA1 is receiving increased attention, little data are available on adherence to screening recommendations among populations comparable to the current population studied. The results of this study indicate that the measure of locus of control, specifically the GLHC, was more useful than other components of the Transactional Model of Stress and Coping in assessing the role of spirituality in this high-risk population. In contrast to other studies (Audrain et al., 1997; Lerman et al., 1995; Phillips et al., 1999), the researchers did not find a significant relationship between primary and secondary appraisal (i.e., family history of breast cancer, perceived risk, and fatalistic attitude about cancer) and breast cancer screening behaviors. Furthermore, the negative association between GLHC and screening adherence in this study appears to support the possibility, as observed by Pargament et al. (1988), that reliance on God to alleviate breast cancer morbidity may lead to decreased reliance on screening and medical treatment options as well as to less effective problem solving in general. In contrast, Fox et al. (1998) found that frequent church attendance was associated with higher mammography rates. These contradictory findings suggest that religious practices such as church attendance act

Table 3. Relationship of God Locus of Health Control (GLHC) Score and Utilization of Breast Cancer Screening

| Screening Test | \bar{x} GLHC Score | | t | df | p |
|--|----------------------|-------------|-------|----|------|
| | Adherent | Nonadherent | | | |
| Breast self-examination (\geq 18 years) | 26 | 24 | 1.18 | 50 | 0.25 |
| Clinical breast examination and mammography (\geq 25 years) | 22 | 26 | -2.16 | 40 | 0.04 |
| Overall adherence (\geq 18 years) | 27 | 25 | 1.14 | 50 | 0.26 |

differently on screening behaviors. Furthermore, these data suggest that more needs to be learned about the effects of spirituality, religiosity, and the belief about God's role in health on coping with breast cancer risk.

The limitations of this study include a small sample size, which resulted in limited power and precluded subgroup analyses. Random selection was not possible, as the sample was fixed (i.e., adult female K2099 members without breast cancer). Information about breast cancer screening practices was collected by in-person or telephone interviews, which increases the possibility of bias caused by the potential for provision of socially desirable answers (Fowler, 1988). However, no significant differences among respondents' answers by type of interview existed (data not shown). The one-item measure of hopelessness about breast cancer was not an optimal way to measure fatalistic attitudes toward cancer. Participants in this study did not exhibit high levels of hopelessness about breast cancer; however, measurement with a single item may have been inadequate. Prior research has indicated that fatalistic attitudes toward cancer are prevalent among African American women (Powe, 1995) and negatively influence cancer screening behaviors (Tessaro, Eng, & Smith, 1994).

The current study's findings suggest that interventions involving communication between healthcare professionals and high-risk individuals could play an important role in increasing use of cancer screening tests. This finding is consistent with the Transactional Model of Stress and Coping, as well as with other studies (Millon-Underwood, Sanders, & Davis, 1993). The high level of belief in God as the source of control over the subjects' breast cancer screening behaviors suggests that this form of spirituality should be assessed among African American women. Because belief systems are difficult to change, nurses must carefully exhibit nonjudgmental interest. Previous research has indicated that locus of control can be influenced by patient education (Kennedy, DeVoe, Ramer-Henry, & West-Kowalski, 1999). Education tailored to patients' belief systems may have an enhanced impact on decisions and thereby increase adherence to breast cancer screening recommendations (Champion, Foster, & Menon, 1997). Nurses should conduct support groups or educational sessions where patients who have developed a more internalized locus of control regarding screening could support others with high GLHC. Education regarding CBE and mammography may be more effective if nurses build on patients' already firm belief in BSE. If beliefs about screening are assessed comprehensively before initiating education or counseling, nurses may be able to avoid repetition of concepts patients already accept and build on beliefs already present (Millon-Underwood, 1992).

The substantial number of participants who reported nonawareness of breast and ovarian cancer risk and the heightened levels of cancer-specific distress reported by many participants indicate the importance of assessing knowledge and perceptions about risk and the source(s) of cancer-specific psychological distress. This finding

also has implications for intervention strategies. Breast cancer risk counseling (Lerman et al., 1995, 1999) and problem-solving training (Schwartz et al., 1998) may be effective in reducing cancer-specific distress among women with a family history of breast cancer. The effect of receiving genetic test results among African American women who are members of families at high risk for breast or ovarian cancer remains to be seen and is an important area for future clinical research.

This study explored the association of women's belief in God as a controlling force in their health and wellness, specifically on their breast cancer screening behaviors. Continued research is recommended to assess breast cancer screening and other health behaviors among different populations. Future research among individuals at high risk for cancer should focus on the relationship between beliefs about God or some higher being, religious and spiritual activity, health behaviors, and psychological distress on the effects of culturally appropriate educational interventions that enhance breast cancer prevention. Additionally, future studies should address healthcare providers' behaviors regarding risk assessment, risk communication, and screening recommendations. This study is one of the first to explore the association between belief in God as a controlling force in one's health and breast cancer screening behaviors in high-risk African American women. The researchers found that higher levels of belief in God as the controlling force over a person's state of health were negatively associated with breast cancer screening. This suggests that including religious and spiritual beliefs into assessments and education sessions may be important in helping healthcare providers recognize possible barriers to breast cancer screening.

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