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Religiosity, Spirituality, and Psychological Distress in African-Americans at Risk for Having a Hereditary Cancer Predisposing Gene Mutation

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Abstract

Elevated psychological distress has been observed among people at increased risk for familial cancer. Researchers consider religiosity and spirituality (RS) to be positive coping mechanisms associated with reduced psychological distress. Relatively little is known about the impact of RS on genomic health issues. The objectives of our study were: (1) describe the prevalence of RS and depressive symptoms and (2) explore how RS relates to psychological distress in a cohort of individuals with a ≥25% prior probability of a genetic predisposition to cancer. Participants (n = 99) were drawn from an African-American, Louisiana-based kindred with a mutation at the *BRCA1* locus. This analysis reports findings from a survey assessing RS and the use of three types of religious coping styles: collaborative, self-directing, and deferring. Clinically significant depressive symptoms were relatively high (27%); with females (33%) more likely than males (17%) to report symptoms ($P < 0.01$). The majority of participants reported being highly religious. The most commonly employed religious problem solving style used by participants was collaborative ($\bar{X} = 22.9$; SD = 5.8) versus self-directing ($\bar{X} = 12.8$; SD = 5.1) and deferring ($\bar{X} = 19.9$; SD = 6.3). We did not observe significant associations between RS indicators and psychological distress, nor did we observe appreciable differences related to gender or risk perception. Although RS beliefs and practices are important for many African-Americans, we did not find evidence that indicators of self-reported RS are associated with psychological distress prior to genetic counseling and testing.

Keywords

religiosity; spirituality; genetic; cancer; psychological distress; African-American

INTRODUCTION

Approximately 182,460 female breast cancers and 21,650 ovarian cancers will be diagnosed in 2008 [American Cancer Society, 2008]. It is estimated that approximately 5–10% of breast and 10% of ovarian cancers are due to known predisposing genetic factors [Claus et al., 1996; Lux et al., 2006]. Two major genes are associated with hereditary susceptibility to breast and ovarian cancer; breast cancer susceptibility gene 1 (*BRCA1*) and breast cancer susceptibility gene 2 (*BRCA2*) [Miki et al., 1994; Tavtigian et al., 1996]. Mutations of *BRCA1* and *BRCA2* genes are associated both with a significantly elevated risk of developing breast and ovarian cancer at an early age in women. Men who inherit abnormal

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BRCA1 or *BRCA2* genes have an increased risk for male breast and prostate cancer [Levy-Lahad and Friedman, 2007].

Individuals diagnosed with hereditary breast and ovarian cancer (HBOC) often have family members at very high risk of getting cancer and of having an inherited cancer predisposing mutation. There may be a family history of multiple cancer-related deaths, often at young ages. Individuals who perceive a high risk (both personally and/or for their family) of being diagnosed with a life-threatening disease may potentially carry a substantial burden of stress.

Moderately elevated levels of distress characterized by depressive symptoms, anxiety, and cancer-specific worry have been observed among men and women at increased risk for familial cancer [Mueller et al., 2001; Pasacreta, 2003; Vadaparampil et al., 2006; Taylor et al., 2007]. Furthermore, a substantial proportion (over 25% in some studies) of enrollees in high-risk cancer genetic clinic programs or women awaiting cancer genetic counseling have distress levels high enough to warrant psychological counseling prior to learning their genetic test results [George et al., 2002; Braithwaite et al., 2006; Masters and Spielmans, 2007; Sivell et al., 2007]. Depression is associated with many adverse health outcomes including suicide, cardiovascular disease, decreased life expectancy, and diminished well-being and continues to represent a burden on mental health resources [Olfson et al., 2002]. Thus, the study of the possible beneficial or detrimental effects of religiosity and spirituality (RS) on psychological distress is of considerable health importance.

RS are complex phenomena that are difficult to define and measure. The numerous instruments that have been used to study them demonstrate the methodological challenges involved in making these constructs operational in research [Stefanek et al., 2005]. For the purposes of this study, religiosity is understood as (1) identification with a religious community, (2) participation in group activities organized by a religious community (organizational religiosity), for example, worship attendance, (3) participation in individual religious practices prescribed but not organized by a religious community (non-organizational religiosity), for example, private prayer or scripture reading, and/or (4) acknowledgment of importance and strength of faith commitments associated with a religious tradition. Spirituality is attributed to individuals who do not necessarily identify with a religious community but who acknowledge and undertake practices and beliefs directed toward a transcendent power or holistic dimension of life. Communal expressions of spirituality resemble organizational religiosity and underscore the important overlap of these two domains [Mueller et al., 2001]. Functional understandings of RS are also important for this area of research. Amidst the many functions ascribed to RS, the most important for this study is the role it plays in coping processes [George et al., 2002; Churchill, 2009].

This study was guided by the Transactional Model of Stress and Coping [Lazarus and Folkman, 1984]. This framework has been used for evaluating the processes of coping with stressful circumstances such as the stress of being a member of a family with a *BRCA1* mutation. According to the model, an individual's initial response to a stressor is a function of two sequentially linked cognitive processes: primary appraisal (e.g., perceived threat if carrying a *BRCA1* mutation) and secondary appraisal (perceptions about their ability to cope with the threat). These appraisals then prompt an individual to cope with his or her concerns about the stressor. Religiosity may play a crucial role throughout the coping process, influencing the meaning that people attribute to stressors and their appraisal of the resources and coping strategies that they have available. There is an extensive body of literature describing an aspect of religiosity termed "religious coping." In this type of coping, one's religion is a resource to assist in adjustment to life situations and stressors. There appear to be positive and negative patterns of religious coping [Koenig, 2001; George et al., 2002].

With the growing interest in understanding how people cope with being a member of a family with a *BRCA1* mutation, we postulate that RS indicators may bolster one's resiliency to depression or worry and may be associated with overall lower levels of distress.

Despite the growing literature on RS and health, relatively little is known about the relationships between various aspects of RS and genetic health issues. The paucity is surprising given the importance of religion in the lives of many Americans and the stress and distress associated with being a member of a family with a hereditary health condition. The few studies that have been conducted in clinical cancer genetics yielded mixed results, suggesting either no relationship or a complex set of relationships between spirituality, religiosity, and coping [Vernon et al., 1999; Schwartz et al., 2000; Kinney et al., 2002; Quillin et al., 2006].

There has been increasing support for assessing and integrating RS beliefs as part of culturally competent and patient-centered genetics care [Exline et al., 1999; Egbert et al., 2004; Berry, 2005]. In view of clinical experiences and insights generated by the literature, the purpose of our analyses was to characterize select aspects of RS in African-American men and women who were at increased risk of carrying a *BRCA1* mutation. We focused on RS because, as discussed above, it has been shown to play central role in coping with health issues and influencing health behavior, particularly the health of African-Americans [Taylor et al., 2007]. For exploratory purposes, we evaluated the relationships between both RS attitudes and practices and general and cancer-specific psychological distress. An increased understanding of the roles of RS factors associated with distress would be helpful in designing interventions to minimize distress and promote healthy behaviors in individuals coping with familial cancer risk or the actual disease. Strategies that target individuals who are most psychologically vulnerable would be particularly effective. Thus, we assessed clinical, psychosocial, and demographic factors associated with distress in members of high-risk cancer families.

MATERIALS AND METHODS

Participants

This cross-sectional analysis included 99 female and male participants age 18 years and older who were members of a high-risk, African-American (Creole) kindred that was previously identified with the *BRCA1* M1775R mutation during a genetic linkage study and a subsequent gene isolation study [Miki et al., 1994]. Carrier status was not revealed as part of the original linkage study, as the testing was done in a research laboratory prior to identification of the *BRCA1* gene. None of the participants had previous genetic counseling or testing. The analyses presented here include males and females without a personal history of invasive cancer who completed a telephone or in-person interview prior to genetic counseling and testing.

Procedures

The study was approved by the Institutional Review Boards at the University of Utah and at Louisiana State University.

Eligibility criteria, recruitment procedures, and the research protocol have been described in detail elsewhere [Kinney et al., 2005, 2006], and are summarized here. One hundred and sixty kindred members expressed initial interest to participate in the study; of those 105 (65%) completed the baseline interview. Baseline-structured computer-assisted personal and telephone interviews were conducted by trained study staff between July 2001 and June 2003.

Measures

Demographic and clinical variables—Demographic data included age, sex, race/ethnicity, marital status, and educational level. Clinical data included family history of a first-degree relative with breast and ovarian cancer and self-reported health status (excellent, very good, good, fair/poor).

Cognitive variables—Primary appraisal was assessed with two questions. One item assessed an individual's perception of their risk of having a deleterious mutation: "How likely is it that you have an altered *BRCA1* gene (very unlikely, unlikely, moderate chance, likely, or very likely)?" Another item asked "How likely is it that your relatives will develop cancer (very unlikely, unlikely, moderate chance, likely, very likely)?" Secondary appraisals were also assessed with two items. The first item, operationalized as perceived control, asked participants to respond to the following statement: "No matter what I do there is a good chance that I'll develop cancer (strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree)." The second item assessed perceived coping self-efficacy related to genetic risk notification: "I am confident that I can cope with the possibility that I carry an altered gene for breast or ovarian cancer (strongly disagree, disagree, neither agree nor disagree, agree, or strongly disagree)."

Religious/spiritual variables—Several single-item measures were used that reflect the diverse aspects of RS, are amenable to administration in a computerized survey, and have been used in general population samples. The standard question, "What is your religious preference?" was used to categorize respondents as Catholic, Non-Catholic, or not religious. Two items were used to assess frequency of RS behaviors or practices: (1) Frequency of church or other place of worship attendance was coded into four ordinal categories: never, less than once a month, two to three times a month, and once a week or more and (2) Frequency of prayer was coded into four ordinal categories: never/a little of the time, some of the time, most of the time, or always. Several questions were used to assess strength and importance of RS: "How strong would you say your religious or spiritual faith is?" (very strong, somewhat strong, not very strong, or not at all strong); "How important is your spiritual or religious faith?" (not very important, somewhat important, important, or very important); and "How important are your religious beliefs in helping you cope with stressful situations?"(not very important, somewhat important, important, or very important).

Religious problem solving—Three styles of problem-solving and religious coping were assessed by the Religious Problem-Solving Scales. These styles are consistent with religious attribution theory, have been uniquely associated with religiosity, and assess two dimensions underlying the problem solving coping styles: locus of responsibility and level of activity [Pargament et al., 1988]. The factor-validated Brief Religious Problem Solving Scale was used [Fox et al., 1998]. This measure consists of 18 items and three validated scales; the collaborative subscale (i.e., an active personal exchange with God), the self-directing style subscale (i.e., reliance upon personal rather than religious resources to resolve problems and emphasis upon the freedom God gives people to direct their own lives), and the deferring subscale (i.e., individuals who wait for God to provide solutions). Subscale scores range from 6 to 30 and each item is scored on a 5-point response scale ranging from "never" to "always." For the present sample, the Cronbach alpha coefficients measuring internal consistency reliability were 0.92 (collaborative), 0.86 (self-directing), and 0.90 (deferring).

Psychological distress—General and cancer-specific measures of affect were used. Depressive symptoms were measured with the Center for Epidemiological Studies Depression Scale ($\alpha = 0.89$) (CESD) [Radloff, 1977].

Cancer worry—The Cancer Worry Scale includes three items, one measuring the frequency of worrying about "getting cancer some day," and two items measuring the impact of worry about getting cancer on mood and performing daily activities ($\alpha = 0.62$) [Lerman et al., 1991].

Analysis Plan

Descriptive statistics including means and standard deviations for continuous data, and frequencies for categorical data were calculated. In addition, Spearman correlation coefficients were used to assess the bivariate relationships among demographic, psychological, RS, and distress measures. We explored the possibility that gender and risk perceptions moderated the effect of RS indicators on distress outcomes. This was done in separate linear regression models by including the main effects of each RS variable and gender or perceived personal risk along with the relevant interaction term. Cronbach's alpha was used to assess the reliability of the multiple item scales. *P*-values <0.05 were considered statistically significant.

RESULTS

Demographic and psychosocial characteristics of the study population are shown in Table I. Descriptive data for RS factors are delineated in Table II. All participants self-identified as African-American were with a mean age of 40 years (SD = 14.2). The majority were female (55%), educated beyond the high school level (61%), married or living as married (56%), and reported an annual household income of >$30,000 (61%). The vast majority of respondents were affiliated with a religion (98%) and most identified themselves as Catholic (63%). The vast majority of participants attended a place of worship (88%) and approximately two-thirds attended a church or place of worship at least weekly. Most participants rated their religious or spiritual faith as important or very important (80%). Furthermore, 80% of participants reported that they prayed most of the time or always and all participants stated that their RS beliefs were somewhat to very important in helping them cope with stressful situations. Use of the collaborative religious coping style was higher than for the deferring and self-directing styles.

As can be seen from Table III, having a first-degree relative with breast or ovarian cancer was positively associated with the collaborative religious coping style and frequency of prayer. There were no other significant Spearman or partial correlations between demographic and psychological variables and religious coping scores (Tables III and IV). The self-directing subscale scores were negatively correlated with measures of RS (Table V). Both the deferring and collaborating styles were positively correlated with RS measures; however these styles were related to different dimensions of religion. The collaborative and deferring styles were strongly correlated with each other ($r = 0.78$, $P < 0.001$) and were strongly to moderately negatively correlated with the self-directing style ($r = -0.70$, $P < 0.001$; $r = -0.56$, $P < 0.001$, respectively).

As expected, many of the RS measures were correlated with one another (data not shown) and the self-deferring style was negatively correlated with other RS measures (Table V). Significant correlations were observed between both the collaborative and deferring styles regarding organizational and non-organizational measures of religiosity while negative correlations were observed between the self-directing style and both organizational and non-organizational aspects of RS (Table V). The observed correlations were modest to moderate.

Partial correlations were also conducted to assess the relationships between each of the problem-solving styles and other RS indicators and psychological factors with the effects of the other two variables removed statistically. A different set of results emerged when the

effects of the religious problem solving styles were partialled. Specifically, the collaborative style continued to be positively associated with the other RS variables while associations with the deferring style were no longer significant with the exception of the importance of beliefs in coping with stress. Partial correlation analysis reveals that beliefs in coping with stress are negatively rather than positively related to the deferring style.

With regard to psychological distress, the presence of depressive symptoms was high. Overall 27% of respondents had CESD scores that were clinically significant for depressive symptoms (i.e., CESD score ≥16). Females (33%) were more likely than males (17%) to have clinically significant CESD scores ($P < 0.01$). Overall, mean CESD scores were 11.4 (SD = 10.0). However, CESD scores were significantly higher among females (mean = 13.3, SD = 10.8) than males (mean = 8.0, SD = 7.3; $P = 0.004$). Cancer worry levels were also higher among females (mean = 8.7, SD = 0.28) than in males (mean = 7.4, SD = 0.40; $P = 0.004$). In bivariate and linear regression analyses, none of the RS variables were significantly associated with CESD or cancer worry. We did not observe appreciable gender-specific subgroup differences with regard to the effects of RS on either measure of psychological distress (data not shown). In bivariate analyses, socioeconomic status as measured by household income was inversely related to depressive symptoms; persons reporting an annual household income less than $30,000 per year were more likely to have higher levels of depressive symptoms ($P < 0.001$). Persons reporting that they were married or living as married ($P = 0.03$) had lower levels of depressive symptoms. Perceived personal risk of having a deleterious *BRCA1* mutation was significantly associated with depressive symptoms ($P = 0.03$) and marginally associated with cancer worry ($P = 0.07$). Likewise, self-reported health was inversely associated with both cancer worry ($P = 0.04$) and depressive symptoms ($P = 0.03$).

DISCUSSION

Our study describes select RS factors and examines relations among socio-demographics, appraisals, RS indicators, and psychological distress in members of African-American kindred with a *BRCA1* mutation. A stress and coping model was used to guide the selection of variables and guide the analysis. Although the primary aims of the parent study [Kinney et al., 2005, 2006] were not concerned with the role of RS on decision-making and psychological adjustment, RS measures were included since RS both appears important to many people, particularly African-Americans, and has been previously shown to affect health-related decisions and outcomes [Mills, 2002; Gibson and Hendricks, 2006].

The findings of this study impart several distinct points. First, as predicted, we observed high levels of RS among our participants which underscore the importance of RS in the lives of most Americans [Kinney et al., 2003; Gibson and Hendricks, 2006; Taylor et al., 2007]. Second, the level of depressive symptoms in our study is higher than that found in primary care samples (e.g., 7.8%) [Stafford et al., 2000] but similar to rates among participants in cancer genetics clinics (27%) [Kash et al., 1992]. As expected, findings indicated that depressive symptoms were more prevalent in women than in men [Stafford et al., 2000], although we did not observe appreciable subgroup differences with regard to the effects of RS on either measure of psychological distress. However, it is noteworthy that prior studies have demonstrated stronger protective effects for RS on disability and depression in women than for men [Strawbridge et al., 2001].

Third, contrary to our expectations, there was no evidence that the RS indicators studied bolstered one's resiliency to depression or cancer worry. In our sample of men and women at risk for carrying a deleterious mutation, we found null associations between non-organizational and intrinsic measures of RS and psychological distress. We did, however,

observe risk factors for depression in our study including female sex, low socioeconomic status, and increased risk perceptions not being married or living as married. Knowledge of factors that increase the risk of depression or ineffective coping with genetic information or experiences of being part of a HBOC family may be important to enhance detection of persons who need supportive counseling.

Published data on the relationships between RS, psychological distress, and adjustment to health conditions are contradictory. A relatively large number of published research studies have reported positive associations between RS and health outcomes (including mental health) [Koenig, 2001; George et al., 2002; Moreira-Almeida et al., 2006; Masters and Spielmans, 2007]. Fewer studies have observed null or negative associations between RS and mental health [Moreira-Almeida et al., 2006]. Differences in findings may reflect differences in sampling, measurement of different dimensions of RS, and other design features across studies.

Finally, the data indicate that some kinds of religious problem solving are more common than others and that none of these coping styles were associated with greater or lesser distress. This is in contrast with previous studies that found that RS might be an important coping strategy for individuals with cancer and those at risk for carrying hereditary, cancer-predisposing mutations. A recent study found, however, that high levels of spiritual coping, when coupled with family history, may lead to the perception of lower risk of breast cancer [Quillin et al., 2006]. Schwartz et al. [2000] argued that the decrease in risk perception resultant from RS might negatively influence genetic testing behavior among women with a risk of *BRCA1/2* mutations. We found high levels of RS among study participants, yet we failed to find meaningful relationships between RS and psychosocial variables (e.g., perceived personal risk). The differences observed may reflect differences in the study populations and variables studied.

The results of the study should be interpreted in the context of several limitations and the respective biases introduced. As with related studies, the sampling methodology and RS measures used here hamper our ability to draw clear conclusions from the data. Although convenience samples are often used in clinical genetic research, our use of a convenience sample appreciably limits the generalizability of our study's findings. Second, this study bears the limitations inherent to cross-sectional research. Longitudinal analyses are necessary to determine the role of these factors in helping individuals cope with their own or a family member's genetic or cancer diagnosis and related stressors. Future longitudinal research should aim to ascertain the role that RS factors play in decision-making about genetic testing and cancer prevention strategies.

Another significant methodological issue is that of measurement. The Religious Problem Solving Scale does not directly assess context specific problem solving (e.g., coping with hereditary cancer risk), but instead assesses generalized problem solving strategies. Our null results with regard to this measure may relate to the lack of specificity. Therefore, future research should consider the effects of these styles of problem solving with regard to specific life stresses or situations. Additionally, the scale focuses on the role "God" might play in problem solving to the exclusion of other ways individuals could utilize religious and spiritual resources to cope. For example, individuals might consult their religious leaders, pray to a saint, or meditate. Instruments need to be developed to capture the diversity of religious coping. With the exception of the Religious Problem Solving Scale, RS was assessed with single items rather than validated, multi-item scales. Further, as with the Religious Problem Solving Scale, these RS items were not HBOC-specific.

Future work should provide more in-depth evaluations of the effects of RS on resiliency and adjustment in the context of hereditary cancer risk. To do so, it should incorporate formative research as well as validated multidimensional measures of RS [Stefanek et al., 2005]. Such research should also consider the socio-historical context of the study population and measures specific to the health issue under study [Berry, 2005]. Use of multidimensional scales that measure RS coping with regard to personal and familial hereditary cancer risk in a larger, more carefully crafted sample may yield quite different results regarding associations between RS and distress. It is possible that specific aspects of RS may differentially affect coping responses among subgroups that vary in stress perceptions, efficacy (competence) and risk perceptions, social support, and socioeconomic status. Larger samples than the one in the present study are needed to assess the interactions of these factors and distress outcomes among persons at increased genetic risk. It will be important for future work to employ study designs that can adequately address these issues.

We did not assess perceptions of need for RS resources or the perceived effectiveness of pre-existing RS resources. It is important to note that our study did not include open-ended questions that would increase the depth and breadth of knowledge about how RS factors relate to being a member of a family with a BRCA mutation. Qualitative research in this area may help elucidate context-specific aspects of RS and may improve scales with items that capture the diverse understandings of RS. Such research may also lead to the generation of testable hypotheses derived from novel theoretical perspectives.

In light of the limited amount of research on RS and genetics and the methodological limitations of these few studies, including the present study, there is much work for future researchers to address. Empirically and conceptually sound longitudinal research that focuses on changes in RS factors, RS mechanisms, psychological well-being, and decision making, and uses methodological triangulation to data collection and analysis will further our understanding of the relations between RS and coping with clinical genetic issues.

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References

American Cancer Society. Cancer Facts and Figures-2008. Atlanta, GA: American Cancer Society; 2008.

Berry D. Methodological pitfalls in the study of religiosity and spirituality. West J Nurs Res. 2005; 27:628–647. [PubMed: 16020569]

Braithwaite D, Emery J, Walter F, Prevost AT, Sutton S. Psychological impact of genetic counseling for familial cancer: A systematic review and meta-analysis. Fam Cancer. 2006; 5:61–75. [PubMed: 16528610]

Churchill LR. Religion, spirituality and genetics: Mapping the terrain for research purposes. Am J Med Genet Part C Semin Med Genet. 2009 (in press).

Claus EB, Schildkraut JM, Thompson WD, Risch NJ. The genetic attributable risk of breast and ovarian cancer. Cancer. 1996; 77:2318–2324. [PubMed: 8635102]

Egbert N, Mickley J, Coeling H. A review and application of social scientific measures of religiosity and spirituality: Assessing a missing component in health communication research. Health Commun. 2004; 16:7–27. [PubMed: 14979849]

Exline JJ, Yali AM, Lobel M. When God disappoints: Difficulty forgiving God and its role in negative emotions. J Health Psychol. 1999; 4:365–379. [PubMed: 22021604]

Fox CA, Blanton PW, Morris ML. Religious problem solving styles: Three styles revisited. J Sci Stud Relig. 1998; 37:673–677.

George LK, Ellison CG, Larson DB. Explaining relationships between religious involvement and health. Psychol Inq. 2002; 13:190–200.

Gibson LM, Hendricks CS. Integrative review of spirituality in African American breast cancer survivors. ABNF J. 2006; 17:67–72. [PubMed: 18402346]

Kash KM, Holland JC, Halper MS, Miller DG. Psychological distress and surveillance behaviors of women with a family history of breast cancer. J Natl Cancer Inst. 1992; 84:24–30. [PubMed: 1738170]

Kinney AY, Emery G, Dudley WN, Croyle RT. Screening behaviors among African American women at high risk for breast cancer: Do beliefs about God matter? Oncol Nurs Forum. 2002; 29:835–843. [PubMed: 12058158]

Kinney AY, Bloor LE, Dudley WN, Millikan RC, Marshall e, Martin C, Sandler RS. Roles of religious involvement and social support in the risk of colon cancer among Blacks and Whites. Am J Epidemiol. 2003; 158:1097–1107. [PubMed: 14630606]

Kinney AY, Bloor LE, Mandal D, Simonsen SE, Baty BJ, Holubkov R, Seggar K, Neuhausen S, Smith K. The impact of receiving genetic test results on general and cancer-specific psychologic distress among members of an African-American kindred with a BRCA1 mutation. Cancer. 2005; 104:2508–2516. [PubMed: 16222692]

Kinney AY, Simonsen SE, Baty BJ, Mandal D, Neuhausen SL, Seggar K, Holubkov R, Smith K. Acceptance of genetic testing for hereditary breast ovarian cancer among study enrollees from an African American kindred. Am J Med Genet Part A. 2006; 140A:813–826. [PubMed: 16523520]

Koenig HG. Religion and medicine II: Religion, mental health, and related behaviors. Int J Psychiatry Med. 2001; 31:97–109. [PubMed: 11529395]

Lazarus, RS.; Folkman, S. Stress, appraisal, and coping. New York: Springer Pub. Co; 1984.

Lerman C, Trock B, Rimer BK, Jepson C, Brody D, Boyce A. Psychological side effects of breast cancer screening. Health Psychol. 1991; 10:259–267. [PubMed: 1915212]

Levy-Lahad E, Friedman E. Cancer risks among BRCA1 and BRCA2 mutation carriers. Br J Cancer. 2007; 96:11–15. [PubMed: 17213823]

Lux MP, Fasching PA, Beckmann MW. Hereditary breast and ovarian cancer: Review and future perspectives. J Mol Med. 2006; 84:16–28. [PubMed: 16283147]

Masters KS, Spielmans GI. Prayer and health: Review, meta-analysis, and research agenda. J Behav Med. 2007; 30:329–338. [PubMed: 17487575]

Miki Y, Swensen J, Shattuck-Eidens D, Futreal PA, Harshman K, Tavtigian S, Liu Q, Cochran C, Bennett LM, Ding W, Bell R, Rosenthal J, Hussey C, Tran T, McClure M, Frye C, Hattier T, Phelps R, Haugen-Strano A, Katcher H, Yakumo K, Gholami Z, Shaffer D, stone S, Bayer S, Wray C, Bogden R, Dayananth P, Ward J, Tonin P, Narod S, Bristow PK, Norris FH, Helvering L, Morrison P, Rosteck P, Lai M, Barrett JC, Lewis C, Neuhausen S, Cannon-Albright L, Goldgar D, Wiseman R, Kamb A, Skolnick MH. A strong candidate for the breast and ovarian cancer susceptibility gene BRCA1. Science. 1994; 266:66–71. [PubMed: 7545954]

Mills PJ. Spirituality, religiousness, and health: From research to clinical practice. Ann Behav Med. 2002; 24:1–2. [PubMed: 12061322]

Moreira-Almeida A, Neto FL, Koenig HG. Religiousness and mental health: A review. Rev Bras Psiquiatr. 2006; 28:242–250. [PubMed: 16924349]

Mueller PS, Plevak DJ, Rummans TA. Religious involvement, spirituality, and medicine: Implications for clinical practice. Mayo Clin Proc. 2001; 76:1225–1235. [PubMed: 11761504]

Olfson M, Marcus SC, Druss B, Elinson L, Tanielian T, Pincus HA. National trends in the outpatient treatment of depression. JAMA. 2002; 287:203–209. [PubMed: 11779262]

Pargament KI, Kennell J, Hathaway W, Greven-goed N, Newman J, Jones W. Religion and the problem-solving process: Three styles of coping. J Sci Stud Relig. 1988; 27:90–104.

Pasacreta JV. Psychosocial issues associated with genetic testing for breast and ovarian cancer risk: An integrative review. Cancer Invest. 2003; 21:588–623. [PubMed: 14533449]

Quillin JM, McClish DK, Jones RM, Burruss K, Bodurtha JN. Spiritual coping, family history, and perceived risk for breast cancer—Can we make sense of it? J Genet Couns. 2006; 15:449–460. [PubMed: 17013546]

Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. Appl Psychol Meas. 1977; 1:385–401.

Schwartz MD, Hughes C, Roth J, Main D, Peshkin BN, Isaacs C, Kavanagh C, Lerman C. Spiritual faith and genetic testing decisions among high-risk breast cancer probands. Cancer Epidemiol Biomarkers Prev. 2000; 9:381–385. [PubMed: 10794482]

Sivell S, Iredale R, Gray J, Coles B. Cancer genetic risk assessment for individuals at risk of familial breast cancer. Cochrane Database Syst Rev. 2007:CD003721. [PubMed: 17443529]

Stafford RS, Ausiello JC, Misra B, Saglam D. National patterns of depression treatment in primary care. Primary Care Companion J Clin Psychiatry. 2000; 2:211–216. [PubMed: 15014631]

Stefanek M, McDonald PG, Hess SA. Religion, spirituality and cancer: Current status and methodological challenges. Psy-cho Oncol. 2005; 14:450–463.

Strawbridge WJ, Shema SJ, Cohen RD, Kaplan GA. Religious attendance increases survival by improving and maintaining good health behaviors, mental health, and social relationships. Ann Behav Med. 2001; 23:68–74. [PubMed: 11302358]

Tavtigian SV, Simard J, Rommens J, Couch F, Shattuck-Eidens D, Neuhausen S, Merajver S, Thorlacius S, Offit K, Stoppa-Lyonnet D, Belanger C, Bell R, Berry S, Bogden R, Chen Q, Davis T, Dumont M, Frye C, Hattier T, Jammulapati S, Janecki T, Jiang P, Kehrer R, Leblanc JF, Mitchell JT, rthur-Morrison J, Nguyen K, Peng Y, Samson C, Schroeder M, Snyder SC, Steele L, Stringfellow M, Stroup C, Swedlund B, Swense J, Teng D, Thomas A, Tran T, Tranchant M, Weaver-Feldhaus J, Wong AK, Shizuya H, Eyfjord JE, Cannon-Albright L, Tranchant M, Labrie F, Skolnick MH, Weber B, Kamb A, Goldgar DE. The complete BRCA2 gene and mutations in chromosome 13q-linked kindreds. Nat Genet. 1996; 12:333–337. [PubMed: 8589730]

Taylor RJ, Chatters LM, Jackson JS. Religious and spiritual involvement among older African Americans, Caribbean blacks, and non-Hispanic whites: Findings from the national survey of American life. J Gerontol B Psychol Sci Soc Sci. 2007; 62:S238–S250. [PubMed: 17673537]

Vadaparampil ST, Miree CA, Wilson C, Jacobsen PB. Psychosocial and behavioral impact of genetic counseling and testing. Breast Dis. 2006; 27:97–108. [PubMed: 17917142]

Vernon SW, Gritz ER, Peterson SK, Perz CA, Marani S, Amos CI, Baile WF. Intention to learn results of genetic testing for hereditary colon cancer. Cancer Epidemiol Biomarkers Prev. 1999; 8:353–360. [PubMed: 10207640]

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TABLE I

Sociodemographics and Psychological Characteristics (n = 99)

Variable	Percent or mean (SD)
Sex (female)	65%
Education	
High school or less	39%
Some college or technical school/technical school graduate	43%
College graduate or higher	18%
Marital Status	
Married/living as married	56%
Separated, divorced, widowed, never been married	44%
Household Income (≥$30,000)	61%
First-degree relative with breast or ovarian cancer	44%
Self-reported health status	
Excellent	14%
Very good	36%
Good	31%
Fair/poor	19%
Perceived risk of carrying a deleterious *BRCA1* mutation	
Likely/very likely	24%
Perceived familial cancer risk	
Likely/very likely	52%
Perceived control	
Agree/strongly agree	71%
Perceived coping self-efficacy	
Agree/strongly agree	58%
Mean age, years (SD)	40 (14.2)
Mean CESD score (SD)	11 (9.9)
Mean cancer worry (SD)	8 (2.4)

TABLE II

Religious and Spiritual Characteristics (n = 99)

Variable	Percent or mean (SD)
Attend church (yes)	88%
Church/place of worship attendance per month	
0	12%
1–3	31%
≥4	57%
Denomination (%)	
Catholic	63%
Non-Catholic	35%
Not religious	2%
How important is your spiritual or religious faith (very important/important)	80%
How frequently do you pray (most of the time/always)	78%
Religious problem solving styles	
Collaborative	23.0 (5.7)
Self-directing	12.9 (5.1)
Deferring	19.8 (6.3)

TABLE III

Spearman Correlations of Demographic and Psychological Factors With Religious/Spiritual Measures

	Frequency of church attendance	Importance of faith	Frequency of prayer	Importance of beliefs in coping with stress	Collaborative coping score	Self-directing coping score	Deferring coping score
Age	0.0236	−0.2568[a]	0.1747	0.1734	0.0868	−0.0929	0.1229
Gender	−0.0795	0.0260	−0.1165	−0.0447	−0.1275	0.1090	−0.1330
Marital status	0.0761	−0.0985	−0.0886	0.0872	0.0130	−0.1156	−0.0446
Income	0.1355	0.0194	0.0004	0.0206	0.0190	−0.1328	−0.0618
Education	0.0539	0.1428	−0.1611	−0.0424	−0.0181	−0.1560	−0.1366
First degree relative with breast/ovarian cancer	0.0188	0.0540	0.2082[a]	0.0693	0.2120[a]	−0.0678	0.1201
Self-reported health status	−0.463	−0.0083	−0.0322	−0.0052	−0.0438	−0.0766	−0.1093
Perceived personal risk of *BRCA1*	0.0000	−0.0185	0.0419	0.1010	0.1646	−0.0723	0.1444
Perceived familial cancer risk	−0.0944	−0.0272	0.0133	0.0412	0.0664	−0.1137	0.0354
Perceived control	−0.0824	0.1478	0.0429	−0.0079	0.0399	0.0426	0.0698
Perceived coping self-efficacy	−0.0190	−0.0017	−0.0342	−0.0305	−0.0461	−0.0682	−0.0411
Cancer worry	−0.1305	−0.0010	−0.0410	−0.0025	0.0432	0.0361	0.1505
CESD Score	−0.0794	0.0870	0.0495	0.0840	−0.1107	0.1637	−0.0597

[a] $P < 0.05$.

TABLE IV

Spearman Correlations of Religious Coping Style with Cognitive and Distress Measures and Partial Correlations of each Coping Style with Psychological Factors with Effects of the Other Two Coping Styles Partialled Out

	Deferring		Collaborative		Self-directing	
	Spearman	**Partial**	**Spearman**	**Partial**	**Spearman**	**Partial**
Perceived personal risk *BRCA1*	0.1444	−0.0049	0.1646	0.1252	−0.0723	0.0739
Perceived familial risk	0.0354	−0.0320	0.0664	−0.0002	−0.1137	−0.1150
Perceived control	0.0698	0.0553	0.0399	0.0306	0.0426	0.0662
Perceived coping self-efficacy	−0.0411	0.0304	−0.0461	−0.1573	−0.0682	−0.1902
Cancer worry	0.1505	0.1954	0.0432	−0.0768	0.0361	0.1025
CESD score	−0.0597	0.0345	−0.1107	0.0239	0.1637	0.1381

$P < 0.05$.

$P < 0.01$.

$P < 0.001$.

TABLE V

Spearman Correlations of Religious Coping Styles with Religious/Spiritual Measures, and Partial Correlations of Each Coping Style with Effects of Other Two Coping Styles Partialled Out

	Deferring		Collaborative		Self-directing	
	Spearman	**Partial**	**Spearman**	**Partial**	**Spearman**	**Partial**
Frequency of church attendance	0.2279[b]	−0.2020	0.2477[a]	0.2102[a]	−0.1393	0.0724
Frequency of prayer	0.4082[c]	−0.0604	0.5142[c]	0.3536[c]	−0.3601[c]	−0.0294
Importance of beliefs in coping with stress	0.4250[b]	−0.2061[a]	0.6051[c]	0.4711[c]	−0.5288[c]	−0.1900
Importance of faith	0.4398[b]	−0.0052	0.4990[c]	0.2922[b]	−0.4247[c]	−0.1023

[a] $P < 0.05$.

[b] $P < 0.01$.

[c] $P < 0.001$.