Spirituality, Breast Cancer Beliefs and Mammography Utilization among Urban African American Women

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Abstract

Spirituality has been shown to be associated with health, and is an important component in the lives of many African Americans. Recent research proposes that spirituality is a multidimensional construct. The present study proposes a two-dimensional model in which spirituality encompasses a belief and behavioral dimension. This hypothesis was examined, as were relationships between these dimensions and spiritual health locus of control, breast cancer beliefs and mammography utilization among African American women. The belief dimension played a more important role in adaptive breast cancer beliefs and mammography utilization that did the behavioral dimension. These findings suggest the importance of spiritual belief systems for health, and implications for spiritual cancer communication interventions are discussed.

Keywords

breast cancer, health locus of control, religiosity, spirituality

THE ASSOCIATION between spirituality and health has become the focus of recent interest in both lay and research communities. Spirituality plays an important role in the lives of African Americans as a whole (Taylor & Chatters, 1986). African Americans, especially those who are older and women, have been found to be more religious than other groups (Ferraro & Koch, 1994; Levin & Taylor, 1993, 1997; Levin, Taylor, & Chatters, 1994; Taylor, Chatters, Jayakody, & Levin, 1996). The present study uses the term spirituality rather than religiosity (except when summarizing the work of others who use the term religiosity). Religion refers to 'an organized system of beliefs, practices, rituals, and symbols', while spirituality refers to 'one's transcendent relationship to some form of higher power' (Thoresen, 1998, p. 415). Religiosity may be seen as a component of spirituality, as spirituality refers to a broader construct than religiosity.

The relationship between spirituality and health is not clear. While most studies find a salutary effect of spirituality on health, there has been a debate in the literature as to whether spirituality has a positive, negative or no relationship with health. In a review of the literature, Payne and colleagues concluded that religiosity is associated with lower rates of both alcohol and drug abuse (Payne, Bergin, Bielema, & Jenkins, 1991). Church-based health interventions and programs have shown promise for promoting the health of African Americans. An example is the Witness Program® (Erwin, Spatz, Stotts, Hollenberg, & Deloney, 1996) in which 'female African American breast cancer survivors teach their peers' about breast cancer early detection through telling their stories. Other church-based health interventions have targeted hypertension (Department of Health and Human Services, 1987; Smith, 1992; Smith, Merritt, & Patel, 1997), cardiovascular disease (Flack & Wiist, 1991; Oexmann, Thomas, Taylor, O'Neill, Garvey, Lackland, & Egan, 2000; Yanek, Becker, Moy, Gittelsoh, & Koffman, 2001), weight loss (McNabb, Cook, Quinn, Karrison, & Kerber, 1997) and smoking cessation (Schorling, Roach, Siegel, Baturka, Hunt, Guterbock, & Stewart, 1997; Vorhees, Stillman, Swank, Heagerty, Levine, & Becker, 1996) in African American populations.

In a sample of elderly individuals with cancer, intrinsic religiosity (living through religious beliefs and being religious for this sake) was positively associated with hope, spiritual well-being and positive mood states, and negatively associated with depression (Fehring, Miller, & Shaw, 1997). Among primary care patients, those high and moderate in intrinsic spirituality were found to have significantly better health than those low in intrinsic spirituality (McBride, Arthur, Brooks, & Pilkington, 1998). In a work-site sample, spiritual health and the performance of health-related behaviors was examined, revealing a significant positive relationship of moderate magnitude (Waite, Hawks, & Gast, 1999).

However, some studies report a negative association between spirituality and health. For example, among a sample of mainly female Caucasian elderly individuals in a geriatric assessment clinic, religiosity was inversely related to health (Koenig, Moberg, & Kvale, 1988). In addition, intrinsic religiosity and non-organized religious activities such as prayer, reading the Bible and watching religious television or radio were associated with poorer health. A study of 193 multi-ethnic adults from a community center in Los Angeles, found that African Americans were significantly more likely to believe that 'prayer can cure disease' than were members of other ethnic groups, and that those embracing this belief were less likely to exercise regularly and to be actively involved in their health care (Klonoff & Landrine, 1996). Others report no association between spirituality and health. In one study, religiosity (measured using church attendance) was not associated with health (Schmied & Jost, 1994). In a 14-year longitudinal study, neither religious affiliation, service attendance, nor the importance of being a religious person, were related to self-rated health or functional health (Atchley, 1997).

Still other studies present both a positive and negative association between spirituality and health. After controlling for relevant covariates, one study found that conservative religious affiliation was significantly associated with poorer health (Ferraro & Albrecht-Jensen, 1991), but level of religious practice (prayer and service attendance) was positively associated with health status. The practice effect was

stronger than that of affiliation. The authors concluded that religiosity has both positive and negative effects on health, depending on the particular dimension of religiosity. Levin, Chatters and Taylor (1995) report that, among African Americans, organized religion (e.g. attending services) is associated with better health and non-organized religion (e.g. reading religious materials) is associated with poorer health.

The multidimensional nature of spirituality

It has been suggested that spirituality is a multidimensional construct, which may in part account for these mixed findings. Spirituality may have a component that is positively associated with health and one that is negatively associated with health. In a review of religiosity measurement among older African Americans, it is recommended that religiosity be conceptualized as a three-dimensional construct: organizational (e.g. service attendance), non-organizational (e.g. watching religious television) and subjective (e.g. beliefs) (Chatters, Taylor, & Lincoln, 2001). Others suggest that religiosity may be thought of as involving behaviors (e.g. church attendance), rituals (e.g. baptism) and outward or public components, while spirituality involves private beliefs (Richards & Bergin, 1997). Intrinsic and extrinsic religiosity (Allport & Ross, 1967) comprise another multidimensional model. Intrinsically religious individuals live through their beliefs, and are religious for this sake. Extrinsically religious individuals are religious for external reasons or gain (e.g. status, security).

Spiritual health locus of control

A similar line of research is emerging with the development of the spiritual health locus of control construct (Holt, Clark, Kreuter, & Rubio, in press). This work developed out of theory on multidimensional health locus of control (Wallston, Wallston, & DeVellis, 1978) whereby control over health may be viewed as being held by the self (internal), or factors outside of the self such as chance or powerful others (chance-external; powerful others-external, respectively). Qualitative work with African American women revealed that spirituality was a significant dimension of health locus of control beliefs that was being overlooked by existing multidimensional health locus of control instruments. Spiritual health locus of control is characterized as a two-dimensional construct. The 'active' dimension is characterized by the belief that a higher spiritual being (e.g. God) empowers the individual to engage in preventive and health-related behaviors. The 'passive' dimension is characterized by the belief that the individual is powerless because health is determined by the higher spiritual being. The two-dimensional nature of this construct was empirically supported by Holt and colleagues (in press). However, it is possible for individuals to hold high or low levels of each dimension. For example, an individual may feel empowered by God to care for their health but also rely on God to give them strength in times of illness or to heal them when medical treatment can go no further (Holt, in press).

The present study

The present study explores a two-dimensional model of spirituality in a sample of African American women. The belief dimension involves spiritual beliefs and non-observable activities (e.g. feeling a close relationship with God; prayer). The behavioral dimension is characterized by observable spiritual behaviors and can involve material from outside sources (e.g. reading religious materials; attending services). The present study examined these dimensions and how they relate to the dimensions of active and passive spiritual health locus of control beliefs. Finally, it examined the association between the dimensions of spirituality and knowledge of mammography, breast cancer and breast cancer treatment, and mammography utilization. Because this model of spirituality is novel and because such a model has not been explored in relation to these variables, no a priori hypotheses were generated. However, by better understanding how spirituality is associated with health beliefs and behavior among African American women, we can refine our strategies of communicating with them in order to reduce health disparities.

Method

Participants

Participants were recruited by African American women research assistants, from 10 public health centers in the City of St Louis. Criteria for participation included that the woman was between the ages of 18 to 65, was able to read material written at the fifth-grade level, had not been diagnosed with breast cancer and had daily access to a working telephone (for follow-up telephone interviews used in the larger study). The present study examined baseline data from a larger study that is examining the effectiveness of tailored women's health magazines ('Reflections of You') attempting to increase mammography and fruit and vegetable consumption among African American women (Kreuter, Skinner, Haire-Joshu, & Clark, 1998).

A total of 1227 women were recruited for participation. Participants ranged in age from 18 to 65, with a mean age of 35.57 years (SD = 11.56). The mean years of education was 12.26 (SD = 1.85) and ranged from two to 20 years. Sixty-one point six percent (N = 756) of the women were single, 16.5 percent (N = 202) were married, 15.1 percent (N = 185) were separated or divorced and 3.6 percent (N = 44) were widowed (3.3%; N = 40 were missing data). Forty-five point five percent (N = 558) reported that they were employed full time, 15.6 percent (N = 191) worked part time and 37.2 percent (N = 456) were not employed at the time of enrollment (1.8%; N = 22 were missing data). The median household income before taxes was in the $10,001–20,000 bracket, ranging from less than $5,000 to more than $60,000 per year (1.5 percent in this highest bracket). Most (74.2%, N = 911) reported belonging to a Christian religion (e.g. Baptist, Methodist), though 0.9 per cent (N = 11) were Muslim, 1.7 percent (N = 21) were Jehovah's Witness, 9.4 percent (N = 115) reported another (unspecified) affiliation and 11.8 percent (N = 145) reported not belonging to a religious group (2.0%; N = 24 were missing data).

Measures

Participants completed a questionnaire including measures of spirituality, spiritual health locus of control, knowledge about mammography, breast cancer and breast cancer treatment, and mammography utilization.

Spirituality The development and validation of the spirituality scale is discussed elsewhere (Lukwago, Kreuter, Buchotz, Holt, & Clark, 2001). Eight of the items were measured in four-point Likert-type response format (strongly agree, agree, disagree, strongly disagree). Two additional items were included for the present study (religious service attendance: 0, 1–3, or 4+ times per month; and religious activity participation: 0, 1–3, 4+ times per month). In previous pilot testing among a group of women demographically similar to the present study, the nine-item scale (scores ranging from 9–36) was found to have high internal consistency, α = .88, and test–retest reliability, r = .89, p < .001. Originally, the spirituality scale contained an item reading 'I rely on God to keep me in good health'. However for the present analysis, this item was excluded from the spirituality scale, and retained in the passive spiritual health locus of control scale, the instrument for which it was originally developed.

Spiritual health locus of control The belief that a higher power (e.g. God) is in control of one's health outcomes was assessed using four items (e.g. 'I rely on God to keep me in good health'), each measured in the same four-point Likert-type format. The development and validation of this instrument is described in detail elsewhere (Holt et al., in press). In brief, a LISREL measurement model for these constructs fit the data, suggesting adequate reliability and validity with this population (Holt et al., in press). These beliefs are characterized by an active and a passive dimension, each of which was measured using two of these items.

Mammography knowledge Four items assessed perceptions of what mammograms can do. For example, one item asked whether participants thought that having a mammogram could reduce their risk of dying from breast cancer. These items were measured in yes/no/not sure response format and correct responses were summed to form an index of mammography knowledge, ranging from 0–4. Test–retest reliability for this scale was acceptable, r = .58, p < .01.

Breast cancer knowledge Six items assessed knowledge about breast cancer. For example, one item assessed whether the participant knew if most lumps turn out to be breast cancer. These items were measured in yes/no/not sure response format and correct responses were summed to form an index of breast cancer knowledge, ranging from 0–6. Test–retest reliability for these items was acceptable, $r = .63$, $p < .01$. This test–retest reliability does not include one of the items added to the questionnaire after the completion of pilot testing, and thus no test–retest reliability data were available.

Breast cancer treatment knowledge Three items assessed knowledge of breast cancer treatment. For example, one item assed whether or not the participant knew if breast cancer has a good chance of being cured if found early. These items were measured in yes/no/not sure response format and correct responses were summed to form an index of breast cancer treatment knowledge, ranging from 0–3. Test–retest reliability for these items was acceptable, $r = .45$, $p < .01$.

Mammography utilization Mammography utilization was assessed using a single item asking when the participant had her last mammogram, coded as whether the participant had ever had a mammogram, versus never having had one. Test–retest reliability for this item was adequate, $r_s = .72$, $p < .001$.

Procedure

Participants were recruited from patient waiting rooms of 10 urban public health centers in the City of St Louis. If they met eligibility criteria and gave informed consent to participate, they completed a baseline questionnaire that took 15 to 30 minutes to complete. Participants received a $20.00 check for their participation.

Results

Factor structure of the spirituality scale

The principal components analysis suggested a two-factor solution for the spirituality scale (see Table 1). Items relating to observable behaviors made up the behavioral dimension (e.g. talking about faith with others, reading religious materials, watching religious programs, attending services). Items relating to beliefs or private activities made up the belief dimension (e.g. feeling presence of God, having a relationship with God, prayer). These two factors accounted for 61.42 percent of the variance in the scale (47.57% belief; 13.84% behavioral). The five-item belief and five-item behavioral subscales were also found to be internally consistent ($\alpha = .85$, $\alpha = .79$, respectively). Because the item 'My spiritual beliefs are the foundation of my whole approach to life' loaded nearly equally on both factors, this item was eliminated from the remainder of the analyses.

Spirituality, spiritual health locus of control and demographic characteristics

To determine the relationships between the dimensions of spirituality, spiritual health locus of control and demographic characteristics (age, education, income) Pearson Product-Moment Correlations were calculated. Correlations between these variables are shown in Table 2. The belief dimension was more strongly associated with passive spiritual health locus of control than the behavioral dimension. The behavioral dimension was more strongly correlated with passive than active spiritual health locus of control ($r = .26$, $r = .20$, respectively). Although all four dimensions were significantly and positively correlated with each other the strongest association (besides the correlations between active and passive spiritual health locus of control, and belief and behavioral dimensions of spirituality) was found between the belief dimension of spirituality and passive spiritual health locus of control, which shared 14 percent of their variance.

Spiritual orientation

Through use of the median split, individuals were characterized as high or low on the belief and behavioral spirituality dimensions, and these two splits were used to characterize individuals according to their spiritual orientation (see Fig. 1). This was done much as Wallston and Wallston (1981) did with their Multidimensional Health Locus of Control scale (Wallston et al., 1978), using median splits. This yielded four spiritual orientations: belief-only,

Table 1. Principal components analysis of spirituality scale

Item	*Belief factor loading*	*Behavioral factor loading*
My spiritual beliefs are the foundation of my whole approach to life[a]	.467	.455
I am often aware of the presence of God in my life	.839	–.057
I have a personal relationship with God	.857	–.009
When I am ill, I pray for healing	.818	–.022
I pray often	.764	.052
I talk openly about my faith with others	.354	.447
I often read religious books, magazines or pamphlets	.244	.658
I often watch or listen to religious programs on TV or radio	.230	.586
About how many times a month do you usually attend religious services?	–.091	.806
Besides attending services, about how many times a month do you take part in other religious activities?	–.181	.875

[a] This item was removed from subsequent analyses because it did not load differentially onto either factor

Table 2. Correlations between dimensions of spirituality, spiritual health locus of control and demographic characteristics

	Spiritual behaviors	*Active spiritual locus*	*Passive spiritual locus*	*Age*	*Education*	*Income*
Spiritual beliefs	.53***	.20***	.37***	.15***	.06*	.07*
Spiritual behaviors	1.00	.20***	.26***	.26***	.12***	.04
Active spiritual health locus		1.00	.55***	–.05	–.08**	–.14***
Passive spiritual health locus			1.00	–.02	–.05	–.12***
Age				1.00	.09***	.10***
Education					1.00	.35***
Income						1.00

*** $p < .001$, ** $p < .01$, * $p < .05$

behavior-only, high spiritual or low spiritual (see Fig. 1). We suggest that belief-only individuals hold spiritual beliefs but do not partake in religious activities such as service attendance. Individuals classified as behavior-only partake in the activities but do not strongly endorse the spiritual beliefs. This procedure yielded 392 (31.9%) individuals who we term 'high spiritual' (high on both belief and behavioral), 145 (11.8%) who were high on belief-only, 141 (11.5%) who were high on behavioral-only and 448 (36.5%) individuals who we termed 'low spiritual' (low on both belief and behavioral dimensions). The remainder were missing data on one or both of the spirituality dimensions. This sample had slightly more individuals who were classified as belief-only than were behavior-only.

Spiritual health locus of control orientation

The same median split method was used to determine spiritual health locus of control orientation for each individual. This analysis yielded 384 (31.3%) individuals classified as both active and passive, 209 (17.0%) as active-only, 174 (14.2%) as passive-only and 393 (32.0%) individuals as neither active nor passive (the remainder were missing data on one or both of the spiritual health locus of control dimensions). This sample had more individuals who were classified as active-only than were passive-only.

Spiritual and spiritual health locus of control orientations

The Chi^2 statistic examining the distributions of

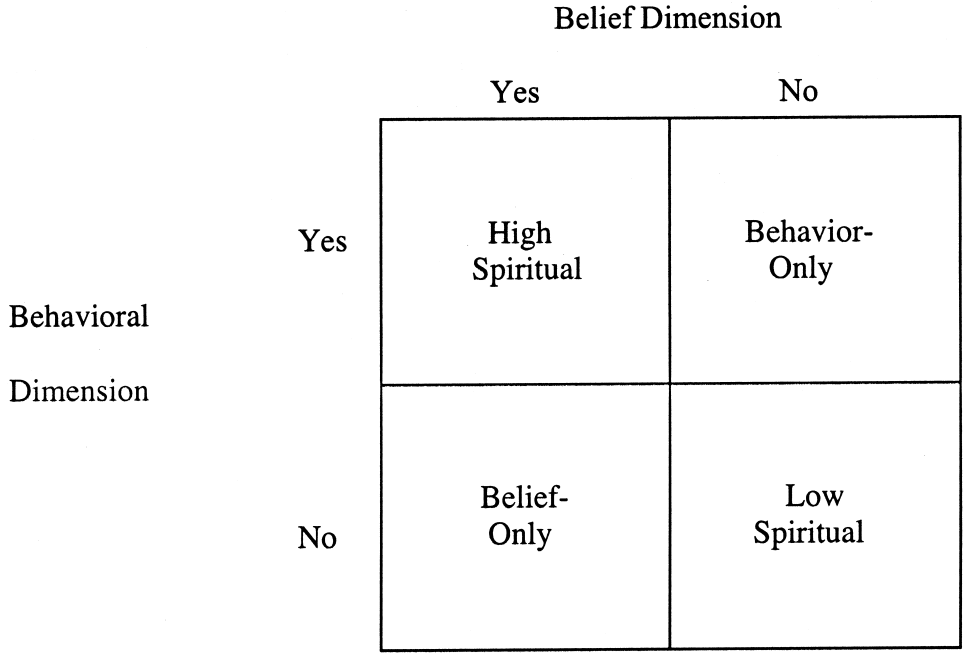

Figure 1. Spiritual orientations.

spiritual and spiritual health locus of control orientation was significant, χ^2 (9, N = 1072) = 103.42, $p < .001$ (see Table 3). There were more individuals who were classified as both belief-only and passive (2.7%) than behavior-only and passive (1.2%). There were more individuals classified as both active and passive, who were also classified as belief-only (4.9%) than were also behavior-only (3.8%). Most individuals were either both active + passive and belief + behavioral, or low on all four dimensions.

Spiritual orientation and breast cancer-related outcomes

While the data could have been kept in continuous form and analyzed using regression, it would have been more difficult to interpret the results in this fashion, to determine how the four spiritual orientations related to breast cancer beliefs and mammography. In fact, when analyzed continuously using regression, the association between spiritual orientation (belief and behavioral dimensions and their interaction

Table 3. Frequencies and percentages from Chi^2 analysis of spiritual orientation and spiritual health locus of control orientations

	Low spiritual	*Belief-only*	*Behavior-only*	*High spiritual*	*Total*
Active + Passive	89 (8.3%)	52 (4.9%)	41 (3.8%)	174 (16.2%)	356
Passive	54 (5.0%)	29 (2.7%)	13 (1.2%)	67 (6.3%)	163
Active	96 (9.0%)	26 (2.4%)	34 (3.2%)	41 (3.8%)	197
Neither	192 (17.9%)	30 (2.8%)	47 (4.4%)	87 (8.1%)	356
Total	431	137	135	369	1072

entered into a hierarchical regression after controlling for age, education and income) and these variables was not significant. This is most likely due to the fact that there was little variability in responses to the spirituality dimensions (the distributions were heavily negatively skewed).

Because of this violation of the assumption of normality, the independent variables were dichotomized and MANCOVA was used for the analysis. This also facilitated the analysis of the spiritual orientations. Wallston and Wallston (1981) formed health locus of control orientations in this manner by examining high and low scores (formed by median split) on multiple health locus of control dimensions to find an individual's dominant orientation(s).

The MANCOVA examining the spiritual orientation main effect on mammography, breast cancer and breast cancer treatment knowledge, controlling for age, education and income, was significant, Wilks Lambda F (9, 2443.62) = 2.92, $p < .01$. The univariate effect of spiritual orientation for mammography knowledge was significant, F (3, 1006) = 3.69, $p = .01$ (see Table 4). The effect for breast cancer knowledge was not significant ($p = .79$), but the effect for breast cancer treatment knowledge was significant, F (3, 1006) = 4.02, $p < .01$. Table 4 displays the means for the main effect of spiritual orientation.

Pairwise comparisons revealed that for mammography knowledge, both individuals classified as high spiritual and belief-only scored higher than low spiritual, $p < .01$, $p < .05$, respectively and high spiritual individuals had marginally higher knowledge scores than those classified as behavior-only, $p = .06$. The effect of spiritual orientation on breast cancer knowledge was not significant. For breast cancer treatment knowledge, those classified as belief-only had higher knowledge scores than those who were

Table 4. Spiritual orientation MANCOVA for breast cancer-related knowledge

		F		
Source	*d.f.*	*Mammography knowledge*	*Breast cancer knowledge*	*Treatment knowledge*
Age	1	43.78***	15.30***	23.41***
Education	1	16.57***	17.99***	9.21**
Income	1	15.60***	24.19***	21.49***
Spiritual orientation	3	3.69**	0.34	4.02**
Error	1006	(1.18)	(2.31)	(0.83)

Values enclosed in parentheses represent mean square errors
Spiritual orientation main effect means are shown in Table 5
Notes: *** $p < .001$, ** $p < .01$, * $p < .05$

Table 5. Means and standard deviations for the main effect of spiritual orientation on breast cancer-related knowledge

	Spiritual orientation			
Area of knowledge	*Low spiritual*	*Behavioral-only*	*Belief-only*	*High spiritual*
Mammography				
M	2.21	2.30	2.46	2.63
SD	1.14	1.21	1.23	1.08
Breast cancer				
M	2.92	2.95	3.05	3.04
SD	1.54	1.63	1.66	1.58
Breast cancer treatment				
M	1.50	1.64	1.84	1.70
SD	0.94	0.97	0.96	0.94

Note: Means and standard deviations from MANCOVA model controlling for age, education and income

low spiritual, behavior-only (marginal), or high spiritual, $p < .001$, $p = .07$, $p < .05$, respectively. Table 5 displays the means for the main effect of spiritual orientation.

To determine relationships between spiritual orientation and mammography utilization, logistic regression was used, also controlling for the demographic characteristics. The hierarchical logistic regression suggested that mammography utilization was significantly associated with age and education, but not income, and thus income was taken out of the model. A model with spiritual orientation controlling for age and education significantly predicted ever having had a mammogram, –2 log likelihood = 310.98, $\chi^2 = 50.86$, $p < .001$ (see Table 6). Those classified as belief-only were marginally more likely to have ever had a mammogram than those who were classified as low spiritual, $p = .06$.

In an additional attempt to examine the skewed data, a transformation was conducted, in which the items comprising the behavioral and belief dimensions of spirituality were transformed into standardized scores, and the cross product of those scores used for the interaction term in a linear regression model (again controlling for age, education and income). The results suggested that for mammography knowledge, the model was significant ($p < .001$), and that the belief dimension was positively associated with this outcome ($\beta = .04$, SE $\beta = .013$, β/SE $\beta = 3.08$, $p < .01$). Neither the behavioral dimension nor the interaction was significant. For breast cancer knowledge, the model was significant ($p < .001$), however neither of the spiritual dimensions nor the interaction were significant. For breast cancer treatment knowledge, the model was significant ($p < .001$), and the belief dimension was marginally associated with this outcome ($\beta = .02$, SE $\beta = .011$, β/SE $= 1.82$, $p = .066$). Finally, for ever having had a mammogram, the logistic regression model was significant ($p < .001$). Again the belief dimension was significant, $\beta = .15$, βSE $= .06$, β/SE $\beta = 2.50$, $p = .001$, OR = 1.16 (95%CI = 1.03–1.30). Neither the behavioral dimension nor the interaction were significant.

Discussion

The results of the present study support a two-dimensional model of spirituality made up of belief and behavioral dimensions. Both dimensions of spirituality increased with age in the present sample of African American women.

Spirituality and spiritual health locus of control

Both the correlations and the Chi^2 analysis of the classification using the 2×2 dimensions of spirituality and of spiritual health locus of control suggested that the spiritual belief and behavioral dimensions are more closely associated with passive spiritual health locus of control than with active spiritual health locus of control. The Chi^2 analysis indicated that individuals tended to be either high on both active/passive spiritual health locus of control and belief/behavioral spirituality dimensions or low on both of these sets of dimensions. This is logical because individuals who are spiritual are more likely to report strong spiritual health locus of control beliefs, and those who are not spiritual do not endorse these beliefs.

Table 6. Hierarchical logistic regression for mammography utilization

Variable	*β*	*SE β*	*β/SE*	*OR*	*95%CI for OR*
Step 1					
Age***	.17	.03	5.67	1.18	(1.11–1.26)
Education*	.18	.07	2.57	1.20	(1.04–1.38)
Step 2					
Age***	.17	.03	5.67	1.19	(1.11–1.27)
Education*	.15	.08	1.88	1.16	(1.00–1.35)
Spiritual orientation^ (reference category is low spiritual)					
vs. Behavioral-only	–.27	.42	.64	.77	(.33–1.75)
vs. Belief-only^	1.23	.66	1.86	3.42	(.94–12.43)
vs. High spiritual	.47	.32	1.47	1.61	(.85–3.03)
Constant	–8.59	1.80	4.77		

*** $p < .001$, ** $p < .01$, * $p < .05$, ^ $p < .10$

Spirituality and breast cancer-related knowledge and mammography

For mammography knowledge, individuals classified as both belief and behavioral (high spiritual) as well as those classified as belief-only scored significantly higher than those who were low on both dimensions (low spiritual). In addition, those who were high spiritual reported marginally more knowledge than those classified as behavior-only. This suggests that the belief dimension is more adaptive than the behavioral dimension, followed by having low spiritual beliefs on both dimensions. For breast cancer treatment knowledge, those classified as belief-only scored significantly higher than both those who were classified low spiritual and high spiritual, and marginally higher than those classified as behavior-only. This again highlights the importance of the belief dimension. For mammography utilization, the importance of the belief dimension is suggested in that those classified as belief-only were marginally more likely to have ever had a mammogram than those classified as low spiritual. These results highlight the importance of spiritual beliefs for health.

It may be that African American churches provide an environment that is conducive to health-related behaviors, where individuals are encouraged to engage in these behaviors (McCrae & Carey, 1998). A relationship between religiosity and cancer has also been reported from an examination of the literature (Levin & Vanderpool, 1991). It was suggested that religion may promote a healthy lifestyle (Ellison & Levin, 1998; Levin & Vanderpool, 1989; Musick, Traphagan, Koenig, & Larson, 2000; Strawbridge, Shema, Cohen, & Kaplan, 2001), influence health-related behavior in accord with religious sanctions (Ellis, 1985; Grasmick, Bursick, & Cochran, 1991) or have psychological effects such as social support (Bradley, 1995; Ellison & George, 1994; Musick et al., 2000), which may contribute to reduced cancer rates. Likely, the mechanism lies in some combination of these effects.

Our findings relate to those of McBride et al. (1998), who found that those with high or moderate levels of intrinsic spirituality had better health than those with low intrinsic spirituality. For both mammography and breast cancer treatment knowledge, the importance of spiritual beliefs is evidenced. The finding that dimensions of spirituality can be differentially associated with health outcomes is also in agreement with previous findings related to spiritual health locus of control and health (Ferraro & Albrecht-Jensen, 1991). In the same sample the active and passive dimensions were differentially associated with perceived mammography benefits and barriers (Holt et al., in press). Levin et al. (1995) found that organized religion was associated with good health and non-organized religion was associated with poor health among African Americans. However, these researchers operationalized religiosity differently than in the present study, and there may have been differences between the two populations.

The notion that spiritual beliefs can be either positive or negative for health is also consistent with Pargament and colleagues' religious coping constructs (Pargament, Cole, Vandecreek, Belavich, Brant, & Perez, 1999). Two of these coping approaches relate directly to the present study: the collaborative and the deferring approach. In the collaborative approach, the individual sees themselves as working along with God to cope with a situation. In the deferring approach, the individual gives up personal responsibility and relies fully on God to handle the situation. The former is similar to active spiritual health locus of control and the latter is similar to passive spiritual health locus of control.

Limitations

The present findings must be considered within the context of several limitations of the study. First, it is unknown whether the present findings would be replicated in a more diverse sample, including African American men, men and women of other ethnicities or of non-Christian orientations. Second, although the terms were clarified previously, the measure of spirituality did not address some of the more broad aspects, such as a more general meaning or purpose in life. Individuals may find spiritual meaning in many forms (e.g. nature). However, with the present population, it was decided that a religious tone including use of the word 'God' would be most appropriate. Formative research through focus groups and cognitive response testing confirmed this notion. Previous research

also points to this group as being spiritually involved (Ferraro & Koch, 1994; Levin & Taylor, 1993, 1997; Levin et al., 1994; Taylor et al., 1996) and church-attendant (Ellison & Taylor, 1996; Taylor, 1993; Taylor & Chatters, 1986).

It is interesting to note that the associations between the belief and behavioral dimensions of spirituality and the breast cancer-related variables were not significant when the raw data were treated as continuous as in the regressions. However, when dichotomizing these dimensions and crossing them with each other as in the 2×2 matrix (see Fig. 1) the importance of the belief dimension is suggested. This discrepancy can be explained by the skewed nature of the spiritual item distributions. When these distributions were transformed by standardizing the items (taking their z-scores), the results were more consistent with the dichotomized results.

There may be dispute as to whether the active and passive dimensions of spiritual health locus of control beliefs are distinct dimensions rather than two ends of a single continuum. Although these dimensions share 30 percent of their variability, our data suggest that they are independent dimensions rather than a continuum from low to high level of spiritual empowerment (Holt et al., in press). Indeed, many participants in this sample highly endorse each of these beliefs. It is quite common to hear both of these themes mentioned in interviews with this population (Holt, 2002). Individuals in this qualitative study report working together with God for good health, relying on God to do what physicians or modern medicine cannot, as well as being empowered and motivated by their religion to take care of themselves. Faith that God will keep one healthy or faith that God will heal one of illness are also common themes, expressed side by side with the empowerment beliefs. While this area would benefit from further investigation, the initial evidence suggests that these are separate dimensions.

Future directions

The multidimensional nature of spirituality should be examined in a more diverse sample, and the possibility of congregational or denominational differences should be explored. It is possible that certain congregations foster a dependence associated with lower likelihood of taking health-related action, while others empower the members to take action. For example, a church with a history of activism and social participation might be characterized by members who are empowered toward health as well. A church that is more fundamentalist may instill a more fatalistic perspective. There may also be socioeconomic interactions with these two orientations and congregation. Further exploring these orientations and their potential association with the passive and active spiritual health locus of control constructs (Holt et al., in press) is also warranted. Another potentially informative area of study would be to investigate the associations between the dimensions of spirituality and Pargament's religious coping styles (Pargament et al., 1999).

Conclusion

The present results provide support for the idea that dimensions of spirituality can have either a positive, negative or no relationship with health. The pure behavioral dimension of spirituality (performing spiritual behaviors in the absence of spiritual beliefs) was associated with low levels of breast cancer beliefs associated with lower likelihood of mammography. This spiritual orientation may be similar to that of extrinsic religiosity (Allport & Ross, 1967). The belief dimension, on the other hand, was positively associated with adaptive breast cancer beliefs and mammography utilization.

These findings can help us refine how we communicate with spiritual African American women. According to the elaboration likelihood model (Petty & Cacioppo, 1981), messages that are personally relevant to the individual will stimulate thoughtful processing of the message, and thus will be more effective for stimulating attitudinal change. Because spirituality has been found to be associated with these breast cancer-related beliefs, it may be appropriate to frame early detection messages within a spiritual context. For example, messages could be based on the fact that 'taking care of one's physical health honors one's relationship with God because we are made in His image and He lives within us'. This type of approach constitutes one aspect of a culturally based approach used in the parent study (#CA 81872-04), funded by the National Cancer Institute. In this project,

spiritual health messages are delivered only to participants who strongly endorse spiritual assessment items. Another appropriate avenue would be to deliver spiritual health messages in a spiritual venue, such as in church-based health education programs. These messages should optimally be developed in conjunction with the study population, to help ensure that they will be acceptable and not offensive or inappropriate. The use of spiritual health communication should only be used if an individual self-identifies as a spiritual person. Ethical considerations involved with incorporating spirituality into health care are currently under discussion. It is recommended that physicians become educated about spirituality in the clinical realm and respect the spirituality of their patients (Post, Puchalski, & Larson, 2000).

However, a different approach may be best for women low in spiritual beliefs. If these women attend church, they might be motivated to engage in breast cancer screening by a church-based intervention that capitalized on some of the other proposed benefits of participating in religion, such as social support (Taylor & Chatters, 1986). Future research should examine ways to effectively reach these women, as well as women who do not attend church, with breast cancer early detection interventions.

In sum, we encourage other health communication researchers and practitioners to include these spirituality dimensions in refining health communications for African American women. Our own future work will include experimentation with these dimensions as well as examination of congregational factors associated with individual health behavior.

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