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Effect of Cultural, Folk, and Religious Beliefs and Practices on Delays in Diagnosis of Ovarian Cancer in African American Women

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Abstract

Background: Certain cultural, folk, and religious beliefs that are more common among African Americans (AAs) have been associated with later-stage breast cancer. It is unknown if these beliefs are similarly associated with delays in diagnosis of ovarian cancer.

Methods: Data from a multicenter case–control study of ovarian cancer in AA women were used to examine associations between cultural/folk beliefs and religious practices and stage at diagnosis and symptom duration before diagnosis. Associations between cultural/folk beliefs or religious practices and stage at diagnosis were assessed with logistic regression analyses, and associations with symptom duration with linear regression analyses.

Results: Agreement with several of the cultural/folk belief statements was high (*e.g.*, 40% agreed that ''if a person prays about cancer, God will heal it without medical treatments''), and ~90% of women expressed moderate to high levels of religiosity/spirituality. Higher levels of religiosity/spirituality were associated with a twofold increase in the odds of stage III–IV ovarian cancer, whereas agreement with the cultural/folk belief statements was not associated with stage. Symptom duration before diagnosis was not consistently associated with cultural/folk beliefs or religiosity/spirituality.

Conclusions: Women who reported stronger religious beliefs or practices had increased odds of higher stage ovarian cancer. Inaccurate cultural/folk beliefs about cancer treament were not associated with stage; however, these beliefs were highly prevalent in our population and could impact patient treatment decisions. Our findings suggest opportunities for health education interventions, especially working with churches, and improved doctor–patient communication.

Keywords: African Americans, ovarian cancer, cultural beliefs, folk beliefs, religion

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Introduction

CULTURAL, FOLK, AND religious beliefs have been examined in relation to the diagnosis and outcomes of several types of cancers.[1–9] An individual's beliefs have the potential to affect cancer outcomes both positively and negatively.[1] A greater sense of spirituality or involvement in organized religion may positively affect quality of life and survival, possibly due to greater social support and improved coping.[6,7,10] Conversely, certain fundamentalist religious, cultural, or folk beliefs may be associated with worse outcomes, particularly if they lead an individual to avoid cancer screening[3,9] or delay seeking treatment because of fatalistic beliefs,[5,11] or if they believe that religious intervention is a substitute for medical care.[3]

Religious practices and cultural/folk beliefs may be especially relevant for African Americans (AAs) with cancer. AAs are more likely than whites to have a religious affiliation and more likely to report praying, regardless of whether they identify with a specific religious affiliation.[12] In addition, prior research indicates that AAs are more likely to report using religion or spirituality for health reasons[13] and more likely to have a greater sense of fatalism, fundamentalist religious beliefs, or beliefs about cancer that could lead to delays in seeking treatment (*e.g.*, ''If a person prays about cancer, God will heal it without medical treatments'' or ''Air causes cancer to grow faster'').[2,3] In turn, these beliefs have been associated with later-stage breast cancer.[2]

There are no data on how cultural/folk beliefs or religiosity are associated with the diagnosis or prognosis of ovarian cancer in AAs. As with breast cancer, AA women with ovarian cancer experience poorer survival than white women.[14] However, unlike breast cancer, racial differences in stage at diagnosis are less pronounced for ovarian cancer, and there is no effective screening for ovarian cancer.[14–16] Therefore, it is unclear whether cultural/folk beliefs or religiosity would be associated with delays in diagnosis, or impact the stage at diagnosis of ovarian cancer in a manner similar to what has been observed for breast cancer.

To address this question, we conducted analyses among AA women in a multicenter case–control study of ovarian cancer. Because many cultural/folk beliefs are intertwined with religious beliefs, our analyses evaluated specific cultural/folk beliefs as well as measures of participation in religious practices and perceived spirituality. We examined whether these beliefs and practices were associated with delays in ovarian cancer diagnosis as indicated by a later stage at diagnosis or longer symptom duration before diagnosis.

Methods

Study population

This case-only analysis **c**omprised of 599 AA women with ovarian cancer from the African American Cancer Epidemiology Study (AACES), a population-based case–control study in 11 U.S. geographic regions: North Carolina, South Carolina, Georgia, Alabama, Tennessee, Louisiana, Texas, New Jersey, Ohio, Chicago, and Detroit. Institutional review board approval was obtained from Duke University (lead institution) and all participating institutions. Study methods have been reported previously and are described here briefly.[17]

Ovarian cancer cases were identified using rapid case ascertainment systems through state cancer registries, Surveillance, Epidemiology, and End Results (SEER) registries, or individual hospitals. Inclusion criteria were self-identified AA/black race, age 20–79 years, histologically confirmed epithelial ovarian cancer, and ability to complete an interview in English. Participants completed an interviewer-administered telephone survey that obtained risk factor information, including reproductive history, medical history, sociodemographic factors, and lifestyle characteristics.

Measures

Questions on cultural/folk beliefs and religiosity and spirituality were adapted from surveys used in previous studies of AA women, including a study of breast cancer

TABLE 1. PREVALENCE OF CULTURAL/FOLK BELIEFS AND RELIGIOSITY/SPIRITUALITY CHARACTERISTICS

	n = *599* % Agree
Cultural/folk beliefs	
''Air causes a cancer to grow faster''	23.5
''Surgery causes a cancer to grow faster''	16.7
''People with high blood pressure are more likely to get cancer''	5.9
''Someone can give you cancer by putting a root or spell on you''	1.4
''If a person worries about their cancer, it will get worse''	46.6
''If a person prays about cancer, God will heal it without medical treatment''	39.6
''The devil can cause a person to get cancer''	7.9
''When I get sick, I am to blame''	6.0
''If it's meant to be, I will stay healthy''	39.9
''Health professionals control my health''	22.6
Religiosity/spirituality	
Religious service attendance	
Never	6.0
<1×/month	10.5
1×/month	9.1
2–3×/month	15.1
1×/week	38.9
Several times/week	20.6
Frequency of prayer	
Rarely or never	1.9
1×/week	1.5
Several times/week	2.9
1–2×/day	26.4
Many times/day	67.3
Extent religion/spirituality involved in dealing with stressful situations	
Not at all	1.5
Not very	1.9
Somewhat	13.4
Very	83.2
Extent you consider yourself a religious/spiritual person	
Not at all	1.0
Slightly	5.3
Moderately	30.7
Very	63.0

patients in North Carolina and the Black Women's Health Study.[18,19] The cultural and folk belief questions related to cancer were developed by Lannin et al.[18] based on interviews by a cultural anthropologist with cancer patients at their institution, and pretested and revised before implementation in their clinic population of cancer patients and control women. The questionnaire was modified to exclude questions that were not relevant to our study population (*e.g.*, those that were specific to breast cancer). Cultural/folk beliefs were addressed through statements related to cancer, fundamentalist religious beliefs, and fatalism (Table 1),[18] and participants indicated whether they strongly disagreed, disagreed, neither agreed nor disagreed, agreed, or strongly agreed with each statement. For the analyses presented in this article, responses were dichotomized as agreed/strongly agreed versus all other responses. (Analyses based on using all five categories or the three categories of agree, neither agree nor disagree, or disagree produced results that were substantively similar to results based on the dichotomized responses.)

Questions on organizational (religious service attendance) and nonorganizational (frequency of prayer) dimensions of religion were assessed with questions from the Duke Religion Index.[20] Questions on overall self-ranking as a religious or spiritual person and religious coping were from the Brief Multidimensional Measure of Religiousness/Spirituality.[21] Study participants were asked about religious service attendance and prayer, the extent to which spirituality was involved with dealing with stressful situations, and the extent to which they considered themselves a religious or spiritual person.[19]

Stage at diagnosis was derived from pathology and medical records, and categorized as stage I–II versus III–IV. Symptom duration was obtained from questions on symptoms commonly associated with ovarian cancer (*e.g.*, pelvic or abdominal discomfort, lump in abdomen, and abnormal vaginal bleeding) as described previously.[22] Participants were asked if they had experienced each of 10 symptoms in the year before diagnosis, and the duration of the symptom (months). For these analyses, the outcome was the maximum duration reported for any symptom.

Statistical analysis

Comparisons of cultural/folk beliefs or religious practices between age categories, geographic regions, income and educational levels, and history of ovarian/breast cancer were made using chi-square or Fisher's exact tests. Odds ratios (ORs) and 95% confidence intervals (CIs) for later stage at diagnosis were calculated using logistic regression models, with the covariates age (continuous), education (less than high school graduation, high school graduation, and college degree), household income (<US$25K, US$25K to <US$50K, ≥US$50K), geographic region (North = Detroit, Chicago, New Jersey, Ohio; South = North Carolina, South Carolina, Georgia, Alabama, Tennessee, Louisiana, Texas), history of ovarian/breast cancer in first-degree relative (yes/no), oral contraceptive use (yes/no), parity (parous/nulliparous), and body mass index 1 year before diagnosis (continuous). Generalized linear regression models were used to estimate mean symptom duration in the year before diagnosis controlling for the same covariates. Analyses were performed using SAS version 9.3.

Results

Characteristics of the ovarian cancer cases are presented in Table 2. Approximately 42% of cases were of age ≥60, and 61% had stage III–IV disease. The majority of women had a high school education or less and a household income <US$50,000. More than three-quarters of the women were from southern states.

Table 1 presents responses to questions on cultural/folk beliefs and religiosity/spirituality practices for the overall case group. The prevalence of agreement with cultural/folk belief statements ranged from 1.4% for ''Someone can give you cancer by putting a root or spell on you'' to 46.6% for ''If a person worries about their cancer, it will get worse.'' We examined the prevalence of these beliefs by age, educational level, income, geographic region, and family history of ovarian/breast cancer (Supplementary Table S1). There were no significant differences in the prevalence of these beliefs by age, with the exception of ''Air causes a cancer to grow faster,'' which women aged 40 to <60 years agreed with more than older or younger women. Differences in the percentage of respondents who agreed with the statements were more prominent when stratified by income levels. For most statements, a higher percentage of women in the lowest income category indicated agreement with the statements. When stratified by geographic region, a higher percentage of women residing in southern states agreed with a majority of the statements, although statistically significant differences were observed for only two statements.

Responses to questions on religiosity/spirituality showed that a large majority of the women regularly participated in religious services and prayers, reporting that religion/spirituality was very much involved in dealing with stressful

Table 2. Characteristics of Ovarian Cancer Cases

Variable	n *(%)*
Age (years)	
<40	33 (5.5)
40 to <60	315 (52.6)
≥60	251 (41.9)
Stage at diagnosis	
I–II	214 (39.4)
III–IV	329 (60.6)
Missing	56
First-degree family history of breast or ovarian cancer	
Yes	164 (28.1)
No	420 (71.9)
Missing	15
Education	
<High school	90 (15.0)
High school graduate	327 (54.6)
College graduate	182 (30.4)
Income	
<US$25K	271 (46.2)
US$25 to <US$50K	149 (28.5)
≥US$50K	167 (25.4)
Geographic region	
South	463 (77.3)
North	136 (22.7)

situations and they considered themselves to be moderately to very religious/spiritual (Table 1 for overall responses; Supplementary Table S2 for responses stratified by age, educational level, income, region, and family history of ovarian or breast cancer). Religious service attendance was higher among older women and women from southern states. There were no statistically significant differences in the frequency of prayer or extent to which religion/spirituality is involved in dealing with stressful situations across age, income, or geographic categories. The proportion of

Table 3. Odds Ratios and 95% Confidence Intervals for Higher Stage Disease by Cultural/Folk Beliefs and Religiosity/Spirituality Characteristics

	Stage I–II (%)	*Stage III–IV (%)*	*Adjusted*[a] *OR (95% CI)*
Cultural/folk beliefs			
''Air causes a cancer to grow faster''			
Agree	23.0	23.8	1.18 (0.76–1.83)
Not agree	77.0	76.2	1.00
''Surgery causes a cancer to grow faster''			
Agree	19.7	14.6	0.67 (0.41–1.10)
Not agree	80.3	85.4	1.00
''People with high blood pressure are more likely to get cancer''			
Agree	6.1	5.2	0.75 (0.34–1.67)
Not agree	93.9	94.8	1.00
''Someone can give you cancer by putting a root or spell on you''			
Agree	1.41	1.2	1.01 (0.21–4.83)
Not agree	98.6	98.8	1.00
''If a person worries about their cancer, it will get worse''			
Agree	45.5	47.1	1.18 (0.82–1.70)
Not agree	54.5	52.9	1.00
''If a person prays about cancer, God will heal it without medical treatment''			
Agree	40.1	40.3	0.99 (0.68–1.45)
Not agree	59.9	59.7	1.00
''The devil can cause a person to get cancer''			
Agree	9.4	7.6	0.83 (0.43–1.58)
Not agree	90.6	92.4	1.00
''When I get sick, I am to blame''			
Agree	6.1	5.2	0.67 (0.30–1.47)
Not agree	93.9	94.8	1.00
''If it's meant to be, I will stay healthy''			
Agree	40.9	38.8	0.86 (0.59–1.26)
Not agree	59.2	61.2	1.00
''Health professionals control my health''			
Agree	20.7	22.0	1.11 (0.71–1.75)
Not agree	79.3	78.0	1.00
Religiosity/spirituality			
Religious service attendance			
≤1×/month	29.9	21.0	1.00
2–3×/month	15.9	14.0	1.47 (0.82–2.64)
1×/week	38.3	40.7	1.50 (0.93–2.40)
Several times/week	15.9	24.3	1.98 (1.11–3.52)
Frequency of prayer			
≤1×/week	4.7	3.0	1.00
Several times/week	4.7	1.5	0.61 (0.14–2.74)
1–2×/day	24.3	26.8	1.97 (0.68–5.73)
Many times/day	66.4	68.7	2.02 (0.72–5.64)
Extent religion/spirituality is involved in dealing with stressful situations			
Not at all/not very	2.8	3.0	1.00
Somewhat	15.9	10.3	0.66 (0.19–2.25)
Very	81.3	86.6	1.15 (0.37–3.63)
Extent you consider yourself a religious/spiritual person			
Not/slightly	8.5	4.9	1.00
Moderately	36.2	26.2	1.33 (0.59–3.02)
Very	55.4	68.9	2.35 (1.07–5.18)

[a]Adjusted for age, education, income, geographic region, BMI, family history of breast/ovarian cancer, oral contraceptive use, and parity.
BMI, body mass index.

women considering themselves to be moderately or very religious or spiritual was significantly lower among younger women and women with lower income, although even in these groups >90% of women described themselves as at least moderately religious/spiritual.

Associations between cultural/folk beliefs and religiosity/spirituality and stage at diagnosis are shown in Table 3. Overall, agreement with the cultural/folk belief statements was not significantly associated with later stage at diagnosis. Religiosity/spirituality showed significant associations with stage at diagnosis. There was a twofold increase in the odds of stage III–IV disease for women who reported attending religious services >1×/week (OR = 1.98, 95% CI 1.11–3.53) and those who considered themselves very religious/spiritual (OR = 2.35, 95% CI 1.07–5.18). The OR was of similar magnitude, although not statistically significant, for those who prayed many times a day (OR = 2.02, 95% CI 0.72–5.64).

Results related to possible delays in diagnosis as measured by symptom duration are presented in Table 4. Statistically significant associations between agreement with the cultural/folk belief statements and symptom duration were observed for only two of the statements. Endorsement of the belief that air causes a cancer to grow faster was associated with 1.2 months longer symptom duration ($p = 0.02$), and agreement with the statement that health professionals control my health was associated with a 0.9-month shorter symptom duration ($p = 0.05$), but no other associations were statistically significant. Similarly, there were no clear trends in symptom duration in relation to the religiosity/spirituality statements. Symptom duration was significantly shorter for women reporting more frequent religious service attendance, but no significant differences were observed for other measures of religiosity or spirituality.

Table 4. Mean Symptom Duration (Months) in Year Before Diagnosis by Cultural/Folk Beliefs and Religiosity/Spirituality Characteristics

	Adjusted[a]	
	Mean	*p-value*
Cultural/folk beliefs		
''Air causes a cancer to grow faster''		
Agree	7.6	0.02
Not agree	6.4	
''Surgery causes a cancer to grow faster''		
Agree	7.1	0.56
Not agree	6.6	
''People with high blood pressure are more likely to get cancer''		
Agree	6.7	0.94
Not agree	6.7	
''Someone can give you cancer by putting a root or spell on you''		
Agree	8.6	0.35
Not agree	6.7	
''If a person worries about their cancer, it will get worse''		
Agree	6.9	0.25
Not agree	6.5	
''If a person prays about cancer, God will heal it without medical treatment''		
Agree	6.9	0.56
Not agree	6.6	
''The devil can cause a person to get cancer''		
Agree	6.7	0.92
Not agree	6.7	
''When I get sick, I am to blame''		
Agree	6.7	0.87
Not agree	6.7	
''If it's meant to be, I will stay healthy''		
Agree	7.1	0.16
Not agree	6.4	
''Health professionals control my health''		
Agree	6.0	0.05
Not agree	6.9	
Religiosity/spirituality		
Religious service attendance		
≤1×/month	7.3	
2–3×/month	6.7	0.32
1×/week	6.6	0.06
Several times/week	6.2	0.01
Frequency of prayer		
≤1×/week	7.4	
Several times/week	5.1	0.11
1–2×/day	7.0	0.41
Many times/day	6.6	0.26
Extent religion/spirituality involved in dealing with stressful situations		
Not at all/not very	5.9	
Somewhat	6.9	0.64
Very	6.7	0.74
Extent you consider yourself a religious/spiritual person		
Not/slightly	6.7	
Moderately	7.1	0.92
Very	6.5	0.58

[a]Adjusted for age, education, income, geographic region, BMI, family history of breast/ovarian cancer, oral contraceptive use, and parity.

Discussion

Our analyses showed that women who reported greater religiosity/spirituality were more likely to have higher stage ovarian cancer, whereas there was no clear association with symptom duration before diagnosis. Endorsement of cultural/folk beliefs related to cancer or health showed little association with either stage at diagnosis or symptom duration.

The lack of association with the cultural/folk beliefs contrasts with what has been observed for breast cancer, where statistically significant associations between agreement with the statements and higher stage disease have been reported.[18] Specifically, Lannin et al. reported that agreement with the statement ''Air causes a cancer to grow faster'' was associated with a nearly threefold increased risk of stage III–IV breast cancer, and agreement with other cultural/folk belief statements also was significantly associated with later-stage disease. Our findings of no association between endorsement of these statements and ovarian cancer may be a reflection of the differences in the biology and presentation of ovarian cancer as compared with breast cancer. Breast cancer often presents with a clearly identifiable symptom and is usually diagnosed as localized disease. In contrast, symptoms of ovarian cancer are typically nonspecific gastrointestinal or urinary complaints, and most women are diagnosed with stage III–IV disease. The more advanced stage at diagnosis may be due to either the inability to recognize early symptoms of ovarian cancer or more aggressive ovarian tumor biology.

Another important difference between the two cancers is the availability of screening. Mammography screening is widely available for breast cancer, yet some reports indicate that women endorsing fatalistic beliefs are less likely to obtain screening, which could lead to differences in stage at diagnosis for women who agree with statements such as ''If it's meant to be, I will stay healthy'' or ''When I get sick, I am to blame.''[9,23] Ovarian cancer has no effective screening tool, therefore fatalistic beliefs could not plausibly affect early detection practices for this cancer.

In contrast to the lack of association with cultural/folk beliefs, women who reported more religious practices or considered themselves very religious/spiritual were at twofold increased risk of stage III–IV disease. Although one explanation could be that highly religious women are more likely to believe that prayer is a substitute for medical care, we found no association between the stage at diagnosis and the statement ''If a person prays about cancer, God will heal it without medical treatments'' (OR = 0.99).

An alternative explanation may be that the religious/spiritual practices captured by the questionnaire reflected the participants' current practices. Although participants were instructed to report on exposures that occurred before their diagnosis, it is possible that some reported postdiagnosis rather than prediagnosis beliefs and practices. If women who had more advanced disease had come to rely more on their religious/spiritual beliefs postdiagnosis, it could explain our findings of stronger associations with greater religiosity.

While there is clear evidence that religious beliefs and spirituality are commonly used as coping mechanisms among cancer patients, the evidence on the impact of a cancer diagnosis on *changes* in religious beliefs and practices is less conclusive. An increase in religiosity or spirituality among cancer patients after their diagnosis has been reported in a number of studies,[1,24–26] while others have not found a clear pattern of changes in religious practices after a diagnosis of cancer.[27,28] Increased belief in God or strength of faith has been described, but a reduction in religious service attendance, possibly due to poorer health, has also been reported.[27,28] As noted in a review by Thune-Boyle et al.,[1] methodological limitations in many studies limit the conclusions that can be drawn about how religiosity or spirituality changes over time. In particular, cross-sectional or retrospective studies are unable to clearly establish how patients' cancer diagnosis may have changed their religious or spiritual beliefs and practices. One prospective study found that baseline religiosity was the strongest predictor of subsequent religiosity,[28] suggesting that while religiosity and spirituality may increase after a cancer diagnosis in some patients, for most patients the diagnosis is unlikely to lead to dramatic changes in these characteristics. For AAs, population-level data describe a high level of participation in religious practices, and the data on religion/spirituality in our study population are consistent with those findings.[12] Because the data for our study were collected after the cancer diagnosis, we cannot rule out the possibility that postdiagnostic changes in spiritual beliefs or religious practices occurred in some of the women in our study, although we do not believe that it is a full explanation for our findings.

Although our results related to cultural/folk beliefs and religious/spirituality are not entirely consistent in relation to delays in diagnosis of ovarian cancer, our data point to the importance of considering these factors across the cancer care spectrum, from health education to treatment. The prevalence of beliefs that might discourage seeking treatment is strikingly high, with 24% of women believing that air causes cancer to grow faster and 40% agreeing that if a person prays about cancer, God will heal it without medical treatments. The recognition of these highly prevalent beliefs could provide an opportunity for both improved health education efforts and better communication between cancer patients and physicians and other health care providers.

The importance of churches and religious beliefs in AA communities is well recognized, and has been incorporated into health education initiatives, screening interventions, and recruitment strategies for research studies.[29–33] Working with churches to address misconceptions about cancer related to religious beliefs, while still acknowledging and respecting the importance of faith in coping with a life-threatening diagnosis, could be a critical health education initiative.

Furthermore, physicians with a greater awareness of these beliefs in their patients may be better able to address concerns that could lead to delays in diagnosis or treatment nonadherence.[34] In a report that described survey results from cancer patients, their caregivers and medical oncologists who asked participants to rank seven factors that might influence chemotherapy treatment decisions, faith in God was ranked second by patients and caregivers (after oncologist's recommendation), whereas oncologists ranked it last. The striking difference between the patients' and physicians' ranking of factors other than oncologist's recommendation suggests that some physicians may not appreciate how strongly faith in God affects some patients' treatment decisions.

Another commonly expressed sentiment from AA patients is that of ''not claiming'' a disease.[35] While this concept can be interpreted in different ways, it is often linked to religious beliefs. It can be an indication of denial, in which persons express that they are putting their health in God's hands. On the contrary, a more positive interpretation of ''not claiming'' a disease is that they are not claiming the worry that goes along with the disease.

Cultural beliefs, which have been handed down over generations, and religious beliefs are often closely intertwined, and can have an important impact on how patients cope with and make cancer treatment decisions. Improved communication about factors that contribute to medical decisions could result in better outcomes and higher patient satisfaction.

Conclusion

Increased risk of higher stage ovarian cancer was observed among women who reported stronger religious beliefs or practices. The associations do not appear to be due to endorsement of cultural/folk beliefs that could lead to delays in seeking cancer treatment. Nonetheless, these beliefs were highly prevalent in our AA study population and could impact treatment decisions, suggesting an opportunity for health education interventions and improved doctor–patient communication.

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