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# Prayer and Self-Reported Health Among Cancer Survivors in the United States, National Health Interview Survey, 2002

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## Abstract

***Objectives:*** At least 10.8 million living Americans have been diagnosed with cancer, and about 1.5 million new cancer cases are expected to be diagnosed in 2008. The purpose of this study was to examine prayer for health and self-reported health among a sample of men and women with a personal history of cancer.
***Methods:*** We used data from the 2002 National Health Interview Survey, which collected information on complementary and alternative medicine practices.
***Results:*** Among 2262 men and women with a history of cancer, 68.5% reported having prayed for their own health and 72% reported good or better health status. Among cancer survivors, praying for one's own health was associated with several sociodemographic variables including being female, non-Hispanic black, and married. Compared to persons with a history of skin cancer, persons with a history of breast cancer, colorectal cancer, a cancer with a short survival period (e.g., pancreatic cancer), or other cancers were more likely to pray for their health. Persons who reported good or better health were more likely to be female, younger, have higher levels of education and income, and have no history of additional chronic disease. Overall, praying for one's own health was inversely associated with good or better health status.
***Conclusions:*** Data from this nationally representative sample indicate that prayer for health is commonly used among people with a history of cancer and that use of prayer varies by cancer site. The findings should add to the current body of literature that debates issues around spirituality, decision-making about treatment, and physician care.

## Introduction

The American Cancer Society estimated in 2004 that about 10.8 million Americans were alive who had been diagnosed with cancer. About 1.5 million new cancer cases are expected to be diagnosed in 2008.[1] With the number of Americans living with cancer increasing, survivorship (life after cancer) is a major issue in the spectrum of cancer care from initial screening and diagnosis through post-treatment. Patient survivorship may involve additional treatments, supportive and/or palliative care, as well as a number of other psychologic and physical coping adjustments.[2]

Many patients with cancer may resort to complementary and alternative medicine (CAM) to aid them in the survivorship period, often for specific health problems and at other times as preventive medicine for their overall health.[3] There are several forms of CAM including alternative medicines, mind–body techniques, energy- and biologic-based therapies, and manipulative and body treatments. Prayer is a commonly practiced form of CAM.[3] These complementary or integrative approaches are typically used with or as an adjunct to, rather than as a replacement for, conventional medicine.[4]

Religion and spirituality have been associated with health-seeking behaviors.[5–8] The use of prayer has been described

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for numerous chronic diseases such as diabetes,[6,9,10] various cancer sites,[11–13] and a variety of cancer treatments.[14,15] The use of prayer in persons with chronic diseases[16,17] has been associated with both more favorable[18] and poorer[19] health outcomes. In one national study, adults with diagnosed chronic diseases, especially cancers, were more likely to use CAM (including prayer) than were adults in the general population.[20] In two studies, cancer survivors were more likely to use prayer for health than all other CAM modalities,[17,21] and in two other studies they also used prayer more often than those in the general population.[18,22]

Studies show that use of CAM—the use of prayer in particular—may vary by sociodemographic variables such as age, gender, and socioeconomic and health status.[18,21] A national study found that Asians were more likely than whites to use CAM (other than prayer),[23] while other studies found that blacks and older people were more likely than other groups to use prayer.[21,22] For persons who have been diagnosed with cancer, the roles of race/ethnicity, sociodemographic, and health-related variables as determinants of the use of prayer for health are less clear. Since cancer survivors in the United States have increased disability and lower reports of good or better health compared with those with no cancer,[24] we hypothesized that use of prayer would be associated with cancer site, cancer survival probability, and general health status.

Available research has not supported claims that spiritual beliefs can cure cancer or any other disease, yet religiosity can play an important role in the lives of people. Noted psychologic benefits of religious activities such as praying include positive mental states, a sense of meaning, and coping with stress, all of which have been associated with positive health outcomes.[25]

For the present study we sought to (1) explore the correlates of both using prayer for health and self-reported or perceived health status; (2) assess the association between demographic, socioeconomic, and health-related variables, and (3) examine the association between prayer for health and self-reported health status among persons previously diagnosed with cancer. Also, we wanted to specifically explore whether there was an association between cancer site and prayer for health, that is, whether the more deadly cancers (those with short survival) are associated with greater use of prayer for health. To our knowledge, this relationship has not been previously examined using a nationally representative sample.

## Methods

The National Health Interview Survey (NHIS) is a population-based multipurpose health survey conducted annually by the National Center for Health Statistics, Centers for Disease Control and Prevention; this face-to-face interview is conducted by trained U.S. Census Bureau interviewers.[26] Information is obtained about health, sociodemographic variables, access to care, and other characteristics of each member of the surveyed household.

### *Study population*

A total of 93,386 adults in 36,831 families were interviewed in the 2002 NHIS. The current analysis focused on 2262 respondents aged 18 years and older who had been diagnosed with one or more types of cancer. The overall final sample adult response rate was 74.3%.[26]

### *Data collection*

The 2002 NHIS Alternate Health/Complementary and Alternative Medicine (CAM) Supplement included questions pertaining to 17 nonconventional health care practices including acupuncture, relaxation techniques, and prayer, among others. Questions on prayer included ever prayed for one's own health, having had others pray for one's health, the importance of prayer, and having prayed for one's own health during the past year. The current study was limited to questions on prayer and self-reported health status. Our variables of interest were "Have you ever prayed specifically for the purpose of your own health," and self-reported health status was measured by the question "Would you say that your health in general is excellent, very good, good, fair, or poor?"

The supplement collected information on several demographic and health-related attitudes and behaviors, including race/ethnicity, age, gender, level of education, marital status, family type, family income (as a percentage above the federally established poverty threshold), and region of the country. Data were also collected on health insurance coverage, number of chronic diseases, and veteran status. Respondents were asked whether they had ever been told by a doctor or other health professional that they had cancer or a malignancy of any kind. If respondents answered "yes," they were asked the type or kind of cancer.

### *Analysis*

Because there were approximately 30 kinds of cancer (including "other") with which respondents could have responded, we collapsed the major types into 6 categories that were associated with the categorizations used by Hewitt et al. and Yabroff et al.[24,27] Yabroff et al. organized these cancers by using the Surveillance, Epidemiology, and End Results Program, which identified specific cancers with a 5-year survival of less than 25%. We used their categorization as a guide to categorize short-survival cancers in our study.

Our categorizations were as follows: breast, colorectal, prostate, short-survival (lung, esophagus, liver, pancreas, and stomach), other cancer sites (bladder, gallbladder, kidney, throat, soft tissue, and multiple cancer), and skin cancers.[27] Although skin cancers are typically considered less chronic than other forms of cancer, we retained them because these comprised more than 25% of the responses in the sample and to ascertain possible variation in the sample by type of cancer.

In our analysis, ever prayed for one's own health had two possible responses (yes or no), and self-reported health status was recoded into two categories (good or better and fair or poor). We chose "ever prayed" instead of having prayed in the past year in order to retain a larger number of cases and because 88% of all persons with cancer who ever prayed for their health had prayed within the past year (Table 1).

The NHIS used a stratified, multistage cluster sample weighted to the 2000 U.S. population.[26] The statistical program SUDAAN® (version 9.1; Research Triangle Institute, Research Triangle park, NC) was used in the analysis to take into account the complex sampling survey design and

Table 1. Characteristics of Men and Women Ages 18 or Older with Any Type of Cancer, National Health Interview Survey (NHIS) 2002 Survey

| *Characteristic* | N | %[a] | *Characteristic* | N | %[a] |
|---|---|---|---|---|---|
| Sociodemographics | | | | | |
| Race/ethnicity | 2262 | | Region | 2262 | |
| Non-Hispanic white | | 90.6 | Northeast | | 18.5 |
| Non-Hispanic black | | 4.5 | Midwest | | 25.7 |
| Hispanic | | 3.3 | South | | 37.5 |
| Non-Hispanic other | | 1.6 | West | | 18.3 |
| Age, years | 2262 | | Health | | |
| 18–34 | | 6.3 | Health insurance coverage | 2255 | |
| 35–49 | | 15.6 | Not covered | | 5.6 |
| 50–64 | | 28.4 | Covered | | 94.4 |
| 65 and older | | 49.7 | Health status | 2257 | |
| Gender | 2262 | | Fair or poor | | 28.3 |
| Male | | 43.1 | Good or better | | 71.7 |
| Female | | 56.9 | Number of chronic diseases | 2262 | |
| Education | 2239 | | None | | 37.1 |
| <High school graduate | | 18.1 | 1 disease | | 31.1 |
| High school graduate | | 31.7 | 2 diseases | | 20.2 |
| Some college/tech school | | 27.3 | 3 or more diseases | | 11.6 |
| College grad | | 22.9 | Ever prayed for your own health | 2189 | |
| Marital status | 2259 | | No | | 31.5 |
| Married/living with partner | | 66.2 | Yes | | 68.5 |
| Widowed | | 15.8 | Prayed in the past 12 months | 1511 | |
| Divorced or separated | | 12.1 | No | | 12.0 |
| Never married | | 5.9 | Yes | | 88.0 |
| Family type[b] | 2262 | | Cancer site | 2247 | |
| One adult no children | | 23.7 | Breast | | 15.3 |
| Multiple adults no children | | 58.6 | Colorectal | | 7.3 |
| One adult with children | | 2.6 | Prostate | | 10.1 |
| Multiple adults with children | | 15.1 | Short survival | | 5.9 |
| Family income as % of poverty | 2262 | | Other | | 35.5 |
| threshold | | | Skin | | 25.9 |
| <200% | | 19.8 | Veteran status | | |
| 200–399% | | 25.2 | Honorably discharged veteran | 2256 | |
| 400%+ | | 27.6 | No | | 74.8 |
| Unknown | | 27.4 | Yes | | 25.2 |

[a]Adjusted for the NHIS sampling methods and weighted to the U.S. Census 2000.
[b]Children refers to one or more children <18 years old.

nonresponse.[28] Sample weights were obtained from the NHIS 2002 public use data file to calculate weighted frequencies and corresponding 95% confidence intervals (CIs). General linear contrasts were used to assess the statistical differences of estimates when compared to a reference level within the variable of interest. Finally, we used SUDAAN for the logistic regression. An initial model included all patient characteristics. Through backward exclusion, the variable with the highest probability ($p$) value was dropped and the model was then rerun. The final model included only those significant variables that would yield the most parsimonious model. Within the logistic regression procedure, general linear contrasts were used to make comparisons between the attributes of the variables of interest and reference levels. The Wald $F$ test was used to assess overall statistical significance of each covariate in the model. Relationships between outcome variables and covariates were determined by examination of overall statistical significance of adjusted odds ratios (ORs) and corresponding 95% CIs.

## Results

The estimates for the various sociodemographic and health-related variables are presented in Table 1. The sample was over 90% white, and majorities were female (56.9%), married or living with a partner (66.2%), with some type of health insurance (94.4%), and reported good or better health (71.7%). About half were older (>65 years) and 37% lived in the South. Over two-thirds had prayed for their own health and 88% of those who had ever prayed for their own health had done so during the past year.

Bivariate analyses examining the relationships between having prayed for one's health and sociodemographic and health-related covariates are presented in Table 2 (lefthand columns). While non-Hispanic blacks used prayer for health significantly more than non-Hispanic whites, non-Hispanic others (Asians, American Indians/Alaska Natives, Native Hawaiian/Pacific Islanders, other races, and multiple races) used prayer for health significantly less than non-Hispanic whites. As age increased, prayer for health also increased.

Table 2. Percentage of Men and Women with Cancer Who Ever Prayed and Who Reported Good Physical Health by Population Subgroups, National Health Interview Survey 2002 Survey

| | *Ever prayed for your own health* | | | | *Self-reported physical health (good or better)* | | | |
|---|---|---|---|---|---|---|---|---|
| | N | %[a] | *95% CI* | *PV* | N | %[a] | *95% CI* | *PV* |
| All | 2189 | 68.5 | 66.2–70.8 | | 2257 | 71.7 | 69.4–73.8 | |
| Sociodemographics | | | | | | | | |
| Race/ethnicity | | | | | | | | |
| Non-Hispanic white | 1912 | 68.2 | 65.7–70.6 | ref | 1973 | 72.9 | 47.7–69.9 | ref |
| Non-Hispanic black | 133 | 80.5 | 71.4–87.2 | 0.004 | 136 | 55.1 | 70.6–75.1 | 0.000 |
| Hispanic | 113 | 72.9 | 62.5–81.3 | 0.342 | 116 | 59.3 | 45.9–63.9 | 0.018 |
| Non-Hispanic other | 17 | 47.1 | 28.5–66.5 | 0.040 | 32 | 72.9 | 55.7–85.2 | 0.999 |
| Age, years | | | | | | | | |
| 18–34 | 131 | 51.4 | 41.5–61.1 | ref | 136 | 86.2 | 78.6–91.4 | ref |
| 35–49 | 310 | 65.8 | 59.7–71.5 | 0.013 | 319 | 78.2 | 72.6–82.9 | 0.051 |
| 50–64 | 596 | 70.4 | 65.9–74.4 | 0.001 | 608 | 73.2 | 69.0–77.0 | 0.000 |
| 65 and older | 1152 | 70.5 | 67.4–73.4 | 0.000 | 1194 | 66.9 | 63.6–70.1 | 0.000 |
| Gender | | | | | | | | |
| Male | 857 | 62.1 | 58.4–65.7 | ref | 890 | 67.8 | 64.2–71.1 | ref |
| Female | 1332 | 73.3 | 70.4–76.1 | 0.000 | 1367 | 74.6 | 71.7–77.4 | 0.003 |
| Education | | | | | | | | |
| <High school graduate | 442 | 71.4 | 66.2–76.0 | ref | 452 | 51.2 | 46.1–56.4 | ref |
| High school graduate | 673 | 66.8 | 62.8–70.7 | 0.155 | 687 | 69.9 | 65.8–73.8 | 0.000 |
| Some college/tech school | 588 | 70.4 | 65.9–74.6 | 0.765 | 611 | 75.4 | 71.2–79.1 | 0.000 |
| College grad | 468 | 66.2 | 61.0–71.0 | 0.150 | 485 | 85.8 | 81.8–89.0 | 0.000 |
| Marital status | | | | | | | | |
| Married/living with partner | 1128 | 68.8 | 67.3–72.7 | ref | 1157 | 73.6 | 70.8–76.3 | ref |
| Widowed | 507 | 72.8 | 75.7–85.2 | 0.127 | 528 | 64.0 | 59.1–68.7 | 0.001 |
| Divorced or separated | 383 | 66.1 | 71.9–78.6 | 0.348 | 395 | 68.9 | 63.2–74.1 | 0.138 |
| Never married | 168 | 59.9 | 55.4–62.6 | 0.038 | 174 | 74.9 | 67.3–81.2 | 0.736 |
| Family type[b] | | | | | | | | |
| One adult no children | 856 | 69.6 | 66.1–72.9 | ref | 881 | 70.3 | 67.1–73.3 | ref |
| Multiple adults no children | 991 | 68.6 | 65.4–71.6 | 0.627 | 1028 | 72.2 | 69.0–75.2 | 0.403 |
| One adult with children | 100 | 67.0 | 56.0–76.4 | 0.629 | 103 | 68.8 | 58.1–77.8 | 0.777 |
| Multiple adults with children | 242 | 67.0 | 60.6–72.9 | 0.456 | 245 | 72.2 | 65.7–78.0 | 0.569 |
| Family income as % of poverty threshold | | | | | | | | |
| <200% | 551 | 70.4 | 65.9–74.6 | ref | 562 | 55.6 | 50.8–60.4 | ref |
| 200–399% | 528 | 70.6 | 65.9–74.9 | 0.948 | 541 | 72.7 | 68.2–76.8 | 0.000 |
| 400%+ | 533 | 65.0 | 60.3–69.4 | 0.101 | 546 | 82.6 | 78.5–86.0 | 0.000 |
| Unknown | 577 | 68.9 | 64.6–72.9 | 0.631 | 608 | 71.3 | 66.9–75.3 | 0.000 |
| Region | | | | | | | | |
| Northeast | 365 | 67.2 | 61.9–71.8 | 0.047 | 380 | 71.1 | 65.4–76.2 | 0.341 |
| Midwest | 569 | 70.5 | 66.0–74.6 | 0.002 | 577 | 73.5 | 69.2–77.4 | 0.731 |
| South | 810 | 72.2 | 67.9–76.1 | 0.000 | 838 | 69.3 | 65.6–72.7 | 0.082 |
| West | 445 | 59.7 | 54.3–64.9 | ref | 462 | 74.6 | 69.5–79.2 | ref |
| Health | | | | | | | | |
| Health insurance coverage | | | | | | | | |
| Not covered | 135 | 63.0 | 52.1–72.8 | ref | 139 | 68.3 | 60.3–75.3 | ref |
| Covered | 2047 | 68.8 | 66.3–71.2 | 0.303 | 2112 | 71.9 | 69.6–74.1 | 0.363 |
| Number of chronic diseases | | | | | | | | |
| None | 779 | 66.3 | 62.3–70.0 | ref | 809 | 87.4 | 84.5–89.8 | ref |
| 1 disease | 686 | 68.5 | 64.1–72.6 | 0.459 | 706 | 74.1 | 70.1–77.7 | 0.000 |
| 2 diseases | 450 | 70.7 | 65.8–75.1 | 0.137 | 460 | 62.1 | 56.8–67.1 | 0.000 |
| 3 or more diseases | 274 | 72.1 | 66.0–77.5 | 0.102 | 282 | 31.5 | 25.8–37.8 | 0.000 |
| Ever prayed for your own health | | | | | | | | |
| No | | | | | 674 | 77.8 | 73.9–81.2 | ref |
| Yes | | | | | 1510 | 69.0 | 66.1–71.7 | 0.000 |
| Cancer site | | | | | | | | |
| Breast | 364 | 78.8 | 73.8–83.0 | 0.000 | 372 | 71.8 | 66.3–76.6 | 0.050 |
| Colorectal | 167 | 71.9 | 63.8–78.7 | 0.012 | 175 | 62.0 | 52.3–70.1 | 0.001 |
| Prostate | 217 | 62.0 | 55.0–68.5 | 0.545 | 222 | 70.1 | 63.3–76.1 | 0.026 |
| Short survival | 138 | 75.1 | 66.5–82.0 | 0.002 | 142 | 47.8 | 38.9–56.8 | 0.000 |
| Other | 753 | 71.0 | 67.1–74.6 | 0.000 | 780 | 73.3 | 69.5–76.8 | 0.105 |
| Skin | 540 | 59.4 | 54.4–64.3 | ref | 551 | 78.3 | 73.9–82.2 | ref |
| Veteran status | | | | | | | | |
| Honorably discharged veteran | | | | | | | | |
| No | 1675 | 70.2 | 67.5–72.7 | ref | 1728 | 72.5 | 70.0–74.9 | ref |
| Yes | 508 | 63.5 | 58.8–67.9 | 0.010 | 523 | 69.2 | 64.4–73.5 | 0.205 |

CI, confidence interval; PV, *p*-value.
[a]Weighted percentage.
[b]Children refers to one or more children <18 years old.

All age categories (35–49, 50–64, and 65+ years) all prayed for their health significantly more than the age 18–34 category. Women used prayer for health more than men, and married persons used prayer for health more than those who had never married. Residents of regions outside the West were more likely to use prayer for health than those residing in the West region. Also, veterans reported significantly less use of prayer for health than nonveterans. Finally, those who had been diagnosed with breast, colorectal, short-survival, and other cancers used prayer for health more than those with skin cancers.

Correlates of having good or better health (henceforth, "better health") are also presented in Table 2 (righthand columns). Specifically, non-Hispanic blacks and Hispanics were less likely than non-Hispanic whites to report better health, and those who were aged 50–64 or 65 and older were less likely to report better health than those persons aged 18–34. Women were more likely than men to be in better health, as were those with a high school education or more versus those with less than a high school education. Married persons were more likely to have better health than those who were widowed, and persons with incomes at least 200% above the poverty threshold reported better health than those with the lowest levels of income. Those with no additional chronic diseases (other than cancer) had better health than those with additional chronic diseases. Those persons who used prayer for health reported better health status less frequently than those who never prayed for their health. Finally, those persons with breast, colorectal, prostate, and short-survival cancers were less likely than those persons with skin cancers to have better health.

After adjustment for all factors in the multivariate logistic model (Table 3), several of the factors from the bivariate model remained significant. As age increased, prayer for health increased incrementally, and women were about two-thirds more likely to use prayer for health than men. Married persons used prayer for health more than those who were divorced or separated, and persons with breast, colorectal, short-survival, and "other" cancers had increased odds of using prayer for their own health than those persons with skin cancer.

Blacks had lower odds than whites of reporting better health, as did men versus women. As education increased, odds of having better health increased incrementally. Similarly, greater family income was associated with better health in comparisons with low income. As the number of additional chronic diseases increased, the odds of having better health decreased. Those with breast or a short-survival cancer had lower odds of having better health than those with skin cancers. Finally, those persons with better health states used prayer for health less often than those in fair or poor health.

## Discussion

The purpose of this study was to explore the correlates of both prayer for health and self-reported health status, and to assess the association between prayer for health and self-reported health among persons previously diagnosed with cancer. We were especially interested in the relationship between praying for health and the type of cancer with which persons had been diagnosed. We were not surprised to find that those with short-survival cancers and those who had been diagnosed with breast or colorectal cancer were more likely to use prayer than the referent (those who had been diagnosed with skin cancer). It was also not surprising that having been diagnosed with breast cancer or a short-survival cancer was inversely associated with reporting good or better health.

Prayer is generally the most commonly used CAM,[12,29] and we found that American adults who are cancer survivors have frequently made use of this form of CAM. Just over two-thirds (68.5%) of these cancer survivors had used prayer for health and 88% of those persons had prayed during the past year. The first proportion is considerably higher than an estimate of 45% for the general population for engaging in any form of prayer[21] and the 35% who used prayer for health concerns in another study.[30] The present study found that being older, married, female, non-Hispanic black, and living in a region other than the West were all important indicators of praying for one's own health among cancer survivors. These associations are somewhat consistent with findings in the general population,[21] but our finding that among cancer survivors married persons were more likely to use prayer for health compared to those who were divorced or separated is a new finding to our knowledge.

Perhaps surprisingly, we found no associations between prostate cancer and our two outcomes of interest. Possibly in this study men with prostate cancer did not see praying for their own health as important, but this observation may be related to the fact that men pray less[21] rather than to the site of the cancer. In contrast, other studies have observed a positive association between (a) spirituality and (b) either quality of life or satisfaction or both among men with prostate cancer.[29,31,32]

An interesting relationship was found between veteran's status and the use of prayer for health in the bivariate analysis, as those persons with military experience used prayer for health less than those who were nonveterans, but this finding is likely driven by the fact that men pray less than women and that increased levels of education and income have been associated with less prayer for health.[21] Indeed, after adjustment for sex, income, and education, the relationship was no longer significant.

Our findings for cancer survivors who had been diagnosed with breast cancer or a short-survival cancer (and marginally for those with colorectal cancer, OR: 0.58, 95% CI, 0.33–1.01) were comparable to other studies, [26,33] as these groups had lower perceived health than those with other cancers. These NHIS-based studies found that persons with a history of cancer also had a greater number of other chronic conditions, more psychologic problems, more functional limitations, more health-related work limitations, and greater overall burden than those without a history of cancer.[26,33] Our study, however, did not make comparisons with those without a history of cancer. Our findings about sociodemographic factors being related to perceived health were consistent with the literature.[34–36] Similar to findings by Franzini and colleagues,[35] health status varied by race/ethnicity and income with whites and those with greater resources having better health. Other predictors of health status included age, gender, marital status, other chronic medical conditions, and education as found in the current study.

Although the overall incidence of cancer has declined recently, it is known that cancer-related health disparities remain for certain population subgroups.[2] Non-Hispanic

Table 3. Adjusted Odds Ratios for Prayer for Health and for Physical Health Status Among Men and Women with Cancer, National Health Interview Survey 2002 Survey

| | *Ever prayed for your own health* | | | *Self reported physical health (Good or better)* | | |
|---|---|---|---|---|---|---|
| | N | N = *2159* *95% CI* | *PV* | N | N = *2155* *95% CI* | *PV* |
| Race/ethnicity | | | 0.377 | | | 0.031 |
| Non-Hispanic white | ref | | | ref | | |
| Non-Hispanic black | 1.94 | 1.16–3.23 | | 0.74 | 0.29–0.89 | |
| Hispanic | 1.15 | 0.69–1.93 | | 0.51 | 0.41–1.34 | |
| Non-Hispanic other | 0.38 | 0.17–0.88 | | 1.14 | 0.39–3.31 | |
| Age, years | | | 0.000 | | | 0.905 |
| 18–34 | ref | | | ref | | |
| 35–49 | 2.04 | 1.26–3.30 | | 0.66 | 0.34–1.27 | |
| 50–64 | 2.92 | 1.81–4.70 | | 0.60 | 0.33–1.12 | |
| 65 and older | 2.95 | 1.79–4.86 | | 0.70 | 0.38–1.30 | |
| Gender | | | 0.000 | | | 0.001 |
| Male | ref | | | ref | | |
| Female | 1.66 | 1.29–2.13 | | 1.61 | 1.22–2.12 | |
| Education | | | 0.439 | | | 0.000 |
| <High school graduate | ref | | | ref | | |
| High school graduate | 0.89 | 0.64–1.23 | | 1.58 | 1.15–2.16 | |
| Some college/tech school | 1.12 | 0.79–1.59 | | 1.86 | 1.33–2.61 | |
| College grad | 1.08 | 0.74–1.59 | | 3.11 | 2.02–4.78 | |
| Marital status | | | 0.019 | | | 0.120 |
| Married/living with partner | ref | | | ref | | |
| Widowed | 0.79 | 0.58–1.05 | | 1.05 | 0.82–1.61 | |
| Divorced or separated | 0.71 | 0.54–0.95 | | 0.77 | 0.74–1.51 | |
| Never married | 0.71 | 0.49–1.04 | | 1.87 | 0.49–1.21 | |
| Family income as % of poverty threshold | | | 0.287 | | | 0.025 |
| <200% | ref | ref | | ref | | |
| 200–399% | 0.99 | 0.71–1.40 | | 1.87 | 1.30–2.67 | |
| 400%+ | 0.76 | 0.53–1.09 | | 2.22 | 1.48–3.33 | |
| Unknown | 0.88 | 0.64–1.22 | | 1.56 | 1.14–2.15 | |
| Number of chronic diseases | | | 0.278 | | | 0.000 |
| None | ref | | | ref | | |
| 1 disease | 0.99 | 0.76–1.32 | | 0.43 | 0.31–0.57 | |
| 2 diseases | 1.10 | 0.83–1.47 | | 0.25 | 0.15–0.36 | |
| 3 or more diseases | 1.14 | 0.79–1.66 | | 0.08 | 0.05–0.12 | |
| Cancer site | | | 0.000 | | | 0.035 |
| Breast | 1.93 | 1.34–2.78 | | 0.6 | 0.39–0.92 | |
| Colorectal | 1.60 | 1.05–2.55 | | 0.58 | 0.33–1.01 | |
| Prostate | 1.20 | 0.82–1.74 | | 0.93 | 0.58–1.52 | |
| Short survival | 2.14 | 1.30–3.52 | | 0.28 | 0.17–0.46 | |
| Other | 1.79 | 1.33–2.39 | | 0.75 | 0.52–1.08 | |
| Skin | ref | | | ref | | |
| Every prayed for your own health | | | | | | 0.001 |
| No | | | | ref | | |
| Yes | | | | 0.65 | 0.49–0.86 | |

OR, odds ratio; CI, confidence interval; PV, *p*-value.

blacks, especially males and people with low socioeconomic status, have the highest rates of both new cancers and cancer deaths.[37] In the general population, non-Hispanic blacks have been found to use prayer for health more than non-Hispanic whites,[3,21] and this pattern was consistent with our study.

We did not find an association between socioeconomic status and praying for one's own health, but we found a linkage between socioeconomic status and perceived health status, as those with higher levels of education and income reported better health. In other NHIS-based studies, persons with higher levels of education and income showed incremental increases in self-reported health status, while persons with chronic diseases showed incremental decreases in perceived health.[25,33] Also, while age showed incremental increases in use of prayer, age also was tied to incremental decreases in health.

There were several strengths in the present study. This is a national sample conducted by trained Census Bureau workers, and the 2002 NHIS allowed for examination of CAM use and sociodemographic and health-related factors among cancer survivors, a group not studied in detail on a

national level. The NHIS also had a sample large enough to examine the characteristics of interest as well as make within- and across-group comparisons. It oversampled both non-Hispanic blacks and Hispanics.

This study also had limitations. Since this was a cross-sectional study, we are only able to describe the use of prayer at a particular time period and were unable to examine past disease states that may have influenced prayer use. While we were able to measure the recency of prayer use (88% of those who had ever prayed had prayed within the past year), data on the frequency of prayer (how often), its ultimate purpose for health, or its specific health-related focus were unavailable. That is, we are not sure whether prayer for health by cancer survivors was used more for the medical condition of cancer itself, future prevention or healing, side-effects from treatment, or some combination of these factors. These additional topics were beyond the focus of this study. An additional limitation was that the 2002 NHIS included a limited number of clinical and psychosocial variables including age at diagnoses and affective distress-related questions ("During the past 30 days, how often did you feel...sad...nervous...hopeless, etc.). Variables such as religiosity, disease stage, treatment status, quality of life, and life satisfaction would have been quite helpful had they been included in the interview. We should also note that attempting to reduce 30 categories of cancer into 6 groups posed a challenge. Within many cancer sites there is high variability in both differentiation and prognosis, adding difficulty to this attempt. In addition, all of the "other" cancer types were placed in a single category, making it difficult to make inferences about this group.

Many patients believe that physicians should consider their patients' spiritual needs as part of their medical care.[39–41] Even so, the role that physicians are to play in acknowledging and supporting the spiritual beliefs of patients continues to be debated.[41,42] Recognizing that spiritual beliefs can influence patient medical decisions, recently Koenig has proposed the taking of a spiritual history to aid physicians in assessing whether to broach spiritual topics with patients.[43] Spiritual histories should be administered to all patients to reduce possible group-level selection bias as physicians and other healthcare providers interact with their patients with cancer and other chronic diseases. Our data suggest that prayer for health is commonly used among cancer survivors and that there are specific sociodemographic and other correlates of its use. Exploring CAM and the use of prayer in clinical settings may help clinicians better understand both the coping and adaptation strategies of their patients with cancer as conduits to better health status. This study may also serve as a springboard for future studies that incorporate additional clinical and psychosocial variables and other types of CAM use among persons in the general population as well as those with a history of cancer.

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## Author Disclosure Statement

The authors declare that they have no competing financial interests.

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