

National Trends in Prayer Use as a Coping Mechanism for Health Concerns: Changes From 2002 to 2007

Amy Wachholtz

University of Massachusetts Medical School

Usha Sambamoorthi

West Virginia University and Morehouse School
of Medicine

The objective of this research was to analyze national trends in the use of prayer to cope with health concerns. Data are from the Alternative Medicine Supplement of the National Health Interview Survey (NHIS) 2002 ($N = 30,080$) and 2007 ($N = 22,306$). We categorized prayer use into 3 groups: never prayed, prayed in the past 12 months, and did not pray in the past 12 months. Chi-square tests and multinomial logistic regressions were performed to analyze prayer use over time. All analyses adjusted for the complex sample design of the NHIS and were conducted in SAS-callable SUDAAN. Recent use (within 12 months) of prayer for health concerns significantly increased from 43% in 2002 to 49% in 2007. After adjusting for demographic, socioeconomic status, health status, and lifestyle behaviors, prayer use was more likely in 2007 than 2002 (adjusted odds ratio = 1.21, 95% CI [1.14, 1.28]). Across time, individuals reporting dental pain were more likely to use prayer to cope compared with those with no pain. The adjusted odds ratios were 1.2 (95% CI [1.09, 1.33]) in 2002 and 1.16 (95% CI [1.03, 1.3]) in 2007. Other predictors of prayer, including gender, race, psychological distress, changing health status, and functional limitations, remained consistent across both time periods. Overall, prayer use for health concerns increased between 2001 and 2007. The escalating positive association between pain and prayer use for health concerns over time suggests that it is critical for mental and physical health treatment providers to be aware of the prevalence of this coping resource.

Keywords: prayer, health, coping, spirituality, pain

Prayer is a common coping resource for individuals with chronic illness (McCaffrey, Eisenberg, Legedza, Davis, & Phillips, 2004). Use of prayer in the past 12 months for one's own health is very common (43%) among

adults in the United States. Prayer (including prayer for self, prayer for others, and belonging to a prayer group) is the third most frequently used alternative medicine practice (Barnes, Powell-Griner, McFann, & Nahin, 2004). For example, among cancer patients, religion and spirituality can affect biological, spiritual, and mental health variables (Kaplar, Wachholtz, & O'Brien, 2004). Almost 70% of cancer survivors reported recent prayers for their own health (Ross, Hall, Fairley, Taylor, & Howard, 2008), and prayer/religion was one of the complementary and alternative therapies most often used by women diagnosed with breast cancer (Greenlee et al., 2009). Prayer is also widely used to address health concerns by individuals with a wide array of physical and mental health diagnoses (Saydah & Eberhardt, 2006).

Across religious and demographic groups, there is evidence that positive forms of religious coping create positive mental and physical health outcomes (Wachholtz, Pearce, & Koenig,

Amy Wachholtz, Department of Psychiatry, University of Massachusetts Medical School; Usha Sambamoorthi, School of Pharmacy, West Virginia University, and Department of Community Health and Preventive Medicine, Morehouse School of Medicine.

This research was partially supported through a faculty development grant at the University of Massachusetts Medical School to Amy Wachholtz. Usha Sambamoo was partially supported for infrastructure with Collaborative Health Outcomes Research of Therapies and Services Grant 1 P20 HS 015390-02. The findings and opinions reported here are those of the authors and do not necessarily represent the views of any other individuals or organizations. The authors hereby disclose that no competing financial interests exist.

Correspondence concerning this article should be addressed to Amy Wachholtz, Department of Psychiatry, UMass Medical School, 55 Lake Ave North, Worcester, MA 01655. E-mail: amy.wachholtz@umassmemorial.org

2007). Positive forms of religious coping include seeking spiritual support, increasing spiritual connection, asking religious forgiveness, and collaborative religious coping (Pargament, Smith, Koenig, & Perez, 1998). Individuals using positive religious coping techniques, such as prayer, tend to have both improved perceived mental and physical health, as well as improved objectively measured health outcomes (Pargament, Koenig, Tarakeshwar, & Hahn, 2004; Wachholtz & Pargament, 2005, 2008).

Many studies have assessed the use of prayer for health concerns at a single time point (Masters & Spielmans, 2007). Some of these studies have focused on prayer as a protective factor against negative effects and some have used prayer as a factor that promotes positive well-being and health (see Masters & Spielmans, 2007, for review). Whatever the mechanisms, the number of individuals who use prayer for health concerns may increase over time in response to a rise in the prevalence of living with chronic illnesses, physical and mental health conditions, and increasing rates of individuals without health insurance or underinsurance. One study measuring trends in alternative medicine use in the United States between 1990 and 1997 reported a 10 percentage-point increase in self-prayer (Eisenberg et al., 1998); however, this study did not examine the association in trends of prayer use by different groups.

Social, cultural, and ethnic groups report varying prevalence of prayer use in response to chronic pain and other physical health difficulties. Qualitative and quantitative evidence suggests that ethnic groups vary on the use of faith-based coping strategies to cope with chronic illness and pain (Harvey & Silverman, 2007). Age may also play a role in the use of prayer for health concerns given that spirituality changes across the lifetime (Wink & Dillon, 2002). It should also be noted that negative life events (such as chronic illness and pain conditions) may affect spirituality (Wink & Dillon, 2002) and thus change the frequency of prayer use among individuals. As individuals transition from acute health concerns to chronic health concerns, they become more likely to use prayer (Dunn & Horgas, 2004). It has also been suggested that prayer use may be affected by socioeconomic status (Banthia, Moskowitz, Acree, & Folkman, 2007). Even the sociodemographic characteristics of race/ethnicity and

gender may be related to frequency of prayer use for health concerns (Abraido-Lanza & Revenson, 2005; Brown, Barner, Richards, & Bohman, 2007). All of these findings suggest that trends in prayer use for health concerns may be different for various demographic groups, and it is important to recognize the trends for each of these groups.

Estimating and identifying trends in prayer use across various demographic groups are important because research studies, such as ours, may add to the knowledge base of the intersection between religion and practice of medicine. This increased knowledge base may enrich doctor-patient communication and move us toward more appropriate patient-centered care (Curlin, 2008). Because overarching cultural influences toward secularism may result in diminished prayer use, there is conflicting evidence as to the use of prayer in relation to health concerns and a need to clarify how prayer use changes over time (Masters & Spielmans, 2007).

In addition, except for use of prayer, complementary and alternative therapies are less likely to be used by Latinos and African Americans (Graham et al., 2005). There are also differences between women who use prayer for health and women who use other forms of complementary and alternative therapies (Upchurch et al., 2002). The differences between those who use prayer compared with those who use other forms of complementary and alternative medicine may also inform culturally sensitive clinical practices (Levin, Chatters, & Taylor, 2005). It has been discussed that the elevated frequency of prayer use among women and non-Caucasian ethnic groups is related to their relative cultural and financial disempowerment, which reduces access to health care (Green, Lewis, Wang, Person, & Rivers, 2004; Holt, Clark, Kreuter, & Rubio, 2003). Thus, it may also be that individuals with lower socioeconomic status or those without health insurance, and consequently less health care access, may also be more likely to use prayer for health concerns. Prayer may then act as a conduit to increase the feelings of health-related loci of control regardless of availability or engagement in health-related practices or perceived health (Arredondo, Elder, Ayala, & Campbell, 2005).

Method

Study Design

The study is based on data from the National Health Interview Survey (NHIS), a cross-sectional multipurpose health survey of the civilian, noninstitutionalized, household population of the United States. We used information from the 2002 and 2007 annual surveys of the NHIS because of the availability of Alternative Medicine Supplement modules in these years. The University of Massachusetts Medical School Institutional Review Board approved the methods used in this study.

Study Sample

Our study sample consisted of adults over 18 years of age who responded to the Alternative Medicine Supplements. These supplements were administered to one randomly selected adult, ages 18 years or older, from each household. The interviewed sample consisted of 31,044 adults from the sample adult component of 44,540 households in 2002 and 23,393 adults from 40,377 households in 2007. Because our main focus was on prayer and pain, we excluded individuals who had missing data on these variables. Thus, the final sample size for analysis was 30,080 adults in 2002 and 22,306 adults in 2007.

Measures

Dependent variable: Use of prayer. The 2002 and 2007 NHIS Alternative Medicine Supplement included questions on prayer such as ever prayed for one's own health and recency of having prayed for one's own health (i.e., during the past year). We used the questions and constructed a categorical variable with three levels on the use of prayer. The categories were (a) never prayed for one's own health, (b) prayed in the past 12 months, and (c) did not pray in the past 12 months.

Independent variables. Independent variables included gender, race/ethnicity (White, African American, and Latino), marital status (married vs. not), and education (less than high school, high school, above high school/college), income adjusted for poverty level (poor/near poor: less than 100%

of poverty level; middle: 100% to <200%; high: $\geq 200\%$), insurance coverage (yes, no), change in health status (better, worse, same), functional limitations (limited and not limited), and lifestyle factors (current smoking, alcohol use, and regular exercise).

Because alternative and complementary therapies are often used to treat anxiety and depression (Barnes et al., 2004), we also used "feeling sad in the past 30 days" as an independent variable. To analyze national trends, we also used year of NHIS as one of the key independent variables.

Recurring pain in the past 12 months (2002 NHIS). Many patients with chronic pain use prayer to cope with their pain (Wachholtz & Pearce, 2009). Therefore, we included pain indicators in our models as one of the independent variables. We measured pain using responses from the queries to each respondent as to whether they have had recurring pain during the past 12 months to measure pain as a categorical variable (yes/no).

Dental pain in the past 12 months. We created a binary variable to indicate whether the respondent had any dental pain, which may include nerve pain, temporomandibular joint disorder, bruxism, tooth pain, mouth pain, and headaches related to these disorders during the past 12 months. This question was administered in both 2002 and 2007 and available for analysis.

Statistical Techniques

Significant bivariate subgroup differences in prayer use were tested with chi-square statistics. To analyze variations in use of prayer over time and the association between pain and prayer, we used multinomial logistic regressions on prayer using with pooled data for NHIS years 2002 and 2007. For these regressions, the reference group for the dependent variable was the "never prayed" group. The parameter estimates from logistic regressions were converted to odds ratios and we report the 95% confidence intervals associated with these estimates. All analyses were conducted in SAS-callable SUDAAN to obtain national estimates and adjust standard errors for the complex survey design.

Results

Table 1 describes the sample characteristics of adult respondents over 18 years of age who responded to the Alternative Medicine Supplements in 2002 and 2007. These respondents represented about 199 million individuals (weighted size) in 2002 and 213 million individuals in 2007. Most of the demographic, socioeconomic, and health characteristics were similar across the 2 years. For example, women made up 52% of the study sample; about two thirds of the sample individuals were married; 16% of individuals were senior citizens, defined as 65 years or older. An overwhelming majority of individuals reported stable health, and approximately 10% reported depressive symptoms some or all of the time during the past 12 months.

In 2002, 43% of U.S. adults had used prayer for health concerns within the past 12 months. This increased to 49% in 2007, an increase that was statistically significant at $p < .001$. The percentage of people who reported not praying in the past 12 months remained similar at 9% in 2002 and 2007.

Individual Time Point Analyses

We also conducted separate multinomial logistic regressions on prayer use for each year. In these regressions, we found that dental pain was associated with prayer use in the past 12 months in both years, with adjusted odds ratios (AORs) of 1.20 (95% CI [1.09, 1.33]) in 2002 and 1.16 (95% CI [1.03, 1.30]) in 2007. In addition, in 2002, we found that recurring pain was associated with an increased likelihood of prayer use in the past 12 months (AOR = 1.57; 95% CI [1.44, 1.77]). In both years, we did not find a significant association between the variable "did not pray in the last 12 months" and pain.

Trend Analyses

Across all characteristics, we found significant differences in prayer ($p < .05$) in 2002 and 2007 (see Table 2). For example, in 2002 and 2007, respectively, we found that a significantly greater proportion of women (51%, 56%) than men (34%, 40%) prayed in the past 12 months for their own health. Compared with Whites (40%, 45%), African Americans (61%, 67%)

were more likely to use prayer for their own health.

The results from multinomial regressions on pooled data (AORs and 95% CIs) are summarized in Table 3. These results confirmed the increase in the use of prayer even after adjusting for other relevant variables. Individuals were more likely to report use of prayer for health concerns in 2007 compared with 2002. The AOR for 2007 was 1.21 (95% CI [1.14, 1.28]).

Many other variables were significant in predicting prayer use; these included women, African Americans, older, married, those with higher education, changing health status (improved or declined), functional limitation, and depressive symptoms. Women compared with men, African Americans compared with Whites, married compared with others, and those with more than a high school education compared with those with less than a high school education were more likely to use prayer in the past 12 months for their own health. Similarly, individuals whose health had changed over the past 12 months and those with functional limitations were more likely to use prayer in the past 12 months compared with those with stable health and no limitations in functional status.

The only two groups that were negatively associated with prayer use in the past 12 months were individuals belonging to high-income households and those who reported regular exercise regimens. For example, the AOR for high income was 0.85 (95% CI [0.78, 0.93]). We also observed that the same pattern of high-income households and regular exercisers was negatively associated with the likelihood of not praying in the last 12 months. This suggests that these groups were more likely to have a remote (12+ months) history of prayer use, rather than never praying for their own health.

Discussion

In the United States, a substantial percentage of the population uses prayer for health concerns, and this percentage significantly increased in a 5-year period from 43% in 2002 to 49% in 2007. This is a substantial increase from the 13.7% who reported using spiritual healing or prayer in 1999 (Ni, Simile, & Hardy, 2002). The use of prayer by a substantial number of individuals and the increases in the rate over

Table 1

Description of Sample Characteristics: National Health Interview Survey, 2002 and 2007

Variable	2002			2007		
	<i>n</i>	Weighted	Wt %	<i>n</i>	Weighted	Wt %
All	30,080	199,302,427	100.0	22,306	213,358,677	100.0
Prayed for self						
Yes, in past 12 months	13,552	85,432,010	42.9	11,286	102,488,594	48.0
No, in past 12 months	2,686	17,937,892	9.0	1,858	18,420,811	8.6
Never prayed	13,842	95,932,525	48.1	9,162	92,449,272	43.3
Gender						
Women	17,023	103,811,110	52.1	12,420	110,293,563	51.7
Men	13,057	95,491,317	47.9	9,886	103,065,114	48.3
Race/ethnicity						
White	19,825	146,060,164	73.3	13,388	147,958,123	69.3
African American	4,025	22,475,569	11.3	3,518	24,832,442	11.6
Latino	5,138	22,114,389	11.1	4,029	28,780,159	13.5
Other	1,092	8,652,305	4.3	1,371	11,787,953	5.5
Age (years)						
<50	18,130	125,335,153	62.9	12,718	128,040,401	60.0
50–64	6,330	42,297,233	21.2	5,249	51,063,185	23.9
≥65	5,620	31,670,041	15.9	4,339	34,255,091	16.1
Marital status						
Married	15,824	127,018,810	63.9	11,524	133,400,263	62.7
Other	14,153	71,840,756	36.1	10,684	79,354,951	37.3
Education						
<High school	5,776	32,799,414	16.6	4,033	32,824,211	15.5
High school	8,593	58,906,211	29.8	6,229	61,288,592	29.0
>High school	15,453	105,891,882	53.6	11,849	117,435,400	55.5
Employed						
Yes	20,556	141,142,965	71.0	14,914	148,881,090	69.9
No	9,444	57,528,729	29.0	7,352	64,093,309	30.1
Poverty status						
Poor	3,371	16,418,342	8.2	3,158	22,133,027	10.4
Middle income	4,522	25,728,947	12.9	3,512	30,271,052	14.2
High income	15,255	110,727,348	55.6	12,307	128,958,613	60.4
Missing	6,932	46,427,790	23.3	3,329	31,995,985	15.0
Any insurance						
Yes	24,979	167,825,075	84.5	18,374	177,016,700	83.2
No	4,989	30,700,827	15.5	3,874	35,688,732	16.8
Change in health						
Better	5,348	35,111,546	17.6	3,968	37,473,788	17.6
Worse	2,810	17,420,501	8.8	1,956	17,824,758	8.4
Same	21,866	146,434,304	73.6	16,350	157,816,159	74.1
Dental pain						
Yes	3,884	25,338,969	12.7	2,704	25,919,310	12.2
No	26,177	173,851,562	87.3	19,593	187,345,934	87.8
Depression						
All of the time	948	5,552,334	2.8	727	6,042,500	2.8
Sometimes	2,583	15,401,300	7.8	1,715	15,013,804	7.1
Never	26,223	176,098,133	89.4	19,741	191,063,836	90.1
Functional status						
Limited	9,674	60,951,043	30.6	7,245	66,450,628	31.2
No limitation	20,341	137,956,024	69.4	15,036	146,690,583	68.8
Smoking						
Never	16,524	108,719,226	54.7	13,220	124,526,616	58.6
Past	6,647	45,050,702	22.7	4,757	45,872,020	21.6
Current	6,782	44,809,348	22.6	4,230	42,067,783	19.8

(table continues)

Table 1 (continued)

Variable	2002			2007		
	<i>n</i>	Weighted	Wt %	<i>n</i>	Weighted	Wt %
Alcohol use						
Current	6,995	43,155,034	21.9	5,526	49,522,873	23.6
Former	4,620	29,615,244	15.0	6,159	57,272,180	27.3
None	18,120	124,287,762	63.1	10,231	103,004,205	49.1
Exercise						
Daily	1,917	13,730,014	7.0	985	10,210,779	4.8
Weekly	8,356	59,022,543	29.9	6,066	63,279,370	29.9
Monthly/yearly	18,539	118,755,864	60.2	14,523	133,277,105	62.9
Unable to do	1,017	5,767,141	2.9	592	5,219,985	2.5
Recurring pain						
Yes	5,512	36,281,523	18.2			
No	24,530	162,700,847	81.8			

Note. Wt % = weighted percentage. Based on adults respondents 18 years of age or older with no missing data on use of prayer in the past 12 months.

time have implications for clinical practice. Many of these individuals also suffer from chronic illnesses and will have medical care encounters (Abraido-Lanza & Revenson, 2005). Prior studies using NHIS data have shown that prayer use complements but does not substitute for primary care (Wilkinson, Saper, Rosen, Welles, & Culpepper, 2008). Therefore, it is likely that many of these individuals are using prayer as a complementary treatment to help cope with physical and mental health conditions (see Pargament, Ano, & Wachholtz, 2005, for review).

Multiple lines of research have indicated that some forms of spiritual and religious coping can be a powerful resource during times of physical health issues (Wachholtz et al., 2007). The positive association in the present study between changes in physical health and use of prayer suggests that there may be an increased use of prayer as a coping mechanism in the United States. Increased prayer use was linked to both improvement and decline in health status, suggesting that individuals who experience a progressive disease that creates a decline in health status or who experience an acute health change are more likely to use prayer to cope with their changing circumstances than are stable health individuals. It may be this instability and uncertainty that influence prayer frequency given that people are more likely to use prayer in times of stress and uncertainty (Ai, Tice, Peterson, & Huang, 2005; Ironson, Stuetzle, & Fletcher, 2006). However, regardless of any potential

causes of the increased in prayer use of physical health, prayer is a common coping resource mechanism for individuals in physical distress.

Mental health and prayer are also linked. Individuals who reported feeling depressed "all the time" and "sometimes" were significantly more likely to use prayer for health concerns in the past 12 months compared with those who reported not feeling depressed at all. Although our study cannot shed light on whether prayer is a protective factor or risk factor for mental health, prior research suggests that prayer use for health concerns can be protective against mental health conditions such as depression (Lawler-Row & Elliott, 2009), anxiety disorders (see Koenig, McCullough, & Larson, 2001, for review), and stress (Ano & Vasconcelles, 2005). Research also suggests that religious/spiritual coping may be a powerful resource for individuals struggling with mental health issues (Phillips, Lakin, & Pargament, 2002).

Although not presented in tabular form, we found that for almost all groups, prayer use increased over time and subgroup differences in prayer use remained consistent in 2002 and 2007. For example, African Americans were more likely to use prayer in 2002 and 2007; similarly, older individuals were more likely than younger individuals to use prayer for health concerns. These findings imply that there have not been any relative changes in subgroup differences in prayer use over time.

We also found that positive health behaviors (i.e., not smoking, abstaining from alcohol use)

Table 2
Weighted Percentages of Sample Characteristics by Use of Prayer: National Health Interview Surveys, 2002 and 2007

Variable	2002			2007		
	Recent prayer	No recent prayer	Never prayed	Recent prayer	No recent prayer	Never prayed
All	42.9	9.0	48.1	48.0	8.6	43.3
Gender						
Women	50.6	9.0	40.4	55.5	8.3	36.2
Men	34.4	9.0	56.6	40.1	9.0	50.9
Race/ethnicity						
White	40.0	9.4	50.6	44.6	9.4	46.0
African American	60.9	7.0	32.2	67.4	6.2	26.4
Latino	46.3	9.0	44.7	51.9	8.0	40.2
Other	35.8	6.9	57.2	40.8	5.8	53.5
Age (years)						
<50	38.2	8.9	52.9	42.8	8.7	48.5
50-64	46.7	9.8	43.5	52.9	9.4	37.7
≥65	56.3	8.4	35.3	60.4	7.4	32.2
Marital status						
Married	43.0	9.4	47.5	48.4	9.0	42.6
Other	42.6	8.2	49.2	47.5	8.0	44.5
Education						
<High school	48.2	7.4	44.4	54.4	7.3	38.3
High school	42.8	9.2	48.0	48.9	8.4	42.7
>High school	41.3	9.4	49.3	45.9	9.2	44.9
Employed						
Yes	38.7	9.4	51.8	43.9	9.2	46.9
No	53.0	7.9	39.1	57.8	7.3	34.9
Poverty status						
Poor	50.5	7.3	42.2	55.3	7.2	37.6
Middle income	49.3	8.1	42.6	54.6	7.7	37.7
High income	39.8	9.5	50.7	45.3	9.4	45.3
Missing	43.9	8.9	47.2	47.7	7.4	44.9
Any insurance						
Yes	43.5	9.1	47.5	48.5	8.8	42.7
No	39.5	8.6	52.0	46.0	8.1	45.9
Insurance						
Yes	46.7	12.1	41.2	54.3	7.3	38.5
No	39.5	8.6	52.0	46.0	8.1	45.9
Change in health						
Better	49.5	8.5	42.0	53.5	8.4	38.1
Worse	62.0	5.6	32.3	65.3	4.7	30.0
Same	39.0	9.5	51.5	44.8	9.1	46.1
Dental pain						
Yes	49.3	8.2	42.5	54.9	6.7	38.5
No	41.9	9.1	49.0	47.1	8.9	44.0
Depression						
All of the time	60.5	4.2	35.4	67.4	5.0	27.6
Sometimes	58.5	7.3	34.2	62.1	6.3	31.7
Never	40.9	9.3	49.8	46.4	9.0	44.7
Functional status						
Limited	57.0	8.3	34.7	61.7	7.2	31.1
No limitation	36.6	9.3	54.1	41.8	9.3	48.9
Smoking						
Never	44.3	9.0	46.7	49.0	8.7	42.3
Past	45.9	9.7	44.4	50.4	8.7	40.9
Current	36.5	8.2	55.3	42.9	8.4	48.8

(table continues)

Table 2 (continued)

Variable	2002			2007		
	Recent prayer	No recent prayer	Never prayed	Recent prayer	No recent prayer	Never prayed
Alcohol use						
Current	51.7	7.8	40.5	54.8	6.5	38.7
Former	56.5	8.0	35.5	56.8	8.5	34.8
None	36.8	9.7	53.6	40.3	9.8	49.9
Exercise						
Daily	39.8	9.0	51.2	43.7	9.6	46.6
Weekly	38.9	9.9	51.2	44.2	8.9	46.9
Monthly/yearly	43.9	8.7	47.4	49.5	8.5	42.0
Unable to do	69.0	5.9	25.1	70.3	4.6	25.1
Recurring pain						
Yes	59.6	7.7	32.6			
No	39.1	9.3	51.6			

Note. Based on adult respondents 18 years of age or older with no missing data on use of prayer in the past 12 months. All characteristics were significantly associated with prayer use based on chi-square statistics at $p < .05$.

were predictive of prayer use. Previous research suggests that those individuals who describe their body as having a sacred dimension (e.g., “My body is holy”) are more likely to engage in health protective behaviors and are more likely to report higher levels of general religiosity (Mahoney et al., 2005). Therefore, our results are similar to previous research suggesting that individuals who are more likely to use prayer for health concerns are also more likely to engage in health protective behaviors.

Limitations and Future Directions

The present study has a number of strengths. The sample is nationally representative, with a substantial sample size, and standardized instruments were administered by trained personnel during both time periods. Furthermore, our study extends previous studies on prayer use that employed 2002 NHIS data, and it is the first, to our knowledge, to explore trends in prayer use for health concerns over time. Our study used the most recent data available so that the current trends can benefit patients by informing medical practice and health policy.

However, like all studies, there are limitations that should be acknowledged. Primarily, because of the nature of the data, we cannot assess causal or temporal relationships. Therefore, we cannot answer the proverbial question, Which came first—the prayer or the health issue? The data set also relies on self-report data,

which require participants to recall health-related behaviors over the past 12 months. This method of data collection may lead to less accurate data than a longitudinal study that closely follows a cohort over 12 months.

Unfortunately, the present data cannot inform us as to the type of prayer participants use to address their health concerns. Previous research suggests that the content and valence of religious coping strategies, such as prayer, have an identifiable and unique impact on mental and physical health (Pargament et al., 1998). Therefore, future research may not only identify that people are increasingly using prayer in response to health concerns, but it also may explore changes in the valence of those prayers related to health. Although we acknowledge the limitations of the present study, we also hope that it will be a stepping stone for future research in the area of prayer and health concerns.

Conclusion

Prayer use in response to health concerns has increased over time. Individuals are more likely to engage in prayer if they are non-Caucasian, female, or highly educated. Furthermore, those employing prayer for health concerns are also more likely to take steps to ensure their health by engaging in health protective behaviors. However, prayer use related to health concerns is seen across multiple demographic and socio-economic factors. Therefore, it is critical to

Table 3
Adjusted Odds Ratios (AOR) and 95% Confidence Intervals (95% CI) From Multinomial Logistic Regression on Use of Prayer in the National Health Interview Survey, 2002 and 2007

Variable	Prayed in past 12 months			Did not pray in past 12 months		
	AOR	95% CI	<i>p</i>	AOR	95% CI	<i>p</i>
Intercept	0.27	[0.22, 0.33]	***	0.09	[0.06, 0.13]	***
Year						
2002						
2007	1.21	[1.14, 1.28]	***	1.06	[0.96, 1.16]	
Dental pain						
Yes	1.21	[1.12, 1.31]	***	0.95	[0.84, 1.07]	
No						
Gender						
Women	1.81	[1.71, 1.90]	***	1.34	[1.24, 1.46]	***
Men						
Race/ethnicity						
White						
African American	2.71	[2.49, 2.94]	***	1.25	[1.09, 1.44]	**
Latino	1.59	[1.46, 1.73]	***	1.19	[1.04, 1.36]	*
Other	0.87	[0.77, 0.97]	*	0.65	[0.53, 0.81]	***
Age (years)						
<50						
50–64	1.40	[1.32, 1.49]	***	1.32	[1.19, 1.47]	***
≥65	1.71	[1.59, 1.85]	***	1.26	[1.12, 1.43]	***
Marital status						
Married	1.27	[1.21, 1.34]	***	1.16	[1.07, 1.26]	***
Other						
Education						
<High school						
High school	1.03	[0.95, 1.11]		1.12	[0.98, 1.28]	
>High school	1.12	[1.04, 1.21]	**	1.17	[1.02, 1.33]	*
Poverty status						
Poor						
Middle income	1.02	[0.93, 1.12]		1.04	[0.88, 1.24]	
High income	0.85	[0.78, 0.93]	***	0.99	[0.85, 1.16]	
Missing	0.87	[0.79, 0.95]	**	0.93	[0.78, 1.10]	
Any insurance						
Yes	1.07	[1.00, 1.15]		0.99	[0.87, 1.12]	
No						
Change in health						
Better	1.41	[1.32, 1.50]	***	1.10	[0.99, 1.22]	
Worse	1.57	[1.44, 1.72]	***	0.79	[0.67, 0.95]	**
Same						
Depression						
All	1.51	[1.29, 1.78]	***	0.79	[0.57, 1.11]	
Sometime	1.55	[1.40, 1.71]	***	1.07	[0.91, 1.27]	
Never						
Functional status						
Limited	1.68	[1.59, 1.78]	***	1.23	[1.11, 1.36]	***
No limitation						
Smoking						
Never	1.30	[1.21, 1.40]	***	1.21	[1.09, 1.34]	***
Past	1.31	[1.21, 1.40]	***	1.20	[1.06, 1.36]	**
Current						
Alcohol Use						
None	1.35	[1.26, 1.44]	***	0.89	[0.79, 1.00]	*
Former	1.55	[1.45, 1.66]	***	1.12	[1.01, 1.25]	*
Current						

(table continues)

Table 3 (continued)

Variable	Prayed in past 12 months			Did not pray in past 12 months		
	AOR	95% CI	<i>p</i>	AOR	95% CI	<i>p</i>
Exercise						
Daily	0.75	[0.62, 0.92]	**	1.17	[0.82, 1.67]	
Weekly	0.80	[0.67, 0.96]	*	1.17	[0.85, 1.62]	
Monthly/yearly	0.71	[0.60, 0.83]	***	1.14	[0.83, 1.56]	
Unable to do						

* *p* < .05. ** *p* < .01. *** *p* < .001.

understand how this religious/spiritual behavior has changed and how this may affect patients' mental and physical health as another step forward in improving the quality of care.

References

- Abraido-Lanza, A., & Revenson, T. (2005). Coping and social support resources among Latinas with arthritis. *Arthritis & Rheumatism*, *9*, 501–508.
- Ai, A., Tice, T. N., Peterson, C., & Huang, B. (2005). Prayers, spiritual support, and positive attitudes in coping with the September 11 national crisis. *Journal of Personality*, *73*, 763–792.
- Ano, G., & Vasconcelles, E. (2005). Religious coping and psychological adjustment to stress: A meta-analysis. *Journal of Clinical Psychology*, *61*, 461–480.
- Arredondo, E. M., Elder, J. P., Ayala, G. X., & Campbell, N. R. (2005). Is church attendance associated with Latinas' health practices and self-reported health? *American Journal of Health Behaviors*, *29*, 502–511.
- Banthia, R., Moskowitz, J. T., Acree, M., & Folkman, S. (2007). Socioeconomic differences in the effects of prayer on physical symptoms and quality of life. *Journal of Health Psychology*, *12*, 249–260.
- Barnes, P. M., Powell-Griner, E., McFann, K., & Nahin, R. L. (2004). Complementary and alternative medicine use among adults: United States, 2002. *Advance Data*, *343*, 1–19.
- Brown, C. M., Barner, J. C., Richards, K. M., & Bohman, T. M. (2007). Patterns of complementary and alternative medicine use in African Americans. *The Journal of Alternative and Complementary Medicine*, *13*, 751–758. doi:10.1089/acm.2006.6392
- Curlin, F. A. (2008). Commentary: A case for studying the relationship between religion and the practice of medicine. *Academic Medicine*, *83*, 1118–1120.
- Dunn, K. S., & Horgas, A. L. (2004). Religious and nonreligious coping in older adults experiencing chronic pain. *Pain Management Nursing*, *5*, 19–28.
- Eisenberg, D. M., Davis, R. B., Ettner, S. L., Appel, S., Wilkey, S., Van Rompay, M., & Kessler, R. C. (1998). Trends in alternative medicine use in the United States, 1990–1997: Results of a follow-up national survey. *Journal of the American Medical Association*, *280*, 1569–1575.
- Graham, R. E., Ahn, A. C., Davis, R. B., O'Connor, B. B., Eisenberg, D. M., & Phillips, R. S. (2005). Use of complementary and alternative medical therapies among racial and ethnic minority adults: Results from the 2002 National Health Interview Survey. *Journal of the National Medical Association*, *97*, 535–545.
- Green, B. L., Lewis, R. K., Wang, M. Q., Person, S., & Rivers, B. (2004). Powerlessness, destiny, and control: The influence on health behaviors of African Americans. *Journal of Community Health*, *29*, 15–27.
- Greenlee, H., Kwan, M. L., Ergas, I. J., Sherman, K. J., Krathwohl, S. E., Bonnell, C., . . . Kushi, L. H. (2009). Complementary and alternative therapy use before and after breast cancer diagnosis: The Pathways Study. *Breast Cancer Research and Treatment*, *117*, 653–665.
- Harvey, I. S., & Silverman, M. (2007). The role of spirituality in the self-management of chronic illness among older African and Whites. *Journal of Cross-Cultural Gerontology*, *22*, 205–220.
- Holt, C. L., Clark, E. M., Kreuter, M. W., & Rubio, D. (2003). Spiritual health locus of control and cancer beliefs among urban African American women. *Health Psychology*, *22*, 294–299.
- Ironson, G., Stuetzle, R., & Fletcher, M. (2006). An increase in religiousness/spirituality occurs after HIV diagnosis and predicts slower disease progression over 4 years in people with HIV. *Journal of General Internal Medicine*, *21*(Suppl. 5), S62–S68.
- Kaplar, M., Wachholtz, A., & O'Brien, W. (2004). The impact of religious and spiritual variables on the psycho-social and biological health factors: A meta-analysis. *Journal of Psycho-Social Oncology*, *22*, 39–49.

- Koenig, H. G., McCullough, M. E., & Larson, D. B. (2001). Anxiety disorders. In *Handbook of religion and health* (pp. 144–153). New York: Oxford University Press.
- Lawler-Row, K. A., & Elliott, J. (2009). The role of religious activity and spirituality in the health and well-being of older adults. *Journal of Health Psychology, 14*, 43–52.
- Levin, J., Chatters, L. M., & Taylor, R. J. (2005). Religion, health and medicine in African Americans: Implications for physicians. *Journal of the National Medical Association, 97*, 237–249.
- Mahoney, A., Carels, R. A., Pargament, K. I., Wachholtz, A., Edwards-Leeper, L., Kaplar, K., & Frutchey, R. (2005). The sanctification of the body and behavioral health patterns of college students. *International Journal for the Psychology of Religion, 15*, 221–238.
- Masters, K. S., & Spielmans, G. I. (2007). Prayer and health: Review, meta-analysis, and research agenda. *Journal of Behavioral Medicine, 30*, 329–338.
- McCaffrey, A. M., Eisenberg, D. M., Legedza, A., Davis, R. B., & Phillips, R. S. (2004). Prayer for health concerns: Results of a national survey on prevalence and patterns of use. *Archives of Internal Medicine, 164*, 858–862.
- Ni, H., Simile, C., & Hardy, A. M. (2002). Utilization of complementary and alternative medicine by United States adults: Results from the 1999 National Health Interview Survey. *Medical Care, 40*, 353–358.
- Pargament, K. I., Ano, G., & Wachholtz, A. B. (2005). Religion and coping. In R. Paloutzian & C. Park (Eds.), *The handbook of the psychology of religion* (pp. 479–495). New York: Guilford Press.
- Pargament, K. I., Koenig, H. G., Tarakeshwar, N., & Hahn, J. (2004). Religious coping methods as predictors of psychological, physical, and spiritual outcomes among medically ill elderly patients: A two-year longitudinal study. *Journal of Health Psychology, 9*, 713–730.
- Pargament, K. I., Smith, B. W., Koenig, H. G., & Perez, L. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal of the Scientific Study of Religion, 37*, 710–724.
- Phillips, R. E., Lakin, R., & Pargament, K. I. (2002). Brief report: Development and implementation of a spiritual issues psychoeducational group for those with serious mental illness. *Community Mental Health Journal, 38*, 487–495.
- Ross, L. E., Hall, I. J., Fairley, T. L., Taylor, Y. J., & Howard, D. L. (2008). Prayer and self-reported health among cancer survivors in the United States, National Health Interview Survey, 2002. *The Journal of Alternative and Complementary Medicine, 14*, 931–938. doi:10.1089/acm.2007.0788
- Saydah, S. H., & Eberhardt, M. S. (2006). Use of complementary and alternative medicine among adults with chronic diseases: United States, 2002. *The Journal of Alternative and Complementary Medicine, 12*, 805–812. doi:10.1089/acm.2006.12.805
- Upchurch, D. M., Chyu, L., Greendale, G. A., Utts, J., Bair, Y. A., Zhang, G., & Gold, E. B. (2007). Complementary and alternative medicine use among American women: Findings from the National Health Interview Survey, 2002. *Journal of Women's Health, 16*, 102–113.
- Wachholtz, A. B., & Pargament, K. (2005). A comparison of relaxation, spiritual meditation, and secular meditation and cardiac reactivity to a cold pressor task. *Journal of Behavioral Medicine, 28*, 369–384.
- Wachholtz, A. B., & Pargament, K. I. (2008). The effect of meditation orientation and content on migraineurs. *Journal of Behavioral Medicine, 31*, 355–361.
- Wachholtz, A. B., & Pearce, M. J. (2009). Does spirituality as a coping mechanism help or hinder coping with chronic pain? *Current Pain and Headache Reports, 13*, 127–132.
- Wachholtz, A. B., Pearce, M., & Koenig, H. (2007). Chronic pain and spirituality: Past research and future directions. *Journal of Behavioral Medicine, 30*, 311–318.
- Wilkinson, J. E., Saper, R. B., Rosen, A. K., Welles, S. L., & Culpepper, L. (2008). Prayer for health and primary care: Results from the 2002 National Health Interview Survey. *Family Medicine, 40*, 638–644.
- Wink, P., & Dillon, M. (2002). Spiritual development across the adult life course: Findings from a longitudinal study. *Journal of Adult Development, 9*, 79–94.

Received March 26, 2010

Revision received July 21, 2010

Accepted August 9, 2010 ■