Religion, Spirituality, and Acute Care Hospitalization and Long-term Care Use by Older Patients

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Background: The impact of religion and spirituality on acute care hospitalization (ACH) and long-term care (LTC) in older patients before, during, and after ACH is not well known.

Methods: Patients 50 years or older consecutively admitted to the general medical service at Duke University Medical Center were interviewed shortly after admission (N=811). Measures of religiosity were organized religious activity (ORA), nonorganizational religious activity (NORA), religiosity through religious radio and/or television (RTV), intrinsic religiosity, and self-rated religiousness. Measures of spirituality included self-rated spirituality and daily spiritual experiences (DSE). Primary outcome was number of ACH days during an average 21-month observation period. Secondary outcomes were times hospitalized and number of days spent in a nursing home or rehabilitation setting (collectively, long-term care: LTC). Race and sex interactions were examined.

Results: In the cross-sectional analysis, ORA was the only religious variable related to fewer ACH days and fewer hospitalizations, an effect that is fully explained by physical health status and that disappeared when examined prospectively. The number of LTC days was inversely related to NORA, RTV, and DSE, effects that were partially explained by social support but not by severity of medical illness. Interactions with race and sex were notable but reached statistical significance only among African Americans and women. In those groups, religious and/or spiritual characteristics also predicted future LTC use independent of physical health and baseline LTC status.

Conclusions: Relationships with ACH were weak, were confined to ORA only, and disappeared in prospective analyses. However, robust and persistent effects were documented for religiousness and/or spirituality in the use of LTC among African Americans and women.

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Religious beliefs and practices are widespread among older adults in the United States, especially those who have acute or chronic health problems that impair function and quality of life. While considerable attention has been paid to religious coping in medical settings, much less is known about how religious behaviors and spiritual experiences influence the use of acute care hospitalization (ACH) and long-term care (LTC) services. There is growing evidence that religious or spiritual practices may be associated with better physical health and greater longevity as well as better mental health and greater social support, factors likely to influence the use of hospital services. However, studies that have directly examined associations between religious involvement and hospitalization have produced mixed results. While greater religiousness has been associated with shorter hospital stays in patients undergoing coronary artery bypass grafting, longer walking distances at discharge in patients undergoing hip surgery, and shorter stays in older medical inpatients, other studies have not found an association between religiousness and days hospitalized. No study has yet examined the effects of religiousness on use of LTC services.

While terms such as religiousness and spirituality are often used interchangeably, they may have different associations with health and use of health services. Religion has been defined as an organized system of beliefs, practices, and symbols designed to facilitate closeness to a higher power, and it emphasizes relationship with and responsibility toward one another in a community. Spirituality, on the other hand, is characterized as the quest for understanding life’s ultimate questions and the meaning and purpose of life; it emphasizes indivi...
individual experience and may or may not lead to participation in a community. Given the well-substantiated effects of social and community support on use of health services, especially LTC services, religiousness and spirituality may have quite different effects on hospital use.

Our primary hypothesis was that religious and spiritual practices, attitudes, and experiences would be associated with fewer ACH days, an effect that is greatest among women and African Americans (owing to strong associations between religion and health in these populations). Related to this was the expectation that religious and spiritual practices would be associated with fewer incidents of ACH. Second, we hypothesized that religious and spiritual practices would be related to fewer days spent in nursing home or rehabilitation settings. Finally, we expected that religiousness, with its emphasis on community support, would have greater effects than spirituality.

Psychosocial Factors

Developed specifically for older patients, the 11-item version of the Duke Social Support Index (DSSI)14 examined 2 major components of social support: social network and subjective support. Marital status was dichotomized into “married” vs “other.” The 11-item Brief Depression Scale (BDS)15 assessed depressive symptoms and is validated for use in medically ill hospitalized patients (score range, 0-11). Psychosocial measures were assessed only at baseline.

Physical Health

The Duke Activity Status Index (DASI)16 is a 12-item self-report questionnaire that measures physical functioning. The Cumulative Illness Rating Scale (CIRS)17 is an observer-rated instrument assessing severity of impairment of 12 major organ systems. Each organ system is rated on a 0 to 4 scale, with 0 indicating no impairment and 4 indicating very severe impairment. The DASI and CIRS score were obtained at baseline and at each of the 4 follow-up contacts; each patient’s baseline score and scores at each follow-up were summed and divided by the number of contacts (n=3 or n=how many total interviews were completed) to give an average DASI and an average CIRS score across time.

Spirituality

We used 3 methods of assessing spirituality following the approach suggested by Zinnbauer and colleagues.20 First, self-rated spirituality was determined by asking patients to rate their overall spirituality using a 5-point Likert scale, ranging from “I am not religious at all” to “I am very religious.” The ORA scores (range, 2-12), NORA scores (range, 2-12), RTV scores (range, 1-6), intrinsic religiosity scores (range, 10-50), and self-rated religiousness scores (range, 1-5) were obtained at baseline and at each of the 9 follow-up contacts; scores were summed across time and divided by the number of contacts to produce averages for each scale during the observation period.

Demographic Features and Access to Health Care

Age, sex, race, education, and insurance status were assessed only at baseline. Insurance status, an access variable, was dichotomized into “self-pay, private major medical, private HMO [health maintenance organization], Medicare with private insurance copay or self-pay, or Medicare HMO” (scored as 1 for statistical analysis) vs “Medicaid, Medicare with Medicaid, VA benefits, or other” (scored as 0 for statistical analysis) to compare patients with and without paid insurance.

METHODS

PROCEDURE

Using lists of daily admissions, we identified patients consecutively admitted to the general medicine service at Duke University Medical Center between August 1998 and April 2002. After obtaining written informed consent, a research nurse conducted a 60- to 90-minute interview, completed a brief physical examination, and reviewed the medical record. At 3, 6, 9, and 12 months following the baseline interview, patients were reinterviewed by telephone concerning their religiousness and/or spirituality, physical health, and use of ACH and LTC services. If on follow-up patients were too ill to complete the interview, the necessary information was obtained from a family member or caregiver (19% of follow-up interviews). A single research nurse conducted all interviews and was retrained every 6 months throughout the study to ensure consistent data collection. The Duke institutional review board approved the study.

MEASURES

Control variables were demographic and access factors. Explanatory variables were divided into psychosocial (social support, marital status, and depressive symptoms) and physical health (ability to perform activities of daily living and observed-rated illness severity). Some control and explanatory variables were assessed only at baseline, whereas others were assessed at each of the 4 telephone contacts. If assessed during follow-up, the scores were summed across all encounters and divided by the number of encounters to obtain an average score across time for the variable of interest. This was done to provide the most comprehensive measures of exposure based on data available from all interviews across time.

Demographic Features and Access to Health Care

Age, sex, race, education, and insurance status were assessed only at baseline. Insurance status, an access variable, was dichotomized into “self-pay, private major medical, private HMO [health maintenance organization], Medicare with private insurance copay or self-pay, or Medicare HMO” (scored as 1 for statistical analysis) vs “Medicaid, Medicare with Medicaid, VA benefits, or other” (scored as 0 for statistical analysis) to compare patients with and without paid insurance.
EXPERIENCES WERE ASSESSED WITH THE 16-ITEM DSE SCALE41 (ASSESSSED ONLY AT BASELINE). THIS SCALE SEEKS TO ASSESS THE PERCEPTION OF THE TRANSCENDENT (IE, GOD) AND INTERACTIONS WITH THE TRANSCENDENT IN DAILY LIFE. RESPONSE OPTIONS FOR EACH ITEM RANGED FROM 1 TO 5 (“NEVER OR ALMOST NEVER” TO “MANY TIMES A DAY”).

HOSPITAL USE


Finally, patients were asked how many days they had spent in LTC (ie, a nursing home or rehabilitation setting) during the 3 months prior to their Duke admission. In addition, patients were asked during each of the 4 follow-up contacts how many days they had spent in LTC since discharge from Duke or last contact 3 months previously. In this way, the number of days spent in LTC during the 3 months prior and 12 months following the baseline evaluation was determined (a 15-month period surrounding the index hospitalization). Since the period of observation varied depending on participation in follow-ups, the total days spent in LTC were divided by the number of months of observation to determine LTC days per month of observation.

STATISTICAL ANALYSIS

TO ASSESS WHETHER RELIGIOUS OR SPIRITUAL FACTORS WERE ASSOCIATED WITH THE PRIMARY OUTCOME, NUMBER OF DAYS HOSPITALIZED, WE CORRELATED AVERAGE SCORES ACROSS TIME ON RELIGIOUS AND/OR SPIRITUAL VARIABLES WITH AVERAGE DAYS HOSPITALIZED PER MONTH OF OBSERVATION. RELATIONSHIPS WERE EXAMINED USING LEAST-SQUARES LINEAR REGRESSION. FIRST, ONLY RELIGIOUS OR SPIRITUAL VARIABLES AND CONTROL VARIABLES WERE ADDED TO THE MODEL (AGE, SEX, RACE, EDUCATION, AND INSURANCE) TO DETERMINE IF ANY TRUE RELATIONSHIP EXISTED BETWEEN RELIGIOUS AND/OR SPIRITUAL CHARACTERISTICS AND THE NUMBER OF DAYS HOSPITALIZED. NEXT, EXPLANATORY PSYCHOSOCIAL VARIABLES (SOCIAL SUPPORT, MATRITAL STATUS, DEPRESSIVE SYMPTOMS) WERE ADDED TO THE MODEL. FINALLY, EXPLANATORY PHYSICAL HEALTH VARIABLES WERE ADDED (SELF-RATED ACTIVITIES OF DAILY LIVING AND OBSERVER-RATED ILLNESS SEVERITY). THIS WAS REPEATED FOR THE NUMBER OF TIMES HOSPITALIZED AND LTC. PHYSICAL HEALTH VARIABLES WERE CONSIDERED EXPLANATORY (NOT CONTROL) VARIABLES BECAUSE RELIGIOUS OR SPIRITUAL FACTORS MAY HAVE PLAYED A SIGNIFICANT ROLE IN THE HEALTH STATUS OF THE PATIENT PRIOR TO THE STUDY, AS OTHERS HAVE FOUND.

For significant or trend-level main effects, interaction terms with sex and race were added to the model; if interactions were significant, analyses were stratified to determine the nature of the interaction. Standardized beta coefficients (β) are presented for all analyses except for interactions, where unstandardized beta coefficients (B) and standard errors (SE) are given. Level of statistical significance was set at .01 owing to multiple statistical comparisons; P values ranging from .10 to .01 were considered trend-level effects.

For significant cross-sectional associations with the number of days hospitalized, number of times hospitalized, and LTC, we examined the effects of religious and/or spiritual variables on future use of hospital services after the baseline interview, controlling for baseline service use prior to the index admission.

RESULTS

SAMPLE

A TOTAL OF 2477 CONSECUTIVE PATIENTS OLDER THAN 50 YEARS WERE ADMITTED DURING THE SCREENING PERIODS. BASED ON EXCLUSION CRITERIA SET UP PRIOR TO THE STUDY, PATIENTS DID NOT PARTICIPATE IN THE STUDY FOR THE FOLLOWING REASONS: (1) SEVERE PHYSICAL ILLNESS, ADVANCED COGNITIVE IMPAIRMENT, OR INABILITY TO COMMUNICATE DUE TO HEARING LOSS OR OTHER REASON (N=711); (2) HOSPITAL DISCHARGE OCCURRED BEFORE WE COULD EVALUATE THE PATIENT (N=456); OR (3) MISCELLANEOUS REASONS (N=65). OF THE 1245 PATIENTS WHO COULD HAVE BEEN INTERVIEWED, 413 REFUSED TO PARTICIPATE, YIELDING A FINAL SAMPLE OF 838 (67% ADJUSTED RESPONSE RATE).

A COMPUTER PROGRAM RANDOMLY SELECTED APPROXIMATELY 1 OF EVERY 20 NONPARTICIPANTS (N=72). THERE WERE NO DIFFERENCES BETWEEN NONPARTICIPANTS AND PARTICIPANTS IN RACE (35% VS 39% NONWHITE), SEX (49% VS 53% FEMALE), OR MEDICAL INSURANCE (50% VS 47% PRIVATE), BUT NONRESPONDENTS WERE OLDER (71 VS 64 YEARS; P=.001), MORE LIKELY TO HAVE CHRONIC PULMONARY OR INFECTIOUS DISEASES (49% VS 29%; P=.01), AND LESS LIKELY TO HAVE CARDIOVASCULAR DISEASE (15% VS 31%; P=.01).

BEFORE CONDUCTING THE FINAL ANALYSES, WE ALSO ELIMINATED 16 LONG-STAY PATIENTS WHO UNDERWENT HEART TRANSPLANTATION, 4 PATIENTS WITH LENGTHS OF STAY GREATER THAN 70 DAYS (OUTLIERS), AND 7 PATIENTS WITH INCOMPLETE OUTCOME DATA, YIELDING A FINAL SAMPLE OF 811. OF THESE, 90.5% (N=734) COMPLETED AT LEAST ONE 3-MONTH TELEPHONE FOLLOW-UP, 72.3% (N=586) AT LEAST 2 FOLLOW-UPS, 62.7% (N=508) AT LEAST 3 FOLLOW-UPS, AND 53.3% (N=432) HAD ALL 4 FOLLOW-UPS. GIVEN THAT SUBJECTS WERE RECRUITED INTO THE STUDY RIGHT UP TO THE FINAL DAY OF THE PROJECT, NOT ALL 811 SUBJECTS WERE ELIGIBLE FOR ALL FOLLOW-UPS WHEN THIS PROJECT WAS TERMINATED. OF THE 616 SUBJECTS ELIGIBLE FOR ALL 4 FOLLOW-UPS AT THE TIME OF PROJECT TERMINATION, 97.1% (N=598) COMPLETED AT LEAST 1 FOLLOW-UP, 82.5% (N=508) HAD AT LAST 2 FOLLOW-UPS, 75.4% (N=464) HAD AT LEAST 3 FOLLOW-UPS, AND 68.8% (N=424) COMPLETED ALL 4 FOLLOW-UPS. THE MEAN (SD) PERIODS OF OBSERVATION AND FOLLOW-UP AFTER THE BASELINE INTERVIEW FOR THE 811 SUBJECTS WERE 20.7 (4.4) AND 8.3 (4.6) MONTHS, RESPECTIVELY. FOR THE 616 SUBJECTS ELIGIBLE FOR ALL FOLLOW-UPS DURING THE STUDY, THE MEAN (SD) PERIODS OF OBSERVATION AND FOLLOW-UP AFTER BASELINE WERE 22.1 (3.7) AND 9.7 (4.1) MONTHS, RESPECTIVELY.

SAMPLE CHARACTERISTICS

THE AVERAGE PATIENT AGE WAS 64.4 YEARS (RANGE, 50-97 YEARS), AND THE AVERAGE EDUCATION WAS 11.9 YEARS (RANGE,
Experiences will be associated with fewer ACH days and a reduction in the number of hospitalizations. Hypothesis 1: Religious and spiritual practices, attitudes, and beliefs are associated with fewer days spent in LTC. This hypothesis was generally confirmed (Table 1). In the cross-sectional analysis, NORA, particularly prayer and Bible study, was inversely related to number of LTC days. Dividing NORA into quartiles, we found that those in the highest quartile spent an average of 11.7 days in LTC during the observation period compared with 26.7 days for the lowest quartile. This effect was partially explained by psychosocial variables in that NORA was related to greater social support (r = 0.18; P = .001), and greater social support was related to fewer LTC days (r = −0.25; P = .001). However, taking into account physical functioning and physical illness severity had little effect on this relationship.

There was also a significant inverse relationship between RTV and number of LTC days. Dividing RTV scores into quartiles, we found that those patients in the highest quartile spent an average of 11.2 days in LTC during the observation period compared with 20.3 days for those in the lowest quartile. This relationship was partially accounted for by psychosocial factors, particularly social support. Adding physical health explanatory variables to the model actually increased the strength of the relationship. Furthermore, when we reanalyzed the data controlling for hospital use during the year prior to the baseline interview, we found that ORA did not predict future days hospitalized (β = −0.04; P = 0.29, with control variables in model) or number of hospitalizations (β = 0.01; P = 0.87 compared with control variables in model).

Hypothesis 2: Religious and spiritual practices will be associated with fewer days spent in LTC. This hypothesis was generally confirmed (Table 1). In the cross-sectional analysis, NORA, particularly prayer and Bible study, was inversely related to number of LTC days. Dividing NORA into quartiles, we found that those in the highest quartile spent an average of 11.7 days in LTC during the observation period compared with 26.7 days for the lowest quartile. This effect was partially explained by psychosocial variables in that NORA was related to greater social support (r = 0.18; P = .001), and greater social support was related to fewer LTC days (r = −0.25; P = .001). However, taking into account physical functioning and physical illness severity had little effect on this relationship.

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Table 1. Standardized β-Value Estimate From Regression Model for the Association of Religiosity and/or Spirituality With Number of Days per Month Spent in Long-term Care

<table>
<thead>
<tr>
<th>Type of Religiosity and/or Spirituality</th>
<th>Demographic Controls</th>
<th>Psychosocial Explanatory</th>
<th>Physical Health Explanatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliation, any vs none†</td>
<td>−0.07‡</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Organizational activity</td>
<td>−0.07§</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Nonorganizational activity</td>
<td>−0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious radio or television</td>
<td>−0.11¶</td>
<td>−0.08§</td>
<td>−0.09¶</td>
</tr>
<tr>
<td>Intrinsic religiosity</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Self-rated religiosity</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Self-rated spirituality</td>
<td>−0.07§</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Spiritual and/or religious categories†</td>
<td>−0.10¶</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Daily spiritual experiences†</td>
<td>−0.10¶</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

Abbreviation: NS, no statistical significance or trend.

*No. subjects ± 1%.
†Measured at baseline only.
‡P < .05.
||P < .01.
||P < .001.

0-26 years). Women made up 54.4% of the sample and nonwhites 39.5%; because 93% of nonwhites were African American, nonwhites are referred to as African Americans. The most common admission diagnoses were heart or circulatory system disease (29.5%) and gastrointestinal disease (19.9%). Most patients had poor physical functioning as measured by the DASI with an average of 18.7 on a scale ranging from 12 (completely independent) to 36 (completely dependent). Depressive symptoms averaged 3.9 on the BDS, where scores higher than 3 indicate significant depression; this suggests that many patients were stressed by their hospital experience.

Religious and spiritual beliefs, practices, and experiences were widespread among these patients, as reported elsewhere.22 Nearly all patients (97.6%) indicated a religious affiliation; 37.3% attended religious services weekly or more often; 80.8% engaged in private prayer at least once daily; and 50.7% read the Bible or other religious literature several times per week or more.

With regard to hospital use, the mean (SD) total number of ACH days during the 21-month observation period was 30.6 (37.6) (range, 1-430); the mean (SD) number of hospitalizations was 3.5 (3.1) (range, 1-31); and the mean (SD) total number of days of LTC was 18.5 (58.9) (range, 0-429).

FINDINGS WITH REGARD TO THE HYPOTHESES

Hypothesis 1: Religious and spiritual practices, attitudes, and experiences will be associated with fewer ACH days and a lower number of hospitalizations, especially in women and African Americans. This hypothesis was not true for any religious variable except for frequency of ORA (β = −0.14; P < .001, with control variables in model). When the ORA scores were divided into quartiles, we found that those patients in the highest quartile (25%) spent an average of 23.7 days in the hospital during the observation period compared with 33.5 days for those in the lowest quartile. The same pattern was true for number of hospitalizations (β = −0.10; P < .005). There were no interactions with race or sex.

However, adding physical health variables to the model (functional status and illness severity) completely explained the relationship. Furthermore, when we repeated the analyses examining number of ACH days hospitalized and number of ACH incidents following the baseline interview (prospective analysis) and controlled for hospital use during the year prior to the baseline interview, we found that ORA did not predict future days hospitalized (β = −0.04; P = 0.29, with control variables in model) or number of hospitalizations (β = 0.01; P = 0.87 compared with control variables in model).

Hypothesis 2: Religious and spiritual practices will be associated with fewer days spent in LTC. This hypothesis was generally confirmed (Table 1). In the cross-sectional analysis, NORA, particularly prayer and Bible study, was inversely related to number of LTC days. Dividing NORA scores into quartiles, we found that those in the highest quartile spent an average of 11.7 days in LTC during the observation period compared with 26.7 days for the lowest quartile. This effect was partially explained by psychosocial variables in that NORA was related to greater social support (r = 0.18; P < 0.001), and greater social support was related to fewer LTC days (r = −0.25; P < 0.001). However, taking into account physical functioning and physical illness severity had little effect on this relationship.

There was also a significant inverse relationship between RTV and number of LTC days. Dividing RTV scores into quartiles, we found that those patients in the highest quartile spent an average of 11.2 days in LTC during the observation period compared with 20.3 days for those in the lowest quartile. This relationship was partially accounted for by psychosocial factors, particularly social support. Adding physical health explanatory variables to the model actually increased the strength of the relationship. Furthermore, when we reanalyzed the data controlling for hospital use during the year prior to the baseline interview, we found that ORA did not predict future days hospitalized (β = −0.04; P = 0.29, with control variables in model) or number of hospitalizations (β = 0.01; P = 0.87 compared with control variables in model).

When interactions with race and sex were examined, some surprising findings emerged. With demographics controlled, significant interactions were found with race for affiliation (B = 19.3 [SE, 3.8]; P < 0.001), NORA (B = 0.58 [SE, 0.17]; P < 0.001), RTV (B = 1.10 [SE, 0.31]; P < 0.001), SRS (B = 1.07 [SE, 0.41]; P = 0.009), and DSE (B = 0.13 [SE, 0.03]; P < 0.001). Stratifying analyses by race revealed that the associations with LTC days were almost entirely confined to effects in African Americans.
Table 2. Standardized β-Value Estimate From Regression Model for the Association of Religiosity and/or Spirituality With Number of Days per Month Spent in Long-term Care for African Americans and Women

<table>
<thead>
<tr>
<th>Type of Religiosity and/or Spirituality</th>
<th>African Americans</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Demographic Controls</td>
<td>Psychosocial Explanatory</td>
</tr>
<tr>
<td>Affiliation, any vs none †</td>
<td>-0.27‡</td>
<td>-0.22‡</td>
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<tr>
<td>Nonorganizational</td>
<td>-0.27‡</td>
<td>-0.21‡</td>
</tr>
<tr>
<td>Religious radio and/or television</td>
<td>-0.21†</td>
<td>-0.19‡</td>
</tr>
<tr>
<td>Self-rated spirituality</td>
<td>-0.17¶</td>
<td>NS</td>
</tr>
<tr>
<td>Daily spiritual experiences †</td>
<td>-0.24‡</td>
<td>-0.16¶</td>
</tr>
</tbody>
</table>

Abbreviations: †, interaction not significant and no trend present (P > .10); NS, no statistical significance or trend.

For African Americans, n = 320; for women, n = 441. There were no statistically significant relationships for whites (n = 491) or men (n = 370). Number of patients may vary up to 1%.

†Measured at baseline only.
‡P = .001.
§P = .05.
¶0.10 < P < .05.
†P = .01.

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(Tab Le 2). While there were no significant associations in whites, African Americans scoring in the lowest quartile for NORA spent an average 48.9 days in LTC during the observation period compared with 5.2 days for those in the highest quartile (Figure). Again, psychosocial variables were primarily responsible for these relationships (to the extent that relationships could be explained), but physical health status had no influence.

Finally, to determine whether religious activities and spiritual experiences actually preceded lower use of LTC services among African Americans (n = 318) (prospective analysis), we constructed a regression model with baseline religious and/or spiritual variables predicting future use of LTC services after baseline hospitalization, controlling for demographics and baseline use of LTC services (defined as days spent in LTC during the 3 months prior to baseline). For this purpose we chose the 3 religious or spiritual variables in Table 2 with the strongest cross-sectional associations with LTC (NORA, RTV, and DSE; affiliation not chosen because of the small number of African Americans with no affiliation). This hypothesis was confirmed for NORA (β = −0.19; P < .001), RTV (β = −0.13; P = .01), and DSE (β = −0.19; P < .001). To determine if severity of medical illness could explain this effect, we added CIRS scores and DASI to the model; however, they had little effect (β = −0.16; P = .003 for NORA; β = −0.12; P = .02 for RTV; and β = −0.16; P = .001 for DSE). The addition of social support to the model added some explanatory power (β = −0.15; P = .006 for NORA; β = −0.11; P = .03 for RTV; β = −0.14; P = .007 for DSE) as did the addition of marital status and depressive symptoms (β = −0.14; P = .01 for NORA; β = −0.11; P = .03 for RTV; and β = −0.13; P = .01 for DSE).

Interactions were also present between sex and religious affiliation (β = −4.23 [SE, 2.22]; P = .06), SRS (β = −0.70 [SE, 0.37]; P = .06), and DSE (β = −0.07 [SE, 0.03]; P ≤ .01), although they were weaker than with race. Stratifying analyses by sex revealed associations only in women (Table 2). Psychosocial factors (social support) again largely explained the associations, whereas physical health factors had little effect. Since the association was strongest for DSE, we examined whether baseline DSE could predict future use of LTC services in women (n = 437) (as done in African Americans above). The hypothesis was confirmed (β = −0.13; P = .004, after baseline controls). Adding baseline physical functioning (DASI) and severity of physical illness (CIRS score) could not explain the effect (β = −0.13; P = .003). Including social support in the model added explanatory power (β = −0.11; P = .02), but marital status or depressive symptoms had no effect.

Hypothesis 3: Associations with hospital use will be stronger for religiousness than for spirituality. This hypothesis was generally confirmed. For ACH, only religiousness expressed as ORA had a negative association; the only relationship with spirituality, in fact, was a trend toward a positive one for SRS (β = 0.06; P = .09 compared with controls and psychosocial variables in model). For LTC days, the strongest and most persistent unexplained associations were observed for religious variables (NORA and RTV). Weaker relationships were observed for SRS and DSE, but these were completely explained by psychosocial factors.

COMMENT

This is the most detailed study to date on associations between religious and/or spiritual characteristics of medical patients and the use of hospital services. With regard to ACH, the findings consistently revealed no association except participating in ORA. Organized religious activity was associated with significantly fewer ACH days and with fewer hospitalizations during the average 21-month observation period, an effect that persisted after controlling for demographic and access variables. That relationship, however, was fully explained by better physical health among those with high ORA scores. Furthermore, prospective analyses controlling for hospital use during the year preceding the index Duke hospital stay suggested that the association between ORA and ACH was not that ORA prevented future hospital use but rather that prior hospitalization (and associated illness) decreased patients’ ability to engage in ORA later on.

In contrast to ACH, LTC associations with religious or spiritual characteristics were more robust. For...
the overall sample, with control variables taken into account, NORA such as prayer and reading the Bible was inversely related to LTC days \( (\beta = 0.14; P < .001) \), an association that weakened when explanatory psychosocial variables—especially social support—were added to the model. Similar associations were seen with RTV \( (\beta = -0.11; P < .01) \) and frequency of DSE \( (\beta = -0.10; P < .01) \). Relationships also tended to be present with religious affiliation, ORA, and self-rated spirituality, but only at the trend level. This is the first study to link private religious activities and spiritual experiences with LTC use.24

Most surprising, however, was that this effect was found only in African Americans and women. In African Americans, religious activities and spiritual experiences also predicted future use of LTC services. Why did African Americans who were more involved in private religious activities or who reported more spiritual experiences use fewer LTC services regardless of age, insurance status, severity of physical illness, or level of physical functioning? Some of the effect might be attributable to religious African Americans having greater social support. The black church is central to many African American communities and is often the primary site for social interactions and support.23,24 Because social support helps to prevent institutionalization, African American patients with strong social support probably had more resources to call on that enabled them to stay in their homes and out of LTC facilities.

However, even after social support was taken into account, some of the relationships persisted, which suggests that there were other influential forces besides the psychosocial factors. Families and friends of religious African Americans—who may well also be quite religious—might feel obligated because of their religious beliefs to provide care at home rather than admit a loved one to a nursing home. Taking care of elders at home has a long tradition within the African American community for both cultural and religious reasons.25 Also, being more active in religious devotions and having more spiritual experiences may make African American patients easier to care for at home, given that such patients have been shown to be more cooperative in general.26 Finally, religion may provide hope and motivate patients to do more things for themselves, delaying the need for LTC.27,28

Relationships between religious or spiritual characteristics and LTC use were also stronger in women than in men, again independent of physical health status. This was particularly true for DSEs, which were associated with fewer LTC days among women \( (\beta = -0.16; P < .001) \) but not men \( (\beta = 0.02) \). Daily spiritual experiences were also shown to predict future use of LTC services. Again, greater social support among women with more DSEs helped to explain this association. The effects of social support on health service use appear to be particularly strong in women,29,30 in whom social factors may be especially important for health31 and ability to continue to live independently.32

Finally, measures of religiousness such as ORA, NORA, and RTV tended to have stronger relationships with lower hospital use than did measures of spirituality. Although the relationship with DSE was perhaps an exception, many of the items on that scale (eg, “I feel God’s presence”) could also be viewed as measuring religiousness. There was little evidence that spirituality disconnected from religion had any influence on ACH or LTC.

This study was limited by the self-report method of determining hospital use, which increases the chances of error in reporting. Multiple statistical comparisons were also made, including subgroup analyses, which increases the likelihood that some associations may have been due to chance alone. However, we reduced the level of statistical significance to .01; statistical testing was hypothesis driven; and associations were relatively robust and consistent with prior research. Another possible limitation is that the study took place in the “Bible belt” of the southeastern United States. Nevertheless, recent Gallup polls indicate that older Americans as a group are quite religious, their religious involvement equaling or exceeding that found in the present sample.33

These findings—especially with regard to the effects of religious activities and spiritual experiences on LTC services—have implications for health care costs and clinical practice, particularly as they relate to African Americans and women. These groups are expected to grow in the southeastern United States. Nevertheless, recent Gallup polls indicate that older Americans as a group are quite religious, their religious involvement equaling or exceeding that found in the present sample.33

These findings—especially with regard to the effects of religious activities and spiritual experiences on LTC services—have implications for health care costs and clinical practice, particularly as they relate to African Americans and women. These groups are expected to grow disproportionately in size over time as the US population ages and health disparities improve among minority communities. If other studies confirm these findings, addressing religious and spiritual needs during hospitalization and mobilizing the religious community for support after hospital discharge may help to keep patients at home and out of LTC facilities.

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