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The Association of Health and Functional Status with Private and Public Religious Practice among Rural, Ethnically Diverse Older Adults with Diabetes

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Abstract

Purpose—This analysis describes the association of health and functional status with private and public religious practice among ethnically diverse (African American, Native American, white) rural older adults with diabetes.

Methods—Data were collected using a population-based, cross-sectional, stratified, random sample survey of 701 community-dwelling elders with diabetes in two rural North Carolina counties. Outcome measures were private religious practice, church attendance, religious support provided, and religious support received. Correlates included religiosity, health and functional status, and personal characteristics. Statistical significance was assessed using multiple linear regression and logistic regression models.

Findings—These rural elders had high levels of religious belief, and private and public religious practice. Religiosity was associated with private and public religious practice. Health and functional status were not associated with private religious practice, but they were associated with public religious practice, such that those with limited functional status participated less in public religious practice. Ethnicity was associated with private religious practice: African Americans had higher levels of private religious practice than Native Americans or whites, while Native Americans had higher levels than whites.

Conclusions—Variation in private religious practice among rural older adults is related to personal characteristics and religiosity, while public religious practice is related to physical health, functional status and religiosity. Declining health may affect the social integration of rural older adults by limiting their ability to participate in a dominant social institution.

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In This Issue

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Religion is a key institution in many rural communities. This study of adults with chronic illness in rural North Carolina finds participation in public religious activities is related to physical health and functional status, suggesting a way that declining health limits social integration of rural elders.

Keywords

rural aging; minority aging; chronic disease; diabetes; religious participation; religiosity; social integration

Religion is important in the lives of many older adults.¹ Religion is particularly important to the social integration, self-definition, and health beliefs of older adults who live in rural communities in the United States. While some residents of rural US communities are not church members, participating in church-related activities has been one of the major forms of social integration and recreation across the lives of most contemporary rural older adults.²⁻⁵

The relationship of different aspects of religion to health and functional status among older adults is of considerable interest in gerontology.⁶ Investigators have reported associations of religious practice with mental health,^{7,8} physical health,^{9,10} and mortality.¹¹ In general, poorer health has been related to indicators of reduced public religious practice, like church attendance.^{6,12-14} However, poorer health is not related to level of private religious practices, like prayer or use of religious media.^{12,15}

Investigators have examined the causal relationship of greater religious practice to better health and functional status among older adults.^{12,13,15-17} Few investigators have found a longitudinal relationship of current public religious practice affecting future health and functional status.¹² Van Ness and Kasl¹⁸ found that religious attendance in 1982 was related to cognitive status in 1985, but 1982 religious attendance was not a predictor of 1988 cognitive status. Rather, high level of cognitive dysfunction in 1982 was a predictor of mortality between 1985 and 1988, suggesting that cognitive function was affecting religious attendance. Hill and colleagues,¹⁹ using four waves of the Hispanic Established Populations for Epidemiologic Studies of the Elderly (EPESE) data, found that frequent church attendance was associated with slower decline in functional status.

Based on a review of the religious involvement and mortality literature, Hummer and colleagues¹¹ suggest that further research is needed on the associations of public and private religious practices with health and functional status in specific populations. This suggestion is echoed by Benjamins,¹⁵ who states that more information on religion and health is needed because existing research is inconclusive, with conflicting results about the salutary relationship between higher levels of religious involvement and health outcomes.

This analysis examines the association of health and functional status with the intensity of private and public religious practice among older adults (aged 65 and older) with diabetes who reside in rural, ethnically diverse communities. These communities include significant African American, Native American, and white populations. A focus on the associations of public and private religious practice with health among rural older adults is particularly important. Religion is a central institution in rural communities, especially in the southern US, and religious belief and activity is a major component in the lives of those living in rural communities. Religion is incorporated into the health self-management of older adults in rural communities, and religious beliefs influence understandings of illness, healing and medical care.²⁻⁴ The older adults in this study are all ill and must deal with a common chronic disease, diabetes. This analysis will extend existing analyses of religion and health in ethnic minorities,¹⁴ and help illuminate the relative importance of ethnicity and rurality in the association of religion and health.²

Research Design and Methods

This analysis is based on cross-sectional survey data designed to consider the relationship of health and functional status with private and public religious practice among rural older adults with a common chronic condition. If health and functional status are not associated with private religious practice, but they are associated with public religious practice, this will inform the debate of whether religious practice is causal to health status or health status is causal to religious practice.

The ELDER (Evaluating Long-term Diabetes Self-management among Elder Rural Adults) Study comprehensively assessed the self-management strategies of rural adults aged 65 years and older with diagnosed diabetes.²⁰ This population-based cross-sectional survey randomly selected participants by gender who had at least two outpatient claims for diabetes (ICD-9 250) in 1998–2000 from Medicare claims for two counties. Recruitment continued to a minimum target number for each of six gender-ethnic groups (female and male African Americans, Native Americans, whites). Both counties are classified as nonmetropolitan.²¹ In-home interviews lasting 1.5 hours were conducted from May through October 2002. The overall response rate for eligible participants was 89% (701/787). Three who did not fit the ethnic categories were excluded from this analysis.

Measures

The dependent variables in this analysis are measures of private and public religious practices.²² The measure of Private Religious Practices²³ was based on the responses to four items (Table 1) (Cronbach's alpha=0.66). Four measures of public religious practice were calculated: Church Non-Attendees versus Attendees, Level of Church Attendance among church attendees, Religious Support Provided, and Religious Support Received (Table 1). Church Attendance was based on two items.²⁴ The overall distribution of the religious attendance was bimodal, with a fairly symmetric distribution among those who attended either religious services or other activities at least several times a year, and then a peak for those whose responses indicated attendance to be no higher than "about once or twice a year" to either question. Consequently, two measures of religious attendance were constructed: a dichotomous measure that differentiated church attendees from church non-attendees (where non-attendees attend church functions once or twice per year or less), and a continuous measure that indicated the level of attendance among attendees. Religious Support Provided was based on two items.²⁵ Religious Support Received was also based on two items.²⁵

The measures of private and public religious practice were constructed by summing the responses for the component items, reversing where appropriate. Because the component items for the Private Religious Practices scale had different response categories, the items were normalized before summing. Each scale was set to missing if more than one component item was missing. Finally, each scale was standardized to have a mean of 0 and a variance of 1. The Private Religious Practices scale was then transformed to correct for skewness. For all religiosity variables, higher values indicate higher levels of religiosity.

Independent variables included measures of religiosity, health and functional status, and personal characteristics. The measure of religiosity was based on the three-item Positive Religious / Spiritual Coping Subscale²⁶ (Table 1). The Religiosity scale was constructed using the same methodology as described for the measures of Private and Public Religious Practice ($\alpha = 0.81$). The first health status measure, duration of diabetes, was calculated using current age minus the age of first diagnosis by a health care professional. Perceived general physical and mental health-related quality of life (HRQOL) were measured with the physical (PCS) and mental (MCS) component score subscales of the SF-12.²⁷ Higher scores

in each of these measures indicated greater perceived HRQOL. Depressive symptoms were assessed by the CES-D.²⁸ Following Blazer and colleagues,²⁹ the response categories were modified from the original Likert scale to “yes” and “no” responses. Values for the CES-D ranged from 0 to 20, with higher scores indicating higher level of depressive symptoms.

Functional status measures were based on the Medical Outcomes Study (MOS) scale of mobility.³⁰ Mobility limitations assesses limitations in activities of daily living, such as carrying groceries, climbing stairs or walking one block (values 0–100). Mobility ability assesses whether a person can move about the community or is restricted to bed or chair (values 2–10), and satisfaction with physical ability is a person's subjective rating of their satisfaction with their physical ability to do what she or he wants (0–100). Higher scores in each of these measures indicated higher functional status.

Personal characteristics included ethnicity (African American, Native American, white), age, gender, living arrangements (living alone, living with others and unmarried, living with others and married) and education (less than high school, high school or equivalent, at least some college). A categorical measure of economic status was created by combining information on Medicaid status and household income from all sources in 2001. The Medicaid group included all participants who reported receiving Medicaid. The No Medicaid, Lower Income group included all others who reported an income of less than \$25,000. The No Medicaid, Higher Income group included all others reporting incomes of \$25,000 or more.

Analysis

Demographic and health characteristics were summarized using counts and percentages, or means and standard deviations. Responses for the individual component items for the religiosity scales were also summarized using counts and percentages. Multiple linear regressions were used to evaluate models for the continuous outcome measures, and multiple logistic regression was used to evaluate the model for the dichotomous outcome. The models included the measures of general religious belief, health and functional status, and personal characteristics as covariates. A gender \times ethnicity term was also evaluated. If this term was statistically significant ($p < 0.05$), then it was retained in the model and the interaction effects were reported. If the interaction term was not significant, then it was dropped from the model, and the main effects for gender and ethnicity were reported. For any covariate having overall significance and more than 2 groups, pairwise comparison results were evaluated using Bonferroni's method. Regression results are presented using beta coefficients or odds ratios for linear and logistic regressions, respectively. All analyses were conducted using SAS Statistical Software (SAS Institute, Inc., Cary, NC, version 8.02).

Results

Participant characteristics are described in Table 2. The rural older adult participants showed high levels of religiosity and religious practices (Table 1). For religiosity, over 60% stated that they thought about how their life was part of a larger spiritual force, and that they worked in partnership with God to get through hard times “a great deal.” Almost three-quarters stated that they looked to God for strength, support and guidance in crises “a great deal.” Fewer than 15% of participants stated “somewhat” or “not at all” in responding to these items.

Private religious practices were common among the rural older adults in this sample. Over half (53.0%) prayed several times a day, and another 30.4% prayed at least once each day. Over three-quarters (76.8%) said a prayer before every meal. Four in five watched or listened to religious programs, and 61.9% read religious literature at least once each week.

Public religious practices were frequent among these rural older adults. Over half (51.6%) attended religious services at least weekly, with one in five attending religious services several times each week. Other religious activities were not as frequent. About 15% participated in other religious activities at church at least once each week, while 44.9% never participated in other religious activities at church. Most felt that they provided support to members of their congregations, with 59.7% stating that they made their fellow congregants feel loved very often, and 31.9% indicating that they listened to the private problems of other members of their congregation very often. Finally, most felt that they received support from the members of their congregations, with 65% stating that their fellow congregants made them feel loved very often, and 23.2% indicating that the members of their congregations listened to them discuss their private problems and concerns very often.

Religiosity had a large, significant positive association with Private Religious Practice (Table 3). None of the health or functional status measures had a significant association with Private Religious Practice. Among the personal characteristics, gender and ethnicity had large significant associations with Private Religious Practice. Women were more likely to engage in private religious practice than were men. African Americans and Native Americans were more likely to engage in private religious practices than were whites, and Native Americans were significantly less likely to engage in private religious practice than were African Americans. The narrow range of values centered around 0 for some of the continuous measures may result in very small beta coefficients. These small effects may still be significant, however, given that the standard errors for the comparisons may also be very small.

Stronger religious belief decreased the odds of being a church non-attender by almost half (OR = 0.510) (Table 3). Better functional status decreased the odds of being a church non-attender. Specifically, lower Mobility Limitations decreased the odds of being a church non-attender by about 3% and better Mobility Ability decreased the odds of being a church non-attender by almost 20%. Neither of the two measures of mental health was significantly associated with being a church non-attender. Stated positively, stronger religious belief and better functional status each increased the odds of attending church regularly.

Religious belief (beta coefficient = 0.190) and functional status in the form of Mobility Ability (beta coefficient = 0.039) were significantly associated with level of church attendance among those who were church attenders, although the size of the associations was smaller than for the comparison of attenders versus non-attenders. Neither of the two measures of mental health was significantly associated with level of church attendance. Ethnicity was significantly associated with level of church attendance, reflecting a negative association of being Native American compared to being African American.

Religious belief was significantly associated with providing religious support (beta coefficient = 0.395). General physical health (SF-12 PCS) was inversely associated with religious support provided; those with greater physical health provided less religious support. The mobility ability measure of functional status was significantly associated with religious support provided such that those with better functional status provided more religious support. Neither of the two measures of mental health was significantly associated with providing religious support.

Religious belief was significantly associated with receiving religious support (beta coefficient = 0.369). Mental health in terms of the CES-D was significantly associated with religious support received (beta coefficient = -0.032) such that those with lower levels of depressive symptoms received more religious support. However, none of the measures of

physical health or functional status were significantly associated with receiving religious support.

Discussion

The older adults in these rural southern communities engage in high levels of private and public religious practice. The extent of religious practice among the participants reflects the traditional norms of southern, particularly rural, Protestant Christianity. Most consider God to be an important consideration and force in their lives, pray privately daily and say grace before all meals, attend church at least weekly, and provide and receive support from their fellow congregants. However, even among these rural older adults there is variability in religious practice. One-quarter attend religious services less than monthly, with 15% never attending church, a quarter never reading the Bible, and about one-third not discussing private concerns with fellow congregants.

Private and public religious practice among these rural older adults is most strongly associated with religious belief. That practice is related to belief is not surprising. However, our results indicate that private religious practice is not associated with health, while health and functional status are associated with some forms of public religious practice. While the association of public religious practice and physical health and functional status is strongest for whether or not rural older adults attend church at all, physical health is also strongly associated with the level of attendance at religious services among those who do attend, as well as with the support an individual gives in a congregation.

We find little association between measures of mental health (MCS, CES-D) and any measure of religious participation. The exception is that those who receive more support from members of their congregation have lower scores on the CES-D. This differs from other studies that report lower religious participation to be associated with worse mental health among older adults.⁵ However, Parker and colleagues⁸ show the complex relationships of different measures of religiosity with different measures of mental health among older adults.

All of the older adults who participated in the ELDER Study had diabetes. Many have had diabetes for a very long time and have experienced significant complications that affect their functional status.²⁰ However, the duration of diabetes did not have a significant association with private or public religious participation in preliminary bivariate analyses. This indicates that functional status, rather than simply having a chronic disease, is important in the association of health and religious practice.

Like other analyses, we find that levels of some forms of religious practice are associated with ethnicity.¹⁴ Even in these rural communities, in which religion is extremely important to older adults from each ethnic group,² ethnic differences are apparent. African Americans engage in private religious practice more than whites and Native Americans; Native Americans engage in private religious practice more than whites. Very little difference in public religious practice among ethnic groups was found, outside of Native Americans attending church less than African Americans. However, health is related to the public religious participation of older adults from all ethnic groups.

This analysis extends our understanding of the relationship of religious practice to social and behavioral aspects of aging in rural communities. We cannot say what continued private religious practice does for the quality of life among these older rural adults. To the extent that the older adults from these two rural counties are similar to older adults in the Southeast, as well as rural communities in other regions of the US, this research shows that private religious practice is important in the lives of rural elders no matter what their

physical and mental health. Our results indicate that the lack of public religious practice has implications for social integration; however, others have shown that although functional status may reduce religious participation, it may not reduce the frequency of social interaction.³¹ Those with lower indices of health and functional status attend church less and do not feel they receive or can give support as much as those with better health and functional status. Not going to church and not participating in other public religious activities may indicate a decline in the physical health of older adults. In this non-clinical population, those who are not going to church may be experiencing both major health problems and social isolation. Not participating in church activities among rural elders should be an indicator to health care providers of the severity of illness their patients are experiencing. It should also be a warning to care givers about the need to ensure social interaction and support.

This study has a number of strengths, including the rural, ethnically diverse sample; the use of validated measures of religious participation; the large sample size; and the high response rate. It is limited by its cross sectional design. This study involves reliance on self-report data, which is subject to recall bias. Finally, the sample was limited to two rural counties in the Southeast, potentially limiting its generalizability outside of the rural Southeast.

The results of this analysis indicate that variation in participation in public religious practice among rural older adults is related to physical health and functional status, along with religiosity, while private religious practice among these rural elders is related to personal characteristics and religiosity. Future research should focus on how health affects specific domains of religious practice among older adults, and the ramifications of declining religious practice on social well-being. Declining health may affect the social integration of rural older adults by limiting their ability to participate in a dominant social institution.

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Table 1

Response Distributions for Items Included in Private Religious Practices, Church Attendance, Religious Support Provided, and Religious Support Received Scales, ELDER Study.

Scale and Items	N	Responses - Percent							
		Several times a day	Once a day	A few times a week	Once a week	A few times a month	Once a month	Less than once a month	Never
Private Religious Practices									
1) How often do you pray privately in places other than at church or synagogue?	695	53.0	30.4	6.3	1.9	1.6	1.7	0.3	4.9
2) How often do you watch or listen to religious programs on TV or radio?	696	18.0	17.7	26.3	18.4	6.5	1.3	2.7	9.2
3) How often do you read the Bible or other religious literature?	695	7.2	26.2	18.0	10.5	4.6	3.2	4.0	26.3
Church Attendance									
4) How often are prayers or grace said before or after meals in your home?	697	76.8	7.6	3.2	6.9	5.6	Only on special occasions	Never	5.6
Religious Support Provided									
1) How often do you attend religious services?	694	20.5	31.1	9.5	8.4	5.3	4.9	2.7	15.1
2) Besides religious services, how often do you take part in other activities at a place of worship?	692	4.5	9.7	4.1	9.0	6.5	11.0	7.7	44.9
Religious Support Received									
1) How often do you make the people in your congregation feel loved and cared for?	695	59.7	11.2	10.4	18.7	30.7	Once in a while	Never	18.7
2) How often do you listen to the people in your congregation talk about their private problems and concerns?	695	31.9	11.7	25.8	30.7	Once in a while	Never	30.7	18.3
Religious Support Received									
1) How often do the people in your congregation make you feel loved and cared for?	694	65.0	8.5	8.2	18.3	Once in a while	Never	18.3	18.3

Scale and Items	N	Responses - Percent			
		A great deal	Quite a bit	Somewhat	Not at all
2) How often do the people in your congregation listen to you talk about your private problems and concerns?	694	23.2	6.8	26.2	43.8
Religiosity					
1) I think about how my life is part of a larger spiritual force.	687	61.4	24.8	9.0	4.8
2) I work together with God as partners to get through hard times.	692	63.0	22.8	10.6	3.6
3) I look to God for strength, support, and guidance in crises.	697	73.9	17.5	6.2	(2.4)

Table 2

Personal Characteristics, Health Status and Functional Status of ELDER Participants, Overall Sample.

Personal Characteristics, Health Status and Functional Status	Overall (n =698) Count (%) or Mean \pm S.D.
Personal Characteristics	
Ethnicity	
African American	220 (31.5)
Native American	181 (25.9)
White	297 (42.6)
Female	343 (49.1)
Age (years)	74.1 \pm 5.4
Living arrangements	
Living alone	214 (30.7)
Living with others – not married	141 (20.2)
Living with others – married	343 (49.1)
Formal education (n=697)	
Less than high school	453 (65.0)
High school	145 (20.8)
At least some college	99 (14.2)
Economic status (n=668)	
Medicaid	236 (35.3)
No Medicaid, household income < \$25,000	304 (45.5)
No Medicaid, household income \geq \$25,000	128 (19.2)
Positive religious/spiritual coping (n=697)	0.0 \pm 1.0
Health Status	
Diabetes duration (years)	12.4 \pm 11.0
SF-12 ^a physical component score (n=665)	35.1 \pm 11.4
SF-12 ^a mental component score (n=665)	50.5 \pm 10.8
CES-D ^b score (n=696)	4.4 \pm 3.7
Functional Status ^c	
Mobility limitations	60.3 \pm 20.7
Mobility ability (n=697)	7.8 \pm 2.9
Satisfaction with physical ability (n=696)	55.8 \pm 26.1

^aShort Form Health Survey (12-item)^bCenter for Epidemiologic Studies Depression Scale^cMedical Outcomes Study

Table 3
Multivariate Models of Associations between Religiosity, Personal Characteristics, Health Status, and Functional Status, with Private Religious Practice, Church Attendance, and Religious Support, the ELDER Study.

Model Covariates	Private Religious Practice ^a (N=638)		Public Religious Practice		
	Beta Coefficient ^f	OR	Church Non-Attendees ^b (N=637)	Church Attendance among Church Attenders ^c (N=515)	Religious Support Provided ^d (N=638)
Religiosity	0.275 ***	0.510 ***	0.190 ***	0.395 ***	0.369 ***
SF-12 physical component score	-0.008	1.023	0.005	-0.014 *	-0.008
SF-12 mental component score	-0.007	1.016	0.003	-0.004	-0.008
CES-D score	-0.013	1.033	-0.001	-0.023	-0.032 *
Mobility limitations	0.002	0.971 **	0.002	0.007	0.003
Mobility ability	0.020	0.814 ***	0.039 *	0.033 *	0.006
MOS satisfaction with physical ability	0.001	1.000	-0.001	0.002	0.002
Female v Male	0.329 ***	0.689	0.086	0.122	0.086
Ethnicity	***	*	*		
African American v white	0.483 ***	0.508	0.100	0.099	-0.013
Native American v white	0.217 **	0.863	-0.114	-0.016	-0.094
Native American v African American	-0.267 ***	1.699	-0.214 *	-0.115	-0.081
Economic status					
No Medicaid, income < \$25,000 v Medicaid	0.011	0.915	-0.034	-0.154	-0.141
No Medicaid, income \$25,000 v Medicaid	-0.003	0.878	0.160	-0.102	-0.182
No Medicaid, income \$25,000 v No Med., < \$25,000	-0.013	0.960	0.193	0.052	-0.041

^aR-square = 0.273

^bHosmer-Lemeshow goodness-of-fit test, Chi Square = 2.85, p-value = 0.9434

^cR-square = 0.127

^dR-square = 0.204

^eR-square = 0.168.

^fDue to the narrow range of the continuous response variables around 0, even small estimates may correspond to large effect relative to that range.

* p < .05

** p < .01

*** p < .001