Religious Attendance and Mortality: An 8-Year Follow-Up of Older Mexican Americans

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Objectives. Studies in the area of religion and mortality are based primarily on data derived from samples of predominantly non-Hispanic Whites. Given the importance of religion in the lives of Hispanics living in the United States, particularly older Hispanics, we examine the effects of religious attendance on mortality risk among Mexican Americans aged 65 and older.

Methods. We employ data from the Hispanic Established Populations for Epidemiologic Studies of the Elderly to predict the risk of all-cause mortality over an 8-year follow-up period.

Results. Overall, the results show that those who attend church once per week exhibit a 32% reduction in the risk of mortality as compared with those who never attend religious services. Moreover, the benefits of weekly attendance persist with controls for sociodemographic characteristics, cardiovascular health, activities of daily living, cognitive functioning, physical mobility and functioning, social support, health behaviors, mental health, and subjective health.

Discussion. Our findings suggest that weekly church attendance may reduce the risk of mortality among older Mexican Americans. Future research should focus on identifying other potential mediators of the relationship between religious involvement and mortality risk in the Mexican-origin population.

OVER THE last two decades, a growing body of research has focused on the relationship between religion and health (for recent reviews, see Ellison & Levin, 1998; Koenig, McCullough, & Larson, 2001). Although this area of study is not without criticism (e.g., Sloan, Bagiella, & Powell, 1999), studies do suggest that multiple features of religious involvement (mainly attendance at religious services) may benefit health and well-being. For example, research shows that religious attendance is associated with lower levels of depression (Ellison, 1994; Ellison & Levin, 1998; Strawbridge, Shema, Cohen, Roberts, & Kaplan, 1998) and anxiety (Hertsgaard & Light, 1984; Koenig, Ford, George, Blazer, & Meador, 1993). Religious attendance is also associated with improvements in physical health, including lower blood pressure (Koenig, George, Cohen, Hays, Larson, & Blazer, 1998a; Livingston, Levine, & Moore, 1991), boosted immune function (Koenig, Cohen, George, Hays, & Blazer, 1997), enhanced physical functioning (Idler & Kasl, 1992, 1997), and better subjective health (Drevenstedt, 1998; Krause, 1998, 2002; Levin & Markides, 1985; Musick, 1996).

Given that religion has been shown to benefit health in so many different ways, it is not at all surprising to find that religion may also influence life expectancies. Taken together, recent reviews of the literature provide convincing evidence that religious attendance may indeed reduce the risk of mortality (Hummer, Ellison, Rogers, Moulton, & Romero, in press; McCullough, Larson, Hoyt, Koenig, & Thoresen, 2000). For example, studies using data from community-based epidemiologic surveys (Koenig et al., 1999; Oman & Reed, 1998; Oman, Kurata, Strawbridge, & Cohen, 2002; Strawbridge, Cohen, Shema, & Kaplan, 1997), national health surveys (Angel, Angel, & Henderson, 1997; Bryant & Rakowski, 1992; Hummer, Rogers, Nam, & Ellison, 1999; Musick, House, & Williams, 2004; Sabin, 1993), and clinical samples (Oxman, Freeman, & Manheimer, 1995; Pargament, Koenig, Tarakeshwar, & Hahn, 2001) consistently find that attendance at religious services is associated with a reduction in the risk of mortality.

Despite recent advances in research on religion, health, and mortality, scholars have only begun to explore these relationships among racial and ethnic minority populations (Ellison, Hummer, Cormier, & Rogers, 2000; Hummer et al., forthcoming). There is some evidence to suggest that religious involvement is associated with a reduction in the risk of mortality among African American adults (Ellison et al., 2000) and elders (Angel et al., 1997; Bryant & Rakowski, 1992), but it is unclear whether this pattern exists among Hispanics. To our knowledge, there have been no analyses of the relationship between religious involvement and mortality among Hispanics living in the United States.

We focus on the association between religious involvement and mortality risk among older Mexican-origin individuals for several reasons. Perhaps most importantly, religious affiliation and practices are highly salient in this population. The literature shows that Mexican American elders tend to identify strongly with Catholicism and its teachings (e.g., Markides, Martin, & Gomez, 1983). According to data from the 1990 Latino National Political Survey, >50% of Mexican Americans over age 55 report attending religious services at least once per week, and nearly 70% report receiving “a great deal” or “quite a bit” of guidance from religion in their daily lives (Stevens-Arroyo & Diaz-Stevens, 1998). Many Mexican Americans maintain a rich devotional practice, with elaborate home
altars and religious symbolism (Matovina & Riebe-Estrella, 2002). Despite the rise of Protestantism throughout much of Latin America, very few older Mexican-origin individuals are converts, and most are members of families who have been Catholic for generations. Further, researchers have highlighted the close interpenetration of Catholicism and Mexican American culture, as reflected by the widespread image of the Virgin of Guadalupe, the patron saint of Mexico and the Mexican people (Rodriguez, 1994).

In addition, the older Mexican American population tends to be poor, experiences a great deal of financial strain, and thus may be motivated to turn to faith communities and religious practices for emotional support and comfort (Angel, Frisco, Angel, & Chiriboga, 2003; Chalfant, Heller, Roberts, Briones, Aguirre-Hochbaum, & Farr, 1990). Despite a poor health profile, elderly Mexican Americans use fewer social and health care services than non-Hispanics, perhaps because they draw upon their religion for succor and support. And some investigators point to the interplay of Catholic symbols and teachings with a vibrant folk religious tradition, which contains a significant healing focus such as the use of curanderos, or folk healers (Matovina & Riebe-Estrella, 2002), although empirical studies cast doubt on the popularity of curanderos among older Mexican Americans (Higginbotham, Trevino, & Ray, 1990). Nevertheless, these aspects of Mexican American religious experience underscore the potential value of research on the religion–mortality connection within this population.

Taking into account the limitations of previous research, we examine two important research questions. First, does religious attendance reduce the risk of mortality among older Mexican Americans? Second, if religious attendance is associated with a reduction in the risk of mortality, what factors might mediate or explain this relationship? To answer these questions, we employ data from the Hispanic Established Populations for Epidemiologic Studies of the Elderly (H-EPES), a sample of 3,050 older Mexican-origin individuals. With these data, we predict the risk of all-cause mortality over 8 years using baseline survey responses, which included a measure of frequency of attendance at religious services.

**Mechanisms Linking Religious Attendance and Mortality**

A fair amount of research suggests that attendance at religious services is associated with a reduction in the risk of mortality; however, explanations for this association are not well established. In this section, we draw on research in the area of religion and health to identify several potential mechanisms by which religious involvement might influence mortality risk. Specifically, we consider the potential mediating influence of social support, health behaviors, mental health, and subjective health.

**Social Support**

Religious attendance may reduce the risk of mortality partly through the promotion of social contacts and social resources (Ellison & Levin, 1998; George, Ellison, & Larson, 2002). For example, studies show that frequent churchgoers report larger and more diverse social networks, more contact with network members, more extensive family ties, more types of social support received and perceived, including instrumental and emotional support, and greater civic participation, including memberships to organizations and clubs (Bradley, 1995; Ellison & George, 1994; McIntosh, Sykes, & Kubena, 2002; Smith, Fabricatore, & Peyrot, 1999). Given that social support has been shown to benefit health (Cohen & Syme, 1985) and reduce the risk of mortality (Blazer, 1982; House, Landis, & Umberson, 1988), we expect that social support from family and friends might mediate some of the effect of religious attendance.

**Health Behaviors**

Another possible explanation might be that people who are more religious are likely to engage in healthier lifestyles (Ellison & Levin, 1998; George et al., 2002). For example, religious involvement may deter drinking and smoking by increasing exposure to anti-abuse norms and anti-abuse peers, by reducing contact with deviant networks, and by satisfying the need for social contact and meaning in life (Cochran, Beeghley, & Bock, 1988; Ellison & Levin, 1998; Gorsuch, 1995). Indeed, studies show that religious attendance is inversely associated with alcohol use and abuse (Cochran et al., 1988; Gorsuch, 1995). Research also suggests that regular churchgoers are less likely to be current smokers and are more likely to quit smoking (Koenig, George, Cohen, Hays, Larson, & Blazer, 1998b; Strawbridge et al., 1997). Because heavy drinking (Rehm, Gmel, Sempos, & Trevisan, 2003; Rogers, Hummer, & Nam, 2000) and smoking (Hummer, Nam, & Rogers, 1998; Krueger, Rogers, Hummer, & Boardman, 2004) have been found to increase the risk of mortality, these specific health behaviors may help to explain the effect of religious attendance.

**Mental Health**

Recent reviews of the literature strongly suggest that attendance at religious services is associated with better mental health and psychological well-being (Hackney & Sanders, 2003; Koenig et al., 2001). For example, the inverse association between religious attendance and depression is generally consistent across studies (Ellison, 1994; Ellison & Levin, 1998; Levin, Markides, & Ray, 1996; Mitchell & Weatherly, 2000; Strawbridge et al., 1998). According to Koenig and colleagues (2001), religious involvement is correlated with greater hope and optimism, a greater sense of meaning and purpose, and greater social support, and each of these mechanisms is thought to benefit mental health. Given that depression has been shown to increase the risk of mortality (Black & Markides, 1999; Blazer, Hybels, & Pieper, 2001), we expect that depression may partially mediate the effect of religious attendance.

Another prominent feature of mental health is cognitive functioning. Bassuk, Glass, and Berkman (1999) argue that social connections provide a dynamic environment that requires the mobilization of cognitive faculties. In their study, they find that social ties reduce the odds of cognitive decline. Drawing on this research, Van Ness and Kasl (2003) contend that religious attendance is a religious form of social engagement that may uniquely influence cognitive functioning. In support of this assertion, they find an inverse association between religious attendance and cognitive dysfunction. Because cognitive impairment is associated with an increase in the risk of mortality (Bassuk, Wypij, & Berkman, 1999; Mehta, Yaffe, Langa, ...
Sands, Whooley, & Covinsky, 2003), cognitive functioning may also help to explain the effect of religious attendance.

**Subjective Health**

In addition to mental health, religious attendance has been shown to benefit physical health. We have already noted that religious attendance is associated with a wide range of physical health outcomes including lower blood pressure, boosted immune function, and enhanced physical functioning. In this article, we focus on subjective health because studies consistently document an inverse association between religious attendance and poor subjective health (Drevenstedt, 1998; Krause, 1998, 2002; Levin & Markides, 1985; Musick, 1996). Although explanations for this association have yet to be established, Drevenstedt (1998) finds social support to be an important mechanism. Given that poor subjective health is associated with an increase in the risk of mortality (Idler & Benyamini, 1999; Idler & Kasl, 1991), we expect that poor subjective health may partially mediate the effect of religious attendance.

**Methods**

**Study Sample**

Subsequent analyses employ four waves of the H-EPESE. This survey consists of a probability sample of 3,050 Mexican-origin individuals aged 65 and over who reside in Texas, California, New Mexico, Arizona, and Colorado. The baseline survey was conducted in 1993–1994 and contains extensive demographic and health information. The response rate at baseline was 86%. The original panel was recontacted three times, in 1995–1996, 1998–1999, and 2000–2001. By the second interview, 239 (7.8%) respondents had died. By the third interview, 661 (21.7%) respondents had died. At the final interview, 933 (30.6%) respondents had died. Table 1 provides descriptive statistics for the study sample.

**Mortality**

We assess mortality over 8 years using the H-EPESE follow-up procedures. Deaths were confirmed by a search of the National Death Index and by proxy; 91.2% of deaths were identified through the National Death Index, and only 8.8% of deaths were identified via proxy reports. Survival time was defined as the number of days between the baseline interview and the date of death or final interview, at which point surviving participants represent censored observations.

**Religious Attendance**

Consistent with other studies in the area, we are limited to using religious attendance as our measure of religious involvement. Respondents were asked, “About how often do you go to mass or services?” Preserving the original response categories for this item, we coded religious attendance into five dummy variables: (a) more than once a week, (b) almost every week, (c) once or twice a month, (d) several times a year, and (e) never or almost never (the reference category). Although we would prefer to use multiple measures religious involvement, religious attendance provides substantial compatibility with other studies of religious involvement and mortality.

**Table 1. Descriptive Statistics (H-EPESE 1993–2001)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>0–1</td>
<td>933</td>
<td>30.59</td>
</tr>
<tr>
<td>Religious attendance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0–1</td>
<td>631</td>
<td>20.69</td>
</tr>
<tr>
<td>Yearly</td>
<td>0–1</td>
<td>564</td>
<td>18.49</td>
</tr>
<tr>
<td>Monthly</td>
<td>0–1</td>
<td>357</td>
<td>11.70</td>
</tr>
<tr>
<td>Once per week</td>
<td>0–1</td>
<td>1,201</td>
<td>39.38</td>
</tr>
<tr>
<td>&gt; Once per week</td>
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<td>297</td>
<td>9.74</td>
</tr>
<tr>
<td>Selection factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor mobility</td>
<td>0–1</td>
<td>831</td>
<td>27.25</td>
</tr>
<tr>
<td>Activity limitations</td>
<td>0–7</td>
<td>—</td>
<td>(1.12)</td>
</tr>
<tr>
<td>Potential mediators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>0–6</td>
<td>—</td>
<td>(2.45)</td>
</tr>
<tr>
<td>Problem drinker</td>
<td>0–1</td>
<td>520</td>
<td>17.05</td>
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<tr>
<td>Current smoker</td>
<td>0–1</td>
<td>377</td>
<td>12.53</td>
</tr>
<tr>
<td>Severe depression</td>
<td>0–1</td>
<td>675</td>
<td>22.13</td>
</tr>
<tr>
<td>Mild cognitive impairment</td>
<td>0–1</td>
<td>994</td>
<td>32.60</td>
</tr>
<tr>
<td>Severe cognitive impairment</td>
<td>0–1</td>
<td>169</td>
<td>5.53</td>
</tr>
<tr>
<td>Poor subjective health</td>
<td>0–1</td>
<td>1,648</td>
<td>54.03</td>
</tr>
</tbody>
</table>

**Cardiovascular health**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight</td>
<td>0–1</td>
<td>1,089</td>
<td>35.70</td>
</tr>
<tr>
<td>Obese</td>
<td>0–1</td>
<td>808</td>
<td>26.49</td>
</tr>
<tr>
<td>Diabetic</td>
<td>0–1</td>
<td>845</td>
<td>27.70</td>
</tr>
<tr>
<td>Hypertensive</td>
<td>0–1</td>
<td>1,300</td>
<td>42.62</td>
</tr>
<tr>
<td>Heart attack</td>
<td>0–1</td>
<td>333</td>
<td>10.92</td>
</tr>
</tbody>
</table>

We would like to emphasize that our measure of religious attendance is based on self-reports. Although some studies suggest that surveys tend to overestimate actual levels of church attendance for Catholics (Chaves & Cavendish, 1994), others find that the extent of overreporting is actually quite small (Hout & Greeley, 1998). Social desirability is a reasonable explanation for overestimates, but it is also plausible that some of the overreporting may reflect participation in prayer meetings, study groups, and other church-related activities (Smith, 1998). Either way, Presser and Stinson (1998) show that overestimates are unlikely to influence the associations between demographic characteristics and religious attendance.

**Social Support**

Our measurement of social support is the mean response to two items. Respondents were asked, “In times of trouble, can you count on at least some of your family or friends?” Respondents were also asked, “Can you talk about your deepest problems with at least some of your family or friends?” Response categories for these items were coded (1) hardly ever, (2) some of the time, or (3) most of the time. The support scale yielded a mean of 2.45, a standard deviation of 1.45, and a correlation coefficient of 0.75.
Health Behaviors

Our measurement of health behaviors includes smoking and heavy drinking. We measure smoking behavior with a single item. Respondents were asked, “Do you smoke cigarettes now?” Response categories for this item were coded (1) for current smoker and (0) otherwise.

We use the Cut, Annoyed, Guilty, Eye Opener (CAGE) questionnaire to measure heavy drinking and drinking problems (Ewing, 1984). The CAGE instrument measures responses to four questions: (a) “Have you ever felt you should cut down on your drinking?” (b) “Have people annoyed you by criticizing your drinking?” (c) “Have you ever felt bad or guilty about your drinking?” (d) “Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (eye opener)?” Following the work of Saitz, Lepore, Sullivan, Amaro, and Samet (1999), respondents who answered “yes” to any of the four questions were coded (1) for problem drinker and (0) otherwise.

Mental Health

We use the Center for Epidemiologic Studies Depression Scale (CES-D) to measure depressive symptoms. The CES-D measures responses to 20 items (Radloff, 1977). Respondents were asked to indicate the frequency of depressive symptoms experienced in the last week. The original response categories for these items were coded (1) rarely or none of the time, (2) some of the time, (3) occasionally, and (4) most or all of the time. We first created an index by summing these items. Respondents who scored ≥16 were then coded (1) to indicate clinical depression and (0) otherwise.

We use the Mini-Mental State Examination (MMSE) to assess cognitive functioning. The MMSE represents a brief, standardized method by which to grade cognitive mental status (Folstein, Folstein, & McHugh, 1975). It measures responses to a standard battery of memory and reasoning items. It assesses orientation, attention, immediate and short-term recall, language, and the ability to follow simple verbal and written commands. Following the work of Black and colleagues (1999), we coded scores below 18 as severe cognitive impairment, scores between 18 and 23 as mild cognitive impairment, and scores above 23 as normal cognitive functioning (the reference category).

Subjective Health

Physical health is measured with a single item, the standard measure of subjective health. Subjective health is widely used to measure general health status and is strongly related to other more objective measures of health and mortality. Respondents were asked, “Overall, how would you rate your health—excellent, good, fair, or poor?” Response categories for this item were coded (1) for fair or poor health and (0) for excellent or good health.

Selection Factors

Research in the area of religion and mortality must also consider the potential for functional selectivity. For example, studies show that elderly persons may attend religious services sparingly or not at all as a result of problems attributed to physical functioning (Ainlay, Singleton, & Swigert, 1992; Bertera & Bailey-Eta, 2001). Of course, these same people are likely to exhibit an increase in the risk of mortality (Markides, Black, Ostir, Angel, Guralnik, & Lichtenstein, 2001; Ostir, Markides, Black, & Goodwin, 1998). As one might expect, the failure of some studies to adequately control for functional selectivity has drawn serious methodologic criticisms. With these concerns in mind, subsequent analyses include two controls for functional limitations at baseline: the performance-oriented mobility assessment (POMA) and the standard measure for instrumental activities of daily living (IADL).

POMA measurement of physical functioning is based on three tasks: standing balance (semitandem and side by side), a timed 8-ft walk at a normal pace (gait speed), and a timed test of five repetitions of rising from a chair and sitting down (Guralnik, Ferrucci, Simonsick, Salive, & Wallace, 1995). Following the work of Markides and colleagues (2001), each assessment was coded (0) unable to complete task, (1) poor, (2) moderate, (3) good, and (4) best. Respondents who received a score of (0) included those who tried but were unable to complete the task and those who did not attempt the task for safety reasons. Original POMA scores range from (0) to (12). Respondents who scored ≤4 were coded (1) to indicate poor performance and (0) otherwise.

IADL refers to at least one limitation in performing instrumental activities of daily living. Respondents were asked to indicate whether they could do any of the following activities by themselves or without any help from anyone else: (a) using the telephone, (b) driving a car or riding a bus, (c) shopping for groceries or clothing, (d) preparing a meal, (e) doing light housework, (f) managing household finances, and (g) taking medications. Original response categories were coded (1) for yes and (0) for no. All of the items were summed to form an IADL index, with scores ranging from (0) to (7).

Sociodemographics and Cardiovascular Health

Several sociodemographic characteristics have been identified as significant correlates of religious attendance and morality risk. In accordance with this research, subsequent analyses include controls for age, sex, education, household income, and marital status. Age is coded (a) 80 and over, (b) 70–79 years, and (c) 60–69 years (the reference category). Sex is coded (1) for females and (0) for males. Education is coded (1) for high school diploma or greater and (0) otherwise. Household income is coded (a) $15,000 and greater, (b) $10,000 to $14,999, and (c) $9,999 or less (the reference category). Marital status is coded (1) for married and (0) otherwise.

Because Mexican Americans have an elevated prevalence of poor cardiovascular health and poor cardiovascular health increases the risk of mortality (Hunt, Resendez, Williams, Haffner, Stern, & Hazuda, 2004; Wei, Mitchell, Haffner, & Stern, 1996), subsequent analyses include controls for body mass, diabetes, hypertension, and whether or not the respondent has had a heart attack. Using the standard formula and documented thresholds provided by the Centers for Disease Control, we coded body mass as (a) obese, (b) overweight, and (c) normal or underweight (the reference category). Note that only a few respondents were classified as underweight (n = 53). The remaining controls were based on self-reports. Respondents were asked to indicate whether they had ever been told by a doctor that they had any of the following conditions: diabetes, hypertension, and heart attack.
Statistical Procedures and Analytic Strategy

In this study, we use the Cox proportional hazard regression model to estimate the relative risk of mortality. We use the Wald statistic to determine the significance of predictor variables, and the $-2 \log$ likelihood statistic to assess model fit. We model the prediction of mortality risk in four steps. Model 1 tests whether religious attendance affects mortality risk over and above sociodemographic characteristics and cardiovascular health. Model 2 controls for poor mobility and activity limitations to determine the extent to which the association between religious attendance and mortality risk may be attributed to functional selectivity. Models 3–7 add potential mediators one by one to isolate possible indirect effects. Finally, Model 8 tests whether religious attendance affects mortality risk over and above sociodemographic characteristics, cardiovascular health, selection factors, and all potential mediators. See Figure 1 for an illustration of our conceptual model.

RESULTS

Table 2 presents hazard ratios obtained from a series of Cox regressions predicting mortality risk. According to the results for Model 1, religious attendance is significantly related to the risk of mortality over and above controls for sociodemographic characteristics and cardiovascular health. Those who attend church almost every week exhibit a 43% reduction in the risk of mortality as compared with those who never attend religious services. Those who attend church once or twice a month exhibit a 33% reduction in the risk of mortality. Those who attend church several times a year and more than once a week also exhibit a significant reduction in the risk of mortality (23% and 27%, respectively).

With the addition of poor mobility impairment and activity limitations in Model 2, the association between religious attendance and mortality risk is reduced by 38% for those who attend once per week, 74% for those who attend more than once per week. Although the selection factors account for a large portion of the association between religious attendance and mortality risk, only yearly and more than once-per-week attendance are reduced to insignificance. In fact, those who attend church monthly or once per week continue to exhibit a significant reduction in the risk of mortality (25% and 35%, respectively) as compared with those who never attend religious services.

Models 3–7 add a sequence of mediators that may help to explain the association between religious attendance and the risk of mortality. The results for Models 3 and 4 indicate that social support, drinking, and smoking are unrelated to the risk of mortality. Moreover, these factors help to explain only a trivial portion of the association between religious attendance and the risk of mortality.

Models 5 and 6 control for depression and cognitive functioning, respectively. Although both are associated with a significant increase in the risk of mortality, only cognitive functioning helps to explain the effect of religious attendance. With the addition of cognitive functioning in Model 6, the association between monthly attendance and the risk of mortality is reduced by nearly 18% from Model 2 and becomes insignificant.

Model 7 controls for poor subjective health. As one would expect, poor subjective health is associated with a significant increase in the risk of mortality. Note that Model 7 is almost identical to Model 5. That is, subjective health fails to explain any of the association between religious attendance and the risk of mortality.

Model 8 tests whether religious attendance affects mortality risk over and above sociodemographic characteristics, cardiovascular health, selection factors, and all potential mediators. In the full model, the association between monthly attendance and the risk of mortality is reduced by 22% from Model 2 and
is insignificant. Taken together, these same factors account for only 10% of the effect of once-per-week attendance. In the end, those who attend church once per week exhibit a 32% reduction in the risk of mortality as compared with those who never attend religious services.

**DISCUSSION**

Despite recent advances in research on religious involvement, health, and mortality, scholars have only begun to explore these relationships among racial and ethnic minority populations. Although there is some evidence to suggest that religious involvement is associated with a reduction in the risk of mortality among African American adults and elders, there have been no analyses of the relationship among Hispanics living in the United States. Building on prior research, we examined the association between religious attendance and the risk of mortality among older Mexican Americans.

Our results suggest that religious attendance is associated with a reduction in the risk of mortality among older Mexican Americans. Although poor mobility and activity limitations seem to produce a large portion of this association, those who attend church either monthly or once per week continued to exhibit a significant reduction in the risk of mortality as compared with those who never attend religious services. Although most studies show that functional limitations tend to discourage religious attendance, these results strongly suggest that functional limitations in late life may also explain why some people attend church more than once per week.

Once it was clear that the association between religious attendance and mortality risk was not entirely due to selection processes, we considered the potential mediating influence of social integration, health behaviors, mental health, and physical health. Whereas social support, heavy drinking, smoking, depression, and subjective health helped to explain only a small portion of the effect of religious attendance, cognitive functioning was a significant mediator of the effect of monthly attendance, but not weekly attendance. Our results concerning social support and depression are generally consistent with prior research (e.g., Ellison et al., 2000; Koenig et al., 1999; Musick et al., 2004). Our results for smoking and drinking are consistent with some studies (e.g., Ellison et al., 2000) and at variance with others (e.g., Koenig et al., 1999; Strawbridge et al., 1997). To our knowledge, we are the first to have examined subjective health and cognitive functioning as potential mediators.

We finally considered whether religious attendance affected mortality risk over and above sociodemographic characteristics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yearly</td>
<td>0.77*</td>
<td>0.85</td>
<td>0.85</td>
<td>0.86</td>
<td>0.86</td>
<td>0.84</td>
<td>0.86</td>
<td>0.86</td>
</tr>
<tr>
<td>Monthly</td>
<td>0.67**</td>
<td>0.75*</td>
<td>0.75*</td>
<td>0.76*</td>
<td>0.76*</td>
<td>0.79</td>
<td>0.76*</td>
<td>0.80</td>
</tr>
<tr>
<td>Once per week</td>
<td>0.57***</td>
<td>0.65****</td>
<td>0.65***</td>
<td>0.66***</td>
<td>0.66***</td>
<td>0.65****</td>
<td>0.65****</td>
<td>0.68***</td>
</tr>
<tr>
<td>&gt; once per week</td>
<td>0.73*</td>
<td>0.92</td>
<td>0.92</td>
<td>0.95</td>
<td>0.92</td>
<td>0.90</td>
<td>0.93</td>
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<td></td>
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<td>Poor mobility</td>
<td>—</td>
<td>1.40***</td>
<td>1.40***</td>
<td>1.39***</td>
<td>1.35***</td>
<td>1.38***</td>
<td>1.34**</td>
<td>1.33**</td>
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<tr>
<td>Activity limitations</td>
<td>—</td>
<td>1.12***</td>
<td>1.11***</td>
<td>1.12***</td>
<td>1.10***</td>
<td>1.08***</td>
<td>1.10***</td>
<td>1.06***</td>
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<tr>
<td>Potential Mediators</td>
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<tr>
<td>Social support</td>
<td>—</td>
<td>—</td>
<td>0.98</td>
<td>—</td>
<td>—</td>
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<td>—</td>
<td>1.01</td>
</tr>
<tr>
<td>Problem drinker</td>
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<td>—</td>
<td>1.07</td>
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<td>—</td>
<td>—</td>
<td>1.03</td>
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<tr>
<td>Current smoker</td>
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<td>—</td>
<td>1.21</td>
<td>—</td>
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<td>—</td>
<td>1.28*</td>
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<tr>
<td>Severe depression</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.15</td>
</tr>
<tr>
<td>Mild cognitive impairment</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.25**</td>
</tr>
<tr>
<td>Severe cognitive impairment</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.30</td>
</tr>
<tr>
<td>Poor subjective health</td>
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<td>—</td>
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<td>—</td>
<td>—</td>
<td>1.32**</td>
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<td>Sociodemographics</td>
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</tr>
<tr>
<td>Age (70–79)</td>
<td>1.44***</td>
<td>1.34**</td>
<td>1.33**</td>
<td>1.35**</td>
<td>1.34***</td>
<td>1.31**</td>
<td>1.34**</td>
<td>1.32**</td>
</tr>
<tr>
<td>Age (80+)</td>
<td>2.96***</td>
<td>2.32***</td>
<td>2.30***</td>
<td>2.38***</td>
<td>2.38***</td>
<td>2.35***</td>
<td>2.33***</td>
<td>2.51***</td>
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<tr>
<td>Female</td>
<td>0.68***</td>
<td>0.66***</td>
<td>0.67***</td>
<td>0.69***</td>
<td>0.65***</td>
<td>0.63***</td>
<td>0.66***</td>
<td>0.66***</td>
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<tr>
<td>Education (HS diploma)</td>
<td>1.04</td>
<td>1.04</td>
<td>1.01</td>
<td>1.03</td>
<td>1.05</td>
<td>1.07</td>
<td>1.10</td>
<td>1.10</td>
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<tr>
<td>Income ($10,000–14,999)</td>
<td>0.90</td>
<td>0.88</td>
<td>0.87</td>
<td>0.88</td>
<td>0.88</td>
<td>0.93</td>
<td>0.90</td>
<td>0.94</td>
</tr>
<tr>
<td>Income ($15,000+)</td>
<td>0.89</td>
<td>0.93</td>
<td>0.91</td>
<td>0.93</td>
<td>0.93</td>
<td>0.97</td>
<td>0.95</td>
<td>1.01</td>
</tr>
<tr>
<td>Marital status (married)</td>
<td>0.89</td>
<td>0.92</td>
<td>0.93</td>
<td>0.94</td>
<td>0.92</td>
<td>0.91</td>
<td>0.91</td>
<td>0.92</td>
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<tr>
<td>Cardiovascular health</td>
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<td></td>
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<tr>
<td>Overweight</td>
<td>1.75***</td>
<td>1.77**</td>
<td>1.78**</td>
<td>1.78**</td>
<td>1.77**</td>
<td>1.77**</td>
<td>1.78**</td>
<td>1.78**</td>
</tr>
<tr>
<td>Obese</td>
<td>1.66***</td>
<td>1.64***</td>
<td>1.64***</td>
<td>1.65***</td>
<td>1.65***</td>
<td>1.64***</td>
<td>1.64***</td>
<td>1.65***</td>
</tr>
<tr>
<td>Diabetic</td>
<td>1.66***</td>
<td>1.53***</td>
<td>1.54***</td>
<td>1.54***</td>
<td>1.52***</td>
<td>1.63***</td>
<td>1.50***</td>
<td>1.63***</td>
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<tr>
<td>Hypertensive</td>
<td>1.16*</td>
<td>1.14</td>
<td>1.15*</td>
<td>1.15*</td>
<td>1.14</td>
<td>1.23***</td>
<td>1.12</td>
<td>1.25**</td>
</tr>
<tr>
<td>Heart attack</td>
<td>1.27*</td>
<td>1.20</td>
<td>1.20</td>
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<td>1.20</td>
<td>1.15</td>
<td>1.16</td>
<td>1.12</td>
</tr>
<tr>
<td>–2 log likelihood</td>
<td>12,548.85</td>
<td>12,324.02</td>
<td>12,592.81</td>
<td>12,318.74</td>
<td>12,005.74</td>
<td>11,998.42</td>
<td>12,016.72</td>
<td>10,817.18</td>
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</table>

**Notes:** N = 3,050.

\*p < .05; \**p < .01; \***p < .001.
cardiovascular health, selection factors, and all potential mediators. Our results for the full model suggest that religious attendance is, indeed, a robust predictor of mortality risk among older Mexican Americans. Specifically, we find that those who attend church once per week exhibit a 32% reduction in the risk of mortality as compared with those who never attend religious services. Interestingly, the size of this effect is consistent with what has been shown to exist in other community-based epidemiologic studies (Oman & Reed, 1998) and national health studies (Musick et al., 2004).

The results of our investigation are quite intriguing; however, much remains to be investigated. Although religious attendance has a strong independent impact on survival, it is probably associated with other factors not controlled for in these analyses. For example, studies show that religious involvement is inversely associated with anger and hostility and positively associated with happiness, hope, and optimism (Koenig et al., 2001). If these variables predict mortality or other important risk factors such as cardiovascular health, they may at least partially mediate the relationship between religious involvement and mortality. It may also be important to control for more specific religious practices and devotional activities. In this report, we find that general social resources have no mediating influence. More specific measures of church-based social support might help to explain some of the association.

Despite the limitations of the data, our results show that religious attendance is associated with a reduction in the risk of mortality among older Mexican Americans. Moreover, we find that the benefits of weekly attendance are especially robust, persisting with statistical adjustments for sociodemographic characteristics, cardiovascular health, functional limitations, social support, health behaviors, mental health, and physical health.

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REFERENCES


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