Introduction

Religious involvement → lower cardiovascular morbidities and mortality.1-4
• Up to 30% risk reduction for religious attendance/mortality association.5

Most population-based studies on religion/spirituality and health focus on service attendance and mortality, missing key aspects of religiosity and spirituality that may promote health
• Limited attention to mediating and moderating factors connecting religiosity and spirituality to health risk factors, processes, and outcomes

Chronic inflammation is a plausible biological pathway connecting religion/spirituality to downstream health outcomes but is largely unexplored in population-based samples.6

Study Objectives:
- Cross-sectional investigation of multidimensional religiosity and spirituality → chronic inflammatory markers
- Models control for sociodemographic factors, health behaviors (smoking, physical activity), and obesity (BMI)

Methods

Midlife in the United States (MIDUS) combined biomarker MIDUS 2 Core (M2) and MIDUS Refresher (MR) samples

Outcomes: Interleukin-6 (IL-6) and C-reactive protein (CRP) from fasting blood draw. Natural log transformed for analyses.

Religion/spirituality Predictors:
- Religious service attendance: At least weekly, less than weekly, or never attender
- Spirituality (2 items): “How important is spirituality in your life?”
- Private religious practices (3 items): “How often do you meditate or chant?”
- Daily spirituality experiences (5 items): “On a daily basis, how often do you experience a deep inner peace or harmony?”
- Religious coping (6 items): “I work together with God as partners.”
- Mindfulness (9 items): “Because of your religion or spirituality, do you try to be more engaged in the present moment?”

Covariates: age, gender, cohort (core vs. Refresher), race (White vs. Black/African American), educational attainment, body mass index (BMI), smoking status (current smoker vs. not), physical activity (150 minutes per week of moderate/vigorous activity per week (meets guidelines vs. not)

Analysis: Ordinary least squares regression models with each religion/spirituality measure in separate regressions, controlling for age, gender, race, BMI, smoking, and physical activity

Results

Table 1. Sample descriptive statistics (N= 2,118)

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>M(SD) or %</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (% female)</td>
<td>55.4(12.6)</td>
<td>26-86</td>
</tr>
<tr>
<td>Race (% Black or African American)</td>
<td>54.9%</td>
<td></td>
</tr>
<tr>
<td>MIDUS Sample (% M2 core)</td>
<td>18.7%</td>
<td></td>
</tr>
<tr>
<td>Education (% high school or less)</td>
<td>59.3%</td>
<td></td>
</tr>
<tr>
<td>Interleukin-6 (pg/mL)</td>
<td>23.6%</td>
<td></td>
</tr>
<tr>
<td>C-reactive protein (µg/mL)</td>
<td>0.12-23</td>
<td></td>
</tr>
<tr>
<td>Religious service attendance (% at least weekly attenders (ref.))</td>
<td>20.3%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Religious involvement and IL-6 and C-reactive protein, respectively.

<table>
<thead>
<tr>
<th>DV = ln(IL-6)</th>
<th>DV = ln(CRP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B(SE)</td>
<td>p</td>
</tr>
<tr>
<td>Attend less than weekly (vs. attend ≥ weekly)</td>
<td>.0004(.04)</td>
</tr>
<tr>
<td>Never attend (vs. attend ≥ weekly)</td>
<td>.02(.04)</td>
</tr>
<tr>
<td>Spirituality</td>
<td>-.03(.01)</td>
</tr>
<tr>
<td>Religious Coping</td>
<td>-.0003(.004)</td>
</tr>
<tr>
<td>Daily Spiritual Experiences</td>
<td>-.01(.01)</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>-.01(.004)</td>
</tr>
</tbody>
</table>

Note. Each religion/spirituality measure entered in separate regression model. All models include age, gender, race, sample (M2 v. MR), education, BMI, smoking, and physical activity.

Additional Results:
- Religiosity/spirituality variables accounted for 0.2-0.3% variance in inflammatory markers
- Associations between religious/spirituality measures and IL-6 and CRP did not differ by study sample (M2 v. MR)

Conclusions

Many aspects of religion and spirituality (service attendance, spirituality, daily spiritual experiences, religious coping, and mindfulness) were associated with lower inflammatory markers.

Collectively, models accounted for ~25% of variance in IL-6 and CRP (~15% accounted for by smoking, physical activity, and BMI).
• Effect sizes for religiosity/spirituality were small but comparable to other psychosocial factors. Small effects at individual level may still represent important influences within the population.

Psychosocial aspects of religion and spirituality are important for midlife and older adults and may promote healthy physiological functioning via behavioral and psychosocial pathways3
• Religiosity and spirituality are patterned by age, gender, and race: higher among older adults, women, and Black/African American adults (relative to White adults)

Research should examine behavioral and biological pathways connecting religion and spirituality to health and mortality outcomes in order to provide targets for intervention and to understand how religious service attendance promotes health and longevity

Study limitations: 1) cross-sectional data and 2) less representation of individuals with low education for whom religion and spirituality may be especially salient

Future directions will consider whether there are gender and/or race differences in the associations between religion and spirituality measures and inflammatory outcomes2,8-9

References


Address correspondence to: jennifer.boylan@ucdenver.edu

This project was made possible through the support of a grant from the John Templeton Foundation.