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“Mental Health and Self-Rated Health among U.S. South Asians: The Role of Religious Group Involvement”

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Abstract

Objectives: Only one community-based study assessed religious group involvement and health outcomes among South Asians in the United States, with mixed results. Using a large, South Asian community-based sample drawn from the Chicago and San Francisco Bay areas, this study examined the effects of six religious group involvement predictors—religious tradition, attendance, group prayer, giving/receiving congregational emotional support, congregational neglect, and congregational criticism. Four health outcomes were assessed: self-rated health, positive mental health functioning, trait anxiety, and trait anger.

Design: This study used a new religion/spirituality questionnaire in the Mediators of Atherosclerosis Among South Asians Living in America (MASALA) study (2010–2018), the largest study of mental and physical well-being among U.S. South Asians. Associations were assessed cross-sectionally using OLS regression in both the full sample (N=928) and a subsample of congregation members (N=312).

Results: Jains reported better self-rated health compared to Hindus and Muslims. Group prayer involvement, when measured ordinally, was positively associated with self-rated health and mental health functioning. In reference group comparisons, individuals who participated in group prayer once/day or more had lower levels of anxiety and anger compared to several comparison groups in which individuals prayed less than once a day. Religious service attendance frequency was

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Ethical Approval The study complied with the principles of the 1964 Helsinki declaration.

Informed Consent Informed consent was obtained from all participants before participation.

associated with higher levels of anxiety. Giving/receiving congregational emotional support was positively associated with self-rated health and mental health functioning, and inversely associated with anxiety. Congregational criticism was associated with higher levels of anger and anxiety.

Conclusions: This study provided a new assessment of religious group involvement and health in the U.S. South Asian population. Religious group participation was associated with mental and self-rated health in well-controlled models, indicating that this is a fruitful area for further research. Group religious involvement may be a health-promoting resource for U.S. South Asians who are religiously active, but it is not an unalloyed boon.

Keywords

Immigrant; South Asian; Religion; Spirituality; Hindu; Muslim; Jain; Mental Health; Depression; Self-Rated Health; Anxiety; Anger

Introduction

Scientific interest in the relationship between religion and spirituality and health has grown in recent decades. Researchers have found that religion is frequently—though not always—associated with positive mental and physical health (Ellison and Lee 2010; Koenig, King, and Carson 2012; Hill and Cobb 2011; VanderWeele 2017). Interest in the health of U.S. ethnic and racial minorities is also increasing. Asians are a growing U.S. minority and are projected to become the largest immigrant group in the U.S., exceeding Hispanics in 2055 (López, Ruiz, and Patten 2017; United States Census Bureau 2010). One in four Asians in the U.S. is South Asian (those with Indian, Pakistani, Sri Lankan, Bangladeshi, and Nepalese ancestry). With a total population of 3.4 million, South Asians are one of the fastest growing racial/ethnic minorities in the U.S. Despite South Asian demographic growth, South Asians have been underrepresented in health research (Kanaya et al. 2013). Further, only two analyses have explored the potential influences of religious/spiritual beliefs and practices on the health of U.S. South Asians (Diwan, Jonnalagadda, and Balaswamy 2004; Diwan and Jonnalagadda 2002).

This dearth of research on religion and health among U.S. South Asians is an important gap in knowledge, one the current study sought to fill in three key ways. First, this study used a large community-based sample of U.S. South Asians that included multiple ethnicities whereas prior research used a smaller sample of Indian South Asians. Second, this study drew on a diverse array of religious group involvement measures, whereas prior research was limited to measures of general religiosity and worship place attendance (Diwan, Jonnalagadda, and Balaswamy 2004; Diwan and Jonnalagadda 2002). Third, by assessing the effects of multiple religious group involvement measures simultaneously (religious tradition, attendance, group prayer, giving/receiving congregational emotional support, congregational neglect, and congregational criticism) this study determined the independent and diverse effects of religious group involvement across multiple physical and mental health outcomes: self-rated health, positive mental health functioning, trait anxiety, and trait anger.

South Asian Religions in the U.S.

Scholars have often characterized religious involvement among South Asians as relatively individual- or family-based. Despite this characterization, a recent study found that religious/spiritual organizations were the most common form of organizational affiliation for U.S. South Asians, and South Asians perceived these organizations as health-promoting (Kandula et al. 2018). Religious groups serve a variety of important functions among U.S. South Asians, such as providing a sense of belonging, locations for cultural identities, contexts for religious practice, and resources for negotiating the wider American social environment. Because three-quarters of South Asians in the U.S. are first generation immigrants, they may especially benefit from social support provided by religious groups as they navigate adjustment to American life (Min 2010; SAALT 2019).

Religious organizations among Dharmic faiths (Hinduism, Jainism, Sikhism, Buddhism) are not typically congregation-based in South Asia, but have undergone a shift toward congregational forms in the U.S. (Yang and Ebaugh 2001). Hindu temples in the U.S., for example, moved toward congregational forms in their organization, not only through the process of cultural adaptation, but also in seeking organizational benefits such as an Internal Revenue Service “church designation” (Kurien 2006, 726). Sikhism, similarly, sought to make the transition from a culturally contextual religion—one that is family-centered and passed organically from generation to generation—to a text-based religion centered around *panthak* (collective worship) in the gurdwara (Leonard 1998; Mann 2000).

Islam has not been compelled to revise its U.S. institutional structure to the extent of Dharmic faiths as Islam is already a more congregationally-centered religion. This can be seen in U.S. Muslims’ relatively high levels of engagement in communal and congregational forms of religious participation. Forty-three percent of U.S. Muslims report attending mosques or Islamic centers weekly or more, and only 26% report seldom or never attending (Sciupac 2017). Prayers occur at specified times throughout the day, often taking place collectively at the mosque, which serves as both a religious and social center (Dana, Barreto, and Oskooii 2011).

Religion and Health

Little is known about the impact of religious group involvement on the health of U.S. South Asians. Only two cross-sectional analyses to date (of a single community-based sample) examined the impact of religious group involvement on mental health and self-reported physical health among U.S. South Asians. In a sample of 226 Asian Indian immigrants in Atlanta, Georgia, Diwan et al. (2004) found that an index of religiosity (which included participants’ visits to their place of worship) was inversely related to negative affect, though not significantly related to positive affect. In the same sample, Diwan and Jonnalagadda (2002) found that frequency of visiting places of worship was not significantly associated with self-reported health conditions (heart disease, stroke, high blood pressure, cancer, and arthritis).

Religious group involvement (particularly religious service attendance) has received more attention in the general U.S. population, highlighting associations among Blacks and

whites, and to a lesser degree Latinxs, most of whom identify as Christian. Religious service attendance has frequently been associated with positive health outcomes in these populations (Koenig, King, and Carson 2012; VanderWeele 2017). In terms of the health outcomes analyzed in the current study, religious service attendance has been beneficially linked to self-rated health, depressive symptoms, anxiety, and anger in large probability samples (Ellison, Burdette, and Hill 2009; Schieman 1999; Idler et al. 2009). In non-Asian minority populations, congregational social support has been indirectly linked to self-rated health among Mexican Americans and inversely related to depressive symptoms among African Americans (Krause and Bastida 2011; Holt et al. 2013). Religious involvement has not always been associated with beneficial health outcomes, however (Hill and Cobb 2011). While religion may frequently serve as a positive resource for individuals, negative congregational interactions, such as being criticized by fellow religious congregants, have been associated with higher levels of anxiety and depressive symptoms (Holt et al. 2013; Ellison and Lee 2010; Sternthal et al. 2010).

One practice—group prayer outside of religious services—has rarely been measured in any population, though one qualitative study found that individuals who shared prayers with others in a group setting tended to express greater subjective well-being and a sense of empowerment (Washington and Moxley 2001). Among Hindus, Jains, and Sikhs, group prayer is typically a collective event that involves singing or chanting prayers and devotional hymns (e.g., bhajans [meaning sharing or belonging to]), often characterized by fast-paced participatory choral singing, dancing, and social bonding (Arnold 2000). Group prayer is also common among Muslim U.S. South Asians (Afzal 2014; Kurien 2017). Group prayer involvement can be mood boosting and may tap into emotionally cathartic qualities of religious group participation (Idler et al. 2009).¹

In sum, while religious group involvement (typically measured as service attendance) has often, though not always, associated with positive mental/self-rated health in the general U.S. population, very limited and mixed research is currently available for U.S. South Asians. No extant community-based studies of South Asians assessed multiple measures of group involvement and mental/self-rated health or used a multi-ethnic U.S. South Asian sample. The current analysis took an important step toward filling this gap by examining six measures of religious group involvement, three mental health outcomes, and self-rated health.

Following this background, theory, and research, it was thus hypothesized that group prayer, along with religious service attendance and congregational emotional support, would be positively related to self-rated health and mental health functioning, and inversely related to trait anxiety and trait anger. It was expected that congregational neglect and criticism would be negatively related to self-rated health and mental health functioning and related to higher levels of trait anxiety and trait anger.

¹The variable assessed in this study asks specifically about group prayer “outside religious services,” but there remains some level of ambiguity regarding what respondents had in mind with their answers. The contextual comments offered here suggest some possibilities but are not definitive.

Methods

Participants

This analysis relied on data from the Mediators of Atherosclerosis Among South Asians Living in America (MASALA) study, an ongoing study designed to investigate the high rates of cardiovascular disease (CVD) among South Asians not explained by traditional risk factors. In addition to CVD, MASALA measured a number of other facets of physical and psychosocial health. Participants were initially recruited from 2010 to 2013. To be eligible, participants must have been between 40 and 84 years of age, of South Asian descent (i.e., at least three grandparents born in India, Nepal, Pakistan, Sri Lanka, or Bangladesh), free of cardiovascular disease, and able to speak, read, and write in English, Hindi, or Urdu. Recruitment took place in the San Francisco Bay and greater Chicago areas using telephone-based recruitment methods in areas where census data revealed high proportions of South Asians. An initial list of 10,000 households was obtained and a random batch of 100 letters were mailed every 2 to 4 weeks with follow-up calls. 906 original cohort members (Exam 1) underwent a 6-hour baseline examination. Sample size for establishing the cohort was based on the exclusion criteria of having atherosclerosis or traditional CVD risk factors among South Asians (Kanaya et al. 2013).

This study also relied on data collected as part of the Study on Stress, Spirituality and Health (SSSH). During a follow-up visit of the MASALA study between 2015 and 2018 (Exam 2), 733 returning cohort members completed the SSSH survey on religious/spiritual beliefs and practices. A new recruitment wave from 2017-2018 (Exam 1A) resulted in an additional 256 participants who completed both the baseline examination and SSSH survey. In all, 989 MASALA participants completed the SSSH questionnaire.

Individuals were removed for this analysis if data were missing on key independent or dependent variables, with the exception of income, marital status, and group prayer (median and modal imputation were used to recover missing data on these variables; 3.3%, 3.4%, and 2.9% respectively). A missing indicator was controlled in all regression models.² In all, 928 of 989 participants in the MASALA study were included in analyses. The analytic sample included 568 Hindus, 71 Muslims, 48 Jains, 51 Sikhs, 36 “others” (Buddhist, Christian, Jewish, Zoroastrian, and other), 67 with multiple affiliations, and 87 categorized as “none” (i.e., no religious tradition). A subsample of respondents indicating that they belonged to a religious congregation (N=312) was also analyzed to assess the impact of congregation-specific measures on health outcomes. Further information on MASALA objectives, design, and cohort description are available elsewhere (Kanaya et al. 2013).

Dependent Variables

Self-rated health was measured with an item that asked participants to rate their overall health, ranging from 1=poor to 5=excellent (Idler and Benyamini 1997). Mental health functioning was addressed using the three-item Mental Health Inventory index (MHI-3).

²Ancillary analyses handled missing data using FIML. In the full sample anxiety model, the p-values for attendance (p-trend) and the group prayer category “several/year” were statistically significant in Table 4 and were marginally significant when using FIML. Other than these exceptions, focal results were unchanged in all models using FIML.

The summed range was 0-15; higher scores equated with better mental ($\alpha=0.65$). The Spielberger scales were used to assess trait anxiety (10 items; range 10-40; $\alpha=0.70$) and trait anger (10 items; range 10-40; $\alpha=0.69$) (Spielberger 1980).

Covariates

Control variables included female sex (1= yes), age in years (45-49, 50-59, 60-69, and 70-89), family income (less than \$75,000, \$75,000-\$149,999, and \$150,000 or more), education (less than bachelor's degree, bachelor's degree, and graduate or professional school), employed full time (1= yes), home owner (1= yes), married (1= yes), percent of life in the United States (range: 5% to 100%)³, language at home, medication use, and alcohol consumption. Language at home was measured as: (0) only a South Asian language, (1) South Asian language more than English, (2) both equally, (3) English more than South Asian language, and (4) only English. Use of antidepressant medication was assessed via a binary variable (1=yes) indicating use of one or more of the following: selective serotonin reuptake inhibitors, selective serotonin and norepinephrine reuptake inhibitors/other antidepressants, tricyclics, and minor tranquilizers. Alcohol consumption was measured as the number of drinks per week and categorized as: none, 1-2, 3-5, 6-9, and 10 or more.

Focal Independent Variables

Religious group participation was measured as religious tradition, frequency of group prayer participation, frequency of religious service attendance, and frequency of giving/receiving congregational emotional support. Because religion may also harm health (Hill and Cobb 2011), explicitly negative forms of religious group participation were measured as respondents' reported congregational criticism and congregational neglect. South Asian religious traditions were categorized as Hindu, Muslim, Jain, Sikh, other (Buddhist, Christian, Jewish, Zoroastrian, and other), multiple religions, and none. The "none" category included atheists, agnostics, and non-religious individuals. Those who selected one of the non-religious categories but also indicated a religious tradition were coded as "none" since identification with a religious tradition in these instances was uncertain.

Other religion variables were modeled as categorical variables and also evaluated for linear trends. Frequency of group prayer participation outside a religious service was categorized as: several times a year, several times a month, once a week, more than once a week, daily/several times a day, and missing. Religious service attendance frequency was coded as: never/rarely, once a month, 2-3 times per month, weekly, and several times per week. Several categories within the group prayer and service attendance variables were collapsed in the congregation member-only models due to small cell sizes (see Table 1). In

³A U.S. born indicator (full sample $n=19$; congregant sample $n=8$) was included in ancillary analyses but was not statistically significant in models. One exception was a positive association with MHI-3 in the congregant subsample ($p=.04$); the coefficient size and statistical significance of focal religion variables were not meaningfully changed. In ancillary analyses, an alternate measurement strategy was used when controlling for age and income. Income and age were included as continuous variables along with age-squared. In both full sample and congregation subsample models, focal predictors did not change in terms of statistical significance and coefficient sizes were similar. One exception was that congregation criticism became significant ($p = .04$) in the congregation subsample MHI-3 model.

these congregation member analyses, six individuals who identified as having no religious tradition (“none”) were also not included.

The remaining religion items were specific to congregation member subgroup analyses. Giving/receiving congregational emotional support (frequency of giving and receiving love and care) was a dummy system constructed from an index of two variables (religious community showing you love/care, showing love/care to your religious community) whose answers ranged from (1) never to (4) very often. These two variables were highly correlated at 0.96 ($p < .0001$), loaded on the same factor at .99 and had a Cronbach’s alpha of .96. The constructed dummy system categories were: “occasional” (“never” and “once in a while” were collapsed into a single category), “fairly often,” and “very often.” Two separate items measured negative congregation experiences. Congregational neglect measured whether respondents felt ignored or neglected by people in the congregation. To measure congregational criticism, respondents were asked, “How often are people in your congregation or religious community critical of you or your lifestyle?” Responses to both items were coded as: 1=once in a while or more, 0=never.

Analytic Strategy

Because this study used recent data from the first in-depth study of religious involvement among U.S. South Asians, analyses necessarily assessed cross-sectional associations between religion measures and health outcomes. Descriptive statistics were examined for all study variables, with particular attention given to appropriate frequency distribution across categorical levels. In some cases, multiple categories were collapsed if cell sizes were insufficient for analysis, particularly when moving from the full analytic sample to the congregational sample. These changes are detailed in the notes of Tables 2-5. Since all outcomes were continuous and normally distributed, general linear models with robust standard errors were fitted to the data using PROC GENMOD in SAS 9.4. Group religion items were analyzed both independently (not shown) and simultaneously, and results were similar. Unstandardized coefficients were converted to a percent scale for ease of interpretation, with each coefficient interpreted as percent difference from the mean of the reference category. A second set of analyses assessed the variables continuously, with p-trend values reported to assess linearity across the construct (e.g., 1=‘never,’ 2=‘several/year,’ 3=‘several/month,’ etc.). Despite some correlation among religion variables, ancillary analyses (not shown) using COLLIN and VIF commands found no evidence of problematic multicollinearity.

Results

Sample Profile

Descriptive data on the full sample and congregational subsample are reported in Table 1. The majority of the full sample was between 50 and 69 years of age (72%), had relatively high income (62% had incomes of \$75,000 or greater) and were well-educated (88% had a bachelor’s degree), were married (92%), and were homeowners (89%). Participation in group prayer outside religious services was not practiced by the majority (29% participated several times/year or more), and frequency of religious service attendance was relatively

normally distributed (excluding the “never” category, which no respondents selected). Although nearly all participants attended religious services at least several times a year, only 33.6% considered themselves members of a congregation (31% Hindu, 45% Muslim, 58% Jain, 45% Sikh, 81% other, 31% multiple, 7% none). Of those, congregational emotional support was relatively evenly reported across categories (31% occasionally, 36% fairly often, 33% often). About one third of respondents felt neglected or criticized by their congregations at least occasionally.

Multivariate Analyses

Tables 2-5 show the results of generalized linear regressions of self-rated health, mental health functioning, trait anxiety, and trait anger.

Religious tradition was rarely identified as a salient predictor of differences in study outcomes. Exceptions included a 6.8% higher score on self-rated health for Jains compared to Hindus (full sample; $p=.04$). The “Other” religion category significantly differed from Hindus in some cases but could not be meaningfully interpreted due to its diverse religious composition (Buddhist, Christian, Zoroastrian, etc.). Contrast categories were rotated such that Muslims were the reference; but, only Jains surpassed Muslims in self-rated health (full sample; $p=0.049$).

Group prayer was associated linearly in the full sample with better self-rated health ($b=.05$, $p=.02$) and mental health functioning ($b=.18$, $p=.003$). In the congregational subsample, group prayer was also associated with better mental health functioning ($b=.20$, $p<.01$). Individuals who indicated that they participated in group prayer ‘never,’ ‘several times a year,’ and ‘once a week’ had worse mental health functioning compared to those who participated ‘once a day or more’ (full sample, $-8.5%$ [$p=.004$], $-8.4%$ [$p=.003$], and $-6.2%$ [$p=.04$] respectively). These patterns carried over to the congregational sample, though ‘once/week’ became marginally significant. Those who participated ‘never’ and ‘several times a year’ exhibited higher levels of anxiety compared to those who participated once a day or more (full sample, $8.1%$ [$p=.04$] and $9.1%$ [$p=.01$]). Those who prayed in a group once a week or more scored higher on trait anger compared to those who prayed once a day or more (full sample, $12.4%$ [$p=.02$]; congregational sample, $15.6%$ [$p=.02$]).

Religious service attendance was linearly associated with higher levels of anxiety in both the full ($b=.41$, $p=.02$) and congregation samples ($b=.84$, $p=.01$). In the congregation sample, those who attended several times a week scored 13.6% ($p=.02$) higher on anxiety compared to those who attended rarely or once a month. Similarly, individuals who attended services once a week or more scored 13.9% higher ($p=.02$) on anger compared to those who attended rarely or once a month.

*Giving/receiving congregational emotional support*⁴ was consistently associated with outcomes on linear p-trend tests for self-rated health ($b=.21$, $p<.001$), mental health functioning ($b=.46$, $p=.008$), and anxiety ($b=-1.08$, $p<.001$). In categorical comparisons,

⁴These variables were combined due to high correlation. When entered separately, both giving and receiving love/care were associated with better self-rated health and reduced anxiety. Giving love/care was associated with better mental health functioning. Neither was associated with anger.

those who often gave/received emotional support reported greater self-rated health over those who only fairly often or occasionally gave/received support (6.7% [$p=.01$] and 10.7% [$p<.001$], respectively). Compared to respondents in the ‘occasional’ group, those in the ‘often’ group had a 7.6% ($p=.01$) advantage in mental health functioning and a 14.2% ($p<.001$) reduction in anxiety. No significant emotional support effects on anger were observed.

Congregational neglect did not have a statistically significant relationship with any study outcomes. Ancillary analyses controlling for religious tradition and study covariates only (no other group religion items) indicated that congregational neglect was associated with higher levels of anxiety (8.6% increase, $p=.02$).

Congregational criticism was associated with a 9.1% ($p=.003$) increase on the trait anger scale and was associated with a 6.2% increase in trait anxiety at the level of marginal significance ($p=.06$).

Discussion

Using a community-based sample of U.S. South Asians, this study found that several forms of religious group involvement were associated with self-rated health, mental health functioning, anxiety, and anger in well-controlled models. Religious affiliation, group prayer, and service attendance in a full sample, and congregational emotional support/provision and congregational criticism in a congregation member subsample, were associated with self-rated and mental health outcomes, controlling for demographic characteristics and other important covariates. Prior analyses of a sample of U.S. Asian Indians found that an index of religiosity was inversely related to negative affect but not positive affect (Diwan et al. 2004), and frequency of visiting places of worship was not significantly associated with self-reported physical health (Diwan and Jonnalagadda 2002). The current study advanced extant research by demonstrating relationships between multiple forms of religious group involvement and self-rated health and mental health among U.S. South Asians.

In this study’s full sample, frequency of group prayer was associated with self-rated health and mental health functioning. In addition to underscoring the importance of group prayer among U.S. South Asians, these results provided mixed and indirect support for Idler (2009) and others who have suggested that emotionally cathartic aspects of religious congregational involvement may be especially health-enhancing. As such, these findings are noteworthy for the broader field of religion and health.

Prior research has found that religious service attendance tends to be associated with decreased symptoms of anxiety (Koenig, King, and Carson 2012). This is not always the case, however, and the current study’s results joined the minority of studies finding a positive association between attendance and anxiety. Several prior studies may shed light on this issue. First, Sternthal et al. (2012) found that an attendance-anxiety benefit was found in whites but not in Blacks or Latinxs. Second, Lavri and Flere (2010) found that service attendance was associated with decreased anxiety in highly religious contexts,

but with increased anxiety in less religious contexts. Third, Bergin et al. (1987) found that extrinsic religiosity, though not intrinsic religiosity, was associated with higher levels of anxiety. Taken together, these studies suggest not only that differing patterns emerge in some social contexts or racial/ethnic groups, but that an individual's motivation for attending services may also play a role. U.S. South Asians reported lower levels of religious attendance and congregation membership compared to the general U.S. population. Given that the South Asian cultural/religious context is distinctive, South Asians may be more motivated to engage in religious attendance by extrinsic factors, and thus be more subject to anxiety-inducing dimensions of attendance. For example, some studies reported that South Asians frequently engage in religious attendance as a family and cultural obligation or religious duty (Kurien 2007; Pechilis and Raj 2013).

This study's attendance-anxiety finding could also reflect a resource mobilization process in which individuals seek support through religious attendance when experiencing distress, thus reversing the causal direction. It is likely this possibility applies more readily to Dharmic faiths than Islam, which, like Western Christianity, has relatively high levels of congregation membership and attendance (66% of Muslims in this sample attended religious services weekly or more, compared to 23% of Hindus). In religions with higher baseline levels of membership and attendance, anxiety is less likely to drive attendance as a form of religious resource mobilization since attendance may not be predicated on emotional need. Where attendance and membership are lower, however, individuals may turn to religion as a source of comfort and support in times of distress.

This study showed divergent findings for group prayer and religious attendance. Group prayer was beneficially associated with anxiety, but attendance had a deleterious association. First, the attendance dynamics as noted above were likely at play. Second, it is possible that group prayer participation may signify a different type of religious engagement than attendance. Bodily presence at a religious service does not necessarily imply emotional, physical, or spiritual engagement. Group prayer, on the other hand, is likely to involve greater levels of voluntary engagement, particularly as this study's group prayer measure addressed experiences outside of religious services. However, precisely what respondents deemed group prayer and what they considered gatherings outside formal services was not clear, pointing to the need for greater specificity in future data collection.

Turning to results from the congregation member subsample, giving and receiving congregational emotional support was generally associated with better health. Higher levels of support were positively associated with self-rated health and mental health functioning, and inversely associated with anxiety. These findings echoed the results of a study among Mexican Americans, which found that church-based emotional support was positively linked to self-rated health (Krause and Bastida 2011). South Asians' religious identities are stigmatized and misunderstood in American society (Kurien 2007), and giving and receiving love and care within the refuge of one's religious community may be an important source of acceptance and belonging that supports better overall health and mental health functioning, and lowers anxiety. Giving and receiving love is a specific application of emotional support; since "love" is a charged religious word and is thought to motivate religious action (Lee,

Poloma, and Post 2013), future research should clarify how love is defined and how it operates among South Asian religionists and other religious communities.

While religious congregations can serve as an important source of support, congregations may also be overly critical and become a threat to the self (Ellison et al. 2009). This study examined both congregational neglect and criticism. Congregational neglect was not significantly related to adverse mental health outcomes.⁵ Congregational criticism was associated with higher levels of anger and marginally associated with greater anxiety (significant when examined independent of other religion variables, not shown). Anxiety and anger are distinct from other psychological measures such as depression. For example, anxiety is closely related to feelings of helplessness and fear (Spielberger 2013). While congregational criticism in part represents social fracture, congregational criticism is likely also a threat to the self. The link between congregational criticism and anxiety aligns with non-South Asian research in the U.S. that found interpersonal struggles (including congregational criticism) associated with greater psychological distress (Ellison and Lee 2010). The current study's results differed, however, from the results of other research that found congregational criticism to be associated with depression but not anxiety (Sternthal et al. 2010). Congregational criticism's noxious link to anger in the current study was a novel finding; researchers should further investigate the link between congregational criticism and anger among South Asians and other populations.

Future examinations should apply prospective analyses to assess causal relationships among these variables, with particular attention paid to the relationships among service attendance, congregational interactions, and health. Specifically, congregational emotional support, neglect, and criticism are likely to be simultaneously conditional on exposure to religious attendance, and also causally linked to future attendance.

Implications

While developing specific clinical applications, interventions, and policy recommendations are beyond the scope of this study, several implications follow. Clinicians, policy makers, and religious leaders should be aware that religious communities, in addition to providing spiritual support, can offer material, social, and psychological resources (e.g., aid, meaning, sense of belonging) useful for negotiating cultural, economic, and personal challenges (Dougherty and Whitehead 2011; Holt et al. 2013; Krause and Bastida 2011). While individuals may engage in private religious practices such as meditation, personal prayer, or religious reading as a strategy for improving health (e.g., Hankey and Shetkar 2016), group religious involvement and its attendant social support, along with the socio-emotional act of engaging in collective religious ritual, is likely to confer unique health benefits (Krause and Bastida 2011; Idler et al. 2009). Prescribing group religious participation to non-adherents would be outside the bounds of clinical practice, but for religious patients, a low-cost and suitable approach to care may entail identifying spiritual elements and resources within an individual's life or religious community.

⁵Ancillary analyses (not shown) revealed a positive interaction ($p < .05$) between service attendance and neglect for anxiety. This suggested attendance was more strongly associated with anxiety among those with experiences of neglect.

Scholars have undertaken much of the research on patient spiritual care within Western, Christian contexts (Koenig 2014); spiritually-integrated care has also recently gained traction among South Asians. The literature has raised two important points: 1) patients would like to see physicians address spiritual and emotional needs in addition to physical ones, and 2) incorporating spirituality may help reduce stigma associated with some types of care, particularly psychiatric care (Chattopadhyay 2007; Ramakrishnan et al. 2014). These points are relevant not just to clinicians, but also to policy makers, advocates, and religious leaders. South Asians both disproportionately experience mental health challenges compared to the general U.S. population, and underutilize mental health services (Karasz et al. 2016). This may be because some South Asian cultures stigmatize mental illness more so than Western cultures and associate admission of illness with weakness or shame (Gilbert, Gilbert, and Sanghera 2004).

The intersection of mental health problems, health service utilization, and stigma is underscored by the fact that religious organizations, like all organizations, are subject to insider/outsider dynamics which can exacerbate stigma and health problems. While religious/spiritual organizations are the most common form of organizational affiliation for U.S. South Asians and are largely perceived as beneficial to health (Kandula et al. 2018), deviating from the norms of a religious community may come at a cost. Whereas normative religionists may experience acceptance, belonging, and encouragement, those on the fringe—due to divergence from customs and norms—may feel exclusion, isolation, or alienation (Kent and Henderson 2017; Stroope and Baker 2018). While successful integration with a religious group can be beneficial, care should be taken from a clinical perspective to identify whether a patient’s religious group is a source of well-being or a source of stress (Peteet, Al Zaben, and Koenig 2019). South Asian religious leaders in the U.S. have an opportunity, perhaps in cooperation with clinicians and public health advocates, to confront and break down mental health stigma.

Finally, several interventions might be used to enhance individual and community health. Interventions that are “faith-based” (utilizing specific teachings or values), “faith-placed” (occurring in a religious setting), and community-based have been developed that seek to enhance health-promoting states and practices such as humility (Lavelock et al. 2014), compassion (Jazaieri et al. 2013), and forgiveness (Griffin et al. 2019).⁶ While these interventions do not necessarily focus on the variables discussed in the present study, they illustrate current efforts to enhance health through religious and non-religious institutions.

Limitations

This study has a number of strengths but is also characterized by several limitations. First, due to the recent fielding of the Study on Stress, Spirituality and Health’s (SSSH) survey in MASALA, data were collected concurrently with the second wave of data within this cohort. Future research can build on the current study by undertaking prospective analysis. Still, the current cross-sectional analysis provided support for the impact of unstudied dimensions of religion as they relate to important mental and physical health outcomes. Second, anxiety

⁶See VanderWeele (2017) for more on faith-based interventions.

and anger were measured prior to the religious involvement data in the original cohort members (Exam 1), but concurrently in the additional recruits (Exam 1A). It is possible that the temporal difference in measurement for the Exam 1 portion of the sample resulted in a loss of power in some analyses, and relative distance from experiences of criticism may have blunted effects. Third, this study may not be generalizable to all South Asians in the U.S. The MASALA survey focused on middle-aged and older South Asians living in the Chicago and San Francisco Bay areas and was comprised predominantly of Asian Indians and individuals with relatively high socio-economic status.

Despite these limitations, the study provided the first examination of an array of religious group involvement measures and self-rated health and mental health outcomes in a community-based sample of U.S. South Asians. Key study findings on group prayer, service attendance, congregational support, and congregational criticism invite further investigation on the role of religion in the health and lives of South Asians. Future research should follow-up with prospective analyses, examine private or family-based religious and spiritual practices among South Asians, and assess whether patterns observed here are also seen for health behaviors and other forms of physical health, mental health, and well-being.

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References

- Afzal Ahmed. 2014. *Lone Star Muslims: Transnational Lives and the South Asian Experience in Texas*. New York, NY: NYU Press.
- Arnold Alison, ed. 2000. *The Garland Encyclopedia of World Music: South Asia, the Indian Subcontinent*. Vol. 5. New York, NY: Garland.
- Bergin Allen E., Masters Kevin S., and Richards P. Scott. 1987. "Religiousness and Mental Health Reconsidered: A Study of an Intrinsically Religious Sample." *Journal of Counseling Psychology* 34 (2): 197–204.
- Chattopadhyay S 2007. "Religion, Spirituality, Health and Medicine: Why Should Indian Physicians Care?" *Journal of Postgraduate Medicine* 53 (4): 262. [PubMed: 18097118]
- Dana Karam, Barreto Matt A., and Oskooii Kassra A. R.. 2011. "Mosques as American Institutions: Mosque Attendance, Religiosity and Integration into the Political System among American Muslims." *Religions* 2 (4): 504–24.
- Diwan Sadhna, and Jonnalagadda Satya S.. 2002. "Social Integration and Health among Asian Indian Immigrants in the United States." *Journal of Gerontological Social Work* 36 (1–2): 45–62.
- Diwan Sadhna, Jonnalagadda Satya S., and Balaswamy Shantha. 2004. "Resources Predicting Positive and Negative Affect during the Experience of Stress: A Study of Older Asian Indian Immigrants in the United States." *The Gerontologist* 44 (5): 605–614. [PubMed: 15498836]
- Dougherty Kevin D., and Whitehead Andrew L.. 2011. "A Place to Belong: Small Group Involvement in Religious Congregations." *Sociology of Religion* 72 (1): 91–111.
- Ellison Christopher G., Burdette Amy M., and Hill Terrence D.. 2009. "Blessed Assurance: Religion, Anxiety, and Tranquility among US Adults." *Social Science Research* 38 (3): 656–667. [PubMed: 19856703]

- Ellison Christopher G., and Lee Jinwoo. 2010. "Spiritual Struggles and Psychological Distress: Is There a Dark Side of Religion?" *Social Indicators Research* 98 (3): 501–517.
- Ellison Christopher G., Zhang Wei, Krause Neal, and Marcum John P.. 2009. "Does Negative Interaction in the Church Increase Psychological Distress? Longitudinal Findings from the Presbyterian Panel Survey." *Sociology of Religion* 70 (4): 409–31. [PubMed: 20694051]
- Gilbert Paul, Gilbert Jean, and Sanghera Jasvinder. 2004. "A Focus Group Exploration of the Impact of Izzat, Shame, Subordination and Entrapment on Mental Health and Service Use in South Asian Women Living in Derby." *Mental Health, Religion & Culture* 7 (2): 109–130.
- Griffin Brandon J., Toussaint Loren L., Zoelzer Mitch, Worthington Everett L. Jr, Coleman Jennifer A., Lavelock Caroline R., McElroy Alec, Hook Joshua N., Wade Nathaniel G., and Sandage Steven J.. 2019. "Evaluating the Effectiveness of a Community-Based Forgiveness Campaign." *The Journal of Positive Psychology* 14 (3): 354–361.
- Hankey Alex, and Shetkar Rashmi. 2016. "Self-Transcending Meditation Is Good for Mental Health: Why This Should Be the Case." *International Review of Psychiatry* 28 (3): 236–240. [PubMed: 27329827]
- Hill Terrence D., and Cobb Ryon J.. 2011. "Religious Involvement and Religious Struggles." In *Toward a Sociological Theory of Religion and Health*, edited by Blasi Anthony, 239–60. Boston: Brill.
- Holt Cheryl L., Wang Min Qi, Clark Eddie M., Williams Beverly Rosa, and Schulz Emily. 2013. "Religious Involvement and Physical and Emotional Functioning among African Americans: The Mediating Role of Religious Support." *Psychology & Health* 28 (3): 267–283. [PubMed: 22928653]
- Idler Ellen L., and Benyamini Yael. 1997. "Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies." *Journal of Health and Social Behavior* 38 (1): 21–37. [PubMed: 9097506]
- Idler Ellen L., Boulifard David A., Labouvie Erich, Chen Yung Y., Krause Tyrone J., and Contrada Richard J.. 2009. "Looking inside the Black Box of 'Attendance at Services': New Measures for Exploring an Old Dimension in Religion and Health Research." *International Journal for the Psychology of Religion* 19 (1): 1–20.
- Jazaieri Hooria, Jinpa Geshe Thupten, McGonigal Kelly, Rosenberg Erika L., Finkelstein Joel, Simon-Thomas Emiliana, Cullen Margaret, Doty James R., Gross James J., and Goldin Philippe R.. 2013. "Enhancing Compassion: A Randomized Controlled Trial of a Compassion Cultivation Training Program." *Journal of Happiness Studies* 14 (4): 1113–1126.
- Kanaya Alka M., Kandula Namratha, Herrington David, Budoff Matthew J., Hulley Stephen, Vittinghoff Eric, and Liu Kiang. 2013. "Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study: Objectives, Methods, and Cohort Description." *Clinical Cardiology* 36 (12): 713–20. [PubMed: 24194499]
- Kandula Namratha R., Cooper Andrew J., Schneider John A., Fujimoto Kayo, Kanaya Alka M., Van Horn Linda, deKoning Lawrence, and Siddique Juned. 2018. "Personal Social Networks and Organizational Affiliation of South Asians in the United States." *BMC Public Health* 18 (1): 218. [PubMed: 29402246]
- Kent Blake Victor, and Henderson W. Matthew. 2017. "Attachment to God, Tenure, Race, and Participation in Congregational Life." *Review of Religious Research* 59 (3): 319–340.
- Koenig Harold G. 2014. "The Spiritual Care Team: Enabling the Practice of Whole Person Medicine." *Religions* 5 (4): 1161–1174.
- Koenig Harold G., King Dana E., and Carson Verna Benner. 2012. *Handbook of Religion and Health* (2nd Ed.). New York, NY, US: Oxford University Press.
- Krause Neal, and Bastida Elena. 2011. "Church-Based Social Relationships, Belonging, and Health among Older Mexican Americans." *Journal for the Scientific Study of Religion* 50 (2): 397–409. [PubMed: 21687808]
- Kurien Prema A. 2006. "Multiculturalism and 'American' Religion: The Case of Hindu Indian Americans." *Social Forces* 85 (2): 723–41.
- Kurien Prema A. 2007. *A Place at the Multicultural Table: The Development of an American Hinduism*. New Brunswick, N.J.: Rutgers University Press.

- Kurien Prema A. 2017. *Ethnic Church Meets Megachurch: Indian American Christianity in Motion*. New York, NY: NYU Press.
- Lavelock Caroline R., Worthington Everett L. Jr, Davis Don E., Griffin Brandon J., Reid Chelsea A., Hook Joshua N., and Van Tongeren Daryl R.. 2014. "The Quiet Virtue Speaks: An Intervention to Promote Humility." *Journal of Psychology and Theology* 42 (1): 99–110.
- Lavri Miran, and Flere Sergej. 2010. "Trait Anxiety and Measures of Religiosity in Four Cultural Settings." *Mental Health, Religion & Culture* 13 (7–8): 667–82.
- Lee Matthew T., Poloma Margaret M., and Post Stephen G.. 2013. *The Heart of Religion: Spiritual Empowerment, Benevolence, and the Experience of God's Love*. OUP USA.
- Leonard Karen. 1998. "Second Generation Sikhs in the US: Consensus and Differences." In *Sikh Identity*, edited by Singh Pashaura and Barrier N. Gerald. Ann Arbor, MI: University of Michigan.
- López Gustavo, Ruiz Neil G., and Patten Eileen. 2017. "Key Facts about Asian Americans." Washington, D.C.: Pew Research Center.
- Mann Gurinder Singh. 2000. "Sikhism in the United States of America." In *The South Asian Religious Diaspora in Britain, Canada, and the United States*, edited by Coward Harold, Hinnells John R., and Williams Raymond Brady. Albany, N.Y.: SUNY Press.
- Min Pyong Gap. 2010. *Preserving Ethnicity through Religion in America: Korean Protestants and Indian Hindus across Generations*. New York: NYU Press.
- Pechilis Karen, and Raj Selva J.. 2013. *South Asian Religions: Tradition and Today*. New York, NY: Routledge.
- Peteet John R., Al Zaben Faten, and Koenig Harold G.. 2019. "Integrating Spirituality into the Care of Older Adults." *International Psychogeriatrics* 31 (1): 31–38. [PubMed: 29986771]
- Ramakrishnan P, Rane A, Dias A, Bhat J, Shukla A, Lakshmi S, Ansari BK, Ramaswamy RS, Reddy RA, and Tribulato A. 2014. "Indian Health Care Professionals' Attitude towards Spiritual Healing and Its Role in Alleviating Stigma of Psychiatric Services." *Journal of Religion and Health* 53 (6): 1800–1814. [PubMed: 24430129]
- SAALT. 2019. "South Asian Americans Leading Together: Demographic Information." 2019. <https://saalt.org/south-asians-in-the-us/demographic-information/>.
- Schieman Scott. 1999. "Age and Anger." *Journal of Health and Social Behavior* 40 (3): 273–89. [PubMed: 10513148]
- Sciupac Elizabeth P. 2017. "U.S. Muslims Are Religiously Observant, but Open to Multiple Interpretations Os Islam." Washington, D.C.: Pew Research Center. <http://www.pewresearch.org/fact-tank/2017/08/28/u-s-muslims-are-religiously-observant-but-open-to-multiple-interpretations-of-islam/>.
- Spielberger Charles D. 1980. *Preliminary Manual for the State-Trait Anger Scale (STAS)*. Palo Alto, CA: Consulting Psychologists Press, Inc.
- Spielberger Charles D. 2013. *Anxiety: Current Trends in Theory and Research*. New York, NY: Academic Press.
- Sternthal Michelle J., Williams David R., Musick Marc A., and Buck Anna C.. 2010. "Depression, Anxiety, and Religious Life: A Search for Mediators." *Journal of Health and Social Behavior* 51 (3): 343–59. [PubMed: 20943594]
- Sternthal Michelle J. 2012. "Religious Practices, Beliefs, and Mental Health: Variations across Ethnicity." *Ethnicity & Health* 17 (1–2): 171–85. [PubMed: 22296590]
- Stroope Samuel, and Baker Joseph O.. 2018. "Whose Moral Community? Religiosity, Secularity, and Self-Rated Health across Communal Religious Contexts." *Journal of Health and Social Behavior* 59 (2): 185–99. [PubMed: 29385355]
- United States Census Bureau. 2010. "Population Groups Summary File 1." https://www.census.gov/newsroom/releases/archives/2010_census/press-kits/summary-file-1.html.
- VanderWeele Tyler J. 2017. "Religion and Health: A Synthesis." In *Spirituality and Religion Within the Culture of Medicine: From Evidence to Practice*, edited by Balboni Michael Dr and Peteet John Dr. New York, NY: Oxford University Press.
- Washington Olivia GM, and Moxley David P. 2001. "The Use of Prayer in Group Work with African American Women Recovering from Chemical Dependency." *Families in Society* 82 (1): 49–59.

Yang Fenggang, and Ebaugh Helen Rose. 2001. "Transformations in New Immigrant Religions and Their Global Implications." *American Sociological Review* 66 (2): 269–288.

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Table 1.

Descriptive statistics for study variables

Variable	Full Sample N=928			Congregation Members Only N=312		
	Mean/Prop	SD	Range	Mean/Prop	SD	Range
Self-rated health	3.57	.81	1-5	3.59	.81	1-5
Mental Health Inventory-3	11.37	2.32	1-15	11.41	2.43	1-15
Trait anxiety	15.85	4.24	10-36	16.23	4.38	10-36
Trait anger	15.86	3.69	10-37	16.16	4.18	10-37
Female	.47	-	0-1	.50	-	0-1
<i>Age</i>						
45-49	.09	-	0-1	.06	-	0-1
50-59	.39	-	0-1	.39	-	0-1
60-69	.33	-	0-1	.34	-	0-1
70-89	.20	-	0-1	.21	-	0-1
<i>Income</i>						
<\$75,000	.38	-	0-1	.49	-	0-1
\$75,000-\$149,999	.35	-	0-1	.32	-	0-1
\$150,000+	.27	-	0-1	.18	-	0-1
<i>Education</i>						
<Bachelor's	.12	-	0-1	.19	-	0-1
Bachelor's	.30	-	0-1	.34	-	0-1
Graduate	.58	-	0-1	.47	-	0-1
Full time employment	.57	-	0-1	.53	-	0-1
Own home	.89	-	0-1	.86	-	0-1
Married	.92	-	0-1	.90	-	0-1
% life lived in U.S.	49.07	18.76	1.63-100	46.92	20.14	5-100
Language at home	3.08	1.21	1-5	2.73	1.16	1-5
Depression/anxiety meds	.04	-	0-1	.05	-	0-1
<i>Alcohol consumption/week</i>						
None	.67	-	0-1	.79	-	0-1
1-2	.16	-	0-1	.13	-	0-1
3-5	.09	-	0-1	.04	-	0-1
6-9	.04	-	0-1	.01	-	0-1
10+	.03	-	0-1	.02	-	0-1
<i>Religious tradition</i>						
Hindu	.61	-	0-1	.57	-	0-1
Muslim	.08	-	0-1	.11	-	0-1
Jain	.05	-	0-1	.09	-	0-1
Sikh	.05	-	0-1	.07	-	0-1
Other religion	.04	-	0-1	.09	-	0-1
Multiple religions	.07	-	0-1	.06	-	0-1

Variable	Full Sample N=928			Congregation Members Only N=312		
	Mean/Prop	SD	Range	Mean/Prop	SD	Range
None	.09	-	0-1	-	-	-
<i>Group prayer</i>						
Once/day or more	.07	-	0-1	.14	-	0-1
>Once/week	.04	-	0-1	.09	-	0-1
Once/week	.11	-	0-1	.21	-	0-1
Several/month	.07	-	0-1	.09	-	0-1
Several/year	.29	-	0-1	.27	-	0-1
Never	.39	-	0-1	.18	-	0-1
<i>Religious attendance</i>						
Several/week	.06	-	0-1	.13	-	0-1
Once/week	.19	-	0-1	.37	-	0-1
2-3/month	.34	-	0-1	.41	-	0-1
Once/month	.35	-	0-1	.09	-	0-1
Rarely	.06	-	0-1	-	-	-
<i>Giving/receiving cong support</i>						
Very Often	-	-	-	.33	-	0-1
Fairly often	-	-	-	.36	-	0-1
Occasional/never	-	-	-	.31	-	0-1
Congregation neglect	-	-	-	.28	-	0-1
Congregation criticism	-	-	-	.39	-	0-1

Source: Mediators of Atherosclerosis in South Asians Living in America Study (MASALA)

Table 2.

OLS regression of self-rated health on religious group involvement

Variable	Full Sample (N=928)			Congregation Members Only (N=312)		
	% diff	(95% CI)	p	% diff	(95% CI)	p
<i>Religious tradition</i>						
Hindu (ref)						
Muslim	-2.63	(-8.51, 3.24)	.38	-5.41	(-14.62, 3.79)	.24
Jain	6.83	(.14, 13.53)	.04	-2.46	(-11.50, 6.58)	.59
Sikh	-0.39	(-6.38, 5.59)	.89	0.25	(-8.52, 9.02)	.95
Other religion	-1.51	(-10.02, 7.00)	.72	0.94	(-12.06, 13.93)	.86
Multiple religions	0.06	(-5.65, 5.77)	.98	0.88	(-7.13, 8.90)	.82
None ^a	1.57	(-4.03, 7.17)	.58	-	-	-
F-test			.54			.92
<i>Group prayer</i>						
Once/day or more (ref)	-	-	-	-	-	-
>Once/week	1.35	(-8.07, 10.76)	.77	2.61	(-7.96, 13.18)	.62
Once/week	-2.81	(-10.19, 4.57)	.45	-0.73	(-9.43, 7.97)	.86
Several/month	1.21	(-7.22, 9.63)	.75	6.66	(-4.24, 17.56)	.23
Several/year	-5.31	(-12.30, 1.68)	.13	-2.30	(-11.22, 6.62)	.61
Never	-6.43	(-13.70, .83)	.08	-5.59	(-15.72, 4.54)	.28
p-trend			.02			.25
<i>Religious attendance</i>						
Several/week (ref)	-	-	-	-	-	-
Once/week	0.40	(-6.86, 7.67)	.90	2.37	(-6.70, 11.44)	.60
2-3/month	0.20	(-6.61, 7.02)	.95	5.91	(-2.99, 14.82)	.19
Once/month	0.92	(-6.51, 8.35)	.80	8.54	(-3.89, 20.97)	.17
Rarely ^c	4.94	(-5.48, 15.36)	.35	-	-	-
p-trend			.60			.10
<i>Giving/receiving cong support</i>						
Very Often (ref)	-	-	-	-	-	-
Fairly often	-	-	-	-6.73	(-12.25, -1.21)	.01
Occasional/never	-	-	-	-10.72	(-17.08, -4.37)	.00
p-trend						.00
Congregation neglect	-	-	-	2.11	(-3.76, 7.97)	.47
Congregation criticism	-	-	-	-2.97	(-8.30, 2.36)	.27
R ²	.093			.178		

Notes: Models control for age, gender, income, education, full time employment, home ownership, marital status, percent of life in US, language spoken at home, depression and anxiety medication, and alcohol consumption.

^a After deletion of non-congregants, six remaining cases removed from sample

^b After deletion of non-congregants, one remaining case moved from "not at all" to "slightly"

^cAfter deletion of non-congregants, one remaining case moved from "rarely" to "once/month"

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Table 3.

OLS regression of Mental Health Inventory-3 on religious group involvement

Variable	Full Sample (N=928)			Congregation Members Only (N=312)		
	% diff	(95% CI)	p	% diff	(95% CI)	p
<i>Religious tradition</i>						
Hindu (ref)	-	-	-	-	-	-
Muslim	-3.90	(-9.19, 1.38)	.14	-2.38	(-9.71, 4.96)	.52
Jain	1.43	(-4.88, 7.73)	.65	-8.33	(-16.69, 0.03)	.05
Sikh	1.12	(-4.21, 6.46)	.68	2.94	(-4.18, 10.06)	.41
Other religion	-8.90	(-16.07, -1.72)	.01	-9.56	(-18.02, -1.10)	.02
Multiple religions	-1.63	(-6.07, 2.80)	.46	-4.77	(-13.87, 4.33)	.30
None ^a	-0.63	(-5.02, 3.77)	.77	-	-	-
F-test			.22			.09
<i>Group prayer</i>						
Once/day or more (ref)	-	-	-	-	-	-
>Once/week	-4.27	(-11.43, 2.90)	.24	-6.30	(-14.09, 1.49)	.11
Once/week	-6.19	(-12.01, -0.37)	.04	-6.22	(-12.75, 0.31)	.06
Several/month	-6.01	(-12.83, .82)	.08	-5.05	(-14.54, 4.43)	.29
Several/year	-8.39	(-13.73, -3.05)	.00	-8.49	(-14.97, -2.01)	.01
Never	-8.52	(-14.10, -2.94)	.00	-10.54	(-18.14, -2.94)	.01
p-trend			.00			.01
<i>Religious attendance</i>						
Several/week (ref)	-	-	-	-	-	-
Once/week	0.25	(-6.32, 6.82)	.94	2.36	(-5.24, 9.96)	.54
2-3/month	-1.43	(-7.97, 5.11)	.66	3.64	(-4.13, 11.41)	.35
Once/month	0.35	(-6.61, 7.31)	.92	7.71	(-2.91, 18.32)	.15
Rarely ^c	3.38	(-5.64, 12.40)	.46	-	-	-
p-trend			.47			.15
<i>Giving/receiving cong support</i>						
Very Often (ref)	-	-	-	-	-	-
Fairly often	-	-	-	-4.61	(-9.59, 0.36)	.06
Occasional/never	-	-	-	-7.64	(-13.25, -2.02)	.01
p-trend						.01
Congregation neglect	-	-	-	-2.42	(-7.41, 2.57)	.34
Congregation criticism	-	-	-	-3.77	(-8.51, 0.97)	.11
R ²	.117			.235		

Notes: Models control for age, gender, income, education, full time employment, home ownership, marital status, percent of life in US, language spoken at home, depression and anxiety medication, and alcohol consumption.

^a After deletion of non-congregants, six remaining cases removed from sample

^b After deletion of non-congregants, one remaining case moved from "not at all" to "slightly"

^cAfter deletion of non-congregants, one remaining case moved from "rarely" to "once/month"

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Table 4.

OLS regression of trait anxiety on religious group involvement

Variable	Full Sample (N=928)			Congregation Members Only (N=312)		
	% diff	(95% CI)	p	% diff	(95% CI)	p
<i>Religious tradition</i>						
Hindu (ref)	-	-	-	-	-	-
Muslim	-1.71	(-8.99, 5.57)	.64	-0.08	(-10.60, 10.45)	.98
Jain	-2.77	(-10.87, 5.33)	.50	3.20	(-8.19, 14.59)	.58
Sikh	-4.68	(-11.31, 1.95)	.16	-1.30	(-10.86, 8.25)	.78
Other religion	7.16	(-1.79, 16.10)	.11	2.02	(-9.27, 13.30)	.72
Multiple religions	1.02	(-6.10, 8.13)	.77	3.31	(-9.89, 16.50)	.62
None ^a	1.72	(-4.69, 8.12)	.59	-	-	-
F-test			.44			.98
<i>Group prayer</i>						
Once/day or more (ref)	-	-	-	-	-	-
>Once/week	8.98	(-2.38, 20.33)	.12	5.18	(-7.22, 17.58)	.41
Once/week	4.91	(-3.10, 12.92)	.23	-0.78	(-9.65, 8.10)	.86
Several/month	4.26	(-4.50, 13.01)	.34	8.92	(-2.25, 20.09)	.11
Several/year	9.14	(1.92, 16.36)	.01	3.37	(-6.25, 12.99)	.49
Never	8.11	(.37, 15.86)	.04	5.26	(-6.63, 17.15)	.38
p-trend			.07			.40
<i>Religious attendance</i>						
Several/week (ref)	-	-	-	-	-	-
Once/week	-1.10	(-8.97, 6.77)	.78	-2.78	(-11.97, 6.41)	.55
2-3/month	-3.13	(-10.63, 4.36)	.41	-9.13	(-18.42, .17)	.05
Once/month	-6.50	(-14.60, 1.60)	.11	-13.59	(-25.72, -1.46)	.02
Rarely ^c	-9.35	(-20.47, 1.78)	.09	-	-	-
p-trend			.02			.01
<i>Giving/receiving cong support</i>						
Very Often (ref)	-	-	-	-	-	-
Fairly often	-	-	-	6.48	(-.71, 13.66)	.07
Occasional/never	-	-	-	14.18	(5.86, 22.51)	.00
p-trend						.00
Congregation neglect ^d	-	-	-	4.82	(-2.65, 12.28)	.20
Congregation criticism	-	-	-	6.15	(-.40, 12.08)	.06
R ²	.110			.212		

Notes: Models control for age, gender, income, education, full time employment, home ownership, marital status, percent of life in US, language spoken at home, depression and anxiety medication, and alcohol consumption.

^aSix remaining cases removed from congregation-only sample

^bAfter deletion of non-congregants, one remaining case moved from "not at all" to "slightly"

^cAfter deletion of non-congregants, one remaining case moved from "rarely" to "once/month"

^dPositively significant ($p < .05$) when controlled for religious tradition and covariates only

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Table 5.

OLS regression of trait anger on religious group involvement

Variable	Full Sample (N=928)			Congregation Members Only (N=312)		
	% diff	(95% CI)	p	% diff	(95% CI)	p
<i>Religious tradition</i>						
Hindu (ref)	-	-	-	-	-	-
Muslim	1.59	(-5.20, 8.38)	.64	-0.54	(-10.15, 9.07)	.91
Jain	0.90	(-8.08, 9.87)	.84	9.14	(-3.84, 22.12)	.16
Sikh	-1.62	(-7.33, 4.09)	.57	-5.49	(-14.72, 3.73)	.24
Other religion	6.28	(-1.19, 13.75)	.09	9.83	(0.32, 19.33)	.04
Multiple religions	-1.49	(-6.60, 3.62)	.56	-5.82	(-14.68, 3.03)	.19
None ^a	-2.93	(-8.44, 2.59)	.29	-	-	-
F-test			.49			.10
<i>Group prayer</i>						
Once/day or more (ref)	-	-	-	-	-	-
>Once/week	12.40	(1.59, 23.21)	.02	15.57	(2.60, 28.54)	.02
Once/week	4.29	(-3.04, 11.62)	.25	3.16	(-5.92, 12.24)	.49
Several/month	3.26	(-5.01, 11.53)	.44	8.27	(-4.51, 21.05)	.20
Several/year	6.22	(-0.25, 12.70)	.06	7.33	(-2.27, 16.92)	.13
Never	4.36	(-2.49, 11.22)	.21	6.57	(-5.56, 18.71)	.28
p-trend			.70			.46
<i>Religious attendance</i>						
Several/week (ref)	-	-	-	-	-	-
Once/week	-1.17	(-8.53, 6.19)	.75	-3.12	(-12.14, 5.90)	.49
2-3/month	0.40	(-6.90, 7.70)	.91	-2.30	(-12.16, 7.56)	.64
Once/month	-4.28	(-12.03, 3.48)	.27	-13.96	(-25.99, -1.94)	.02
Rarely ^c	-4.94	(-15.59, 5.70)	.36	-	-	-
p-trend			.10			.14
<i>Giving/receiving cong support</i>						
Very Often (ref)	-	-	-	-	-	-
Fairly often	-	-	-	-3.73	(-10.82, 3.36)	.30
Occasional	-	-	-	6.16	(-2.21, 14.53)	.14
p-trend						.16
Congregation neglect	-	-	-	1.55	(-5.19, 8.28)	.65
Congregation criticism	-	-	-	9.06	(3.09, 15.02)	.00
R ²	.066			.178		

Notes: Models control for age, gender, income, education, full time employment, home ownership, marital status, percent of life in US, language spoken at home, depression and anxiety medication, and alcohol consumption.

^a After deletion of non-congregants, six remaining cases removed from sample

^b After deletion of non-congregants, one remaining case moved from "not at all" to "slightly"

^cAfter deletion of non-congregants, one remaining case moved from "rarely" to "once/month"

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