Religiosity and Major Depression in Adults at High Risk: A Ten-Year Prospective Study

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Abstract

Objective—Previously the authors found that personal importance of religion or spirituality was associated with a lower risk for major depression in a study of adults with and without a history of depression. Here the authors examine the association of personal importance of religion or spirituality with major depression in the adult offspring of the original sample using a 10-year prospective longitudinal design.

Method—Participants were 114 adult offspring of depressed and nondepressed parents, followed longitudinally. The analysis covers the period from the 10-year to the 20-year follow-up assessments. Diagnosis was assessed with the Schedule for Affective Disorders and Schizophrenia–Lifetime Version. Religiosity measures included personal importance of religion or spirituality, frequency of attendance at religious services, and denomination (all participants were Catholic or Protestant). In a logistic regression analysis, major depression at 20 years was used as the outcome measure and the three religiosity variables at 10 years as predictors.

Results—Offspring who reported at year 10 that religion or spirituality was highly important to them had about one-fourth the risk of experiencing major depression between years 10 and 20 compared with other participants. Religious attendance and denomination did not significantly predict this outcome. The effect was most pronounced among offspring at high risk for depression by virtue of having a depressed parent; in this group, those who reported a high importance of religion or spirituality had about one-tenth the risk of experiencing major depression between years 10 and 20 compared with those who did not. The protective effect was found primarily against recurrence rather than onset of depression.

Conclusions—A high self-report rating of the importance of religion or spirituality may have a protective effect against recurrence of depression, particularly in adults with a history of parental depression.

Previously we found that adult women at high or low risk for depression based on lifetime depression history who felt that religion or spirituality was highly important to them had less than one-tenth the risk of recurrence or incidence of major depressive disorder over the previous 10-year period compared to those who did not rate religion or spirituality as highly important (1). The study was cross-sectional, and depression was assessed retrospectively from data collected at several points over the previous 10 years. To date, the study stands as the sole published investigation of religion and depression that spans a 10-year period. Nonetheless, this finding is consistent with findings showing an inverse association between

religiosity and symptoms of depression (2–9) and a meta-analysis of 147 studies (N=98,975) showing a significant inverse association between religiosity and depression (10). Although most previous research has been cross-sectional in design, two prospective longitudinal studies with 1-year follow-up periods found a protective effect of religiosity against depression in the elderly (11, 12). That depressed patients may sense spiritual or religious roots, significance, and resolution to their suffering is suggested by patterns of treatment utilization; nearly a quarter of people who seek help in any given year for a mental health problem do so from a clergy member, according to the National Comorbidity Survey (13).

We had an opportunity to investigate the potential protective qualities of religiosity against major depression in a prospective design through an additional 10-year follow-up in which offspring of our original sample were interviewed in year 10 and year 20 (14). Overall, our initial findings showed that adult offspring of depressed as compared with nondepressed women were at high risk for lifetime major depression (14). Parental depression status determined high-risk status for offspring.

In the additional follow-up period, we now have measures of religiosity and major depression at two points in time: at 10 years and at 20 years. In this study, our aim was to determine whether religiosity has a protective effect against depression, especially in the high-risk offspring. We ask two questions here: Does religiosity protect against major depression over 10 years in adults? If so, does this effect pertain equally to adults at high and low risk for major depression, with risk status of the offspring based on parental depression status?

Method

The data for this replication study come from assessments at year 10 (T10) and year 20 (T20) of a multiwave three-generation longitudinal study of individuals at high and low risk for major depression (13). These analyses are restricted to the offspring because the original probands were not interviewed at T20 and the grandchildren were too young at the last follow-up to provide reliable information on religion.

A full description of the 20-year longitudinal study has been published elsewhere (14). In the original wave of the study, pro-bands with moderate to severe major depressive disorder were selected from outpatient clinics for the psychopharmacologic treatment of mood disorders. Nondepressed matched subjects were selected at the same time from an epidemiologic sample of adults with no psychiatric history from the same community. The original sample of probands was recruited from an urban setting in the Northeastern region of the United States—the greater New Haven, Conn., area—and were all Caucasian and working class or middle class.

Assessments were conducted by independent clinical interviewers who were blind to the clinical status of the previous generations and the subject's previous history. All waves of the study were approved by the institutional review boards at Yale University and at Columbia University and New York State Psychiatric Institute. After a complete description of the study was provided to participants, written informed consent was obtained from adults, and assent was obtained from minors, with written consent from their parents.

Study Participants

In keeping with the original study of religiosity (1), participants eligible for the present study had to be offspring who participated in the study at both T10 and T20, reported their religion consistently at both time points as either Catholic or Protestant, answered the religiosity items (see Assessments, below) at both time points, and were assessed for psychiatric

diagnoses at T20. Of the 226 biological offspring who were interviewed at T10, the present analysis excluded those who did not report being either Catholic or Protestant at T10 in order to be consistent with our previous study, in which we excluded participants of other denominations because there were too few to allow meaningful analyses by denomination (see Figure S1 in the data supplement that accompanies the online edition of this article). We thus excluded 33 participants who reported denominations other than Catholic or Protestant and 15 who reported no denomination at T10. Of the 178 participants who at T10 reported being either Catholic or Protestant, all responded at that time to questions on the importance of religion/spirituality and on frequency of attendance at religious or spiritual services. Thirty (16.9%) of these 178 individuals did not participate in the T20 assessment: 20 declined, six could not be located or scheduled, and four were deceased. In addition, 34 individuals who reported being Catholic or Protestant at T10 but changed or did not report a denomination at T20 were excluded, because we wished to study the stability of personal importance of religion/spirituality and frequency of attendance over time in the context of stable denomination.

Among the 178 Catholic or Protestant participants at T10, we compared the three component groups on demographic characteristics and responses to the T10 religiosity items: the final sample of 114 subjects, the 34 participants who were interviewed at T20 but were excluded based on their T20 denomination, and the 30 participants who were not interviewed at T20. The three groups did not differ significantly in sex, age, education, income, risk status (high or low) based on parental depression, or personal importance of religion/spirituality at T10. The groups differed significantly on lifetime major depression assessed at T10 (χ^2=7.4, df=2, p=0.02), with the highest rate among the T20 interviewees excluded based on T20 denomination (64.7%; 22/34), followed by the participants not interviewed at T20 (51.7%; 15/29) and the final sample (38.9%; 44/113). The groups also differed significantly on frequency of religious attendance at T10 (χ^2=7.8, df=2, p=0.02), with the highest rate among the T20 interviewees who were excluded because of T20 denomination (73.5%; 25/34), followed by the final sample (51.8%; 59/114) and the participants not interviewed at T20 (40.0%; 12/30).

Assessments

Diagnosis of major depression at all follow-up points was assessed with the Schedule for Affective Disorders and Schizophrenia–Lifetime Version for adults (15) and the related version for children ages 6–17 years when the offspring were children (16). A diagnosis of major depression at T10 was defined as an episode of major depression between year 1 and T10, and a diagnosis of major depression at T20 was defined as an episode of major depression between T10 and T20.

Religiosity at T10 and T20 was assessed by self-report on three items: 1) personal importance of religion/spirituality ("How important to you is religion or spirituality?" with response options ranging from 1 [not important at all] to 4 [highly important]); 2) frequency of attendance ("How often, if at all, do you attend church, synagogue, or other religious or spiritual services?" with five response choices ranging from "never" to "once a week or more"); and 3) current religious denomination ("How would you describe your current religious beliefs? Is there a particular denomination or religious organization that you are part of?" with 10 denominations specified, including an opportunity to specify others). These three areas of religion have historically been the most frequently used items in the literature on religion and health (4, 5). The single item on personal importance of religion/spirituality has been shown to have a correlation of 0.7 with the widely used Fetzer Institute full-scale measure of personal spirituality (17, 18). Both "religion" and "spirituality" were included in the question because these terms are often compounded in the health literature (3, 7, 19). Attendance was categorized as frequent if it occurred at least once a month, based

on the review by Larson and Larson (20) showing a protective effect against psychopathology with at least monthly attendance at religious services. Identical questions and classification in the analyses were used at T10 and T20 interviews. In this article, "personal importance of religion/spirituality" refers to question 1, "frequent attendance" refers to question 2, and "denomination" refers to question 3. When all three variables are considered together, they are referred to as "religiosity," which is a common term in the literature on religion (3, 11, 12).

Interviewers and Best-Estimate Procedures

The diagnostic assessments were administered by trained doctoral- and master's-level mental health professionals who were blind to the clinical status of the parents and to previous history information including religion variables. Training remained the same across waves, as described previously (13). Multiple sources of information were obtained, including direct and informant interviews and medical records when available, with final diagnoses for all generations based on the best-estimate procedure and blind to the participant's risk status.

Statistical Analysis

Initially, prospective analyses on religiosity as a potential protective factor against major depression were conducted using logistic regression analysis with T20 major depression (representing any major depression between T10 and T20) as the dichotomous outcome variable and each of the T10 religiosity variables as predictors (individually in univariate regression and then together in multivariate regression) to determine whether each of the religiosity variables individually predicted the occurrence of major depression between T10 and T20. Age and sex, as well as parental depression status, were included in all analyses to control for potential confounds. When cell size permitted, other demographic variables, such as income and education levels, were also controlled.

Next, for those religiosity variables assessed at T10 that were found to predict major depression between T10 and T20, we determined whether parental depression status (lifetime depression) moderated the effect of religiosity on subsequent occurrence of major depression. The data were stratified by parental depression status, and the logistic regression analysis was repeated. Logistic regression analyses were then performed to test for interaction of parental depression status and religiosity on major depression.

To investigate potentially protective effects of personal importance of religion/spirituality against recurrence versus onset of major depression, the data were stratified both by parental depression status and previous episode of depression. Based on the cell sizes in each of the four 2×2 contingency tables generated by this stratification, either chi-square tests or Fisher's exact tests were used to test for an association between personal importance of religion/spirituality and major depression in each of the four tables. The Breslow-Day test was used to formally test for homogeneity of the four odds ratios in order to determine whether the strength of the association between personal importance of religion/spirituality and major depression varied significantly across the four strata.

Results

Sample Characteristics

Table 1 summarizes the demographic and clinical variables and responses to the three religiosity items at T10 for the 114 participants whose data were included in the analysis. In the period between T10 and T20 (data not shown), there were increases in the lifetime rate of depression (T10=39%, T20=45%, p<0.001), the rate of reported high personal importance

of religion/spirituality (T10=26%, T20=42%, χ^2=17.79, p<0.001), and the rate of frequent attendance (T10=48%, T20=56%, χ^2=17.65, p<0.001). No other differences between T10 and T20 were found on any of the other variables.

High- and Low-Risk Groups

Chi-square tests conducted on difference in demographic characteristics and study variables between risk groups showed differences both at T10 and T20 in rates of major depression and in religiosity variables (data not shown).

The rate of lifetime major depression at T10 was twice as great in the high-risk group as the low-risk group (49% [35/72] compared with 24% [10/42]; χ^2=6.83, df=1, p<0.01). Similarly, the rate of major depression between T10 and T20 was twice as great in the high-risk group as in the low-risk group (29% [21/72] compared with 14% [6/42]; χ^2=3.25, df=1, p=0.07).

The rate of high personal importance of religion/spirituality at T10 was significantly lower in the high-risk group compared with the low-risk group (19% [14/72] compared with 36% [15/42]; χ^2=3.70, df=1, p=0.05). The rate of high personal importance of religion/ spirituality at T20 did not differ significantly between the two risk groups (41% [29/71] in the high-risk group and 45% [19/42] in the low-risk group).

The rate of attendance at religious services at T10 was significantly lower in the high-risk group compared with the low-risk group (38% [27/72] compared with 67% [28/42]; χ^2=9.04, df=1, p=0.003). The rate of attendance at T20 did not differ significantly between the two risk groups (56% [40/72] in the high-risk group and 57% [24/42] in the low-risk group).

Religiosity and Major Depression

Table 2 lists, for each of the three religiosity variables, the odds ratios for major depression at 10-year follow-up while controlling for age and sex of offspring in the full sample. Participants with high personal importance of religion/spirituality had about one-fourth the risk, compared with other participants, of having an episode of major depression between T10 and T20 (odds ratio=0.24, 95% CI=0.06–0.95). Frequent attendance at religious services at T10 was not significantly associated with the odds of major depression between T10 and T20, nor was religious denomination. Findings from the univariate and multivariate logistic regressions were of comparable magnitude and significance. The findings also remained stable when controlling for income, education, marital status, and parental clinical status.

Table 3 lists, for each of the three religiosity variables, the odds ratios for major depression at 10-year follow-up while controlling for age and sex of offspring by risk group. In the high-risk group, participants with high personal importance of religion/spirituality had about one-tenth the risk, compared with those who did not report a high personal importance of religion/spirituality, of having an episode of major depression between T10 and T20 (odds ratio=0.09; 95% CI=0.01–0.82). In the low-risk group, no significant association was found between personal importance of religion/spirituality and major depression between T10 and T20. A test of the interaction between risk group and personal importance of religion/ spirituality on major depression fell short of significance (χ^2=2.73, p=0.10).

Recurrence Versus Onset of Major Depression

With the data stratified both by previous episode of depression (yes or no) and by risk based on parental depression status (high or low risk), a significant association was observed

between high personal importance of religion/spirituality and depression between T10 and T20 in only one of the four strata. In the high-risk group with a previous episode of depression, 9% (1/11) of offspring who gave high ratings to personal importance of religion/spirituality had a recurrence of depression, whereas 50% (12/24) of those who did not give high ratings to personal importance of religion/spirituality had a recurrence of depression between T10 and T20 (Fisher's exact test, p=0.02). In each of the other three strata, there was no association between high personal importance of religion/spirituality and depression between T10 and T20. A formal test of homogeneity of odds ratios across the four strata found that the hypothesis of homogeneity could not be rejected, probably because of lack of statistical power. These findings suggest that the protective qualities of high personal importance of religion/spirituality against major depression may exist most strongly against recurrence of depression in the high-risk group.

Discussion

This 10-year follow-up study found a long-term protective effect of high personal importance of religion/spirituality against major depression. Participants with high personal importance of religion/spirituality had about one-fourth the risk, compared with the other study participants, of having an episode of depression over a 10-year prospective period. When investigated by risk group, the protective quality of personal importance of religion/spirituality was observed primarily in the adult offspring of depressed parents, a group at high risk for lifetime major depression as well as for longer and more severe episodes of depression (14). Among adult offspring at high risk, those with high personal importance of religion/spirituality had about one-tenth the risk, compared with others in the high-risk group, of having an episode of depression over the 10-year follow-up period.

The protective effect of personal importance of religion/spirituality against major depression in the high-risk group was found to exist primarily against recurrence rather than onset. This finding is consistent with data on the medically ill elderly (12) showing that high personal importance of religion/spirituality was particularly protective against recurrence, as compared with onset, of major depression through a prospective 1-year study.

The magnitude of the relative risk of major depression between those in the high-risk group who report high personal importance of religion/spirituality and those who do not (odds ratio=0.09) raises a speculative hypothesis: Perhaps depression and personal importance of religion/spirituality engage a common pathway. High personal importance of religion/spirituality might form an aggregate pattern of "kindling" (21) that protects against recurrence of depression. Future research on the protective effects of personal importance of religion/spirituality against recurrence of depression might use EEG or MRI to explore possible biological correlates of these findings (22). Patients more likely to recover from depression, for instance, show high-amplitude alpha activity (23), the same brain rhythm associated in other studies with ongoing practice of Qigong meditation (24). Newberg (25) recently reviewed a large body of research suggesting that spiritual practice may be associated with physiological and morphological changes in the brain, including increases in serotonin, another potential target for future research.

From the perspective of genetic epidemiology, both Kendler and colleagues (2) and Tsuang and colleagues (19) identified in adults a heritable contribution to personal spirituality as measured through the constructs of personal devotion (29% heritable, 24% familial environment, 47% unique environment) and spiritual well-being (37% heritable, 10% familial environment, 52% unique environment). Subsequently, Kendler and colleagues (26) found that a broad range of dimensions of personal religiosity are associated with a single common additive genetic factor, yet are phenotypically disparately associated with three

distinct factors of unique environment. Within the context of Kendler's findings, we postulate that depression is a phenotypic expression of the single common additive genetic factor of religiosity. This possibility gains support from research in developmental psychopathology showing, from early to late adolescence, an increase in the heritable contribution of personal religiosity (27) concomitant with an increase in the magnitude of the protective effect of personal religiosity against depression, specifically when timed with physical expressions of puberty (28).

Limitations

This is the first 10-year prospective study of the personal importance of religion/spirituality and major depression in a high-risk sample. There are limitations that qualify the findings. First, the single-item measure of personal importance of religion/spirituality, while widely used in health research (4), may seem to rely on face validity (26). Previous research, however, has shown this item to have a high correlation (0.7) with the widely used Fetzer Institute full-scale measure of personal spirituality (17, 18). Because the longitudinal high-risk design necessitates recruitment of offspring of depressed and nondepressed parents and assessment over 10 years, the sample size is smaller than can be generated through other study designs. Our sample was drawn from the greater New Haven area and hence is limited to the religious denominations that are highly represented in that community, namely, Catholics and Protestants. The sample is entirely Caucasian, and our findings cannot be assumed to generalize to other ethnic groups. Our findings may be understated for ethnic groups in which religion is more highly valued or overestimated for groups in which spirituality and religion already inform the normative culture.

Clinical Implications

The magnitude of the protective effect in the high-risk group suggests that personal importance of religion/spirituality may be clinically relevant in assessment and treatment and may be potentially constitutive of major depression. Spiritually integrated psychotherapy for depression, within a variety of approaches, has been described (29–31) and may be useful to some patients. Although attendance at religious services was not protective against recurrence of depression, individual engagement with clergy in times of difficulty for spiritual support and to gain understanding of suffering from a spiritual perspective may offer prevention against future episodes of depression. Treatment utilization patterns suggest that many individuals seek spiritual meaning or resolution of depression, as nearly a quarter of people in the United States who seek help for a mental disorder do so from a clergy member (14).

Acknowledgments

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TABLE 1

Demographic, Religiosity, and Clinical Characteristics of 114 Adult Offspring of Depressed and Nondepressed Parents at 10-Year Follow-Up in a 20-Year Study

Characteristic		
	Mean	**SD**
Age	29.3	5.5
	N	%
Female	70	61.4
Annual income ($)		
<20,000 (low)	46	42.6
20,000–39,000 (medium)	40	37.0
>40,000 (high)	22	20.4
Education level		
<High school	2	1.8
High school graduate	47	41.2
>High school	60	52.6
Other	5	4.4
Marital status		
Single	40	35.4
Married	59	52.2
Separated or divorced	14	12.4
Religiosity		
Personal importance of religion/spirituality		
High	29	25.4
Moderate	59	51.8
Slight	22	19.3
None	4	3.5
Frequent attendance at religious/spiritual services[a]	55	48.3
Religious denomination		
Protestant	17	14.9
Catholic	97	85.1
Clinical characteristics		
Risk group[b]		
High risk	72	63.2
Low risk	42	36.8
Major depression[c]		
Episode between year 1 and year 10	17	15.0
Lifetime episode (at year 10)	45	39.5

[a] Attends at least once a month.

[b] Based on whether either parent had lifetime major depression.

[c]Assessed with the Schedule for Affective Disorders and Schizophrenia–Lifetime Version.

TABLE 2

Odds Ratios of Major Depressive Disorder in 114 Adult Offspring of Depressed and Nondepressed Parents Between 10- and 20-Year Follow-Ups Associated With Religiosity Variables at Year 10

Religiosity Variable	Univariate Models[a]				Multivariate Model[b]			
	Odds Ratio	95% CI	Wald χ^2	p	Odds Ratio	95% CI	Wald χ^2	p
Religion/spirituality highly important	0.24	0.06–0.95	4.12	0.04	0.27	0.07–1.08	3.42	0.06
Frequent attendance at religious/spiritual services	0.59	0.23–1.53	1.20	0.27	0.77	0.29–2.07	0.27	0.60
Catholic (vs. Protestant)	1.34	0.37–4.82	0.20	0.66	0.83	0.22–3.04	0.08	0.77

[a]For each of the three univariate models, the outcome measure is major depressive disorder at year 20 (yes/no) and the primary predictor is the dichotomous religiosity variable at year 10. Sex, age, history of depression, and risk status (high or low, based on parental depression status) are controlled.

[b]For the multivariate model, the outcome measure is major depressive disorder at year 20 (yes/no) and the primary predictor is the dichotomous religiosity variable at year 10. Sex, age, history of depression, risk status (high or low), and each of the other two dichotomous religiosity variables are controlled.

TABLE 3

Odds Ratios of Major Depressive Disorder in 114 Adult Offspring of Depressed and Nondepressed Parents Between 10- and 20-Year Follow-Ups Associated With Religiosity Variables at Year 10, by Risk Group[a]

Risk Group and Religiosity Variable	Univariate Models[b]				Multivariate Models[c]			
	Odds Ratio	95% CI	Wald χ^2	p	Odds Ratio	95% CI	Wald χ^2	p
High-risk group (N=72)								
Religion/spirituality highly important	0.09	0.01–0.82	4.59	0.03	0.10	0.01–0.92	4.15	0.04
Frequent attendance at religious/spiritual services	0.49	0.16–1.55	1.47	0.23	0.62	0.18–2.09	0.60	0.44
Catholic (vs. Protestant)	1.37	0.32–5.88	0.17	0.68	0.96	0.20–4.64	0.00	0.96
Low-risk group (N=42)								
Religion/spirituality highly important	0.72	0.08–6.58	0.08	0.77	0.70	0.06–8.20	0.08	0.78
Frequent attendance at religious/spiritual services	0.99	0.13–7.80	0.00	0.99	0.91	0.07–12.01	0.01	0.94
Catholic (vs. Protestant)	1.59	0.10–24.58	0.11	0.74	1.82	0.07–46.01	0.13	0.72

[a] High or low risk is based on parental depression status.

[b] For each of the six univariate models, the outcome measure is major depressive disorder at year 20 (yes/no) and the primary predictor is the dichotomous religiosity variable at year 10. Sex, age, and history of depression are controlled in all models.

[c] For each of the two multivariate models, the outcome measure is major depressive disorder at year 20 (yes/no) and the primary predictor is the dichotomous religiosity variable at year 10. Sex, age, history of depression, and each of the other two dichotomous religiosity variables are controlled in both models.