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Religion and Suicide Risk: a systematic review

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Abstract

Although religion is reported to be protective against suicide, the empirical evidence is inconsistent. Research is complicated by the fact that there are many dimensions to religion (affiliation, participation, doctrine) and suicide (ideation, attempt, completion). We systematically reviewed the literature on religion and suicide over the last ten years (89 articles) with a goal of identifying what specific dimensions of religion are associated with specific aspects of suicide. We found that religious affiliation does not necessarily protect against suicidal ideation, but does protect against suicide attempts. Whether religious affiliation protects against suicide attempts may depend on the culture-specific implications of affiliating with a particular religion, since minority religious groups can feel socially isolated. After adjusting for social support measures, religious service attendance is not especially protective against suicidal ideation, but does protect against suicide attempts, and possibly protects against suicide. Future qualitative studies might further clarify these associations.

Keywords

Suicide; suicidal ideation; suicide attempt; religion; spirituality

INTRODUCTION

Although religion is reported to be protective against suicide, (Suicide Prevention Resource Center 2003; Koenig 2009; Perlman, Neufeld et al. 2011), the empirical evidence is inconsistent, with some studies reporting it to be protective (Dervic, Oquendo et al. 2004), others finding it a risk factor(Zhao, Yang et al. 2012), and still others reporting it unrelated to suicide risk (Le, Nguyen et al. 2012). The relationship between religion and suicide is complicated because both religion and suicide are complex constructs. Religion has many

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dimensions (affiliation, participation, doctrine) as does suicide (ideation, attempt, completion).

We conducted a systematic review of the literature with the goal of identifying what specific dimensions of religiosity are associated with specific aspects of suicide. We hypothesized that religious affiliation and frequent attendance at religious services would protect against suicide attempts, but not suicidal ideation, reflective of clinical experience wherein persons say, “I think about suicide, but would never do it because of my religion.” A second goal was to identify whether religion is ever associated with increased suicide risk, for instance if a person feels rejected by God or by the community.

METHOD

In October 2013 we searched Pubmed (all fields) using the terms “suicide AND religion” (n=387 articles), “deliberate self-harm AND religion” (n=1 article with original data and 2 review articles), “suicide AND spirituality” (n=15 additional articles), and “deliberate self-harm AND spirituality” (n=0 articles). Results were limited to English language articles published within the last 10 years.

We focused on articles that measured suicidal ideation (seriously thinking about attempting suicide), suicide attempt (non-fatal self-harm accompanied by any intent to die), and suicide (intentional self-harm resulting in death). No article was excluded owing to differences in terminology.

Religion and spirituality are concepts that elude strict definition. Nevertheless, they have been operationalized in a variety of ways, ranging from single-item measures (e.g. religious affiliation: yes/no (Dervic, Oquendo et al. 2004)) to more complex scales (e.g. 20-item Spiritual Wellbeing Scale (Ellison 1983)). For the purposes of this review, we included any characteristic that was described in the article as religious or spiritual. One article was excluded because the religious variable was “being possessed by spirits,” and three articles were excluded because they utilized religious characteristics of large populations, rather than individuals.

The final review included 89 articles. 316 articles were excluded for reasons described in Table 1. In this manuscript we focus primarily on religious affiliation and religious service attendance, since these were by far the most commonly used religious variables. The relationship between suicide risk and other religious variables is summarized in the supplementary materials.

RELIGIOUS AFFILIATION AND SUICIDAL BEHAVIOR

Religious affiliation and suicidal ideation

Two studies in the United States suggest persons with a religious affiliation have less suicidal ideation than unaffiliated persons. Dervic et al. interviewed 371 depressed inpatients in the United States, and found that unaffiliated persons had higher scores on the Scale of Suicidal Ideation (mean 16.0, n=61) compared to religiously affiliated persons (mean 12.9, n=305, bivariate p=0.04). (Dervic, Oquendo et al. 2004) Similarly, Spencer et al. interviewed

700 adults with advanced cancer in the United States, and found that suicidal ideation was more common among unaffiliated patients (10 of 34, 29.4%) than religiously affiliated persons (51 of 661, 7.7%).(Spencer, Ray et al. 2012) (Table 2)

However, religious affiliations do not all provide the same protection against suicidal ideation. In a large study of US Air Force personnel (n=52,780), rates of suicidal ideation were higher than average among non-Christian religions. (Snarr, Heyman et al. 2010) In Malaysia (n=20,552), suicidal ideation rates were higher among Hindus than Christians (Maniam, Chinna et al. 2013), and in Taiwan (n=4,000) rates of suicidal ideation were higher among Christians than Buddhists. (Fang, Lu et al. 2011) (Table 3)

These studies do not conclusively answer the question of whether religious affiliation is protective against suicidal ideation. Pooling all religious affiliations may mask important differences between specific affiliations. Each population studied is associated with some limited generalizability (e.g. advanced cancer patients, US Air Force personnel, Malaysian adults). The studies also do not account for whether a particular religious affiliation is a majority or minority group, an important variable given that those who are from minority groups may feel less supported and more isolated from mainstream culture. Many other studies have non-significant findings (c.f. Tables 1–2). Overall, the data do not support a simple conclusion that religious affiliation protects against suicidal ideation.

Religious affiliation and suicide attempts

Several studies have suggested religious affiliation protects against suicide attempts. In a US sample Dervic et al. (n=200 depressed bipolar patients) found that suicide attempts were more common among patients with no religious affiliation (total n=51, 80.4% had a suicide attempt) compared to affiliated patients (total n=641, 63.1% had a suicide attempt, bivariate p=.023). Moreover non-affiliated patients had more suicide attempts on average (2.3) than affiliated patients (1.6, bivariate p=.034). The relationship between religious affiliation and suicide attempt, however, was not significant after adjusting for Moral and Religious Objections to Suicide. (Dervic, Carballo et al. 2011) see also (Dervic, Oquendo et al. 2006) and (Dervic, Oquendo et al. 2004)

Similar results were found in Europe. Kralovec et al. surveyed Austrian lesbian, gay, or bisexual adults (n=219 had a religious affiliation, n=139 did not) along with heterosexual matched controls (n=215 had a religious affiliation, n=52 did not). Those with a religious affiliation reported fewer suicide attempts than those with no religious affiliation; both in the whole sample (6% versus 15%, OR 2.92, CI 1.65–5.18) and in the lesbian, gay, or bisexual group (11% versus 20%, OR 1.95, CI 1.07–3.58). (Kralovec, Fartacek et al. 2012) Carli et al. reviewed 2,631 suicide attempts in Europe and found that professing no religion increased the risk of having a serious suicide attempt (clear intentionality, high case-fatality method, or serious injury), as opposed to a non-serious suicide attempt (B=.331, p<.0001). (Carli, Mandelli et al. 2014)

Importantly, religious affiliation is not protective in all samples. Sisask et al. collected data from seven countries and found that in South Africa, suicide attempters were *more* likely than controls to report a religious affiliation (n=541 of 565 suicide attempters versus 414 of

497 controls). (Sisask, Varnik et al. 2010) The South African sample was unusual though, since it had much higher numbers in the “other religious affiliation” category (n=481 of 1062) than samples from other countries. This suggests the common religious affiliation categories did not successfully categorize large numbers of participants, creating the possibility that the result is driven by unmeasured characteristics (unmeasured religious affiliations for instance). The finding should be interpreted cautiously until more detailed data are available.

Another important dimension is whether a person’s religious affiliation is congruent with his or her local community. A Scottish longitudinal study (n=1,698 students, surveyed at ages 11, 15, and 19) found higher suicide attempt rates at Catholic schools compared to non-denominational schools, and determined this was because of higher rates among Non-Catholics attending Catholic school (14.5% attempted suicide) compared to Catholics attending Catholic school (5.8% attempted suicide, bivariate p=.016). (Young, Sweeting et al. 2011) Whether religious affiliation fosters a sense of belonging, or makes a person feel ostracized likely impacts suicide attempt risk.

Religious affiliation and suicide

The belief that suicide rates vary by religious affiliation dates back to Emil Durkheim, who observed in 1897 that Protestant states in Western Europe had higher suicide rates than Catholic states, a finding he attributed to Protestantism “being a less strongly integrated church than the Catholic church.” page 159 (Durkheim 1897/2010)

Some contemporary data on suicide exist from post-mortem record reviews and proxy interviews. In Switzerland, Spoerri et al. used census data (3.7 million adults) and death certificates (5,082 suicides), and found that crude suicide rates were highest among those with no religious affiliation (39.0 per 100,000, HR 1.37, CI 1.27–1.48), followed by Protestants (28.5 per 100,000; referent), and Catholics (19.7 per 100,000; HR 0.69, CI 0.65–0.74). Follow-up analysis accounting for age suggested that, compared to Protestants, the protective effect of Catholicism was stronger in older persons, and the hazard associated with being unaffiliated became stronger in older persons. (Spoerri, Zwahlen et al. 2010) The protective effect of Catholic or Protestant affiliation was also stronger if the person carried a cancer diagnosis, and weaker when a mental illness (any ICD-10 F code) was present. (Panczak, Spoerri et al. 2013) The findings raise questions about whether religious communities offer different support to persons suffering from cancer, than to persons suffering from mental illness; whether persons with mental illness have more difficulty integrating into religious community; or whether mental illness overwhelms the effects of protective factors.

Researchers in China found the opposite trend. When they compared 392 suicides with 416 controls, they found that suicides were *more* likely to have a religious affiliation (29.27%) than controls (16.99%, multivariable OR 2.906, CI 1.661–5.083). (Jia and Zhang 2012) see also (Zhang, Wieczorek et al. 2011) The authors suggest three possible explanations: religion in China has more emphasis on private worship which offers less social support to believers; Buddhist ideas about reincarnation may encourage suicide in some cases; and

Chinese religious believers are a minority group in (atheist) China, which puts them at numerical and political disadvantage, and creates strain with mainstream culture.

Comment

We did not find clear evidence that religious affiliation protects against suicidal ideation. However there is evidence that it protects against suicide attempt, and the severity of suicide attempts. Importantly, protective effects are not seen in every sample. Before assuming religious affiliation is protective, one must consider the culture-specific implications of affiliating with a particular religion. In some places the affiliation might connect the person with community resources, while elsewhere the affiliation could isolate the person.

The religious affiliation variable has inherent limitations, which may partially explain why suicide risk is not uniform across all affiliations and all studies (Table 3). Even within a single affiliation, beliefs and practices can vary widely. For instance, the Jewish community includes secular, Reform, Conservative, and Orthodox communities. Moreover individuals may not embrace all of their religion's teachings, yet remain affiliated with that religion (e.g. many Catholics use contraceptives). The variable also does not account for the social context in which a person professes a particular religious affiliation, and whether the local society or government is favorably disposed or hostile to that religious group. While religion seems to be related to suicide risk, simple affiliation variables may not capture the most important distinctions.

ATTENDANCE AT RELIGIOUS SERVICES AND SUICIDAL BEHAVIOR

Studies consistently report a protective relationship between religious service attendance and suicide risk (Table 3), but few of these studies adjusted for social support as a potential confounder. (Service attendance might create opportunities for social support, which might reduce suicide risk factors.) We focus here on those studies that adjusted for social support, to discern whether religious service attendance offers additional benefits.

Religious attendance and suicidal ideation

Perhaps the strongest evidence for religious service attendance protecting against suicidal ideation comes from a sample of 248 depressed older adults receiving psychiatric services in the United States. (Rushing, Corsentino et al. 2013) More frequent attendance at religious activities (measured with a 6-point scale ranging from never to more than once a week) was associated with decreased current suicidal ideation scores (standardized beta .201, t=2.709, p=.007), and this relationship remained significant when social support was added to the model (mediation analysis, Sobel test, z=2.068, SE 0.015, p=.039), indicating social support was a partial mediator, yet religious attendance still played an independent role. This study has the benefits of a straightforward design and the use of standardized scales, but is limited by its sample size and its single-location design.

Three other studies have ultimately found no association between attendance and suicidal ideation. In a Canadian survey (n=1,615 high school students), service attendance (dichotomized at never or a few times per year versus once a month or more) was protective only among females. Specifically, less frequent attendance was associated with more

suicidal ideation in the past year (OR 1.6, CI 1.0–2.5, p<.05) after adjusting for sociodemographic factors. However this relationship became non-significant when depression risk, substance use, and social support (measured as perceived trustworthiness of people at school) were added to the model (OR 1.3, CI .8–2.2). (Rasic, Kisely et al. 2011) The study is notable for its high response rate (92%) and a moderately large sample size, but includes just three high schools in the same region. Moreover, religious attendance among adolescents may reflect family norms rather than personal choice.

A United States study of young adults (n=454 undergraduate psychology students at one university) also found that attendance at services predicted less suicidal ideation (t(387)= −2.44, p=.02), but this association was not significant when social support was added to the model (mediational analysis, t(386)=.33, p=.74). (Robins and Fiske 2009) Importantly, the study did not calculate a response rate, so there is no way to know whether the sample is representative (rates of past-year suicidal ideation (35%) and past-year suicide attempt (10%) were high, suggesting selection bias).

The Canadian Community Health survey (n=36,984 adults) is the largest study we identified addressing this question. Religious service attendance (dichotomized at never versus once a year or more) decreased past-year suicidal ideation after adjusting for sociodemographic factors (OR .64, CI .53-.77), but not when adding social support to the model (OR .68, CI .45–1.03). (Rasic, Belik et al. 2009) The sample size adds credibility to the finding, but the dichotomized religion scale limits the information conveyed.

Overall, these studies show limited support for religious service attendance having a protective effect on suicidal ideation, beyond providing social support.

Religious attendance and suicide attempt

Several studies have found lower rates of suicide attempts among persons who attend religious services, after adjusting for social support. In the Canadian Community Health Survey (n=36,984 adults) past-year “suicidal acts” (self-reported suicide attempt or trying to take one’s own life) were least common among those who attended services weekly (referent), with greater odds among those who attended monthly (OR 2.10, CI 1.98–2.23), 3–4 times per year (OR 4.27, CI 3.97–4.60), once a year (OR 2.94, CI 2.75–3.14), or never (OR 1.18, CI 1.10–1.25). This was significant after adjusting for receiving higher levels of tangible social support (OR 1.16, CI 1.15–1.17, defined as material aid or behavioral assistance; other social support subscales were not significant in the final model). (Blackmore, Munce et al. 2008) The authors offer as a possible limitation that there was no measure of suicidal intent, so some reported attempts might have been better classified as non-suicidal self-injury.

Sisask, Varnik et al. (2010) analyzed international data from the WHO SUPRE-MISS study (n=2,819 suicide attempters; n= 5,484 controls; from Brazil, Estonia, India, Islamic Republic of Iran, South Africa, Sri Lanka, and Vietnam). The analysis did not adjust for social support directly, but did adjust for marital status and employment (as well as education, age, and gender). Religious service attendance was associated with lower suicide rates in Brazil (weekly OR .33, monthly OR .25, yearly OR .30), Estonia (monthly OR .23),

India (yearly OR .45), Islamic Republic of Iran (weekly OR .50, monthly OR .53, yearly OR .46), and Vietnam (yearly OR .28) compared with non-attenders (referent). Attendance was not significantly related to suicide attempts in South Africa or Sri Lanka. (Sisask, Varnik et al. 2010) A possible limitation of this study is that the controls were randomly selected, and it is unclear how closely they matched the cases.

Longitudinal data from the Baltimore Epidemiological Catchment Area study (n=1,015) suggested that more frequent service attendance at baseline (wave 1, 1981) was associated with lower odds of suicide attempt at follow up (wave 3, 1993–1996). This was significant (OR 0.43, CI 0.08–0.77) after adjusting for perceived quality of social support, size of social network, and other covariates. (Rasic, Robinson et al. 2011) Limitations of this study include being geographically limited to East Baltimore, and having considerable attrition between baseline assessment (n=3,481) and follow up.

We identified only one study where attendance was not associated with suicide attempts after adjusting for social support. In their survey of 454 undergraduate psychology students in the US, Robins and Fiske (2009) found that attendance at religious services was protective against suicide attempts (Wald = 4.78, df=1, p=.03), but not when social support was added to the model (Wald=1.18, df=1, p=.28). (Robins and Fiske 2009) Limitations (mentioned above) include no reported response rate, and a potentially non-representative sample.

These studies are fairly consistent in reporting that religious service attendance protects against suicide attempts after adjusting for social support.

Religious attendance and suicides

One study comes close to the issue of religious service attendance and suicides, using religious involvement as the variable (arguably a frequency measure, dichotomized as yes/no). When comparing suicides (n=86) and matched controls (n=86) in the United States, the absence of religious involvement was a risk factor for suicide (OR 3.08, CI 1.03–10.79) after adjusting for social interaction, employment, and affective disorder. The study is limited by not describing its religious variable in detail. (Duberstein, Conwell et al. 2004)

Comment

While religious service attendance is consistently associated with lower suicide risk, much of the effect can be attributed to social support rather than religion specifically. Studies that adjust for social support generally have not shown service attendance to be protective against suicidal ideation. However, multiple studies have shown that service attendance is protective against suicide attempt.

The studies face several obstacles: they rely on self-report and historical recall, sample sizes are often limited, they use different social support measures, and persons with the same service attendance frequency might differ in other important religious characteristics. Additionally, causality cannot necessarily be inferred: service attendance might help a person cope, or might be an indicator that the person is coping and functioning well enough to maintain a social routine. The studies also came primarily from countries with a

significant religious presence (mostly Christian), leaving unanswered questions about the role of service attendance in countries where religious participation is socially discouraged.

Nevertheless, these findings raise the possibility that religious service attenders manage their suicidal ideation differently than non-attenders, or that the type of support they receive from the religious community differs from secular social support. Neither possibility has been explored in detail.

Potential mechanisms for a protective effect—Religion might reduce suicide risk through shaping a person's beliefs. Persons who endorse "Moral and Religious Objections to Suicide" (I believe only God has the right to end a life; My religious beliefs forbid suicide; I am afraid of going to hell; and I consider suicide morally wrong) have been shown to have less suicidal ideation and fewer suicide attempts. (Dervic, Oquendo et al. 2004) (Lizardi, Dervic et al. 2008) (Dervic, Grunebaum et al. 2006) Some evidence suggests Moral and Religious Objections to Suicide are more important predictors of suicidal ideation (Dervic, Oquendo et al. 2004) and suicide attempt than religious affiliation (Dervic, Oquendo et al. 2004; Dervic, Oquendo et al. 2006; Lizardi, Dervic et al. 2008; Dervic, Carballo et al. 2011). Religious prohibitions and fear of divine punishment are prominent themes in qualitative studies from Ghana (Osafo, Hjelmeland et al. 2011) (Knizek, Akotia et al. 2010–2011), Korea (Jo, An et al. 2011), and Malaysia (Abdul Kadir and Bifulco 2010).

Qualitative studies suggest religion can also be a source of hope. (Osafo, Knizek et al. 2013) For some, this involves feeling reassured of divine control. Undergraduates in Ghana said, "People who want to commit suicide … should know with [God] all the things in this world are possible, and [God] provides their needs..." (Knizek, Akotia et al. 2010–2011) A United States veteran - who experienced suicidal thoughts - commented, "[God's] got something for me to do. And I'm going to find it..." (Brenner, Homaifar et al. 2009) Undergraduates in Ghana found hope in emphasizing submission to God and anticipating a divine reward for obedience: "People should be made aware of their existence on earth and who it is that has made them and that this world in which they are in, will one day come to an end. This life is not the end of everything. There is a better life somewhere therefore, they should take the ultimate way and put their full trust in God, the maker." (Knizek, Akotia et al. 2010–2011) For others, religion offered a meaningful way to interpret suffering; faithful perseverance (choosing not to commit suicide) could show selflessness, loyalty, and discipline. (Oliffe, Ogrodniczuk et al. 2012)

Qualitative literature has also identified prayer as an important tool for managing suicidal thoughts. (Osafo, Knizek et al. 2013) Undergraduates in Ghana reported, "Whatever problems we have, we can just go on our knees and pray, and it's going to be solved." (Osafo, Hjelmeland et al. 2011) However, this has not been observed so clearly in quantitative studies (see supplementary materials).

These data suggest a variety of ways that religious individuals might manage their suicidal thoughts, but do not suggest that religious persons will have fewer suicidal thoughts. This is consistent with our initial hypothesis that religion will protect against suicide attempts but not necessarily against suicidal ideation. The data are limited; they represent a small number

of studies which include non-clinical populations (Table 5), and many of the qualitative findings have not yet been studied quantitatively.

RELIGION AS A RISK-FACTOR FOR SUICIDE

An important yet under-studied area is why religion is sometimes associated with *increased* suicide risk. A few studies have identified patterns of "negative religious coping," which may include: deferring all responsibility to God, feeling abandoned by God, blaming God for difficulties, experiencing spiritual tension or doubt, or experiencing conflict and struggle with God. (Pargament, Smith et al. 1998) We found two studies in which negative religious coping increased suicide risk. One study involved Croatian war veterans (n=111 veterans with post-traumatic stress disorder; 39 controls), and the other study involved earthquake victims in Italy (n=426 victims and 522 controls). (Mihaljevic, Aukst-Margetic et al. 2012; Stratta, Capanna et al. 2012) Both studies are geographically limited, utilize a case-control design, and do not distinguish between suicidal ideation and attempts. Additionally, the focus on trauma victims might not represent attitudes from other populations. Nevertheless, the results suggest this is an important area for further study, and may suggest a special area of inquiry for trauma research.

There are other studies where high levels of religious activity are occasionally associated with *more* suicide risk. Prayer was a risk factor for suicidal ideation in a longitudinal study of adolescents in the United States (n=9,412); compared to those who pray once a week, those who never pray were at reduced risk of suicidal ideation (OR 0.34, CI 0.13–0.89). (Nkansah-Amankra, Diedhiou et al. 2012) Similarly, among Black-Caribbeans in the United States (n=1,621), respondents who said prayer is important during stressful situations were more likely to report suicidal ideation (OR 2.80, CI 1.38–5.71). (Taylor, Chatters et al. 2011) Reading religious material was also associated with suicidal ideation in a study of African-Americans in the United States (n=3,570, OR 1.24, CI 1.11–1.38). (Taylor, Chatters et al. 2011) In another analysis of African-American respondents (n=2,870) and Black-Caribbeans (n=1,256), more frequent interaction with members of one's religious community was associated with greater likelihood of a lifetime suicide attempt (OR 1.14, CI 1.02–1.27). (Chatters, Taylor et al. 2011) These studies should be interpreted cautiously, for they are scattered amidst numerous other studies showing religious activity to be protective, and could represent type 1 error. However they do raise the possibility of a subgroup of persons who increase their religious activity in response to distress. For this group, religious activity might be a marker for emotional distress, rather than a simple protective factor.

Qualitative studies shed further light on moments where religion can be a risk factor. Swiss patients with schizophrenia or depression mentioned: wishing to die and be with God, wishing to live another life after death, feeling angry with God, losing faith, losing meaning in life, breaking with their religious communities, or feeling unsupported by their religious communities. (Huguelet, Mohr et al. 2007) (Mohr, Brandt et al. 2006)

Conclusion

Our review of the literature yields several important conclusions. Many studies indicate religious affiliation is protective against suicide attempts and suicide, but not suicidal

ideation. Likewise attendance at religious services is protective against suicide attempt, but not suicidal ideation (after adjusting for social support). These studies suggest religion may inhibit a person from acting on suicidal ideas by: providing access to a supportive community, shaping a person's beliefs about suicide, providing a source of hope, providing ways to interpret suffering.

The literature also indicates that the relationship between religion and suicide risk is complex. Different religious affiliations provide different degrees of protection. Religious affiliation can connect a person to community, but adhering to a minority affiliation might also cause feelings of isolation. In countries or societies that oppose specific religions or religion-in-general, a person's religious beliefs and practices are less likely to protect against suicide. If religion leaves a person feeling guilty, distant from God, or abandoned by the religious community, that can increase suicide risk.

Existing studies have limitations. Religious variables often lack detail, which makes it difficult to identify the most active components of the relationship between religion and suicide risk. The religious variables considered here address very different aspects of religion (e.g. affiliation versus practices) which limit attempts to generalize conclusions to religion in general. The existing studies are thinly spread across many locations, cultures, age groups, and diagnostic groups; limiting efforts to draw general conclusions about the role of religion in general for specific groups (e.g. its role among adolescents, or among cancer patients). Most of the quantitative studies use a cross-sectional design, allowing researchers to identify correlations without necessarily identifying causal direction. Religious or spiritual practices may be especially difficult for persons who are hopeless, depressed, and suicidal; suggesting they could serve as markers of emotional well-being and social functioning rather than independent protective factors. Additionally, studies involving special populations (e.g. persons with physical or mental health diagnoses) may not be directly comparable to studies among the general population if those special populations have different experiences of religion or community involvement.

Moreover this systematic literature review has limitations. We used a single database, utilizing four sets of search terms, which may not have captured all relevant articles. The large number of articles reviewed here does not allow in-depth discussion of many important articles.

Many future research directions are possible. Existing studies address similar questions, and use similar measures, which might lend themselves to meta-analysis. Studies could also examine whether there are identifiable sub-populations that are especially helped by religion, and others for whom religion is unhelpful. Qualitative studies might ask participants about their religious involvement specifically during periods of suicidal ideation.

A particularly important area to address in future study involves the timing of suicide risk and religious characteristics. Both suicide risk and some religious characteristics (e.g. feeling close to God) can change over time, and researchers have yet to ask participants "In the moment when you were acutely suicidal, what was the role of religion?" Another

research area, also related to timing, would be to examine how the experience of physical or mental illness might shape a person's religious characteristics. It would also be valuable to understand how society's view of the individual's religious characteristics impacts suicide risk – since there are some communities where religious participation can increase a person's connection to society, and other communities where particular forms of religion can increase feelings of isolation.

Ideally, research findings on the role of religion could help generate educational interventions, so that clinicians can help religious patients access religious supports, and so that religious communities (and their leaders) can increase their awareness of what they are doing that is helpful and provide more of it.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

The table lists articles excluded from the current literature review on religion and suicide.

Pubmed was searched (October 2013). Search terms were: suicide AND religion, deliberate self-harm AND religion, suicide AND spirituality, deliberate self-harm AND spirituality. The search was limited to articles published within the last 10 years, and written in English. 405 articles were retrieved, 89 articles were reviewed, 316 articles were excluded for reasons described here.

No original data (136)	**Different topic (100)**	**Analytic limitations (77)**	**Other exclusions (3)**
Review article (68)	Assisted suicide / Euthanasia (70)	No religion variable (18)	Article not in English (1)
Essay (52)	Suicide terrorism (15)	Religion variable was “spirit possession” (1)	Incorrect citation (1)
Commentary (14)	Beliefs about suicide in general (9)	Did not measure suicidal ideation, attempt or suicide (18)	Outside 10-year frame (1)
Annotated bibliography (1)	Beliefs about people who self-harm (1)	Case report or series (16) *	
Not a formal study (1)	Rational suicide (2)	Did not compare suicide risk across religion (12) or spirituality (5) variables	
	Coping after a suicide (2)	Did not report results from comparing suicide risk by religion (1)	
	Talking with patients about suicide (1)	No statistical test for significance (1)	
		Did not use individual-level religion data (4)	
		Religion/spirituality variables were not sufficiently described for evaluation (1)	

* Case series described religious characteristics of the cases, but did not compare them with non-cases or with the general population.

Table 2:

Quantitative studies comparing suicide risk for affiliated versus unaffiliated persons

Author/Date	Location	Sample	Suicidal ideation	Suicide attempt
(Dervic, Oquendo et al. 2004)	USA	N=371 depressed inpatients	Increased if unaffiliated	Increased if unaffiliated
(Tran Thi Thanh, Tran et al. 2006)	Vietnam	N=2,260 persons	NS (Not Significant)	
(Zhang, Jia et al. 2006)	China	N= 74 suicide attempters, 92 accidentally injured emergency room patients		NS
(Huguelet, Mohr et al. 2007)	Switzerland	N=115 adults with schizophrenia N=30 non-psychotic inpatients with prior suicide attempt		NS
(Sisask, Varnik et al. 2010)	7 countries	N=2,819 suicide attempters, N=5,484 controls		Results varied by country[§]
(Kukoyi, Shuaib et al. 2010)	Jamaica	N=332 adolescents in school	NS	Increased if unaffiliated[*]
(Dervic, Carballo et al. 2011)	USA	N=200 inpatients with bipolar depression	NS	Increased if unaffiliated
(Young, Riordan et al. 2011)	Scotland	N=2,157 adolescents	NS	NS
(Kralovec, Fartacek et al. 2012)	Austria	N=358 lesbian, gay, or bisexual persons N=267 heterosexual matched controls	NS	Increased if unaffiliated
(Spencer, Ray et al. 2012)	USA	N=700 adults with advanced cancer	Increased if unaffiliated	
(Le, Nguyen et al. 2012)	Vietnam	N=11,117 persons		NS
(Carli, Mandelli et al. 2014)	Europe	N=2,631 nonfatal suicide attempts		Unaffiliated had more serious attempts
(Martiny, de Oliveira et al. 2011)	Brazil	N=69 hemodialysis patients	Affiliation decreased risk (only in the absence of major depression)[†]	
(Benute, Nomura et al. 2011)	Brazil	N=268 women with high-risk pregnancy	Increased if unaffiliated [†]	
(Shim and Park 2012)	Korea	N=400 cancer patients	Increased if unaffiliated[†]	
(Zhao, Yang et al. 2012)	China	N=1,177 undergraduates	Affiliation decreased suicide risk for those who believe in socialism. Affiliation increased suicide risk for those who do not believe in socialism.[†]	
(Stratta, Capanna et al. 2012)	Italy	N=426 earthquake victims, N=522 controls	NS[†]	

[*] Result was not significant in the final model adjusting for all covariates.

[†] Authors combined suicidal ideation and attempt

[§] Affiliation protected against suicide attempts in Estonia, but was a risk factor in South Africa. Affiliation was not significant in Brazil and Vietnam. In India, Sri Lanka, and Islamic Republic of Iran all respondents reported a religious denomination.

Additionally Zhang, Conwell et al. (2004) compared 66 completed suicides (psychological autopsy) with 66 matched controls and found no significant association between affiliation and suicide.

Table 3:

Quantitative studies addressing suicide risk by religious affiliation

Author/Date	Location	Sample	Suicidal Ideation	Suicide attempt	Completed Suicide
(Aghanwa 2004)	Fiji	N=128 adult suicide attempters		NS	
(Birkholz, Gibson et al. 2004)	United States	N=49 hospice patients	NS		
(Sidhartha and Jena 2006)	India	N=1,205 adolescents	Higher among Hindus versus other religions (combined Muslim, Christian, Jain, and Sikh)		
(Snarr, Heyman et al. 2010)	United States	52,780 Air Force personnel *	Higher among non-Christian religions. Reduced among Christians who are Evangelical Christian, female Roman Catholic, and male "other Protestant"	NS	
(Maniam, Chinna et al. 2013)	Malaysia	20,552 adults *	Higher for Hindus than Christians. Buddhists and Muslims did not differ significantly from Christians.		
(Fang, Lu et al. 2011)	Taiwan	4000 adults recruited from religious services *	Higher among Christians than Buddhists. Catholics and Taoists did not differ significantly from Christians. †	Higher among Christians than Buddhists. Catholics and Taoists did not differ significantly from Christians. †	
(Gal, Goldberger et al. 2012)	Israel	Interviews with 469 Muslims & 3997 Jews about ideation, records of 20,480 suicide attempts, records of 1,843 suicides	NS	Higher among Jews than Muslims	Higher risk among Jews than Muslims
(Kohler and Preston 2011)	Bulgaria	Census data and death records			Christians had higher risk than Muslims
(Chan, Maniam et al. 2011)	Malaysia	75 consecutive psychiatric inpatient admits for major depression		NS in multivariate logistic regression	
(Klein, Bischoff et al. 2010)	Switzerland	Death records from 1995–2007			Roman Catholics had lower suicide rate than Protestants
(Foo, Mohd Alwi et al. 2012)	Malaysia	139 undergraduates	NS		
(Cooper-Kazaz 2013)	Israel	49 suicide attempters, 389 non-attempters evaluated by CL psychiatry service		NS	

* The dataset did not include a group with no religious affiliation.

† The authors separated "Catholic" and "Christian" without explanation.

NB: In Uganda (100 cases of deliberate self-harm, 300 controls) there was no significant association between religious affiliation and deliberate self-harm. (Kinyanda, Hjelmeland et al. 2004)

Table 4:

Quantitative studies addressing associations between religious service attendance and suicide risk

Author/Date	Location	Sample	Suicidal ideation	Suicide attempt
(Nonnemaker, McNeely et al. 2003)	United States	16,306 adolescents	NS	NS
(Kaslow, Price et al. 2004)	United States	100 African-American suicide attempters; 100 controls		Less attendance increases risk
(Blackmore, Munce et al. 2008)	Canada	36,984 adults		Less attendance increases risk †
(Rasic, Belik et al. 2009)	Canada	36,984 adults	More attendance is protective *†	More attendance is protective †
(Robins and Fiske 2009)	United States	454 undergraduates	More attendance is protective *†	More attendance is protective *†
(Taliaferro, Rienzo et al. 2009)	United States	522 undergraduates	More attendance is protective *	
(Sisask, Varnik et al. 2010)	Brazil, Estonia, India, Islamic Republic of Iran, South Africa, Sri Lanka, Vietnam	2,819 suicide attempters; 5,484 controls		More attendance is protective (not significant for South Africa or Sri Lanka) †
(Rasic, Kisely et al. 2011)	Canada	1,615 high school students	Less attendance increases risk for females only *†	NS
(Langille, Asbridge et al. 2012)	Canada	1,597 high school students	More attendance is protective *†	NS
(Rasic, Robinson et al. 2011)	United States	1,091 adults	NS	More attendance is protective †
(Chatters, Taylor et al. 2011)	United States	2,870 African-Americans; 1,256 Black Caribbean-Americans	NS	NS
(Taylor, Chatters et al. 2011)	United States	3,570 African-Americans; 1,621 Black Caribbean-Americans	More attendance is protective for African-Americans; NS for Black Caribbean-Americans	More attendance is protective for African-Americans; frequent attendance increased risk among Black Caribbean-Americans
(Robinson, Bolton et al. 2012)	United States	2,178 Asians; 3,264 Hispanics; 5,825 African-Americans; 5,071 Whites	Less attendance increases risk for Hispanics and Whites	Less attendance increases risk for Hispanics
(Langille, Asbridge et al. 2012)	Canada	1,597 high school students	More attendance is protective *	NS
(Nkansah-Amankra, Diedhiou et al. 2012)	United States	9,412 adolescents	More attendance is protective †	NS
(Hoffman and Marsiglia 2012)	Mexico	702 high school students	More attendance is protective	
(Caribe, Nunez et al. 2012)	Brazil	110 attempters, 114 controls		More attendance is protective
(Rushing, Corsentino et al. 2013)	United States	248 depressed older adults receiving psych services	More attendance is protective †	NS
(Stroppa and Moreira-Almeida 2013)	Brazil	168 bipolar outpatients		NS

Author/Date	Location	Sample	Suicidal ideation	Suicide attempt
(Stratta, Capanna et al. 2012)	Italy	426 adults exposed to an earthquake, 522 controls	NS[≠]	

[*] Not significant after adjusting for covariates.

[†] The analysis adjusted for social support.

[≠] Authors combined suicidal ideation and attempt.

Table 5:

Qualitative studies addressing Religion and Suicide, published 2003–2013

Authors, Date	Country	Participants
(Mohr, Brandt et al. 2006)	Switzerland	118 adults with schizophrenia
(Huguelet, Mohr et al. 2007)	Switzerland	115 adults with schizophrenia, and 30 non-psychotic inpatients with prior suicide attempt
(Alexander, Haugland et al. 2009)	United States	198 adults with mental illness and a prior suicide attempt
(Brenner, Homaifar et al. 2009)	United States	13 veterans with traumatic brain injury and suicidal ideation/behavior
(Abdul Kadir and Bifulco 2010)	Malaysia	61 women with depression
(Knizek, Akotia et al. 2010–2011)	Ghana	196 psychology undergraduates
(Osafo, Hjelmeland et al. 2011)	Ghana	15 psychology undergraduates
(Yodchai, Dunning et al. 2011)	Thailand	5 adults receiving hemodialysis
(Jo, An et al. 2011)	Korea	134 undergraduates with suicidal ideation but no attempt
(Mason, Polischuk et al. 2011)	United States	15 Protestant clergy
(Oliffe, Ogrodniczuk et al. 2012)	Canada	38 men with depression
(Bullock, Nadeau et al. 2012)	Canada	15 adolescent suicide attempters
(Osafo, Knizek et al. 2013)	Ghana	27 adults in the community