

Sexual minority status, religiosity, and suicidal behaviors among college students in the United States

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INTRODUCTION

Suicide is a leading cause of death among young adults and college students (CDC, 2019), calling for preventive interventions informed by a comprehensive understanding of key risk and protective factors. A considerable literature has shown that aspects of religiosity are considered protective against a wide range of mental health problems (Rasic et al., 2011; Schieman et al., 2013) as well as suicidal behaviors (Caribé et al., 2012; Gearing & Alonzo, 2018). In theory, religion is protective against suicidal behaviors because of the objections to suicide found in religious teachings, in addition to the social support available in religious communities (Schieman et al., 2013).

The protective effects of religion, however, do not appear to extend evenly across the population. For example, sexual minorities are at high-risk for suicidal thoughts and behaviors (Plöderl & Tremblay, 2015), yet studies suggest that the effects of religion on mental and psychosocial outcomes are mixed for this group (Blosnich, De Luca, et al., 2020; Lefevor, Davis, et al., 2021; Lefevor et al., 2020; Lytle et al., 2015, 2018). Gibbs and Goldbach (Gibbs & Goldbach, 2015) compared sexual minority young adults (ages 18 to 24; N=2949) who were raised in religious environments to sexual minority young adults with nonreligious upbringings, and found that respondents that reported unresolved identity conflict between their sexual orientation and religious upbringing had higher prevalence of suicidal thoughts. Further, respondents whose identity conflicts specifically involved leaving their religion or being raised by caregivers with anti-gay religious beliefs had more than double the odds of attempting suicide within the prior year. In another study, Shearer and colleagues (Shearer et al., 2018) examined the moderating effects of same-sex attraction on the relationship between parent/adolescent religiosity and suicide ideation/attempts in a suicidal adolescent sample (N=129). The interaction was not significant for suicidal thoughts; however, high religiosity was associated with more attempts in youth reporting same-sex attraction and fewer attempts in those reporting opposite-sex attraction only. Kravolec and colleagues (Kralovec et al., 2014) examined the protective role of religion among lesbian, gay, and bisexual Austrians (N=358), and found that religion was associated with higher scores of internalized homophobia, but with fewer suicide attempts. These studies illustrate the complexity of religion as both a risk and protective factor against suicidal thoughts and behaviors among religiously affiliated sexual minorities.

Much of the research on this topic used data collected prior to major milestones for the LGBTQ community (e.g., before marriage equality and employment nondiscrimination; (Pierceson, 2014).

Moreover, younger people both increasingly accept LGBTQ individuals and are decreasingly religiously affiliated (Brauer, 2018; Fetner, 2016). Thus, analyses of more recent data can clarify whether these prior findings may still be occurring. However, there are few studies that have examined the interactive effects of religion and sexual minority status in predicting suicidal behaviors in large national samples of young adults. Because the literature is equivocal about the nature of the association of religion and suicidal phenomena among sexual minorities, we hypothesize that the interaction of sexual orientation and religion will be significantly associated with suicidal behaviors.

METHODS

Sample

We analyzed data from the Fall + Spring cohort of the 2020-2021 Healthy Minds Study (HMS), a repeated cross-sectional, non-probability, web-based survey examining health and wellness among undergraduate and graduate student populations in the United States. The first survey was administered at 37 universities (N=34,168) between September through December of 2020; and the second survey was administered at 103 universities (N=103,748) between January through June 2021. These data were pooled into a single cross-sectional dataset. At each university, a random sample of 8,000 students was invited by e-mail to participate, except at smaller universities (<8,000 students) where all students were invited to participate. The response rate was 14%, which is comparable to other response rates from online surveys using convenience samples and panels (Baker et al., 2013; Craig et al., 2013). We restricted the sample by age (18-29) to isolate emerging adults (18,013 observations excluded) and excluded individuals who were missing sexual orientation data (n=1,917). We used complete-case analysis (13,555 observations deleted listwise), resulting in a final analytic sample of 104,463. The HMS was approved by the Institutional Review Board Advarra, and the Institutional Review Boards at all participating campuses. The HMS data are available upon request at: <https://healthymindsnetwork.org/hms/>.

Suicidal behaviors (dependent variables). We examine suicide risk by using binary variables of the following three measures: ideation (“In the past year, did you ever seriously think about attempting suicide?”), plans (“In the past year, did you make a plan for attempting suicide?”), and attempts (“In the past year, did you attempt suicide?”). The questions about suicide plan and was only given if the respondent answered affirmatively to ideation, and the question about attempt was only given if the respondent answered affirmatively to having made a suicide plan.

Religiosity. Religiosity was measured using a single item: “How important is religion in your life?” Respondents could answer: Very important, important, neutral, unimportant, and very unimportant. This item was coded 1 (very important) through 5 (very unimportant), which higher values indicating lower importance of religion. Unfortunately, the HMS data do not include other measures of religiosity (e.g., frequency of service attendance), however important of religion is a commonly used item to operationalize religiosity (Archibald & Thorpe Jr, 2021; Homan & Hollenberger, 2021; Scott & Cnaan, 2020). This variable was reverse-coded for ease of interpretation.

Sexual minority status. Respondents were asked: “How would you describe your sexual orientation?” Respondents could answer: Heterosexual, Lesbian, Gay, Bisexual, Queer, or Questioning. This variable was dichotomized to reflect heterosexual vs. sexual minority (Lesbian, Gay, Bisexual, Queer, or Questioning).

Sociodemographic covariates. Respondents self-reported sociodemographic characteristics, including age (continuous), and race/ethnicity (White, Black, Latinx/Hispanic, Multiracial, Other). Respondents were asked “What is your gender identity?” with response options of male, female, trans male/trans man, trans female/trans woman, genderqueer/gender non-conforming, gender non-binary, and other. Gender identity was recoded as male, female, and transgender/non-binary.

Analysis

We calculated the prevalence of suicidal outcomes and importance of religion, stratifying by sexual minority status. We then used multivariable logistic regression to examine the associations between predictors (sexual minority status, importance of religion) and suicidal behaviors (suicidal ideation, plans, and attempts), adjusting for age (continuous), gender (man, woman, transgender/non-binary/other), and race/ethnicity (White, Black, Asian American/Pacific Islanders [AAPI], Latinx, Multiracial, Other). Hierarchically, we added interaction terms (sexual minority status x importance of religion), to test whether the association between importance of religion and suicidal behaviors was conditional on sexual minority status. Standard errors were clustered by college. All results were presented as odds ratios with 95% confidence intervals.

Survey weights. We used sample probability weights to adjust for non-response using administrative available data on full student populations at each institution. Using multivariable logistic regression,

response propensity was estimated based on gender identity, race/ethnicity, academic level, and grade point average. We then assigned response propensity weights to each student who completed the survey. Students who were less likely to have completed the survey were assigned a larger weight in the analysis. Sample weights gave equal aggregate weight to each school in the national estimates rather than assigning weights in proportion to school size, so that overall national estimates were not dominated by schools in our sample with large enrollment.

Sensitivity analyses. We examined the relations between importance of religion and suicidal behaviors while stratifying by sexual orientation and stratifying by the following religious affiliations: Agnostic, Atheist, Buddhist, Catholic, Protestant, Hindu, Jewish, Muslim, Mormon, and No Preference.

RESULTS

Descriptive statistics for the sample stratified by sexual minority status are presented in **TABLE 1**. Over the past year, approximately 14.1% of the sample reported suicidal ideation, 5.9% made a suicide plan, and 1.5% made a suicide attempt, with significantly larger proportions among sexual minority students than heterosexual students. In terms of religion (range: 1-5), the mean for the importance of religion was 3.2, with a significantly higher average among heterosexual students when compared with sexual minority students (3.4 vs. 2.5, respectively, $p < .05$).

TABLE 1.

Multivariable logistic regression models are presented in **TABLE 2**. In models showing main effects, compared to heterosexuals, sexual minority status was associated with 2.6 times greater odds of having past-year suicidal ideation, 2.8 times greater odds of making suicide plan, 2.9 times greater odds of making suicide attempts, after adjusting for importance of religion and sociodemographic characteristics. A one-unit increase in the importance of religion was associated with a 12% decrease in odds of having suicidal ideation, and 15% decreased odds of making a suicide plan, but was not associated with suicide attempts. The associations between the importance of religion and suicidal ideation, and between the importance of religion and suicide plan were conditional on sexual minority status, but this was not the case for the association between the importance of religion and suicide attempts. In stratified models, a one-unit increase in the importance of religion was significantly associated with 15% lower odds of having suicidal ideation among heterosexual students (aOR: 0.85;

95% CI: 0.83-0.88) and 6% lower odds of having suicidal ideation among sexual minority students (aOR: 0.94; 95% CI: 0.90-0.99). Further, a one-unit increase in the importance of religion was significantly associated with 14% lower odds of making a suicide plan among heterosexual students (aOR: 0.86; 95% CI: 0.82-0.91) but was not significantly associated with suicide plans among sexual minority students (aOR: 0.97; 95% CI: 0.91-1.02). The importance of religion was not significantly associated with making suicide plans among heterosexual students (aOR: 0.96; 95% CI: 0.87-1.06) or sexual minority students (aOR: 0.97; 95% CI: 0.86-1.09).

TABLE 2.

In a set of sensitivity analyses (TABLE 3), importance of religion was protective against suicidal ideation for heterosexual Catholic, Protestant, and Mormon students at a conventional level of statistical significance, but not for their respective sexual minority student counterparts. For suicide plans, importance of religion was protective among heterosexual Atheist, Protestant, and Mormon students, but not among sexual minority students within those same religions. The importance of religion was protective for Hindu sexual minority students. In terms of suicide attempts, importance of religion was only protective for heterosexual Mormon students.

DISCUSSION

Main findings

In this large national sample of college students, we found that (a) the importance of religion was associated with significantly lower odds of suicidal ideation and suicide plans over the past year, but not significantly associated with suicide attempts; (b) sexual minority status was associated with significantly greater odds of suicidal ideation, suicide plans, and suicide attempts; (c) importance of religion was more strongly protective against suicidal ideation and planning for heterosexual students than sexual minority students; and (d) the protective effects of importance of religion was further conditional on religious affiliation. This study contributes to the emerging body of literature by suggesting that religiosity tends to be protective against suicidal ideation and planning, but sexual minorities do not necessarily enjoy the same benefits of religiosity as their heterosexual counterparts, or at least not to the same degree, depending on the religious affiliation. Our study in some ways contradicts prior findings that showed that lesbian/gay students who viewed religion as very important had greater odds for recent suicidal ideation and lifetime suicide attempt compared with less religious lesbian/gay

students (Lytle et al., 2018). Yet our findings comport with other studies that show slightly protective effects for suicidal ideation (Kralovec et al., 2014), and ideation and attempt among heterosexual students (Lytle et al., 2018) and non-significant associations for suicide plans and attempts (Rosik et al., 2021).

Religiosity is generally associated with lower odds of psychiatric disorders (Schieman et al., 2013) and lower odds of substance use (Chitwood et al., 2008), which are risk factors for suicidal behaviors. Sexual minorities have significantly greater odds of having mental health problems and suicidal behaviors (Plöderl & Tremblay, 2015), yet research on the protective effects of religiosity within this population is still emerging. On one hand, aspects of religiosity can create significant distress due to religious doctrine disavowing same-sex attraction as sinful (Page et al., 2013), contributing to negative mental health outcomes for sexual minorities (Gibbs & Goldbach, 2015). Indeed, numerous studies describe the distress that can come with being sexual minority within a religious community (Newman et al., 2018), where individuals may be subjected to greater stressors (e.g., conversion therapy (Blosnich, Henderson, et al., 2020; Ryan et al., 2020), discrimination (Doyle & Molix, 2015; Page et al., 2013), bullying (Newman et al., 2018), and other traumas (Lefevor, Huffman, et al., 2021) while having fewer coping resources (e.g., access to queer support groups). This can result in feelings of thwarted belongingness (Chu et al., 2017), isolation and loneliness (Gorczyński & Fasoli, 2021), higher levels of distress, mood and anxiety problems, and substance use, which contribute to suicidal behaviors (Gvion & Levi-Belz, 2018; Page et al., 2013; Plöderl & Tremblay, 2015).

On the other hand, aspects of religion may also still be protective for sexual minorities in certain contexts (Kralovec et al., 2014). Toward this end, we found a small but significant protective effect of importance of religion against suicidal ideation. However, we did not find evidence to suggest importance of religion was significantly protective for plans or attempts for sexual minority students, aligned with studies that have shown that aspects of religion do not have improved or worsened health outcomes for depression and anxiety (Rosik et al., 2021). Along these lines, we did not find evidence to suggest that importance of religion was significantly related to greater or lower odds of suicide attempts, for either heterosexual or sexual minority students, contradicting findings from other contexts and populations (Caribé et al., 2012; Kralovec et al., 2014). While sensitivity analyses suffered from smaller samples, we found that importance of religion was protective among specific religious affiliations (ideation: Catholic, Protestant, Mormon; plan: Atheist, Protestant, Mormon; attempts:

Mormon), but largely statistically insignificant for other religious affiliations. Notably, the importance of religion was protective for Hindu sexual minority students, which stands in contrast to the overall patterns observed in the study. Thus, more nuanced research is needed to understand the complex aspects of religiosity among specific religious affiliations and sexual minorities within those religious communities.

Strengths and Limitations

Our study uses one of the largest college samples to examine the relations between religion, sexual minority status, and suicide outcomes, when compared to prior studies that used moderate to small samples. However, our findings should be interpreted with caution. First, all data were cross-sectional, which did not allow for causal inferences. It is unclear whether religion *reduces* suicidal behaviors per se, as we did not examine the temporal order of events. Second, the response rate was low, raising concerns of response bias. We attempted to account for this by using survey weights; however, the bias remains a concern. Along these lines, the sample consisted only of college students, which limits generalizability. Third, sexuality was captured and categorized using a single self-reported item, which we dichotomized into heterosexual vs. sexual minority. Other definitional approaches to operationalizing sexual orientation (i.e., attraction, sexual behavior) may produce different results. Fourth, religiosity is a multi-dimensional construct, and we only examined importance of religion without examining other dimensions, such as service attendance (Schieman et al., 2013). While importance of religion may not have been related to attempts, church attendance and other social aspects of religion could be significantly related. Other key factors might include internalized homonegativity and the extent to which one resolves the conflict between sexual and religious identities (Lefevor, McGraw, et al., 2021). Fifth, it is possible that individuals with the highest levels of depression and lowest levels of functioning may have been less likely to complete this survey, leading to sampling bias. Finally, the respondents were located throughout the country within different communities that espouse varying attitudes towards sexual orientation. Future studies should account for these contexts and assess the level of discrimination that people experience. Despite these limitations, our study was among the first to examine this topic among a large sample of students drawn from across multiple colleges in the United States.

Conclusion

Preventive interventions and screenings may include measures of religiosity (including importance of religion, religious affiliation) as part of a comprehensive risk assessment. As faith-based organizations continue to play a role in suicide prevention (General (US & Prevention (US, 2012), it is important to recognize that their efforts require additional awareness and consideration when interfacing with sexual minorities, who are a high-risk population. Interventions to reduce suicidal behaviors among sexual minorities may seek to discuss religious beliefs through an intersectional lens to accommodate both religion and sexuality.

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TABLES

Table 1: Descriptive statistics (N=104,463)				
Variables	N (weighted %) Heterosexual (n=78480)	N (weighted %) Sexual minority (n=25993)	N (weighted %) Total (N=104,463)	P-value
Suicidal ideation (12-months)				
Yes	7326 (10.25)	6569 (26.57)	13897 (14.11)	<0.001
Suicide plan (12-months)				
Yes	2677 (3.93)	2857 (12.22)	5534 (5.89)	<0.001
Suicide attempts (12-months)				
Yes	604 (0.97)	665 (3.06)	1269 (1.46)	<0.001
Importance of religion (1-5)	3.39 (3.31-3.47)	2.51 (2.46-2.56)	3.18 (3.10-3.26)	<0.001
Gender				<0.001
Man	24309 (44.12)	4422 (24.99)	28734 (39.59)	
Woman	53940 (55.57)	18160 (61.78)	72,100 (57.04)	
Trans/non-binary/queer/other	177 (0.25)	3367 (13.07)	3545 (3.28)	
Missing/ unknown	54 (0.06)	40 (0.16)	94 (0.09)	
Race/ Ethnicity				<0.001
White	47516 (59.93)	16330 (61.45)	(60.29)	
Asian Pacific Islander	10280 (9.95)	2269 (7.47)	(9.36)	
Black	6921 (11.50)	2027 (9.52)	8948 (11.03)	
Latinx/Hispanic	5371 (8.07)	1744 (7.56)	7115 (7.95)	
Multiracial	6680 (8.60)	3251 (12.74)	9931 (9.58)	
Other	1418 (1.55)	270 (0.92)	1688 (1.40)	
Missing/unknown	293 (0.40)	75 (0.34)	368 (0.39)	
Age (18-29), mean	21.23 (21.06-21.39)	20.87 (20.82-21.11)	21.17 (21.01-21.32)	
Survey Timing				
Fall 2020 (vs. Spring 2021)	20393 (26.98)	5669 (23.54)	(26.17)	0.089
P-values by t-test for continuous variables and Chi2 test for binary/categorical variables				

Table 2. Multivariable logistic regression models showing associations between sexual minority status and suicidal thoughts and behaviors, conditional on sexual minority status, Healthy Minds Study 2020-2021 (N=104,463)

	Thoughts		Plans		Attempts	
	Main	Interactive	Main	Interactive	Main	Interactive
Sexual minority						
Yes	2.58 (2.39-2.78)	1.96(1.67-2.29)	2.82(2.57-3.11)	2.12(1.70-2.64)	2.86(2.39-3.44)	2.80(1.75-4.51)
No	1.00	1.00	1.00	1.00	1.00	1.00
Importance of religion						
0-5	0.88 (0.86-0.91)	0.85(0.83-0.88)	0.91(0.87-0.94)	0.87(0.83-0.91)	0.99(0.93-1.06)	0.99(0.91-1.08)
Sexual minority status x Importance of religion						
Interaction		1.11(1.05-1.16)		1.11(1.04-1.19)		0.99(0.85-1.14)
Adjusted for age, gender, race/ethnicity, and survey cohort						
Survey weights adjusted for non-response						
P<0.05 indicated in bold						

Table S1. Multivariable logistic regression models showing associations between sexual minority status and suicidal behaviors among college students aged 18-29, stratified by sexual minority status and religious affiliation, Healthy Minds Study 2020-2021 (N=104,463)

	Thoughts		Plans		Attempts	
	Heterosexual	Sexual Minority	Heterosexual	Sexual Minority	Heterosexual	Sexual Minority
Agnostic						
Importance of religion	1.00 [0.89, 1.12]	1.03 [0.95, 1.12]	1.01 [0.84, 1.21]	1.05 [0.95, 1.18]	0.81 [0.57, 1.17]	1.01 [0.81, 1.27]
N	8731	7202	8722	7181	8720	7163
Atheist						
Importance of religion	0.91 [0.78, 1.06]	1.07 [0.93, 1.23]	0.76 [0.59, 0.98]	1.06 [0.86, 1.30]	1.08 [0.69, 1.70]	1.01 [0.62, 1.65]
N			6002	4795	5936	4787
Buddhist						
Importance of religion	0.89 [0.70, 1.13]	1.17 [0.93, 1.47]	1.07 [0.71, 1.62]	1.01 [0.69, 1.48]	1.38 [0.69, 2.75]	1.48 [0.93, 2.34]
N	6030	4806	1542	761	1488	754
Christian - Catholic						
Importance of religion	0.92 [0.84, 0.99]	1.01 [0.90, 1.14]	0.89 [0.77, 1.02]	0.88 [0.76, 1.02]	1.11 [0.87, 1.43]	1.07 [0.78, 1.48]
N	1552	766	21072	3722	21021	3702
Christian - Protestant						
Importance of religion	0.82 [0.75, 0.89]	1.01 [0.87, 1.18]	0.86 [0.76, 0.98]	1.04 [0.84, 1.29]	1.02 [0.82, 1.27]	0.95 [0.70, 1.29]
N	21121	3726	20,184	3310	20179	3309
Hindu						
Importance of religion	1.20 [0.81, 1.76]	0.75 [0.51, 1.10]	0.93 [0.57, 1.51]	0.46 [0.31, 0.69]	2.96 [0.58, 15.03]	0.71 [0.43, 1.20]
N	20194	3319	1641	266	1606	190
Jewish						
Importance of religion	0.82 [0.62, 1.09]	0.89 [0.73, 1.07]	0.93 [0.62, 1.40]	0.91 [0.72, 1.14]	2.19 [0.80, 5.94]	1.32 [0.93, 1.89]
N	1648	264	1989	915	1966	892
Muslim						
Importance of religion	0.81 [0.63, 1.05]	0.84 [0.53, 1.33]	1.14 [0.83, 1.57]	1.33 [0.86, 2.06]	1.46 [0.76, 2.79]	0.64 [0.32, 1.29]
N	2047	927	2141	299	1943	271
Mormon						
Importance of religion (1-5)	0.61 [0.49, 0.77]	1.12 [0.69, 1.81]	0.64 [0.52, 0.78]	1.05 [0.60, 1.82]	0.51 [0.41, 0.65]	1.00 [0.46, 2.19]
N	2157	302	2182	241	2182	186
No preference						

Importance of religion (1-5)	0.98 [0.88, 1.08]	0.93 [0.82, 1.04]	0.88 [0.75, 1.03]	1.02 [0.89, 1.17]	0.95 [0.66, 1.38]	0.84 [0.62, 1.13]
N	2192	241	9933	4657	9859	4647
<p>Adjusted for age, gender, race/ethnicity, and survey cohort</p> <p>Survey weights adjusted for non-response</p> <p>P<0.05 indicated in bold</p> <p>Importance of religion is an ordinal continuous measure (1-5)</p> <p>Religious affiliation reflects self-identified non-mutually exclusive affiliation</p>						