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Associations of religiosity, attitudes towards suicide and religious coping with suicidal ideation and suicide attempts in 11 muslim countries☆

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ABSTRACT

Objective: The study investigated the associations of religiosity, religious coping and suicide acceptance to suicide ideation and attempts in 7427 young adults affiliating with Islam from 11 Muslim countries.
Method: A self-administered questionnaire was used to collect the data. We used F and $\chi 2$ tests and correlation analyses to report descriptive statistics. Multi-group path models with (i) a zero-inflated Poisson distribution and, (ii) a Binomial distribution were used to model the number of occurrences of suicidal ideation, and occurrence of a suicide attempt, respectively.
Results: Religiosity was negatively associated with acceptability of suicide, but it was positively related to punishment after death across the 11 countries. Religiosity was negatively associated with ever experiencing suicidal ideation, both directly and indirectly through its association with attitudes towards suicide, especially the belief in acceptability of suicide. Neither positive nor negative religious coping were related to suicidal ideation. However, religiosity was negatively related to suicide attempts among those who experienced suicidal ideation at least once. This association was mediated through the belief in acceptability of suicide and religious coping. Negative religious coping was positively associated with suicide attempts probably because it weakened the protective effects of religiosity.
Conclusions: Findings from this study suggest that the effects of religiosity in the suicidal process operate through attitudes towards suicide. We therefore conclude that clinical assessment as well as research in suicidology may benefit from paying due attention to attitudes towards suicide.

☆ **Author note:** Except the first and the second authors, the first twelve authors are by random order and the last seven authors are by alphabetical (first name) order.

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1. Introduction

Suicidal behaviors that include contemplating, planning, attempting, and ending one's own life constitute a serious public health concern. According to the World Health Organization (WHO), someone dies by suicide every 40 seconds totaling more than 800,000 people per annum, and many more attempt suicide (World Health Organization, 2014). Besides emotional distress of the close ones, suicidal behaviors put a heavy financial burden on national health care systems (Shepard et al., 2016). Religiosity is seen as a protective factor against suicide, partly because of the prohibition of suicide by major world religions, and partly because of the positive effects of religious coping on mental health. Religion plays a significant role in the lives of people in Muslim nations. According to WHO, 78% of all suicides occur in nations with low to middle income and an overwhelming majority of Muslim countries lie within this income bracket (World Health Organisation, 2014). Thus, in this study, we focus on the link between religiosity and suicidal ideation and suicide attempts in 11 Muslim countries.

There are three major theoretical approaches that account for the link between religiosity and suicide. The social integration theory (Durkheim, 1951) and the network theory (Pescosolido, 1990) posit that religion has a protective function because it promotes communal ties and social integration. Recent research, however, suggested a nuanced association of social integration and suicide, such that too little as well as too much social integration might be associated with high risk of suicide (Peng et al., 2019). The commitment theory (Stark et al., 1983), on the other hand, posits that religious core beliefs opposing self-killing deter people from considering it during difficult times. Consistent with these theories, studies documented lower rates of suicidal behavior (Cook, 2014; Dervic et al., 2004; Gearing and Alonzo, 2018; Stack and Laubepin, 2019; Wu et al., 2015) and better mental health in people and groups with a religious conviction (Abu-Raiya et al., 2016; Zou et al., 2014) compared to others. Further, people with a religious affiliation viewed suicide as unacceptable (Stack and Kposowa, 2011).

A fourth possible process linking religiosity with suicide may operate through coping styles. Some individuals who are exposed to adversity may turn to their faith to search for meaning, comfort, purpose and personal control but some others may attribute the adversity to their faith system and hence react by questioning and/or rejecting previously held religious beliefs (Abu-Raiya et al., 2016; Pargament et al., 1998). Extant research generally documents beneficial effects of positive religious coping and harmful effects of negative religious coping during stressful life-events (Ano and Vasconcelles, 2005; Kopacz et al., 2018; O'Brien et al., 2019; Pargament et al., 1990; Winter et al., 2009). Negative but not positive religious coping was found to be uniquely related to suicide risk when controlled for demographic risk factors, war-zone experiences, depression, and PTSD among U.S. Iraq and Afghanistan veterans (Currier et al., 2017). A recent longitudinal study provided strong evidence that spiritual struggles such as questioning God's existence or God's love was predictive of suicidal attempts (Currier et al., 2018). Further, negative but not positive religious coping moderated the association between stress and depression (Ahles et al., 2016) and it mediated the association of stress with psychological distress (McCleary-Gaddy and Miller, 2018). Much research on this topic was conducted with war veterans and in countries with Christian faith. However, other research suggested that positive religious coping was a protective factor for suicidal ideation and attempt (Carroll et al., 2019; Currier et al., 2017). In addition, there was evidence that positive religious coping buffered the deleterious effects of negative life-events on mental health (Bjorck and Thurman, 2007).

The findings from the studies of the association of religiosity with suicide were inconclusive. While some studies demonstrated a clear protective effect, others found the opposite. For instance, in a meta-analytic study with nonclinical samples by Lawrence and colleagues, religious affiliation was protective against suicide attempts but not against suicidal ideation (Lawrence et al., 2016b). Another study with depressed patients found higher rates of suicide attempts in patients with religious affiliation than those who reported no religious affiliation (Lawrence et al., 2016a). This study also found higher rates of suicidal ideation in patients who attributed importance to religion than others.

Recent research suggested that the association of religiosity with suicide might be complex, and that it might depend on the characteristics of the religious belief and on the characteristics of the individuals. For example, one study (Lester and Walker, 2017) found religiosity to be protective against suicidal ideation, but only in women and only in non-minority college students. It was also suggested that intrinsic but not extrinsic religiosity was protective against suicidal behavior (Hovey et al., 2014; Lester and Walker, 2017). The current study builds on this line of research by investigating the nuanced association of individual-level religiosity with suicidal ideation and attempt. To this aim, we investigate the roles of knowledge of Islamic prohibition of suicide, secular and religious attitudes towards suicide, and positive and negative religious coping in Muslim countries.

The officially reported incidence of suicide mortality in Muslim countries is lower than in non-Muslim countries (Brunstein Klomek et al., 2016; Coskun et al., 2012; Gal et al., 2012). This has often been attributed to the strong condemnation of suicide by Islam. Other studies suggested that suicide mortality rates in these countries were on the rise (Khan and Ali Hyder, 2006). Despite low rates of suicide mortality, people from Muslim countries report as much or higher incidences of suicidal ideation and suicide attempts compared to other countries (Eskin, 2004, 1995; Eskin et al., 2019a, 2019b, 2016b; 2014, 2011; Ghafarian Shirazi et al., 2012). These paradoxical findings raise concerns regarding the validity of suicide statistics in Muslim countries. Indeed, research showed that most suicides were recorded as "other violent deaths" in Arab countries (Pritchard and Amanullah, 2007). A recent study with a multinational and multi-religious sample of university students showed that suicide attempts were more frequent in participants who had an affiliation with Islam compared to those affiliated with other religions (Eskin et al., 2019a, 2019b).

Regardless of probable validity issues, comparisons of national suicide statistics of Muslim versus non-Muslim countries could be problematic because of confounding characteristics of the countries such as their geography, wealth, and political systems. For example, 78% of global suicides occur in low-to-middle income countries (World Health Organisation, 2014) and the majority of Muslim countries are in this income group.

The association of religiosity (an individually constructed cognition) with suicide is a complex one, and research on the link between religiosity and suicidal behavior in Muslim countries is scarce but needed (Lester, 2006). To address this need, we investigated the association of religiosity with suicidal ideation and suicide attempts in a multinational sample of young adults from 11 Muslim countries. We tested the mediating roles of knowledge of Islamic prohibition of suicide, attitudes towards suicide, and positive and negative religious coping in these associations. We considered three specific attitudes towards suicide: belief in punishment of suicide in afterlife, belief in acceptability of suicide under some dire circumstances, and endorsement of reporting and open discussion of suicide (see Measures). Our conceptual framework is presented in Fig. 1. This framework incorporates religious social integration and religious commitment perspectives and recognizes the distinct roles of positive and negative religious coping. In this framework, the effect of religiosity on reduced suicidality can partly be accounted for by the social integrative functions of religiosity, and partly by the unwillingness of individuals who are highly committed to Islam, to consider suicide as an acceptable option even under dire circumstances. In this article, we present the results of four models that test hypotheses derived from this conceptual model.

We empirically established that there was substantial variability of religiosity, attitudes towards suicide, religious coping, suicidal ideation, and suicide attempts across the Muslim countries represented in this study. Indeed, country-level statistics were so widely distributed that a

broad-brush characterization of "Muslim" societies was rendered meaningless. Nevertheless, we hypothesized that within-country processes that linked religiosity to suicidal ideation and suicide attempts could be comparable. We tested the following hypotheses:

1. Religiosity is associated with attitudes towards suicide similarly across the 11 Muslim samples.
2. The association of Muslim religiosity with the attitudes towards suicide is mediated by the knowledge of Islamic prohibition of suicide. Furthermore, this mediated association is moderated by religiosity: the stronger one's religiosity, the stronger is the association of knowledge of Islamic prohibition of suicide with one's attitudes towards suicide.
3. Religiosity is negatively associated with suicidal ideation, both directly, and indirectly through its association with attitudes towards suicide. However, once a person has experienced suicidal ideation, a high level of religiosity will no longer be a protective factor against repeated incidences of suicidal ideation.
4. Positive religious coping is negatively, and negative religious coping is positively associated with suicidal ideation. As per previous research, the strength of the association of negative religious coping with suicidal ideation is stronger than that of positive religious coping.
5. Suicide attempts among those who experienced suicidal ideation are associated with religiosity. This association operates through the attitudes towards suicide and religious coping styles.
6. Negative religious coping is expected to be positively associated with attempting suicide because it will weaken the protective effects of religiosity.

2. Method

2.1. Sample

The sample consisted of college students from 11 Muslim countries, recruited based on convenience by local researchers (data collected from Malaysia were excluded from the current study because the item response patterns suggested validity problems). Only those respondents who self-identified as Muslim were included in this study ($N = 7427$), excluding 396 participants (5.1%) who did not respond, or who reported affiliation with another religion. At each site, some individuals refused to participate in the study, and some provided incomplete information to the extent that their data had to be discarded. The number of participants refusing to take part in the study were 10 in Turkey, 40 in Palestine, 115 in Iran, 145 in Tunisia, 20 in Egypt, and 28 in Pakistan. The cases that had to be discarded due to incomplete information were Egypt (7), Jordan (7), Azerbaijan (23), Palestine (12), Iran (14), Tunisia (48), Turkey (40), Lebanon (170) and Saudi Arabia (462). Because our analyses included the participants who had reported their religious affiliation, the proportion of missing information was extremely low (0.2% for religiosity, 3.6% for having ever thought about suicide, and 2.6% for having ever attempted suicide).

2.2. Procedure

A self-administered anonymous questionnaire was used which contained questions about various aspects of nonfatal suicidal behavior, religious affiliation, religious belief, attitudes towards suicide, and religious coping. The questionnaire and the study protocol were prepared by the first author in English and translated into native languages (Arabic, Indonesian, Malay, Persian, Urdu, and Turkish) using the parallel blind method (Behling and Law, 2000). Ethical approval was obtained first at the institution with which the first author was affiliated (Aydın Adnan Menderes University, School of Medicine Ethics Review Committee for Non-invasive Clinical Investigations Protocol Number: 2016/807). This approval was then sent to other study sites where approvals depended on the approval of the coordinating study site. Ethics or IRB approvals were obtained in all study sites. The data were collected in 2016. Paper and pencil questionnaires were used in all study sites except in Saudi Arabia where an online version was implemented. A standard informed consent protocol was followed. Researchers from Jordan, Pakistan, Palestine, and Saudi Arabia reported that attempting suicide was illegal in their countries.

2.3. Measures

For this 11-country study, the foremost psychometric concern was measurement invariance. In order to establish measurement invariance we tested a series of increasingly restrictive models (configural, metric, and scalar invariance) using MPLUS 7.4 (Muthén and Muthén, 2007). In most cases, we proceeded with partial rather than full scalar invariance (Byrne et al., 1989). Full details of this testing, the criteria that were used, and associated tables are given in Online Supplemental Materials A.

2.4. Religiosity

We relied on two items to measure religiosity: affiliation and the

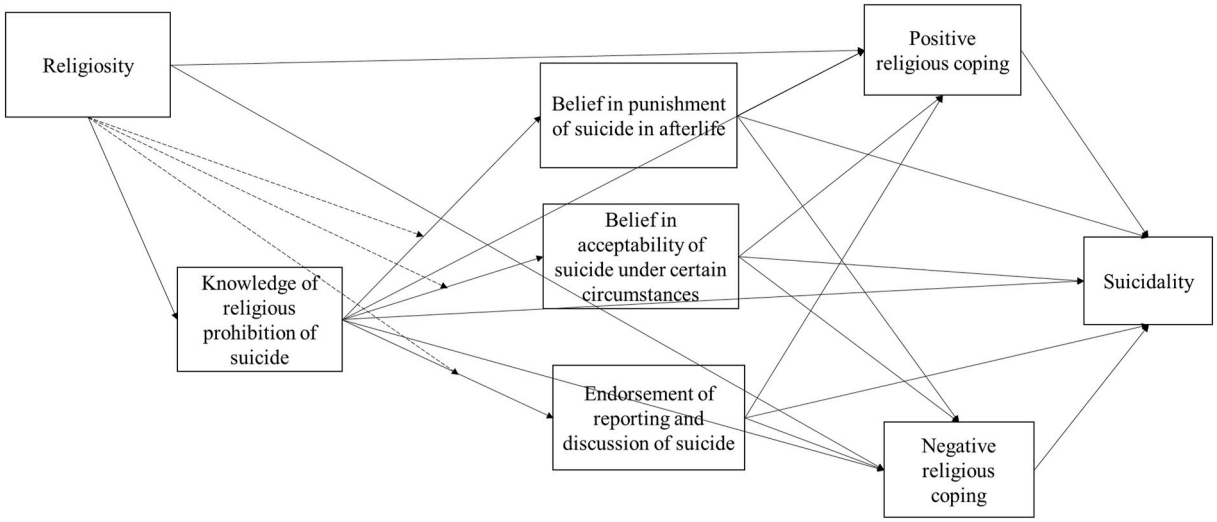

Fig. 1. Note. Hypothesized moderation effects are shown with dashed lines. Our conceptual model of suicidality.

strength of religious belief. All participants who reported affiliation to a religion, were asked to rate the strength of their religious belief on a 0–10 scale, anchored at 0 "none whatsoever" to 10 "very strong" ("Thinking on a ten-point scale, how would you rate your religious belief?). Our decision to emphasize subjective religiosity was guided by the fact that other aspects and practice of Muslim religiosity such as fasting, prayers, Friday mosque prayers vary between sects and genders. The affiliation and subjective strength of religious belief apply to all and are the essence of the role of religiosity in well-being from the religious commitment perspective (Stark et al., 1983).

2.5. Knowledge of Islamic prohibition of suicide

The participants responded to a 4-option multiple-choice question about Islam's position vis-à-vis suicide ("In your opinion, which one of the following statements best describes your religion's attitude towards self-killing?"). The correct answer was "My religion prohibits suicide" (0: incorrect; 1: correct).

2.6. Attitudes towards suicide

Eskin's 24 item inventory of Attitudes Towards Suicide Scale (E-ATSS) (Eskin, 2013) with five-point Likert type response options ranging from "Completely disagree (1)" to "Completely agree (5)" was used. For the purposes of this study, three measures were constructed and their measurement invariances were established: belief in punishment of suicide in afterlife (5 items, e.g., "People who attempt suicide are going to be punished in the other world"), belief in acceptability of suicide in some circumstances (8 items, e.g., "Someone suffering from an incurable illness has the right to kill him/herself"), and endorsement of reporting and discussion of suicide (4 items, e.g., "The matter of suicide should be discussed openly among friends"). A complete list of attitude items can be found in Online Supplemental Materials A. These three attitude measures were found to be highly associated with suicidal ideation and suicidal behavior in previous studies (Eskin, Kujan, et al., 2016a, 2016b). The average ω reliability coefficient for the belief in punishment of suicide in afterlife was 0.884 (95% confidence interval [CI] = 0.868, 900). The average ω coefficient for belief in acceptability of suicide was 0.913 (95% *CI* = 0.894, 0.930). The average ω coefficient for the endorsement of reporting and discussion of suicide was 0.629 (95% *CI* = 0.602, 0.656). The relatively low-reliability values for this measure are partly due to the small number of items. The average Cronbach's α values for the belief in punishment of suicide in afterlife, acceptability of suicide, and endorsement of reporting and discussion of suicide were 0.840 (range = 0.740, 0.889), 0.896 (range = 0.853, 0.929), and 0.600 (range = 0.482, 0.729), respectively.

The attitude measures were the factor scores obtained from the Confirmatory Factor Analysis (CFA) models that demonstrated full or partial scalar measurement equivalence of the three latent factors. These scores are theoretically free of measurement error. In multi-group CFA models, all intercept values can be interpreted relative to the mean of an arbitrarily chosen group that is viewed as the reference group. In these analyses, the reference group was the sample from Iran.

2.7. Religious coping

The original religious coping scale consisted of seven positive and seven negative religious coping items (Pargament et al., 2011). One item of each subscale was excluded from the current study because they were not suitable for Muslim respondents. The items for positive coping included statements that represented religious reaffirmation in the face of difficulties (e.g., "When bad things happen to me, I seek God's love and care"), and the items for negative coping included statements that represented questioning of one's religious convictions in the face of difficulties (e.g., "When bad things happen to me, I question the power of God"). For positive religious coping, the average ω coefficient was 0.913 (95% *CI* = 0.896, 0.925). For negative religious coping, the average ω coefficient was 0.842, (95% *CI* = 0.821, 0.861). The Cronbach's α values for these two scales were 0.927 (range = 0.906, 0.948) and 0.811, (range = 0.697, 0.854), respectively.

2.8. Suicidal ideation and suicide attempts

Responses to two questions were used to measure suicidal ideation. The first question asked "Have you ever thought of killing yourself?". If the response was yes, the participant was asked how many times they had thoughts of killing themselves. The response options to the latter question were truncated at five times or more.

Respondents were also asked "Have you ever attempted to kill yourself?", and if yes, how many times. There were very few ($N = 19$, 0.3%) respondents who reported attempting suicide who had reported never experiencing suicidal ideation. These respondents were not included in our analyses of suicide attempts.

2.9. Statistical methods

We used standard descriptive statistics of the characteristics of the national samples. We also provided tests of country differences of means (*F*-tests) and proportions (χ^2-tests). Due to the very large sample size and large differences across countries in the mean levels of the variables, all of these tests were statistically significant. We used MPLUS 7.4 (Muthén and Muthén, 2007) to conduct a likelihood ratio χ^2-test that compared the goodness of fit of country-specific versus a common correlation matrix. All multivariate path models were estimated using Maximum Likelihood with MPLUS 7.4. A few different specifications were used to accommodate mediating or dependent variables that were count variables (number of incidences of suicidal ideation) or binary variables (e.g., attempting suicide; see Online Supplemental Materials B). The first step of modeling estimated a standard multi-group path model of the association of religiosity with the three measures of attitudes towards suicide. At the second step, we estimated a model that included a binary variable (the knowledge of Islamic prohibition of suicide) that was represented with a binomial distribution.

The third step consisted of a multi-group path model of incidences of suicidal ideation. In multi-group models, models for all samples (countries) are jointly estimated, and the model coefficients can be flexibly specified to be equal or different across groups. We used this flexibility to specify models that adequately fit the observed data, but at the same time, were as parsimonious as possible. In all multi-group models, the means and intercepts were allowed to differ across countries, thereby avoiding ecological fallacy.

Because a large proportion of respondents never experienced suicidal ideation, this outcome was represented with a zero-inflated Poisson distribution. This approach allowed the joint modeling of never versus ever experiencing suicidal ideation, and the number of experiences of suicidal ideation, once the first incidence occurred. As often observed with events that have relatively low rates of occurrence, we proposed that the process leading to experiencing suicidal ideation for the first time could differ from the process leading to multiple experiences. This hypothesis was represented by allowing the effect estimates of the predictors to differ for these two components of suicidal ideation.

At the final step, we estimated a path model of the probability of a suicide attempt among the respondents who experienced suicidal ideation. In this model, suicide attempt was represented with a binomial distribution.

The aim of this research was to identify common patterns of association of religiosity, suicidal attitudes, and religious coping with suicidal ideation and behavior across samples from 11 Muslim countries. Considering the size and complexity of the models estimated here (e.g., the model of suicidal ideation presented here had 162 parameters including coefficients, covariances, and residual variances) we included no additional covariates that could account for some of the variance in

suicidal ideation and behavior. Nevertheless, the samples from different countries were fairly homogenous because all samples consisted of college students.

In order to identify models that were as parsimonious as possible, we conducted comparative goodness of fit tests of models with progressively more equality constraints on the model parameters. The criteria that were adopted for these tests are presented in Online Supplemental Materials B.

In multi-group models, when unstandardized path coefficients are equal across samples, the standardized coefficients could vary depending on the variances of the estimated parameters. At the same time, standardized coefficients provide valuable information about the relative strength of the estimated associations. In tables, we reported unstandardized coefficients, the average standardized coefficients across samples, and the ranges of the latter across samples.

There were low proportions of missing data that were contributed by the countries. Mean substitution was used for the responses that were missing from a set of items that constituted a scale (i.e., the scales that measured attitudes towards suicide and religious coping). Data on religiosity, knowledge of Islamic prohibition of suicide, suicidal ideation and suicide attempts were not imputed. The models estimated here handled missing data with Full Information Maximum Likelihood (FIML) that provides maximum likelihood estimates of all parameters under the assumption of missingness at random. The three attitude scores and the two coping scores were the estimated latent factor scores, and therefore they were already FIML estimates for the full available sample. Nevertheless, we estimated all of the models once more after we deleted all cases that had missing data. The results of those analyses are presented in Supplemental Materials D. Due to the small proportion of missing data in each country, the results of these models were extremely similar to those that used FIML approach to the handling of missing data.

3. Results

3.1. Descriptive results

More than 95% of the participants in each country identified themselves as Muslim, except in Azerbaijan (83.4%) and Turkey (90.8%). The basic demographic characteristics and the sample sizes for each country are presented in Table 1. Gender distribution was fairly even, with the percentage of female participants ranging from 50 to 60% except Saudi Arabia (62.5% female) and Indonesia (69.2% female). Overall mean age was 20.9 ($SD = 2.7$). A vast majority of the participants came from two-parent households (range: 82.2–96.0%). The mean number of siblings of the respondents varied from 1.79 (Azerbaijan) to 5.78 (Saudi Arabia). Descriptive information for each of the 11 countries is presented in Supplemental Materials C, Table C1.

Religiosity was highest in Egypt, Pakistan, and Indonesia, and lowest in Iran, Turkey, and Azerbaijan. The range of the mean religiosity levels of the countries was equivalent to about 1.5*SD*. Between country variance of religiosity far exceeded within-country variance, $F(10, 7398) = 102.0$, $p < .001$. In Egypt, Indonesia, Jordan, Palestine, and Saudi Arabia, more than 98% of those who participated in the study knew that Islam prohibited suicide (suicide was prohibited by law in the latter three countries). In Pakistan, where suicide was prohibited by law, almost 10% of the participants reported not knowing the Islamic prohibition of suicide. Indeed, Pakistan had one of the lowest rates of knowledge of this edict, together with Turkey and Azerbaijan.

Attitudes towards suicide were not closely aligned with religiosity. For example, both Pakistan and Azerbaijan had low levels of belief in punishment of suicide in afterlife, although these two samples had disparate levels of religiosity. Belief in the punishment of suicide in afterlife was the highest in Indonesia, where both religiosity and knowledge of the Islamic prohibition of suicide were high. Belief in the acceptability of suicide had a greater variability both within each country and between countries than belief in the punishment of suicide in afterlife. Indonesia and Jordan had the lowest mean levels, whereas Azerbaijan had the highest mean level of belief in the acceptability of suicide. Endorsement of reporting and discussion of suicide was not associated with the mean levels of religiosity or knowledge of Islamic prohibition of suicide. Endorsement was the highest in Pakistan, and lowest in Turkey, Azerbaijan, and Iran, the three countries with the lowest levels of religiosity. Between country variance of belief in punishment, acceptability, and endorsement of reporting of suicide exceeded that of within-country variance; $F(10, 7416) = 49.1$, $p < .001$, $F(10, 7416) = 52.4$, $p < .001$, and $F(10, 7416) = 96.4$, $p < .001$, respectively. Both positive and negative religious coping were highest in Egypt, another indicator of the high level of religiosity in this country. Negative religious coping was low in Saudi Arabia and Tunisia. For the two coping measures, between country variance was substantially larger than the within-country variance; $F(10, 7416) = 41.1$, $p < .001$ and $F(10, 7416) = 50.4$, $p < .001$, for positive and negative coping, respectively.

The rate of suicidal ideation was less than 15% in Jordan, Palestine, and Lebanon. Note that in the former two countries, suicide is prohibited by law. At the same time, suicidal ideation rates were highest in Saudi Arabia (36.6%), where suicide is also prohibited by law. In Saudi Arabia, Egypt, and Azerbaijan, suicidal ideation rates exceeded 30%. Suicide attempts among those who experienced suicidal ideation were also very high in Azerbaijan, with over 60% of those who experienced suicidal ideation attempting suicide. This was followed by Palestine, Lebanon, and Jordan with rates of suicide attempts over 40% among those who experienced suicidal ideation.

The correlation structure of the variables differed significantly between the 11 countries, $\chi^2(df = 210) = 1453.888$, $p = .000$, $CFI = 0.766$, $RMSEA = 0.094$, 90% $CI = 0.089, 0.098$. Full correlation tables for all countries are given in Supplemental Materials C, Tables C2-C.12. The correlations of religiosity with belief in punishment of suicide in afterlife were positive (average $r = 0.179$; range 0.063–0.425), and with belief in acceptability of suicide were negative and substantial (average $r = -0.236$; range -0.459 to -0.107). Correlations of religiosity with the endorsement of reporting and discussion of suicide were nearly zero (average $r = -0.035$; range -0.152 to 0.092). As expected, the belief in

Table 1
Demographic characteristics of the samples from each country.

Country	% Female	Mean age	*SD* of age	Mean number of siblings	*SD* of number of siblings	% Whose parents are living together	*N*
Iran	50.6%	22.19	4.01	2.63	1.79	91.0%	690
Jordan	50.3%	21.11	1.54	5.09	2.67	89.7%	682
Lebanon	52.1%	19.80	1.61	2.73	1.68	89.8%	668
Pakistan	54.5%	21.11	2.20	3.33	2.28	87.9%	685
Palestine	60.4%	20.45	3.13	5.37	2.05	93.0%	761
Saudi Arabia	62.5%	22.04	3.61	5.78	2.92	82.2%	1089
Tunisia	51.2%	20.98	2.03	2.65	1.38	91.1%	676
Turkey	58.4%	20.52	2.11	2.11	1.75	93.3%	681
Indonesia	69.2%	19.75	1.02	2.17	1.35	96.0%	299
Egypt	51.4%	20.34	1.14	2.65	1.42	90.8%	625
Azerbaijan	55.4%	19.96	1.96	1.79	0.85	92.2%	571

Table 2
The mean levels of religiosity by experience of suicidal ideation for each country.

Country	Did not experience suicidal ideation			Experienced suicidal ideation			*F*	*p*	Effect size *d*[a]
	Mean	*SD*	*N*	Mean	*SD*	*N*			
Iran	6.38	1.91	535	5.66	2.09	155	16.0	<.01	0.36
Jordan	8.36	2.23	584	7.20	2.72	80	18.1	<.01	0.50
Lebanon	7.56	2.30	586	7.41	2.20	82	0.3	.58	0.06
Pakistan	8.57	1.98	535	7.95	2.45	150	10.5	<.01	0.30
Palestine	8.05	1.98	547	7.62	2.53	79	3.1	.08	0.31
Saudi Arabia	8.57	1.86	689	7.33	2.46	398	88.0	<.01	0.57
Tunisia	7.62	2.19	551	6.73	2.45	124	15.6	<.01	0.39
Turkey	6.48	2.32	535	5.78	2.36	146	10.3	<.01	0.30
Indonesia	9.20	1.33	204	8.85	1.58	95	3.9	.05	0.25
Egypt	8.37	2.12	511	8.21	2.13	113	0.5	.47	0.08
Azerbaijan	6.84	2.54	347	6.55	2.69	152	1.4	.25	0.11

Note. Religiosity was self-reported on a scale of 0–10.
[a] Cohen's *d* was computed as the ratio of the difference of the means for those who did not experience and those who experienced suicidal ideation to the pooled *SD* of the sample for that country. Cohen's *d* values smaller than .2 are considered small.

punishment of suicide in afterlife and belief in acceptability of suicide were moderately and negatively associated (average $r = -0.244$; range −0.594 to −0.122). Religiosity was also strongly and positively correlated with positive religious coping (average $r = 0.377$; range 0.218–0.560) but substantively uncorrelated with negative religious coping (average $r = 0.026$; range −0.035 to 0.162).

Suicidal ideation was negatively associated with religiosity in seven of 11 countries, with those who have experienced suicidal ideation having significantly lower levels of religiosity than others in Iran, Jordan, Pakistan, Saudi Arabia, Tunisia, Turkey, and Indonesia (Table 2). In the remaining countries, the mean level of religiosity of those who experienced suicidal ideation was not significantly different from those who did not experience suicidal ideation.

3.2. Path models

We estimated four path models, all derived from the conceptual model presented in Fig. 1. The first model tested the associations of religiosity with the three dimensions of attitudes towards suicide, addressing our Hypothesis 1. The second model tested the mediated associations of religiosity with the three dimensions of attitudes towards suicide through the knowledge of Islamic prohibition of suicide (Hypothesis 2). The latter model could only be estimated for the four countries where at least 5% of the participants did not know the Islamic prohibition of suicide. The third path model tested the association of religiosity, attitudes towards suicide, and religious coping with suicidal ideation (Hypotheses 3 and 4). The fourth path model predicting suicide attempts was similar in structure to the previous model, but it was estimated for the subsamples who had experienced suicidal ideation at least once in each country (Hypotheses 5 and 6). Additional covariates were not included in these models. For each model, we present the most parsimonious estimate that could be obtained via progressive nested testing.

3.3. Association of religiosity with the attitudes towards suicide

We estimated a simple path model where religiosity predicted the three measures of attitudes towards suicide (Table 3). Nested goodness of fit tests and examination of model modification indices suggested that only two countries differed substantially from the rest with respect to the structural parameters: Iran and Saudi Arabia. The resulting model had a good overall fit, $\chi^2(df = 27) = 101.9$, $p < .001$, $CFI = 0.960$, $RMSEA = 0.064$, 90% $CI = 0.051, 0.078$.

Religiosity was positively associated with the belief in punishment of suicide in afterlife, and negatively associated with the belief in acceptability of suicide. The average standardized beta (β^s) were 0.146 (range 0.100, 0.216) and −0.184 (range −0.241, −0.122), respectively. The exceptions were Saudi Arabia and Iran, where these associations were stronger than in other countries (see Table 3).

Table 3
The estimated coefficients of the model of association of religiosity with the three measures of attitudes towards suicide in 11 Muslim majority countries.

Predictor variables	Predicted variables		
	Belief in punishment of suicide in afterlife	Belief in acceptability of suicide under certain circumstances	Endorsement of reporting and discussion of suicide
Religiosity	0.110***[a] *0.146 (0.100, 0.216)*	−0.150***[b] *−0.184 (-0.241, -0.156)*	−0.007*** *−0.044 (-0.057, -0.028)*

Note. The countries included in this model were Iran, Jordan, Lebanon, Pakistan, Palestine, Saudi Arabia, Tunisia, Turkey, Indonesia, Egypt, and Azerbaijan. Unstandardized coefficients are given in regular font and standardized coefficients are given in italic font, followed by the range of the standardized coefficients in parentheses. Goodness of fit statistics for the model were $\chi^2(27) = 101.9$, $p < .001$, $CFI = 0.960$, $RMSEA = 0.064$, 90% $CI = 0.051, 0.078$.
[a] An exception was Saudi Arabia (.235, *.424*, $p < .001$); [b]Exceptions were Iran (−.379, *-.327*, $p < .001$) and Saudi Arabia (−.522, *-.459*, $p < .001$). ***$p < .001$.

3.4. The mediating role of the knowledge of islamic prohibition of suicide

In four countries (Iran, Pakistan, Turkey, and Azerbaijan) there were 5% or more respondents who did not know the Islamic prohibition of suicide. For these countries, we estimated a model that included knowledge of this doctrine as a moderated mediator (Hypothesis 2). Specifically, we tested the hypothesis that the association of knowledge of Islamic prohibition of suicide was more strongly associated with the attitudes towards suicide for individuals who were highly religious than others. The results are presented in (Table 4). The model had an excellent fit to the data, $\chi^2(26) = 40.9$, $p = .032$, $CFI = 0.991$, $RMSEA = 0.030$, 90% $CI = 0.009, 0.046$. The knowledge of Islamic prohibition of suicide had uniform associations with the attitudes towards suicide. As expected, religiosity was strongly associated with the knowledge of Islamic prohibition of suicide in all countries except Pakistan. In Pakistan, Islamic law is enforced and those who attempt suicide can be prosecuted (Naveed et al., 2017). It is likely that the respondents knew this law whether they were religious or not.

Religiosity strongly moderated the association of knowledge of Islamic prohibition of suicide with belief in acceptability of suicide. Those who had a low level of religiosity (1.5*SD* below the mean) and did not know of the Islamic prohibition of suicide had an estimated *z*-score of 0.24 on its acceptability, compared to a *z*-score of −0.40 for those who had a similar level of religiosity and knew the Islamic prohibition of suicide. Those who had a high level of religiosity (1.5*SD* above the

Table 4
The estimated coefficients of the moderated mediation model of the association of religiosity with the three dimensions of attitudes towards suicide for Iran, Pakistan, Turkey, and Azerbaijan.

Predictor variables	Predicted variables			
	Knowledge of Islamic prohibition of suicide	Belief in punishment of suicide in afterlife	Belief in acceptability of suicide under certain circumstances	Endorsement of reporting and discussion of suicide
Religiosity	*0.219****[a] *0.424 (0.395, 0.454)*	*0.129* *0.156 (0.126, 0.185)*	*0.152*[b] *0.184 (0.168, 0.200)*	*−0.074***[c] *−0.437 (-0.516, -.0376)*
Knowledge of Islamic prohibition of suicide		*0.266**** *0.160 (0.145, 0.185)*	*−0.356**** *−0.189 (-0.169, -0.207)*	*0.025* *0.077 (0.069, 0.086)*
Religiosity × Knowledge of religious prohibition of suicide		*0.004* *0.005 (0.004, 0.006)*	*−0.318*** *−0.325 (-0.250, -0.356)*	*0.053** *0.314 (0.252, 0.365)*

Note. In these countries, more than 5% of the participants reported not knowing of the Islamic prohibition of suicide. Standardized coefficients are given in *italics*, followed by the range of the standardized coefficients in parentheses. Goodness of fit statistics for the model were $\chi^2(26) = 40.9$, $p = .032$, $CFI = 0.991$, $RMSEA = 0.030$, 90% $CI = 0.009, 0.046$.

[a] Exceptions were Pakistan (−.004, *-.009, ns*) and Azerbaijan (.102, *.256, p* < .001). [b]An exception was Iran (−.041, *-.035, ns*). [c]An exception was Azerbaijan (−.038, *-.307, p* < .01). ***p* < .001.

mean) and knew the Islamic prohibition of suicide had an estimated *z*-score of −0.97 on acceptability of suicide. This moderation was also statistically significant, but the effect size was small for the endorsement of reporting and discussion of suicide.

3.5. Association of religiosity with suicidal ideation

The third model tested the association of religiosity with suicidal ideation mediated by the attitudes towards suicide and religious coping (see Fig. 1 and Hypotheses 3 and 4). The model was built progressively, starting with the model presented in Table 3 (see Supplemental Materials B for details). The resulting best fitting most parsimonious model is presented in Table 5. There was remarkable similarity across 11 countries in the structural parameters of the model. The only exceptions were Saudi Arabia, Jordan, and Indonesia for a few of the parameters. The goodness of fit indicators for the unconstrained baseline model were *AIC* = 166,953.2 and *BIC* = 169,572.3, with 379 free parameters. The restricted best-fitting model had an *AIC* of 167,294.7 and a *BIC* of 168,414.2, with 162 free parameters.

Religiosity was negatively associated with suicidal ideation. Although the direct association of religiosity with never experiencing suicidal ideation and the number of times experiencing suicidal ideation were small (average $\beta^s = 0.032$. range 0.020–0.040; and, average $\beta^s = -0.092$. range −0.118 to −0.032, respectively), its indirect associations through attitudes towards suicide were substantial. As a result, the total effect of religiosity on never experiencing suicidal ideation was

Table 5
The estimated coefficients of the model of association of religiosity, attitudes towards suicide, and religious coping with suicidal ideation for 11 Muslim countries.

Predictor variables	Predicted variables						
	Belief in punishment of suicide in afterlife	Belief in acceptability of suicide under certain circumstances	Endorsement of reporting and discussion of suicide	Positive religious coping	Negative religious coping	Never experienced suicidal ideation	Number of times experienced suicidal ideation
Religiosity	0.116***[a] *0.151 (0.100, 0.180)*	−0.380***[b] *−0.195 (-0.364, -0.116)*	−0.007*** *−0.038 (-0.046, -0.025)*	0.258*** *0.319 (0.221, 0.376)*	0.041*** *0.053 (0.035, 0.064)*	0.029* *OR = 1.029*	−0.006 *−0.092 (-0.118, -0.032)*
Belief in punishment of suicide in afterlife				0.142*** *0.135 (0.133, 0.141)*	−0.024 *−0.024 (-0.024, -0.023)*	0.005[c] *OR = 1.005*	0.010[d] *0.126 (0.066, 0.143)*
Belief in acceptability of suicide under certain circumstances				−0.170*** *−0.194 (-0.209, -0.188)*	0.084*** *0.100 (0.096, 0.112)*	−0.245***[e] *OR = 0.783*	0.057***[f] *0.880 (0.845, 0.933)*
Endorsement of reporting and discussion of suicide				0.053 *0.011 (0.011, 0.012)*	−0.163** *−0.037 (-0.037, -0.035)*	−0.148 *OR = .862*	0.075 *0.210 (0.111, 0.237)*
Positive religious coping						0.034 *OR = 1.035*	−0.004 *−0.044 (-0.053, -0.014)*
Negative religious coping						0.019 *OR = 1.016*	0.026 *0.302 (0.101, 0.363)*

Note. The countries included in this model were Iran, Jordan, Lebanon, Pakistan, Palestine, Saudi Arabia, Tunisia, Turkey, Indonesia, Egypt, and Azerbaijan. Unstandardized coefficients are given in regular font and standardized coefficients are given in *italics*, followed by the range of the standardized coefficients. *OR:* Odds ratio.

*$p < .05$, **$p < .01$, ***$p < .001$.

[a] An exception was Saudi Arabia (.234, *.299, p* < .001).

[b] An exception was Saudi Arabia (−.522, *.509, p* < .001).

[c] An exception was Saudi Arabia (.396, *OR = 1.486, p* < .001).

[d] An exception was Saudi Arabia (.047, *.635, ns*).

[e] Exceptions were Saudi Arabia (−.370, *OR = .691, p* < .001), Jordan (−.439, *OR = .645, p* < .001) and Indonesia (−.536, *OR = .651, p* < .001).

[f] Exceptions were Saudi Arabia (.056, *.990, p* < .001) Jordan (−.189, *-.841, p* < .01) and Indonesia (.127, *.973, p* < .001).

substantial (total $\beta^s = 0.363$, $p < .001$; odds ratio = 1.15). However, the total effect of religiosity on the number of times experiencing suicidal ideation was small and statistically non-significant (total $\beta^s = -0.264$, *n. s.*). The total effects of belief in the acceptability of suicide on never experiencing suicidal ideation, and the number of times experiencing suicidal ideation were large (total $\beta^s = -0.933$, $p < .001$, odds ratio = 0.78; and, total $\beta^s = 0.923$, $p < .001$, respectively). Surprisingly, neither positive nor negative religious coping were significantly associated with suicidal ideation. Nevertheless, religiosity was strongly associated with positive religious coping (average $\beta^s = 0.319$, range 0.221–0.376). In addition, belief in punishment of suicide in afterlife (average $\beta^s = 0.135$, range 0.133–0.141), and belief in acceptability of suicide (average $\beta^s = -0.194$, range −0.209 to −0.188) were also significantly associated with positive religious coping.

Among the three measures of attitudes towards suicide, the belief in acceptability of suicide was the only one that was significantly associated with never experiencing suicidal ideation (average $\beta^s = -0.253$, range −0.267 to −0.232) and the frequency of suicidal ideation (average $\beta^s = 0.880$, range 0.845–0.933). These strong associations accounted for the significant total effects of religiosity with the indicators of suicidal ideation. Fig. 2 represents the total effects of religiosity on the indicators of suicidal ideation for eight countries that had similar path coefficients, and for Saudi Arabia, where the total effect of religiosity was substantially larger than the remaining countries. The same model predicted 0.16 more experiences of suicidal ideation for those who had a low level of religiosity than those who had a high level of religiosity, among those who ever experienced suicidal ideation.

3.6. Association of religiosity with suicide attempts

The fourth model provided estimates of the associations of religiosity with the likelihood of attempting suicide mediated by the attitudes towards suicide and religious coping (Hypotheses 5 and 6). This model had a structure similar to that presented in Fig. 1 and was estimated for the subsample reporting at least one incidence of suicidal ideation. The results of the most parsimonious, yet adequately fitting model are presented in Table 6. The goodness of fit indicators for the unconstrained baseline model were *AIC* = 34,700.2 and *BIC* = 35,804.2 with 206 free parameters. The restricted best-fitting model had *AIC* = 34,651.8 and *BIC* = 35,434.3 with 146 free parameters.

There were only two statistically significant predictors of suicide attempts: acceptability of suicide and negative religious coping. The odds ratios showed that once suicidal ideation occurred, 1*SD* higher acceptability of suicide was associated with 20% higher odds of a suicide attempt. Similarly, 1*SD* higher negative coping was associated with 27% higher odds of a suicide attempt. Although these two attributes were

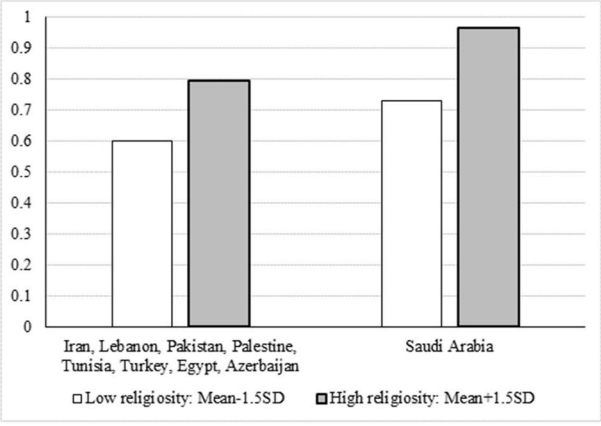

Fig. 2. The predicted probabilities of never experiencing suicidal ideation by religiosity.

Table 6
The estimated coefficients of the direct paths of the model of association of religiosity, attitudes towards suicide, and religious coping with suicide attempts for 11 Muslim countries.

Predictors	Estimated coefficients for all countries
Religiosity	0.051
	1.053
Belief in punishment of suicide in afterlife	−0.044
	0.957
Belief in acceptability of suicide under certain circumstances	0.092***
	1.097
Endorsement of reporting and discussion of suicide	−0.017
	0.983
Positive religious coping	−0.062
	0.940
Negative religious coping	0.137***
	1.147

Note. The countries included in this model were Iran, Jordan, Lebanon, Pakistan, Palestine, Saudi Arabia, Tunisia, Turkey, Indonesia, Egypt, and Azerbaijan. This model is estimated for the subsample of individuals who reported experiencing at least one incidence of suicidal ideation. The model structure that represented the association of religiosity with attitudes towards suicide and religious coping was identical to that presented in Table 5, and therefore the coefficients pertaining to the associations of religiosity with attitudes towards suicide and religious coping are not presented here. Odds ratios are in presented in *italics*.
***$p < .001$.

associated with religiosity, the total effect of religiosity on suicide attempts was non-significant. However, the total effect of acceptability of suicide on suicide attempts was direct and indirect through negative religious coping ($\beta^u = 0.113$, $p < .001$). This implied that 1*SD* higher acceptability of suicide was associated with a total of 24% higher odds of an attempt of suicide.

4. Discussion

In this study, we investigated the association of religiosity with suicidal ideation and suicide attempts among young adults from 11 Muslim countries who self-reported being affiliated with Islam. Although some studies showed a negative association between religiosity and suicidal behavior (Dervic et al., 2004; Stack and Laubepin, 2019; Wu et al., 2015), others documented that they were unrelated (Eskin et al., 2019a, 2019b; Lawrence, Brent, et al., 2016; Lawrence, Oquendo, et al., 2016). The association of religiosity with suicidal ideation and suicide attempts, and the cognitions that might mediate this association have not been investigated in Islamic cultural contexts (Lester, 2006). Our findings show mediated and nuanced associations of religiosity with suicidality and address this knowledge gap.

We focused on religiosity rather than affiliation with Islam because people normatively report affiliation in Islamic contexts and therefore affiliation has little predictive power (Eskin et al., 2019a, 2019b). We tested six hypotheses with path models (see Fig. 1) that represented the associations of religiosity with suicidal ideation and suicide attempts that were partially mediated through knowledge of Islamic prohibition of suicide, attitudes towards suicide, and religious coping. These models incorporated (1) the direct association of religiosity with suicide due to its protective effects against alienation (social integration and network theories); (2) its indirect association through the knowledge of Islamic prohibition of suicide, religious belief that suicide would be punished in the afterlife (commitment theory); and, (3) its indirect association through positive and negative religious coping (coping styles theory). We incorporated a further nuance in our analyses by making a distinction between an initial experience of suicidal ideation and repeated experiences of suicidal ideation. In addition, we modeled the likelihood of a suicide attempt among those who experienced suicidal ideation.

The Muslim nations included in this study have diverse backgrounds in terms of ethnic-racial compositions, indigenous cultures, legal

systems, and sectarian divisions that may influence the level and/or reporting of subjective religiosity, prevailing attitudes towards suicide, and knowledge of Islamic prohibition of suicide. Self-reported levels of religiosity varied widely, both within and between countries (a range that was equivalent to about 1.5 standard deviations, see Table 2). Knowledge of Islamic prohibition of suicide did not overlap with religiosity, nor did it overlap with the legal prohibition of suicide in that country. Attitudes towards suicide were neither closely aligned with religiosity, nor with the knowledge of Islamic prohibition of suicide.

The reporting of negative religious coping was lower than that of positive religious coping. In many Muslim countries, religion tends to shape not only one's behaviors but also one's willingness to disclose information about one's religious thoughts because of their faith-based political and judicial systems (Masmoudi, 2003; Platteau, 2008). In some countries, any negative thoughts of God may be considered blasphemy (e.g., Pakistan and Saudi Arabia), and therefore negative coping may be underreported. Suicidal ideation rates of country samples ranged between 13% and 37%, whereas suicide attempt rates among those who experienced ideation ranged between 13% and 63% (see also Eskin et al., 2019a, 2019b).

Previous research hypothesized that the permissiveness of attitudes towards suicide could be the underlying cause of both inter-individual and intercultural variations in suicidal behavior (Eskin, Kujan, et al., 2016a, 2016b; Winterrowd et al., 2017). Recent research showed that affiliation with a religion, and especially with Islam was associated with low acceptability of suicide (Stack and Kposowa, 2011, 2008). Accordingly, the first hypothesis of this study predicted that religiosity would be related to attitudes towards suicide in all 11 countries. The data supported this hypothesis. Religiosity was positively associated with the belief in punishment of suicide in the afterlife and negatively associated with the belief in the acceptability of suicide (see Table 3).

According to commitment theory (Stark et al., 1983), core religious beliefs against suicide are of pivotal importance in shaping people's attitudes towards suicide. Nevertheless, attitudes towards suicide can only be associated with these beliefs if people have the knowledge of the Islamic prohibition of suicide. In line with the commitment theory, we found that knowledge of Islamic prohibition of suicide was associated with low levels of suicide acceptability, even for those who had low levels of religiosity. However, this association was stronger, the higher the religiosity of the respondent (see Table 4). Thus, the prohibition of suicide may be an especially effective deterrent for those who are committed to their faith.

The theory (Stark et al., 1983) and some research in suicidology (Gearing and Alonzo, 2018) suggested a negative association of religiosity with suicidal behavior. Accordingly, our third hypothesis anticipated a negative association of religiosity with suicidal ideation, both directly, and indirectly through the attitudes towards suicide. The fourth hypothesis predicted that positive religious coping to be negatively, and negative religious coping to be positively associated with suicidal ideation. The data supported the former hypothesis but not the latter. There was remarkable similarity across 11 countries in the association of religiosity, religious attitudes, and religious coping with suicidal ideation (see Table 5). Religiosity was positively associated with never experiencing suicidal ideation. As expected, most of this association was indirect, through attitudes towards suicide. Once suicidal ideation was experienced, religiosity was not significantly associated with repeated experiences of suicidal ideation (see Table 5). Acceptability of suicide was the only attitudinal dimension that was strongly associated with both the first and the repeated experiences of suicidal ideation. Neither positive nor negative religious coping were associated with suicidal ideation, controlling for religiosity and attitudes towards suicide.

These findings suggest a "mover-stayer" process for the link between religiosity and suicidal ideation. Religiosity is linked to attitudes towards suicide, and therefore it acts as a protective factor against suicidal ideation. However, once an individual considers suicide, the protective effect of religion against repeated episodes of consideration of suicide no longer remains.

The fifth and sixth hypotheses pertained to suicide attempts. We addressed these hypotheses in a sample who reported having experienced suicidal ideation at least once. There were extremely few suicide attempts among those who reported never experiencing suicidal ideation. This may be a reporting issue: individuals who refrained from reporting suicidal ideation might have also refrained from reporting attempts. If taken at face value, however, this finding is significant, in that it points to a process that progresses from consideration of suicide to an attempt, that allows for a window for prevention.

We predicted that suicide attempts would be negatively associated with religiosity and positively associated with negative religious coping because the latter would be an indication of weakening religious beliefs in the face of adversity. We hypothesized that positive religious coping would not be associated with suicide attempts because it was viewed merely as an expression of preservation of one's religiosity in the face of adversity and was not expected to strengthen religious belief. Contrary to our expectation, religiosity was not related to suicide attempts among those who had considered suicide at least once (see Table 6). Negative religious coping was positively related to suicide attempts, as expected. In addition, suicide acceptability was associated with the likelihood of a suicide attempt.

4.1. Limitations

A limitation of this study arises from the self-report nature of our data. Self-report data may suffer from validity issues selectively. For example, individuals who live in religiously restrictive societies, those who live in societies where suicide is a crime, and those who are sensitized to suicide due to their own or families' past experiences may underreport suicidality. Retrospective data also suffer from selective attrition, which is a particularly problematic issue when studying a behavior that is likely to lead to death. Our community samples for studying suicide retrospectively are limited to those individuals who have not ended their lives and those who are not impacted by debilitating mental health issues that remove them from the activities of daily living.

The most important limitation of this study is its cross-sectional correlational design. The causal process linking religiosity to suicide awaits development and testing through longitudinal multi-cultural data. Nevertheless, our correlational findings allow us to propose a model for future studies. Specifically, religiosity appears to have a strong deterrent effect on a key attitude: acceptability of suicide. This deterrent effect may be operating through the knowledge of Islamic prohibition of suicide and is stronger, the stronger one's commitment to religion. Through its effects on this attitude, religiosity deters the first experience of considering suicide. Once that threshold is crossed, the effects of religiosity diminish to non-significance. The effects of acceptability of suicide, however, persist. Repeated experiences of suicide are likely among those who view suicide as an acceptable solution to life's difficult problems. Once the threshold of considering suicide is crossed, an attempt also becomes more likely, and the role of religious coping style emerges as a new factor at this stage of the process. A suicide attempt seems to be facilitated by suicide acceptability and negative religious coping, perhaps signaling a decline in some individuals' religious commitment in the face of negative experiences.

Another serious limitation of this study relates to the nature of the samples. We collected data on convenience samples of college students. University students are highly educated, from the higher socioeconomic strata and liberal segments of populations especially in the developing nations such the Muslim countries. On these grounds, caution should be exercised when generalizing the findings of this study. Future studies with community samples are needed.

5. Conclusions

Our findings suggest a complex and nuanced process that links religiosity to suicidal ideation and attempts. Most remarkably, our analyses suggest that this process is highly similar among societies that strongly differ in demographics, wealth, levels of education, history, culture, levels of religiosity, and rates of suicide. The results reported in this study have implications for science and practice. Findings from this study clearly demonstrate that religion has a protective role against suicidal behavior through attitudes towards suicide. All three Abrahamic religions (Judaism, Christianity, and Islam) prohibit self-annihilation because it is viewed as an act against divine will. From a scientific perspective, identifying the effects of religiosity controlling for the effects of the attitudes towards suicide is a major challenge.

From a policy point of view, our findings highlight the importance of incorporating attitudes towards suicide in risk assessment, in designing interventions, and in predicting the outcome of an intervention. At the same time, attitudes towards suicide are an integral part of religious doctrines and it is a major challenge to design interventions that target those attitudes without appearing to manipulate the religious belief systems of the participants.

Our findings also clearly show that the nature of people's relationships with the sacred has limited power to predict their suicidal behavior. Specifically, it may prove difficult to predict individuals' responses to the sacred when faced with a personal crisis, based on the prior stable aspects of their relationship with the sacred. While some individuals undergoing a crisis reaffirm their strong relationship with the sacred, others may question that relationship, resulting in an increased risk for suicide that cannot be foreseen.

Ethical approval

Ethical or IRB approval was obtained in all study sites (countries). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Credit author statement

Mehmet Eskin: Conceptualization, Methodology, Writing - original draft, Supervision, Project administration, Writing - review & editing. Nazlı Baydar: Data curation, Formal analysis, Writing - original draft, Writing - review & editing. Mayssah El-Nayal, Nargis Asad, Isa Multazam Noor, Mohsen Rezaeian, Ahmed M. Abdel-Khalek, Fadia Al Buhairan, Hacer Harlak, Motasem Hamdan, Anwar Mechri, Ulker Isayeva, Yousef Khader, Aqeel Khan, Alaa Al Sayyari, Albaraa Khader, Bahareh Behzadi, Cennet Şafak Öztürk, Hazem Agha, Laifa Annisa Hendarmin, Murad Moosa Khan: Investigation, Data Curation, Writing - Original Draft, Visualization, Resources.

Declaration of competing interest

There is no conflict of interest for this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2020.113390.

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