Common and Country-Specific Characteristics Associated With Suicidality in the Arab Region

Sariah Daouk, MA[a]; Rania Awaad, MD[b]; Bilal Ahmed, BA[c]; Suzanne Barakat, MD[d]; Ricardo F. Muñoz, PhD[a,e]; and Yan Leykin, PhD[a,e,*]

ABSTRACT

Objective: To explore the prevalence of recent (previous 2 weeks) suicide attempts and estimates of likelihood of future suicide attempts as well as demographic characteristics associated with such attempts among residents of the Arab region looking for depression information online.

Methods: Google Ads were used to recruit 1,003 Arabic-speaking adults mostly from February 2014 to June 2014 to take part in a depression and suicidality screening study using a self-report questionnaire based on *DSM-IV* diagnostic criteria.

Results: Of the eligible participants (N = 900), 10.6% reported a suicide attempt in the previous 2 weeks, and 16.1% indicated a likelihood of making a suicide attempt in the following month. Men, those declining to state their sexual orientation, those from lower subjective social status (SSS), and unemployed individuals had higher odds of reporting a past suicide attempt ($P = .001$, $P = .002$, $P < .001$, $P = .023$, respectively). Younger individuals, those less religious, those with past suicide attempt, and those with lower SSS had higher odds of a likelihood of a future suicide attempt ($P = .03$, $P = .02$, $P < .001$, $P = .001$, respectively). Comparing the 4 countries with highest number of participants (Algeria, n = 148, Egypt, n = 260, Morocco, n = 118, and Saudi Arabia, n = 99), lower SSS was associated with higher odds of an attempt for Algeria, Morocco, and Saudi Arabia, but not for Egypt ($P = .002$). Lower religiosity was related to higher odds of estimates of future suicide for Algeria, Egypt, and Saudi Arabia, but not for Morocco ($P = .014$).

Conclusions: Suicidality among residents of Arab-speaking countries warrants further exploration. Common predictors of risk may be less relevant for some populations.

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[a]Department of Psychology, Palo Alto University, Palo Alto, California

[b]Department of Psychiatry and Behavioral Sciences, Stanford University, Palo Alto, California

[c]College of Medicine and Life Sciences, University of Toledo, Toledo, Ohio

[d]Sutter Health, San Francisco, California

[e]School of Medicine, University of California, San Francisco, California

**Corresponding author:* Yan Leykin, PhD, Palo Alto University, 1791 Arastradero Rd, Palo Alto, CA 94304 (yleykin@paloaltou.edu).

The Arab world, or the primarily Arabic-speaking countries in the Middle East and North Africa, is defined by shared cultural, religious, and linguistic characteristics.[1] The vast majority of Arabs consider Islam to be an important part of their lives and their identity.[2,3] Islamic values have greatly influenced Arab cultural values and social practices.[4] Collectivistic values and family honor that are underscored in Islam may outweigh individual needs and goals[5–8]; an individual's choices and actions may therefore reflect well or poorly on their family.

The Arab family unit influences mental development, illness-related behaviors, and management of family members' illnesses.[9] Arab families also shape beliefs and help-seeking preferences for mental illness specifically.[10] Additionally, culture plays an important role in shaping suicidality-related beliefs and behaviors.[11] In the Arab world, beliefs about suicide are greatly informed by Islam, which forbids suicide.[12] Being religious and having moral objection toward suicide were found to act as protective factors against suicide among Arabs.[13,14] The severe cultural and legal consequences of suicide suggest that many suicide attempts will not be disclosed.[15] A suicide attempt may bring dishonor to not just the individual, but the entire family system, which may serve as a deterrent to the disclosure of an attempt. Perceived social support from family and friends can be protective against suicidality among Arabs.[13]

Annually, more than 800,000 individuals die of suicide worldwide.[16] Most individuals who died by suicide had a mental disorder, mainly major depressive disorder (MDD).[17–19] Depression strongly predicts both suicidal ideation and attempts.[20] Moreover, suicidality is one of the diagnostic criteria for MDD in the *DSM-5*.[21] Association between depression and suicidality is also present in the Arab world[22] and is especially pronounced for men.[23–25]

Unfortunately, research on suicidal behavior in the Arab region is scarce. One study[14] found that, among the predominantly Arabic-speaking countries, the prevalence of suicide attempts ranged from 0.55 to 5.4 per 100,000, which is similar to police and government records (1.1 to 6.2 per 100,000); hospital-based studies[26] in the Arab region suggest annual rates of attempted suicide varying from 1.9 to 127 per 100,000. Though these prevalence rates tend to be lower than those from other regions in the world,[16] suicidality overall may still be quite common, with 22% of young Arab adults endorsing suicidal ideation, and 8.6% reporting a lifetime attempt.[12]

Mental illness and mental health treatment are highly stigmatized in the Arab region,[27] including on a governmental level,[28] and mental health services are usually nonexistent in public clinics.[28,29] Indeed, underreporting of suicide due to stigma and cultural factors may be the main reason for lower suicide prevalence rates.[30] Furthermore, stigma and cultural beliefs about mental disorders reduce the likelihood of seeking mental health services,[27,31] which

Clinical Points

- Suicidality in the Arab region is greatly understudied.
- Risk factors for suicide attempts in the Arab region include common characteristics, such as younger age or past suicide attempt, and unique ones, such as refusal to disclose one's sexual orientation.
- Some common factors (eg, religiosity, subjective social status) may not be as protective against suicidality for individuals from some countries as for individuals from others.

further compromises the ability to estimate and track suicidal behaviors. Aside from stigma, other reasons for lower suicide prevalence rate may be cultural protective factors, such as perceived social ties and collectivist values.[13,32] However, research about both protective and risk factors for suicidality in the Arab region is very limited. Similarly to other parts of the world, presence of psychopathology, feelings of hopelessness, impulsivity, aggression, and family history of suicide was found to increase risks.[13] However, more research is desperately needed.

Although the 22 countries in the Arab region share commonalities such as religion, language, and, to a large extent, culture, the countries differ in their social structures and institutions, legal and political entities, and economic development.[33] This diversity may influence suicidal ideation and behavior, in terms of both prevalence and risk factors. For instance, in a recent study[12] of the region, Saudi Arabia was among the countries with the highest prevalences of suicidal ideation (38.7%) and suicide attempts (13.4%), which were about twice of those found in Egypt and Tunisia, and an earlier study[34] found even lower prevalences in Morocco. Though reasons for differences in the rates of suicidality between countries are not well understood, differences in social factors, such as rates of unemployment, religiosity, or political stability, may play a role.[35]

Developing a better understanding of risk factors in populations that have been grossly underresearched and underserved is critical to stem the public health crisis of suicide. Thus, the present study sought to explore the prevalence of past attempts and current ideation in the Arab region among those who are looking for depression information online and to examine overall and country-specific individual characteristics that are associated with suicidality.

METHODS

Participants

The main recruitment avenue into this online study was Google Ads[36]; participants may also have entered the study links via other websites, word of mouth, or organic search results (natural search results produced by a search engine on the basis of similarity to the search query, rather than sponsored marketing ads). Most participants (97%) were recruited from February to June of 2014. Eligibility criteria included being aged ≥ 18 years and Arabic-literate and residing in 1 of the 22 "Arab world" countries. Of the 1,003 respondents, 900 participants from 18 countries were eligible for the study; the top 4 countries in terms of sample size were Egypt (n = 260), Algeria (n = 148), Morocco (n = 118), and Saudi Arabia (n = 99). Demographic information for the total sample (N = 900) and the 4 countries can be found in Table 1. Countries represented in the dataset are listed in Table 2.

Table 1. Demographics

Participants' Characteristics	Overall (N = 900)[a]	Egypt (n = 260)[a]	Algeria (n = 148)[a]	Morocco (n = 118)[a]	Saudi Arabia (n = 99)[a]	Comparing 4 Countries, *P* Value	Other Countries (n = 275)[a]	4 Countries vs Others, *P* Value
Age, mean (SD), y	27.4 (8.5)	26.5 (8.3)	27.3 (8.6)	26.3 (7.4)	28.1 (8.3)	.28	28.5 (9.16)	.011
Gender, female	44.7	41.5	45.9	34.7	52.5	.053	48.4	.15
Years of education, mean (SD)	14.8 (3.6)	15.3 (3.3)	14.6 (3.5)	14.0 (3.8)	14.6 (3.5)	.01	14.7 (3.6)	.88
Religiosity, mean (SD)[b]	3.5 (0.8)	3.6 (0.6)	3.6 (0.6)	3.6 (0.6)	3.6 (0.7)	.91	3.31 (0.9)	.0001
Unemployment	56.6	60.2	62.6	74.4	48.5	.001	46.5	.0001
Sexual orientation						.33		.99
Heterosexual	76.1	75.8	75.7	75.4	78.8		76.0	
Gay/lesbian	3.2	3.1	4.1	2.5	3.0		3.3	
Bisexual	3.1	3.1	3.4	0	6.1		3.3	
Prefer not to state	17.6	18.1	16.9	22	12.1		17.5	
Marital Status						.14		.67
Married	27.0	29.2	25.7	17.8	28.3		29.1	
Single and not in a relationship	51.6	49.8	52.7	53.4	52.5		51.6	
Single and in a stable relationship	14.8	15.2	17.6	19.5	9.1		13.1	
Divorced, separated, or widowed	6.6	5.8	4.1	9.3	10.1		6.2	
Subjective social status, mean (SD)[c]	5.3 (2.3)	5.3 (2.3)	5.5 (2.4)	4.8 (2.5)	5.1 (2.3)	.07	5.59 (2.23)	.03
With current MDD	74.3	79.6	71.4	72.0	74.7	.21	71.5	.22
Attempt in previous 2 weeks	10.6	11.2	8.8	8.5	12.1	.72	11.3	.64
Attempt likely in following month	16.1	16.5	10.8	18.8	18.1	.43	11.6	.82

[a]All values are % unless otherwise noted.
[b]Religiosity scores range from 1 (not important at all) to 4 (very important).
[c]Social status was measured using the MacArthur Scale of Subjective Social Status (possible range: 1–10, with 1 being the "bottom" of the "social ladder" and 10 being the "top").
Abbreviation: MDD = major depressive disorder.

Table 2. Arab Countries Represented in Sample

Countries	Frequency	%
Egypt	260	28.9
Algeria	148	16.4
Morocco	118	13.1
Saudi Arabia	99	11.0
Iraq	45	5.0
Jordan	42	4.7
Syrian Arab Republic	33	3.7
Tunisia	27	3.0
Sudan	26	2.9
Libya	23	2.6
Yemen	19	2.1
Palestine (State of)	18	2.0
United Arab Emirates	18	2.0
Lebanon	10	1.1
Oman	5	0.6
Kuwait	4	0.4
Bahrain	3	0.3
Qatar	2	0.2
Total	900	100.0

Measures

Demographics questionnaire. Participants provided their age, gender, race, country of residence, and zip/postal code (if available). For the purposes of this study, 53 who did not identify as either male or female were not included in the sample.

Demographics 2 questionnaire. Participants provided their years of education, employment status, relationship status (married or in a relationship, or single and not in a relationship), and sexual orientation (50 participants reporting "Other" as their sexual orientation were not included in the sample). Participants reported their subjective social status (SSS) using the MacArthur Scale of Subjective Social Status,[37] a measure of the perception of one's relative social standing in society, which is assessed by participants' marking, on an image of a ladder with 10 rungs, the rung that best represents where they think they stand relative to others. Participants indicated their religiosity via a question asking about the importance of religion in their lives (1—not important at all; 4—very important). Participants also responded to several other questions not used in the present study.

The Major Depressive Episode Screener. The Major Depressive Episode (MDE) Screener[38] is a validated[39,40] 18-item instrument based on the National Institute of Mental Health Diagnostic Interview Schedule[41] that assesses for the presence of current and past major depressive episodes. The MDE Screener assesses the 9 symptoms of depression according to the *DSM-IV*[42] as well as Criterion C (significant impairment in functioning). The "current MDE" is determined via assessment of symptoms in the previous 2 weeks. One of the questions (question number 17) asks whether individuals have attempted suicide in the past 2 weeks (Y/N).

14-Item Suicidal Behaviors Questionnaire. The 14-item Suicidal Behaviors Questionnaire (SBQ-14)[43,44] is a self-report instrument that assesses various aspects of individuals' current, past, and future suicidality. As part of this measure, participants are asked about their likelihood of attempting suicide in the future—in their lifetime, within the next year, within the next 4 months, within the next month, and today or in the next few days—with the choices ranging from 0 (no chance at all) to 4 (very likely). Consistent with SBQ procedures, if a more distant period is answered as 0, more proximal periods are assumed to also be 0. For example, if an individual states that "there is no chance at all" (0) that they will attempt suicide in their lifetime, they are not asked whether they will attempt in the next 4 months or in the next month, etc, because those periods are subsumed under "lifetime." For this study, only the "next month" response was analyzed (as the closest parallel to "past 2 weeks" in the MDE Screener), and the responses were dichotomized as either 0 (no chance at all) or 1 (some chance). See Supplementary Table 1 for proportions of participants endorsing likelihood of future suicide attempts for all time periods.

Procedure

The procedures of this investigation have been described elsewhere.[45,46] In brief, individuals searching for terms related to depression or suicide on the Google search engine may have seen an online advertisement for this study. Those clicking on an ad were sent to the study website. Individuals completed the Demographics questionnaire to verify eligibility (≥ 18 years of age). Those eligible completed the MDE Screener and were shown feedback about their depression level; they were then invited to join a monthly depression rescreening study. Interested individuals electronically signed the consent document and completed additional measures, such as the Demographics 2 questionnaire and the SBQ-14 (only those endorsing past or current suicidality at any level via the MDE Screener completed the SBQ-14). All procedures were approved by the Institutional Review Board at the University of California, San Francisco.

Statistical Approaches

Four countries with the highest number of participants (Algeria, Egypt, Morocco, and Saudi Arabia) were compared with the rest of the sample on demographic (age, gender, sexual orientation, marital status, years of education, religiosity, SSS, and employment status) and clinical variables via χ^2 or Fisher exact tests for categorical variables and via *t* tests or analysis of variance tests for continuous variables. Algeria, Egypt, Morocco, and Saudi Arabia were similarly compared with each other. To identify factors related to suicidality, binary logistic regression models were used, with demographic variables as predictors and suicide attempt as the variable of interest. First, 2 binary logistic regression models were used to understand the association of demographic characteristics with past (the previous 2 weeks) and future (nonzero likelihood that an attempt will be made in the future) suicide attempts for the entire sample. Second, to understand whether demographic characteristics differ for the 4 countries with the highest number of participants, these models were repeated, with the addition

of the country as a predictor and 2-way interactions of country and predictors; nonsignificant interactions were iteratively removed until none remained. For the models examining future suicidality, reported attempt in the previous 2 weeks was also included as a predictor. Statistical analyses were performed using SPSS version 25 (IBM Corp).

RESULTS

Characteristics of the Sample

Participants were aged 27.37 ± 8.54 years (mean ± SD), and 44.7% identified as female (Table 1). The majority identified as single (51.6%) and heterosexual (76.1%). Participants reported having a mean ± SD of 14.75 ± 3.55 years of education. Over half (56.6%) of the participants were unemployed. Participants reported being in the middle range of SSS (mean ± SD = 5.33 ± 2.33; possible range: 1–10), and largely reported that religion is very important to them (mean ± SD = 3.52 ± 0.75; possible range: 1–4).

Almost three-quarters (74.3%) of participants screened positive for current MDD, and 80.2% for lifetime MDD. Regarding suicidality, 10.6% of participants reported a suicide attempt in the previous 2 weeks, and 16.1% indicated at least some expectation that they would commit suicide within the following month.

Compared with the rest of the sample, participants from Algeria, Egypt, Morocco, and Saudi Arabia were younger ($t_{475.3} = 2.54$, $P = .011$, $d = 0.19$), more religious ($t_{391.8} = 4.99$, $P < .0001$, $d = 0.39$), and more likely to be unemployed (Fisher exact test, $P = .0001$) and report a lower SSS ($t_{887} = -217$, $P = .03$, $d = 0.16$). No other significant differences were observed.

Comparing Algeria, Egypt, Morocco, and Saudi Arabia with each other, several differences were likewise observed, including differences in unemployment ($\chi^2_3 = 15.53$, $P = .001$) and education level ($F_{3,618} = 3.86$, $P = .009$). Thus, participants from Morocco were more likely to report being unemployed, and those from Saudi Arabia less likely to do so. Participants from Egypt reported more years of education, and those from Morocco fewer years of education. Additionally, though the χ^2 analysis was just short of significance, the 4 countries differed in terms of gender ($\chi^2_3 = 7.69$, $P = .053$). No other significant differences were noted.

Past Suicide Attempt: Full Sample

Compared with women, men had higher odds of having a past suicide attempt (Wald $\chi^2_1 = 10.17$; $P = .001$; OR = 2.38; 95% CI, 1.40–4.05; Supplementary Table 2). The odds of having reported a past suicide attempt in the previous 2 weeks differed between stated sexual orientations (Wald $\chi^2_3 = 10.77$, $P = .013$); individuals who declined to state their orientation reported higher odds of having made a suicide attempt compared with heterosexuals (Wald $\chi^2_1 = 9.76$; $P = .002$; OR = 2.29; 95% CI, 1.36–3.85). Additionally, higher SSS appeared to be protective against attempts, with the odds of having made an attempt in the previous 2 weeks declining by 17.2% for every unit increase in SSS measure (Wald $\chi^2_1 = 13.33$; $P < .001$; OR = 0.83; 95%, CI 0.75–0.92), and those who were unemployed were more likely to have made an attempt (Wald $\chi^2_1 = 5.15$; $P = .023$; OR = 1.98; 95% CI, 1.10–3.56). Finally, 2 other variables were associated with lower odds of attempt at a level of nonsignificant trend: religiosity (Wald $\chi^2_1 = 3.14$; $P = .076$; OR = 0.77; 95% CI, 0.57–1.03) and level of education (Wald $\chi^2_1 = 3.20$; $P = .074$; OR = 0.94; 95% CI, 0.88–1.01).

Estimates of Suicide Attempt in the Following Month: Full Sample

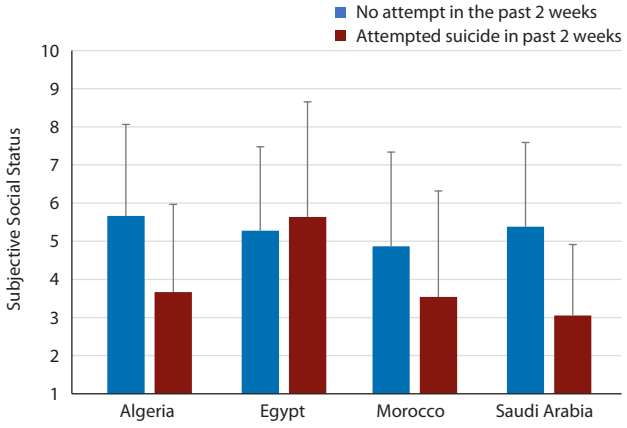
SSS was also associated with estimate of suicide attempt in the following month, with the odds of future suicide declining by 17.1% for every unit increase in SSS (Wald $\chi^2_1 = 10.27$; $P = .001$; OR = 0.83; 95% CI, 0.74–0.93; Supplementary Table 3). As expected, participants who reported attempting suicide in the previous 2 weeks had far higher odds of believing that they would attempt suicide in the following month (Wald $\chi^2_1 = 74.78$; $P < .001$; OR = 17.94; 95% CI, 9.32–34.50). Religiosity was associated with lower odds of estimating a future suicide attempt as likely (Wald $\chi^2_1 = 5.45$; $P = .02$; OR = 0.67; 95% CI, 0.48–0.94). Older participants also reported lower likelihood of future suicide, with the odds of future suicide declining by 5.5 for every unit increase in age (Wald $\chi^2_1 = 4.73$; $P = .03$; OR = 0.95; 95% CI, 0.90–0.99).

Past Suicide Attempt: 4 Countries

The interaction of country of residence and SSS was significant in predicting a suicide attempt in the previous 2 weeks (Wald $\chi^2_3 = 14.33$, $P = .002$; Supplementary Table 4), suggesting that the relationship of SSS and suicidality differs between countries. As shown in Figure 1, whereas in Algeria, Morocco, and Saudi Arabia higher SSS seems to be related to lower likelihood of a suicide attempt, the same does not seem to be true for Egypt. Additionally, an interaction of country of residence and gender attained a level of nonsignificant trend (Wald $\chi^2_3 = 7.06$, $P = .07$); whereas women were far less likely to have endorsed an attempt than men in Algeria (1.5% vs 15.0%), Egypt (4.6% vs 16.0%), or Morocco (4.9% vs 10.5%), the same was not true in Saudi Arabia (11.5% vs 12.8%).

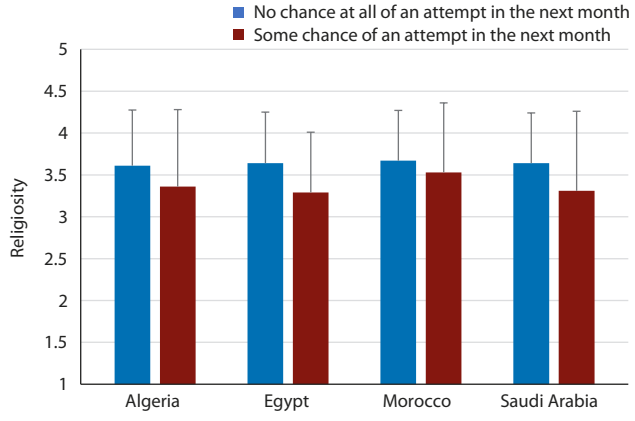
Regarding main effects, higher religiosity decreased the odds of having attempted suicide in the previous 2 weeks (Wald $\chi^2_1 = 8.37$; $P = .004$; OR = 0.54; 95% CI, 0.35–0.82). Higher years of education decreased the odds of having attempted suicide in the previous 2 weeks (Wald $\chi^2_1 = 9.34$; $P = .002$; OR = 0.87; 95% CI, 0.79–0.95). Two other variables attained a level of a nonsignificant trend: sexual orientation (Wald $\chi^2_1 = 6.93$, $P = .074$), with individuals' declining to disclose their orientation having greater odds of endorsing a likelihood of future attempt (Wald $\chi^2_1 = 6.29$; $P = .01$; OR = 2.39; 95% CI, 1.21–4.70), and employment, with unemployed participants' reporting higher odds of future attempt (Wald $\chi^2_1 = 3.35$; $P = .067$; OR = 2.18; 95% CI, 0.95–5.02).

Figure 1. Differences in Subjective Social Status Between Those Endorsing vs not Endorsing a Suicide Attempt in the Previous 2 Weeks, Across 4 Arab Countries[a]



[a]Error bars represent standard deviation (SD). Subjective social status is measured via self-report using the MacArthur Scale of Subjective Social Status (possible range: 1–10), with 1 being the "bottom" of the "social ladder" and 10 being the "top."

Figure 2. Differences in Religiosity Between Those Indicating No Likelihood vs Some Likelihood of Future Suicide Attempt, Across 4 Arab Countries[a]



[a]Error bars represent standard deviation (SD). Religiosity is measured using a question about importance of religion in everyday life, with possible responses ranging from 1 (not at all important) to 4 (very important).

Estimates of Future Suicide Attempt: 4 Countries

Whereas religiosity was associated with report of past suicide attempt as a main effect, in predicting the likelihood of future attempt a more nuanced picture emerged. Thus, country of residence interacted with religiosity in predicting future suicide in the following month (Wald $\chi^2_3 = 8.61$, $P = .04$; Supplementary Table 5). As shown in Figure 2, whereas in Algeria, Egypt, and Saudi Arabia higher religiosity seems to have a protective factor for future suicide attempts, the same does not seem to be true for Morocco.

Regarding main effects, similar to the full-sample analysis, participants who attempted suicide in the previous 2 weeks were far more likely to endorse future suicide in the following month (Wald $\chi^2_1 = 45.12$; $P < .001$; OR = 16.68; 95% CI, 7.34–37.91). Higher SSS decreased the odds of wanting to attempt suicide in the following month (Wald $\chi^2_1 = 6.80$; $P = .009$; OR = 0.83; 95% CI, 0.72–0.95). Older age also decreased the odds of future suicide in the following month, with the odds of future suicide declining by 9.7% for every year of age (Wald $\chi^2_1 = 7.43$; $P = .006$; OR = 0.90; 95% CI, 0.84–0.97). Finally, men had higher odds of believing that a future suicide is likely (Wald $\chi^2_1 = 3.84$; $P = .05$; OR = 2.09; 95% CI, 1.00–4.38).

DISCUSSION

In this sample of individuals who were looking for depression information on the Internet, over 1 in 10 reported a suicide attempt in the previous 2 weeks. Depression is strongly related to suicide attempts.[17–20] The association between depression and suicide holds true in the Arab world; thus, in a review[22] of community-based studies across the Arab region, 12-month suicidal ideation was significantly associated with depressive symptoms, and 1-month suicidal ideation was associated with a history of MDD and dysthymia, among other psychiatric disorders. The suicide attempt rate in this study is somewhat higher than the rate reported in an English-speaking sample,[45] but lower than that in a Chinese-speaking sample[47] collected using similar methods. Given the strong cultural prohibition against suicide, which would be expected to reduce suicide rates, the high rates of past suicide attempts (10.6%) and of likely future suicide attempts (16.1%) are quite troubling.

Several of our findings regarding risk factors for suicide appeared to be consistent with previously published literature, such as lower education,[48] unemployment,[49,50] and a history of suicide attempts.[51] Several of our other findings were less expected. Globally, men are more likely to complete suicides, whereas women are more likely to attempt suicides.[52] In this sample, men were more likely to report having attempted suicide than women, which parallels previous findings from specific countries in the Arab region.[23,35,52,] There could be several explanations for this finding including, for instance, the relative lethality of methods used in different countries. Whereas in the United States, men are most likely to use highly lethal means like firearms,[53] in the Arab world, men may be more likely to use hanging, overdosing, or wrist cutting, which may not be as reliably lethal.[54,55] Furthermore, some evidence suggests that Arab men are more likely than women to have suicide attempts that are aborted or interrupted.[23] Finally, suicide attempts by Arab men may be more driven by depression (which may have oversampled suicide attempts in this study given our recruitment methods),[24,25] whereas attempts by women may be motivated primarily by family and marital problems.[24] Similarly, though suicide is one of the leading causes of death for young people,[56] younger individuals tend to be less likely to die by suicide.[56,57] In our sample, however, younger participants were more likely to endorse a likelihood of future suicide attempts.

An intriguing finding is the relatively high rate of individuals who refused to indicate their sexual orientation

and the fact that these individuals were most likely to report having attempted suicide. Sexual minorities are at a higher risk for suicide worldwide,[58,59] and in the Arab culture dominated by heteronormativity,[60] individuals who might identify as sexual minorities might fear disclosing their sexual identities. Homosexual acts are criminalized in most Arab countries.[61] As such, Arabs might fear openly disclosing their sexual identities due to fear of prosecution or due to the stigma attached to sexual minorities. It is also important to consider that in Arab societies, speaking openly about sexuality is looked down upon, and modesty is highly praised; thus, it is possible that participants were not comfortable answering questions about sexual orientation directly. Conservative religious beliefs have been linked to higher feelings of shame, guilt, and internalized homophobia.[62] Nonetheless, the prevalence of sexual minorities in the Arab region is believed to be similar to that in other parts of the world.[63] Though it is unclear whether individuals who had declined to state their orientation were in fact sexual minorities, this result is consistent with previous findings suggesting that individuals declining to state their orientation may face additional challenges.[64]

Risk and protective factors for suicidality appeared to differ between countries in the Arab region. Religious beliefs are a protective factor against suicide in Muslim countries[14,65,66]; however, this was not the case for Morocco. Personal religious beliefs could be different from the religious practice and participation in rituals. Some argue that individuals receive increased social support from their religious communities, and this support could be protective against suicide.[67] Similarly, lower subjective social status (SSS) has previously been linked to suicidality,[68,69] which was broadly confirmed in this study; however, SSS did not appear to be related to suicidality in Egypt.

The study had several limitations. Participants were individuals looking for depression information online; therefore, the results may not generalize to the general population or to individuals who may lack resources or knowledge to seek mental health information online. However, the privacy of the Internet most likely allowed us to capture individuals who might otherwise have refused participation due to stigma. This study relied on Google Ads for recruitment; thus, participants were a self-select group, and results cannot be generalized to the larger population. Country-level comparison was limited to those countries where a sufficiently large sample was gathered. This sample was collected in part during politically and socially volatile period, which may have influenced the results.

Suicidality in the Arab region is greatly understudied. This study is one of the few that has investigated suicidality and its predictors in this population, across and between several countries. The Internet allows researchers to study suicidality in regions where there are strong negative cultural, social, and religious implications of suicide or of suicidal thoughts or behaviors. Suicide risk factors are often assumed to be global or largely similar between populations. It is important to recognize the unique culture- and country-level differences in suicidality risk factors to offer more effective clinical tools for clinicians. Attaining a more nuanced understanding of suicidality and the associated factors may help to stem the global public health crisis of suicide.

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Editor's Note: We encourage authors to submit papers for consideration as a part of our Focus on Suicide section. Please contact Philippe Courtet, MD, PhD, at pcourtet@psychiatrist.com.

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Supplementary Material

Article Title: Common and Country-Specific Characteristics Associated With Suicidality in the Arab Region

Author(s): Sariah Daouk, MA; Rania Awaad, MD; Bilal Ahmed, BA; Suzanne Barakat, MD; Ricardo F. Muñoz, PhD; and Yan Leykin, PhD

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Supplementary Table 1. SBQ-14. Likelihood of future suicide attempts, all time periods.

	FULL SAMPLE (%)	Algeria (%)	Egypt (%)	Morocco (%)	Saudi Arabia (%)
How likely is it that you will attempt suicide in your lifetime?					
No chance at all	74.3	79.8	73.8	72.0	72.2
At least some chance	25.7	20.2	26.2	28.0	27.8
How likely is it that you will attempt suicide in the next year?					
No chance at all	79.9	86.3	79.1	80.0	75.0
At least some chance	20.1	13.7	20.9	20.0	25.0
How likely is it that you will attempt suicide in the next 4 months?					
No chance at all	81.3	88.0	80.1	81.3	76.4
At least some chance	18.7	11.8	19.9	18.8	23.6
How likely is it that you will attempt suicide in the next month?					
No chance at all	83.9	89.2	83.5	81.3	81.9
At least some chance	16.1	10.8	16.5	18.8	18.1
How likely is it that you will attempt suicide today or in the next several days?					
No chance at all	86.3	90.2	85.4	81.3	86.1
At least some chance	13.7	9.8	14.6	18.8	13.9

Note: If a response "No chance at all" is given to a distal time period, responses to more proximal time periods are also assumed to be "No chance at all".

Supplementary Table 2. Logistic regression. Past suicide attempt: full sample

Variable	B	S.E.	Wald chi-square	df	p	OR	95% C.I of OR	
Age	-.029	.022	1.795	1	.180	.971	.931	1.014
Gender – male (ref. female)	.866	.272	10.168	1	.001	2.378	1.396	4.050
Sexual orientation			10.772	3	.013			
Sexual orientation -- Gay/lesbian (ref. heterosexual)	.734	.544	1.819	1	.177	2.084	.717	6.055
Sexual orientation -- bisexual (ref. heterosexual)	-.095	.780	.015	1	.903	.909	.197	4.192
Sexual orientation -- Refuse to state (ref. heterosexual)	.829	.265	9.756	1	.002	2.290	1.362	3.851
Unmarried (ref. married)	-.349	.379	.849	1	.357	.705	.336	1.482
Religiosity	-.263	.149	3.138	1	.076	.769	.574	1.028
Subjective Social Status (SSS)	-.189	.052	13.330	1	.000	.828	.748	.916
Years of Education	-.061	.034	3.201	1	.074	.940	.879	1.006
Unemployed (ref. employed)	.681	.300	5.145	1	.023	1.976	1.097	3.560

Supplementary Table 3. Logistic regression. Estimates of suicide attempt in the next month: full sample

Variable	B	S.E.	Wald chi-square	df	p	OR	95% C.I. of OR	
Age	-.057	.026	4.726	1	.030	.945	.898	.994
Gender – male (ref. female)	-.149	.282	.280	1	.597	.861	.495	1.498
Sexual orientation			2.127	3	.546			
Sexual orientation -- Gay/lesbian (ref. heterosexual)	-.404	.698	.335	1	.563	.668	.170	2.624
Sexual orientation -- bisexual (ref. heterosexual)	.726	.711	1.043	1	.307	2.066	.513	8.318
Sexual orientation -- Refuse to state (ref. heterosexual)	.281	.339	.689	1	.406	1.325	.682	2.575
Unmarried (ref. married)	.410	.381	1.158	1	.282	1.507	.714	3.184
Religiosity	-.398	.170	5.452	1	.020	.672	.481	.938
Subjective Social Status (SSS)	-.187	.058	10.266	1	.001	.829	.739	.930
Years of Education	-.006	.039	.020	1	.889	.995	.921	1.074
Unemployed (ref. employed)	-.045	.306	.022	1	.882	.956	.525	1.740
Past suicide attempt (ref. no attempt)	2.887	.334	74.783	1	.000	17.936	9.323	34.504

Supplementary Table 4: Logistic regression. Past suicide attempt: four countries

Variable	B	S.E.	Wald chi-square	DF	p	OR	95%CI of OR	
Age	-.045	.030	2.282	1	.131	.956	.902	1.013
Gender – male (ref. female)	-.507	.760	.445	1	.505	.602	.136	2.671
Sexual orientation			6.927	3	.074			
Sexual orientation -- Gay/lesbian (ref. heterosexual)	-.095	.813	.014	1	.907	.910	.185	4.481
Sexual orientation -- bisexual (ref. heterosexual)	-.447	1.165	.147	1	.701	.640	.065	6.271
Sexual orientation -- Refuse to state (ref. heterosexual)	.869	.347	6.294	1	.012	2.385	1.209	4.704
Unmarried (ref. married)	-.523	.487	1.157	1	.282	.592	.228	1.538
Religiosity	-.625	.216	8.365	1	.004	.535	.350	.817
Subjective Social Status (SSS)	-.479	.200	5.748	1	.017	.619	.419	.916
Years of Education	-.142	.046	9.338	1	.002	.868	.793	.950
Unemployed (ref. employed)	.779	.426	3.349	1	.067	2.180	.946	5.021
Country			13.738	3	.003			
Country – Algeria (ref. Saudi Arabia)	-3.194	1.424	5.032	1	.025	.041	.003	.668
Country – Egypt (ref. Saudi Arabia)	-4.019	1.107	13.189	1	.000	.018	.002	.157
Country – Morocco (ref. Saudi Arabia)	-2.680	1.255	4.556	1	.033	.069	.006	.803
SSS * Country			14.333	3	.002			
SSS * Country – Algeria (ref. Saudi Arabia)	.095	.244	.152	1	.697	1.100	.682	1.774
SSS * Country – Egypt (ref. Saudi Arabia)	.615	.221	7.714	1	.005	1.850	1.198	2.855
SSS * Country – Morocco (ref. Saudi Arabia)	.264	.255	1.074	1	.300	1.302	.790	2.146
Gender * Country			7.059	3	.070			
Gender * Country – Algeria (ref. Saudi Arabia)	3.468	1.409	6.061	1	.014	32.067	2.028	507.108
Gender * Country – Egypt (ref. Saudi Arabia)	1.867	.944	3.908	1	.048	6.466	1.016	41.158
Gender * Country – Morocco (ref. Saudi Arabia)	1.315	1.145	1.318	1	.251	3.724	.395	35.148

Supplementary Table 5. Logistic regression. Future suicide attempt: four countries

Variable	B	S.E.	Wald chi-square	df	p	OR	95% C.I. of OR	
Age	-.103	.038	7.428	1	.006	.902	.837	.971
Gender – male (ref. female)	.739	.377	3.843	1	.050	2.093	1.000	4.380
Sexual orientation			.304	3	.959			
Sexual orientation -- Gay/lesbian (ref. heterosexual)	.015	.898	.000	1	.987	1.015	.175	5.900
Sexual orientation -- bisexual (ref. heterosexual)	.418	1.086	.148	1	.700	1.519	.181	12.752
Sexual orientation -- Refuse to state (ref. heterosexual)	.182	.434	.176	1	.675	1.199	.513	2.807
Unmarried (ref. married)	.502	.478	1.102	1	.294	1.652	.647	4.217
Religiosity	-.481	.508	.897	1	.344	.618	.229	1.672
Subjective Social Status (SSS)	-.192	.074	6.803	1	.009	.826	.715	.953
Years of Education	-.048	.055	.745	1	.388	.953	.856	1.062
Unemployed (ref. employed)	-.528	.387	1.860	1	.173	.590	.276	1.260
Country			9.485	3	.023			
Country – Algeria (ref. Saudi Arabia)	-1.938	3.012	.414	1	.520	.144	.000	52.800
Country – Egypt (ref. Saudi Arabia)	2.686	2.111	1.618	1	.203	14.668	.234	919.095
Country – Morocco (ref. Saudi Arabia)	-3.631	2.527	2.065	1	.151	.027	.000	3.750
Past Suicide Attempt (ref. no attempt)	2.814	.419	45.124	1	.000	16.677	7.337	37.906
Religiosity * Country_all			8.614	3	.035			
Religiosity by Algeria (ref. Saudi Arabia)	.377	.837	.203	1	.652	1.458	.283	7.521
Religiosity by Egypt (ref. Saudi Arabia)	-.729	.602	1.469	1	.226	.482	.148	1.568
Religiosity by Morocco (ref. Saudi Arabia)	.978	.706	1.916	1	.166	2.658	.666	10.608