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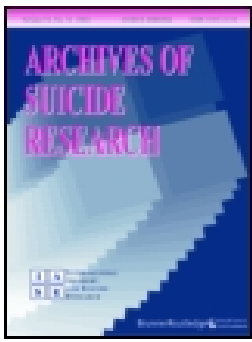
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Suicidal Behavior and Psychological Distress in University Students: A 12-nation Study

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This study investigated the prevalence of suicidal behavior and psychological distress in university students across 12 nations. A total of 5,572 university students from 12 countries were surveyed about suicide ideation, suicide attempts, and psychological distress by means of a self-administered questionnaire. Almost 29% of the samples reported having contemplated suicide and 7% reported attempting suicide. Of the total sample, 51.1% scored above the General Health Questionnaire-12 ≥ 3 cut-off points, 41.6% above the GHQ-12 ≥ 4 cut-off points, and 33.8% scored above the GHQ-12 ≥ 5 cut-off points. While odds of suicide ideation were elevated in Austria and the UK, reduced ORs were detected for China, Italy, Saudi Arabia, Tunisia, and Turkey. Similarly, while odds of suicide attempt were high in Jordan, Palestine, Saudi Arabia, and to some extent in Turkey, reduced ORs were observed for Austria, China, Italy, Japan and the United States. Elevated ORs for psychological distress were seen in Japan, Jordan, Palestine, Saudi Arabia, Tunisia, and Turkey but reduced ORs were noted in Austria, China, Iran, Italy, and the United States. Psychological distress was strongly associated with reports of suicide ideation and attempts. Suicide ideation, suicide attempt, and psychological distress are common in university students but their rates vary depending on the sociocultural context. Due attention should be devoted to the mental health needs of young adults enrolled in higher educational institutions and more cross-cultural research is warranted to better understand the etiology of the observed intersocietal variations in suicidal behavior and psychological distress.

Keywords cross-cultural comparisons, psychological distress, suicide attempt, suicide ideation

INTRODUCTION

The university students of today are the physicians, lawyers, nurses, engineers, economists, psychologists, dentists, pharmacists, historians, public and business administrators, and scientists of the future. The knowledge and expertise that this group attains through their education play a significant role in shaping the future of societies in which they will choose to live and work. This, however, can be actualized if they have the opportunity to develop their full potential and develop optimal degrees of expertise free from mental health problems. Therefore, the mental health needs of university students around the globe deserve more scientific research than anticipated.

Leaving home and living away from home, adjusting to a new social environment, financial difficulties, academic pressure, and so on render the period of university education as a stressful time for young women and men. The most common sources of stress in university students stem from self-imposed stressors and pressures (Hamaideh, 2011). These stressors may have a consequence for this population in terms of reduced mental well-being. Studies indicate that adolescence and young adulthood are the most common onset period for major psychiatric disorders (McGorry, Purcell, Goldstone, & Amminger, 2011; Ormel et al., 2015). The empirical evidence suggests that the prevalence of psychological distress in university students is higher than in the age matched general population in Sri Lanka and Australia (Kuruppuarachchi, Kuruppuarachchi, Wijerathne, & Williams, 2014; Stallman, 2010). In a review, Hunt and Eisenberg (2010) concluded that mental health problems are prevalent among college students and mental disorders increase in number and severity. In a recent study with 1,557 Irish university students, Deasy, Coughlan, Pironom, Jourdan, and Mannix-McNamara

(2014) found that 41.9% of the sample were psychologically distressed according General Health Questionnaire scores.

A more severe form of psychological distress is depression. Though rare during childhood, the rate of depression increases during adolescence and young adulthood (Costello, Copeland, & Angold, 2011; Thapar, Collishaw, Pine, & Thapar, 2012). Depression (either defined as major depression or a score above the cut-off point for major depression on screening instruments such as Beck Depression Inventory) is a common experience of young adults attending university. For instance, in a sample of 14,175 U.S. students, Eisenberg, Hunt, and Speer (2013) found that 17.3% had major depression, 4.1% panic disorder, 7.0% generalized anxiety, 6.3% suicidal ideation, and 15.3% reported nonsuicidal self-injury. In another study with 1,622 Canadian students, Mackenzie et al. (2011) found that 25% of men and 26% of women had depression. Moreover, in a systematic review of 40 scientific articles on mental health problems in Canadian and U.S. medical students, Dyrbye, Thomas, and Shanafelt (2006) concluded that the prevalence of depression in medical students was high. In a recent review, Ibrahim, Kelly, Adams, and Glazebrook (2013) reported a 30.6% weighted mean prevalence of depression in university students.

Suicide is the most severe form and behavioral expression of psychological distress and it is a serious public health concern. The World Health Organization (WHO) estimates that by the year 2020, 1.53 million people will kill themselves and 10–20 times more people will attempt to do so (Bertolote & Fleischmann, 2002). Suicide is the leading cause of death in adolescents and young adults around the globe (Bridge, Goldstein, & Brent, 2006; Bridge, Horowitz, Fontanella, Grupp-Phelan, & Campo, 2014; Haegerich et al. 2014; Wasserman, Cheng, & Jiang, 2005).

Suicidal ideation and attempts are common events in younger sections of the population (Eskin, 2012; Eskin, Kaynak-Demir, & Demir, 2005; Eskin, Voracek, Steiger, & Altinyazar, 2011; Skala et al., 2012; Toprak, Cetin, Guven, Can, & Demirtas, 2011; Zhang, Wang, Xia, Liu, & Jung, 2012). The strongest risk factors for suicidal behavior in university students include psychological distress or depression (Garlow et al., 2008), low social support and affective dysregulation, alcohol use disorder (Arria et al., 2009), and depressogenic cognitive style, (Hiramura, Shono, Tanaka, Nagata, & Kitamura, 2008).

Although not all people who contemplate suicide and those who attempt suicide eventually attempt or die from suicide, nonfatal suicidal behavior constitutes a major risk for completed suicides. For instance, in a longitudinal study it was shown that subjects who have had suicidal ideation during adolescence were twice as likely to have a DSM axis I disorder and were nearly 12 times more likely to have attempted suicide by age 30 (Reinherz, Tanner, Berger, Beardslee, & Fitzmaurice, 2006). The scientific evidence indicates that a suicide attempt is a severe risk for premature deaths (Ostamo & Lönnqvist, 2001). Further, patients presenting to emergency departments of hospitals constitute a burden to national health care systems. Thus, not only suicidal mortality but also nonfatal suicidal behaviors deserve due research attention.

The scientific evidence, mostly from the developed Western nations, suggests that mental health problems are prevalent in this group (Kuruppuarachchi, Kuruppuarachchi, Wijerathne, & Williams, 2014; Ibrahim et al., 2013). The rates of suicide mortality vary among countries (Nock et al., 2008), and nonfatal suicidal behaviors are the most powerful proximal risk factor for suicidal mortality. Contingent upon their religious traditions Muslim nations especially the Arab countries report the lowest suicide

rates (Lester, 2006). Do these observations apply for nonfatal suicidal behavior and psychological distress as well? To answer this question, methodologically sound scientific investigations are needed. Due to ethical reasons, controlled experimental studies on suicide are ruled out. Instead, cross-cultural comparative studies done between nations with varying rates of suicidal mortality may throw important light on the issue. From a methodological point of view, however, cross-cultural comparisons require that the samples should be comparable. University students are similar in age and level of education and therefore comparable. Bearing these issues in mind the current study was conceived and conducted in 12 nations, encompassing from the Far East to the Far West.

METHODS

Participants

Participants in the study were 5,572 (55.3% women) university students from 12 countries with a grand total population of 2,146,739,383 (Austria, China, Iran, Italy, Japan, Jordan, Palestine, Saudi Arabia, Tunisia, Turkey, the UK, and the United States). We have drawn our samples from countries belonging to four culture zones identified by Inglehart and Baker (2000): 1) Confucian (China, Japan), 2) Islamic (Iran, Jordan, Palestine, Saudi Arabia, Turkey, Tunisia), 3) English speaking (UK, United States) and 4) Catholic (Austria, Italy). The principal investigator (ME) recruited researchers in those countries whose specialty was mental health to participate in the current survey. Initially researchers from 14 countries agreed to participate in the study. However, since researchers from 6 countries withdrew due to financial and other reasons, 4 additional countries were recruited, and finally researchers from a total of

12 countries participated in the study. Subjects were undergraduate students of the institutions of each investigator. Inclusion and exclusion criteria were left to each investigator's decision, since systems of institutional review boards differed among the institutions. Investigators of each country explained the purpose of the study to the students and then distributed the questionnaires. Students were also informed that participation in the study was voluntary.

Thus, students consented to take part in a study called "Suicidal Behavior and Attitudes across Nations: A Cross-Cultural Investigation." Demographic characteristics of participants are given in Table 1.

The proportions of participants' gender differed significantly among countries, $\chi^2 = 294.56$, $df = 11$, $p < 0.001$. Overall more women than men participated in this research. However, there were more men than women in the Japanese and Saudi Arabian samples. The age and number of siblings of students among samples

differed significantly (Age: $F_{(11, 5407)} = 105.61$, $p < 0.001$; Number of siblings: $F_{(11, 5560)} = 366.45$, $p < 0.001$). The U.S. sample was the youngest and the UK sample was the oldest, and Jordanian and Palestinian samples had the highest number of siblings and the Chinese had the lowest number of siblings. There were statistically significant differences among samples in maternal ($\chi^2 = 119.10$, $df = 11$, $p < 0.001$) and paternal loss ($\chi^2 = 103.68$, $df = 11$, $p < 0.001$). National samples differed significantly in numbers of siblings, $F_{(11, 5560)} = 366.45$, $p < 0.001$. Samples also differed significantly from one another in terms of parental separation, $\chi^2 = 541.40$, $df = 11$, $p < 0.001$.

In order to better interpret findings from this comparative study, we obtained the latest (for the year 2012) suicide statistics of the 12 countries from the World Health Organization (2014) data bank. The age-standardized suicide rates (suicides per 100,000 population) for the 12 countries were as follows: Austria: 11.5; China: 7.8; Iran: 5.2; Italy: 4.7; Japan: 18.5; Jordan: 2.0;

TABLE 1. Demographic Characteristics of Participants According to Country

Country	N	Gender				Age		Mother Died		Father Died		Par.Sep.		# of siblings	
		Women		Men											
		n	%	n	%	M	SD	n	%	n	%	n	%	M	SD
Austria	627	343	54.7	284	45.3	22.8	3.3	7	1.1	38	6.1	157	26.0	1.4	1.1
China	651	335	52.0	309	48.0	21.5	2.0	11	1.7	8	1.3	27	4.3	0.7	0.9
Iran	1000	603	60.4	396	39.6	22.4	3.9	14	1.4	69	6.9	10	1.0	2.9	1.7
Italy	471	244	51.9	226	48.1	23.3	3.3	13	2.8	23	4.9	40	8.6	1.3	0.9
Japan	246	79	32.5	164	67.5	21.0	2.2	3	1.2	6	2.5	35	15.2	1.3	0.8
Jordan	436	243	59.3	167	40.7	21.1	1.6	13	3.1	46	10.9	23	5.5	4.6	1.8
Palestine	358	213	60.0	142	40.0	20.8	2.5	6	1.7	18	5.0	5	1.4	4.6	2.0
Saudi Arabia	413	124	30.0	289	70.0	25.0	3.5	40	9.7	51	12.3	44	10.7	4.7	2.1
Tunisia	484	373	77.1	111	22.9	21.5	1.9	9	1.9	20	4.1	12	2.6	2.7	1.4
Turkey	497	302	62.5	181	37.5	20.6	1.8	10	2.1	18	3.7	27	5.8	2.3	1.9
UK	150	103	68.7	47	31.3	26.9	8.0	13	8.7	20	13.3	32	21.3	1.8	1.5
USA	239	122	51.0	117	49.0	19.9	3.9	9	3.8	12	5.0	71	30.1	1.7	1.6
Total	5572	3084	55.9	2433	44.1	22.1	3.5	148	2.7	329	6.0	483	8.9	2.5	2.0

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Palestine: not available; Saudi Arabia: 0.4; Tunisia: 2.4; Turkey: 7.9; UK: 6.2; United States: 12.1.

As there is a strong correlation between economic conditions and suicidal behavior and population mental health (Ceccherini-Nelli & Priebe, 2011; Zivin, Paczkowski, & Galea, 2011), indices of economic conditions in the 12 countries may ease the understanding of the results from this study. For this purpose, we have extracted gross domestic product per capita at the current purchasing power parity (GDP/capita in U.S. Dollars), GINI index (an index of inequality for the distribution of national wealth: Where higher values indicate an unequal distribution whereas lower values indicate an equal distribution) and unemployment rate from The Central Intelligence Agency's World Factbook (Central Intelligence Agency [CIA], 2014). Accordingly, GDP/capita, the GINI indices, and unemployment rates were as follows: Austria: 42,600, 26.3, 4.9; China: 9,800, 47.3, 4.1; Iran: 12,800, 44.5, 16.0; Italy: 29,600, 31.9, 12.4; Japan: 37,100, 37.6, 4.1; Jordan: 6,100, 39.7, 14.0; Palestine (West Bank): 2,900, NA, 22.5; Saudi Arabia: 31,300, NA; 10.5, Tunisia: 9,900, 40.0, 17.2; Turkey: 15,300, 40.2, 9.3; UK: 37,300, 32.3, 7.2; United States: 52,800, 45.0, 7.3.

Japanese, Iranian, and Tunisian samples were comprised of only medical students whereas the Saudi Arabian sample was comprised only of students of dentistry. Fields of study of the students in the other samples were mixed and more than 100 fields of study were represented in the total sample.

Instrument

A self-administered questionnaire was utilized to collect the data. The questionnaire included questions about nonfatal suicidal behavior, religious affiliation and

strength of religious belief, attitudes towards suicide and suicidal individuals, individualistic-collectivistic value orientations, and a measure of psychological distress. In this article, the prevalence of suicidal behavior and psychological distress is reported. (In order to keep a clear focus, the associations of suicidal behavior and psychological distress to religion, suicidal attitudes, and individualism-collectivism values will be reported in three separate papers).

Demographics. Participants were asked about their gender, age, number of siblings, parental loss and separation, and field of study.

Suicidal Behavior. There were five questions about past and current suicidal behavior which were responded as Yes = 1 or No = 0. They were:

1. Have you ever thought of killing yourself?
2. Have you, during the past 12-months, thought of killing yourself?
3. Do you have thoughts of killing yourself right now?
4. Have you ever made an attempt to kill yourself?
5. Have you, during the past 12-months, made an attempt to kill yourself?

Participants responding affirmatively to all or at least one of the first three questions were dichotomized as having suicidal ideation and participants responding affirmatively to both or one of questions 4 and 5 were dichotomized as having attempted suicide. Affirmative responses to these five questions were found to be associated with lower problem-solving, social-support, self-esteem, and parental attachment, and higher depression in adolescents (Eskin, Ertekin, Dereboy, & Demirkiran, 2007), adult psychiatric inpatients (Eskin, Akoglu, & Uygur, 2006), and young adults (Eskin, 2012).

Psychological Distress. The 12-item General Health Questionnaire (GHQ-12) (Goldberg & Williams, 1988) is the most widely used screening tool for assessing psychological distress. The reliability and the validity of the GHQ-12 are well established (Goldberg et al., 1997). Its brevity and availability in almost all languages make it attractive and suitable for research purposes. The standard method—0-0-1-1 of scoring was used in the study. In this method, a score of 0 was assigned to the first two low-stress alternatives and a score of 1 was given to the two high-stress alternatives. The method results in individual scores from 0 to 12. The internal consistency reliability of GHQ-12 in this study was 0.87 with item-total correlations ranging from 0.45 to 0.62. The study by Goldberg et al. (1997) suggested varying GHQ-12 cut-off points from a low of 2 to a high of 4 in 15 centers. Therefore, we used three cut-off (GHQ-12 \geq 3, 4, 5) points in this study. Due to practical reasons the GHQ-12 was not administered in the UK.

Procedure

First, the questionnaire and the study protocol were prepared by the principal investigator (ME) and then the other researchers were invited via e-mail to join the study. At the first page of the questionnaire it was highlighted that the study was anonymous. The students were reminded that they did not need to provide personal details. The name, telephone number and e-mail address of the investigator were provided on the first page for participants who might have had personal concerns over the questions.

When data collection was completed a short follow-up researcher survey about the practicalities of data collection was prepared by the leading researcher and sent to the other study sites electronically. According to the information provided by the site researchers, home language

versions of the questionnaire were used in Austria, China, Iran, Italy, Japan, Turkey, the UK and the United States, while the English versions were used in Jordan, Palestine, Saudi Arabia, and Tunisia. Except in Austria, ethical approval was obtained in all study sites. A paper and pencil questionnaire was used to collect the data in all study sites, except the UK, where data were collected via the internet. No adverse effects for participants were recorded during data collection but the data collection was stopped by the ethics committee in the UK due to one ethics committee member's concerns over the possible distress that asking people about suicide could cause. With the exception of Jordan, no researcher reported having legal sanctions against suicidal behavior in their respective country. According to the Jordanian Penal Code, "The person who attempts suicide will be punished by imprisonment from three months to two years."

The number of participants refusing to take part in the study was not documented in Austria, Iran, Palestine and the UK and 80 students in China, 65 in Italy, 64 in Japan, 27 in Jordan, 119 in Saudi Arabia, 12 in Tunisia, 22 in Turkey and no one in the United States refused participation. Fifty-two questionnaires in China, 200 in Iran, 3 in Italy, 42 in Jordan, 34 in Saudi Arabia, 24 in Tunisia, 2 in Turkey, 33 in the UK, and 0 in Austria, Japan, and the United States were discarded due to incomplete information.

Statistical Analyses

Percentages of different forms of suicidal behavior, psychological distress at three cut-off points of GHQ-12, and demographic characteristics of participants were calculated by country and sex. One-way analysis of variance was used to compare the age, number of siblings and

the GHQ-12 scores between the samples. First, the 12 countries were coded as dummy variables and then their associations were tested by calculating the odds ratios (OR) for suicidal behavior and psychological distress. Odds ratios were also computed for testing the relationships between psychological distress, suicidal ideation and attempts, and parental loss and separation. Chi-square tests were used to test possible gender differences. Two binary logistic regression analyses were carried out to identify the GHQ-12 items predicting suicide ideation and attempts independently.

behavior are presented in Table 2. As the table shows, 28.8% of participants endorsed having had suicidal thoughts and 7% reported having attempted to kill themselves. The χ^2 statistics in the table reveal that the proportion of participants endorsing suicidal behaviors differed significantly between the samples from the 12 nations. While highest percentages of students reporting suicidal ideation were noted in Austrian sample, the lowest percentages were noted in the Saudi Arabian sample. The highest percentages of students reporting suicidal attempts were noted in the Jordanian sample, and the lowest percentages were noted in the Italian sample.

RESULTS

Suicidal Behaviors

Numbers and percentages of participants reporting different forms of suicidal

Psychological Distress

Table 3 presents the numbers and percentages of students scoring above the three cut-off points of GHQ-12. As the table displays, 51.1% of participants scored

TABLE 2. Numbers and Percentages of Suicidal Behavior in University Students in 12 Nations

Country	Suicide Ideation								Suicide Attempt					
	Life-time		12 months		Current		Total		Life-time		12 months		Total	
	N	%	N	%	n	%	n	%	n	%	n	%	n	%
Austria	298	47.6	100	15.9	40	6.4	308	49.1	19	3.3	2	0.3	19	3.3
China	142	21.8	46	7.1	15	2.3	149	22.9	23	3.5	8	1.2	25	3.8
Iran	297	29.7	150	15.0	62	6.2	303	30.3	45	4.5	41	4.1	67	6.7
Italy	91	19.4	20	4.3	7	1.5	96	20.5	12	2.6	1	0.2	12	2.6
Japan	63	25.9	23	9.5	2	0.8	63	25.9	7	2.9	1	0.4	7	2.9
Jordan	90	22.0	75	17.7	58	13.6	126	29.6	67	15.8	64	15.1	89	20.9
Palestine	79	22.2	57	16.0	22	6.2	91	25.6	41	11.5	22	6.2	46	12.9
Saudi Arabia	23	17.7	13	10.0	14	10.8	26	20.0	13	10.0	12	9.2	16	12.3
Tunisia	101	20.9	41	8.5	13	2.7	101	20.9	26	5.4	5	1.0	27	5.6
Turkey	119	24.2	43	8.8	16	3.3	122	24.7	42	8.6	11	2.2	43	8.8
UK	59	39.3	23	15.3	5	3.3	59	39.3	11	7.3	4	2.7	11	7.3
USA	75	31.4	24	10.0	1	0.4	75	31.4	8	3.3	0	0.0	8	3.3
TOTAL	1437	27.4	615	11.7	255	4.8	1519	28.8	314	6.0	171	3.3	370	7.0
χ^2	199.2		94.3		137.3		189.6		139.8		278.8		205.4	

Note. All chi-square values are significant $p < 0.001$.

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TABLE 3. Mean, Standard Deviation, and Numbers and Percentages of Participants With Psychological Distress at Three Cut-off Points of GHQ-12 in 11 Nations

	GHQ-12 score		GHQ-12 ≥ 3		GHQ-12 ≥ 4		GHQ-12 ≥ 5	
	M	SD	n	%	n	%	n	%
Austria	2.57	2.73	238	38.0	183	29.2	136	21.7
China	2.43	3.01	228	35.0	179	27.5	137	21.0
Iran	3.03	3.37	453	45.3	368	36.8	296	29.6
Italy	2.81	2.90	200	42.5	138	29.3	109	23.1
Japan	4.46	3.42	161	65.4	134	54.5	118	48.0
Jordan	3.98	2.95	236	54.1	204	46.8	174	39.9
Palestine	4.47	3.05	247	69.0	204	57.0	169	47.2
Saudi Arabia	5.56	3.27	324	78.5	289	70.0	251	60.8
Tunisia	4.34	3.37	309	63.8	253	52.3	208	43.0
Turkey	4.14	3.53	298	60.0	243	48.9	201	40.4
USA	2.06	2.46	77	32.2	60	25.1	34	14.2
Total	3.49	3.29	2771	51.1	2255	41.6	1833	33.8
<i>F</i> * and χ^2	52.64		410.7		385.6		381.5	

Note. * df for $F = (10, 5411)$; F and all chi-square values are significant $p < 0.001$.

Post-Hoc comparisons of GHQ-12 scores with Tukey's Honestly Significant Difference Test.

Austria = China, Iran, Italy, USA <Japan, Jordan, Palestine, Saudi Arabia, Tunisia, Turkey.
 China = Austria, Italy, USA <Iran, Japan, Jordan, Palestine, Saudi Arabia, Tunisia, Turkey.
 Iran = Austria, Italy <Japan, Jordan, Palestine, Saudi Arabia, Tunisia, Turkey>China, USA.
 Italy = Austria, China, Iran, USA <Japan, Jordan, Palestine, Saudi Arabia, Tunisia, Turkey.
 Japan = Jordan, Palestine, Turkey, Tunisia <Austria, China, Iran, Italy, USA>Saudi Arabia.
 Jordan = Japan, Palestine, Turkey, Tunisia <Saudi Arabia>Austria, China, Iran, Italy, USA.
 Palestine = Japan, Jordan, Turkey, Tunisia <Saudi Arabia>Austria, China, Iran, Italy, USA.
 Saudi Arabia >Austria, China, Iran, Italy, Japan, Jordan, Palestine, Turkey, Tunisia, USA.
 Tunisia = Japan, Jordan, Palestine, Turkey <Saudi Arabia>Austria, China, Iran, Italy, USA.
 Turkey = Japan, Jordan, Palestine, Tunisia <Saudi Arabia>Austria, China, Iran, Italy, USA.
 USA = Austria, China, Italy <Iran, Japan, Jordan, Palestine, Saudi Arabia, Tunisia, Turkey.

above the GHQ-12 ≥ 3 cut-off point while 41.6% scored above GHQ-12 ≥ 4 cut-off point and 33.6% scored above the GHQ-12 ≥ 5 cut-off point.

The χ^2 statistics in the table show that the proportions of students scoring at three GHQ-12 cut-off points differed significantly between the samples. A one-way analysis of variance with GHQ-12 total scores as dependent and country as the independent variable produced a significant effect (see Table 3). Post-hoc comparisons with Tukey's honestly significant difference test indicated that Saudi Arabian sample had the highest, the U.S.

sample had the lowest GHQ-12 mean scores (see Table 3).

Table 4 displays the country odds ratios for suicide ideation, attempt, and psychological distress. While the odds for suicidal thoughts were significantly larger for participants from Austria and the UK, the odds for participants from China, Italy, Saudi Arabia, Tunisia, and Turkey were significantly smaller. Odds for suicidal attempts were smaller for participants from Austria, China, Italy, Japan, and the United States, but were larger for participants from Jordan, Palestine, and Saudi Arabia. Odds for GHQ-12 scores above the three cut-off

TABLE 4. Country Odds Ratios (OR) for Suicidality and Scores above the Three Cut-Off Points of GHQ-12

Countries	Suicide Ideation		Suicide Attempt		GHQ-12 ≥ 3		GHQ-12 ≥ 4		GHQ-12 ≥ 5	
	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI
Austria	2.73 ^b	2.31–3.24	0.38 ^b	0.24–0.61	0.55 ^b	0.46–0.65	0.54 ^b	0.45–0.65	0.51 ^b	0.41–0.62
China	0.71 ^b	0.58–0.86	0.50 ^b	0.33–0.75	0.47 ^b	0.40–0.56	0.49 ^b	0.41–0.59	0.48 ^b	0.40–0.59
Iran	1.09	0.94–1.27	0.94	0.71–1.24	0.75 ^b	0.66–0.86	0.78 ^b	0.68–0.90	0.79 ^b	0.68–0.92
Italy	0.61 ^b	0.48–0.77	0.33 ^b	0.18–0.58	0.68 ^b	0.56–0.83	0.56 ^b	0.45–0.68	0.56 ^b	0.45–0.70
Japan	0.86	0.64–1.15	0.31 ^a	0.18–0.81	1.86 ^b	1.42–2.44	1.72 ^b	1.33–2.23	1.86 ^b	1.44–2.41
Jordan	1.04	0.84–1.30	4.30 ^b	3.30–5.56	1.14	0.94–1.39	1.26 ^a	1.03–1.53	1.33 ^b	1.09–1.63
Palestine	0.84	0.66–1.07	2.10 ^b	1.51–2.92	2.34 ^b	1.78–2.82	1.95 ^b	1.57–2.42	1.83 ^b	1.47–2.27
Saudi Arabia	0.61 ^a	0.40–0.94	1.90 ^a	1.11–3.23	3.81 ^b	3.00–4.85	3.61 ^b	2.90–4.49	3.36 ^b	2.73–4.13
Tunisia	0.63 ^b	0.50–0.79	0.76	0.51–1.14	1.78 ^b	1.46–2.16	1.61 ^b	1.33–1.94	1.54 ^b	1.27–1.86
Turkey	0.80 ^a	0.64–0.98	1.31	0.94–1.82	1.49 ^b	1.23–1.79	1.39 ^b	1.15–1.67	1.37 ^b	1.14–1.66
U.K.	1.62 ^b	1.16–2.67	1.05	0.56–1.96	NA	NA	NA	NA	NA	NA
USA	1.14	0.86–1.50	0.45 ^a	0.22–0.91	0.44 ^b	0.33–0.58	0.46 ^b	0.34–0.61	0.31 ^b	0.22–0.45

Note. Associated chi-square values are significant at: ^a $p < 0.05$; ^b $p < 0.01$.

points were smaller for participants from Austria, China, Italy, and the United States, but larger for participants from Japan, Jordan, Palestine, Saudi Arabia, Tunisia, and Turkey.

Gender Differences

In the whole sample, significantly more men ($n = 675$, 30.4%) than women ($n = 834$, 27.7%) reported suicidal ideation, $\chi^2_{(1)} = 4.55$, $p = 0.033$, while similar percentages of men ($n = 141$, 6.4%) and women ($n = 222$, 7.4%) endorsed having had attempted suicide, $\chi^2_{(1)} = 2.08$, $p = 0.150$. Significantly more women ($n = 1274$, 42.7%) than men ($n = 953$, 39.9%) scored ≥ 4 cut-off point of the GHQ-12, $\chi^2_{(1)} = 4.27$, $p = 0.039$.

Table 5 shows the odds ratios for gender differences in suicidal behavior and psychological distress. As it can be seen in the Table, significantly more men than women reported suicide ideation in Iran, Italy and Palestine but significantly more

women than men in China. Significantly more men than women in Iran and more women than men in Jordan said that they had attempted to kill themselves. More women than men scored above the three cut-off point in Austria, Japan and Jordan, and more women than men scored above the lowest cut-off point in Italy.

Psychological Distress and Suicidal Behavior

Table 6 presents odds ratios between suicidal ideation, suicidal attempts and scoring at three cut-off points of GHQ-12 in eleven countries. As the table shows scoring above three cut-off points of GHQ-12 were associated with larger ORs for both contemplating and attempting suicide in all countries.

Table 7 presents the results from two binary-logistic regression analyses predicting suicidal thoughts and attempts. While feeling worthless, losing sleep, being unable to make decisions predicted both

TABLE 5. Odds Ratios for Gender Differences in Suicidal Behavior and Psychological Distress by Country (Women = 1; Men = 0)

Countries	Suicide Ideation		Suicide Attempt		GHQ-12 ≥ 3		GHQ-12 ≥ 4		GHQ-12 ≥ 5	
	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI
Austria	1.07	0.78–1.46	2.37	0.85–6.67	2.31 ^b	1.65–3.23	2.09 ^b	1.46–2.99	1.77 ^b	1.19–2.62
China	1.56 ^a	1.07–2.26	2.01	0.86–4.73	1.13	0.82–1.56	1.24	0.88–1.76	0.97	0.67–1.42
Iran	0.70 ^a	0.54–0.93	0.54 ^a	0.33–0.89	0.99	0.76–1.27	1.08	0.83–1.41	1.02	0.77–1.35
Italy	0.53 ^b	0.33–0.83	1.29	0.41–4.14	1.65 ^b	1.14–2.38	1.41	0.95–2.11	1.43	0.93–2.21
Japan	0.98	0.53–1.82	1.61	0.35–7.38	1.89 ^a	1.04–3.43	1.87 ^a	1.07–3.25	1.87 ^a	1.09–3.22
Jordan	1.36	0.88–2.12	2.02 ^b	1.19–3.43	1.77 ^b	1.19–2.64	1.78 ^b	1.19–2.66	1.94 ^b	1.28–2.94
Palestine	0.46 ^b	0.28–0.74	0.70	0.37–1.30	0.72	0.45–1.14	0.67	0.44–1.04	0.82	0.54–1.26
Saudi Arabia	0.89	0.37–2.14	0.86	0.29–2.52	0.80	0.49–1.33	0.82	0.52–1.28	0.77	0.50–1.19
Tunisia	0.88	0.53–1.47	0.69	0.29–1.62	1.34	0.87–2.07	1.27	0.83–1.93	1.25	0.81–1.93
Turkey	0.85	0.56–1.29	1.28	0.66–2.49	1.10	0.76–1.61	0.89	0.62–1.29	0.93	0.64–1.36
U.K.	1.39	0.68–2.85	2.15	0.45–10.38	NA	NA	NA	NA	NA	NA
USA	0.61	0.35–1.06	0.96	0.23–3.92	0.78	0.45–1.34	0.79	0.44–1.42	1.25	0.60–2.60

Note. Associated chi-square values are significant at: ^a $p < 0.05$; ^b $p < 0.01$.

TABLE 6. Odds Ratios Between Suicidal Behavior and Three GHQ-12 Cut-Off Scores According to Country

Country	Suicide Ideation						Suicide Attempt					
	GHQ-12 ≥ 3		GHQ-12 ≥ 4		GHQ-12 ≥ 5		GHQ-12 ≥ 3		GHQ-12 ≥ 4		GHQ-12 ≥ 5	
	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI
Austria	2.10 ^b	1.51–2.92	2.43 ^b	1.70–3.47	2.90 ^b	1.93–4.34	0.75	0.28–2.00	0.64	0.21–1.95	0.67	0.19–2.33
China	2.07 ^b	1.42–3.00	2.08 ^b	1.41–3.07	2.74 ^b	1.82–4.13	2.90 ^b	1.28–6.57	3.00 ^b	1.34–6.70	3.11 ^b	1.38–7.02
Iran	2.72 ^b	2.06–3.59	2.74 ^b	2.07–3.62	3.04 ^b	2.28–4.06	5.04 ^b	2.76–9.22	3.13 ^b	1.87–5.23	2.64 ^b	1.60–4.35
Italy	1.78 ^a	1.14–2.82	1.59	1.00–2.56	1.69 ^a	1.03–2.78	2.76	0.81–9.30	5.03 ^b	1.49–16.99	4.87 ^b	1.51–5.68
Japan	2.90 ^b	1.45–5.81	2.96 ^b	1.58–5.55	2.61 ^b	1.44–4.74	3.32	0.39–28.01	5.24	0.62–44.18	2.81	0.54–14.80
Jordan	3.12 ^b	1.97–4.92	3.18 ^b	2.05–4.93	3.02 ^b	1.96–4.64	8.09 ^b	4.15–15.75	6.10 ^b	3.48–10.69	6.61 ^b	3.88–11.27
Palestine	3.41 ^b	1.80–6.45	3.02 ^b	1.77–5.17	2.77 ^b	1.68–4.56	5.38 ^b	1.88–15.40	4.90 ^b	2.13–11.28	4.79 ^b	2.30–10.00
Saudi Arabia	2.96	0.83–10.63	3.58 ^a	1.15–11.14	2.86 ^a	1.06–7.69	5.60	0.71–44.21	9.43 ^b	1.20–73.91	5.87 ^b	1.28–27.03
Tunisia	3.77 ^b	2.13–6.68	4.62 ^b	2.75–7.79	3.79 ^b	2.37–6.04	15.99 ^b	2.15–118.86	26.34 ^b	3.55–195.77	8.45 ^b	2.88–24.85
Turkey	2.63 ^b	1.65–4.18	2.84 ^b	1.84–4.37	2.86 ^b	1.88–4.36	2.05 ^a	1.01–4.16	2.62 ^b	1.33–5.15	3.05 ^b	1.59–5.88
USA	2.77 ^b	1.56–4.92	2.23 ^b	1.22–4.10	2.53 ^a	1.21–5.30	6.76 ^b	1.33–34.32	5.33 ^a	1.24–23.04	2.07	0.40–10.72
Total	2.11 ^b	1.86–2.39	2.22 ^b	1.97–2.52	2.32 ^b	2.06–2.65	4.43 ^b	3.40–5.78	4.31 ^b	3.39–5.46	4.18 ^b	3.34–5.23

Note. Associated chi-square values are significant at: ^a $p < 0.05$; ^b $p < 0.01$.

TABLE 7. GHQ-12 Items Predicting Suicidal Ideation and Attempts in Binary Logistic Regression Analysis

Predictor Variables	Reporting suicidal behavior = 1 Not reporting suicidal behavior = 0						
	B	SE	Wald	DF	P =	e ^B	95% CI
Suicidal Ideation							
Constant	-0.92	0.03	879.13	1	0.000		
Felt as a worthless person	0.50	0.04	206.74	1	0.000	1.65	1.54–1.77
Lost sleep over worry	0.24	0.04	45.62	1	0.000	1.28	1.19–1.37
Could not make decisions	0.23	0.04	26.92	1	0.000	1.24	1.15–1.37
Lost self confidence	0.17	0.04	15.35	1	0.000	1.19	1.09–1.30
Not playing a useful part in things	0.11	0.05	4.73	1	0.000	1.12	1.01–1.23
Suicide Attempt							
Constant	-2.58	0.06	2228.15	1	0.000		
Felt as a worthless person	0.75	0.06	173.84	1	0.000	2.11	1.89–2.36
Lost sleep over worry	0.33	0.06	26.64	1	0.000	1.36	1.22–1.57
Could not make decisions	0.28	0.07	14.46	1	0.000	1.32	1.14–1.52

suicidal thoughts and attempts; losing self-confidence, and feelings of not playing a useful part in things made independent contributions in predicting suicidal thoughts (see Table 7).

three cut-off points of the GHQ-12. Parental separation was associated with increased risk for having contemplated suicide only.

Parental Loss-Separation and Suicidal Behavior and Psychological Distress

DISCUSSION

Table 8 shows the associations between parental loss-separation with suicidal behavior and psychological distress. Both maternal and paternal loss were associated with increased risk for having attempted suicide, and scored above the

Mental health problems in young adults enrolled in higher education is an important but mostly neglected issue especially in low and middle-income countries. Studies conducted so far, mostly in the United States, Western Europe, and Australia suggest that university students represent

TABLE 8. Odds Ratios (OR) for Parental Loss-Separation, Suicidality and Scores Above the Three Cut-Off Points of GHQ-12

Variables	Suicide Ideation		Suicide Attempt		GHQ-12 ≥ 3		GHQ-12 ≥ 4		GHQ-12 ≥ 5	
	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI	OR	%95 CI
Maternal loss	1.23	0.84–1.81	1.94 ^a	1.11–3.36	2.79 ^b	1.89–4.12	2.52 ^b	1.77–3.59	1.96 ^b	1.39–2.76
Paternal loss	1.29	0.90–1.49	1.72 ^b	1.18–2.51	1.60 ^b	1.27–2.03	1.58 ^b	1.26–1.99	1.45 ^b	1.15–1.83
Parental separation	1.58 ^b	1.30–1.93	1.17	0.82–1.68	0.98	0.81–1.19	0.99	0.81–1.21	0.86	0.70–1.06

Note. Associated chi-square values are significant at: ^a*p* < 0.05; ^b*p* < 0.01.

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a vulnerable group (Locke, Bieschke, Castonguay, & Hayes, 2012; Storrie, Ahern Tuckett, 2010). The present paper focuses on the prevalence of nonfatal suicidal behavior and psychological distress in samples of university students from 12 nations.

The findings from the present study confirm that the prevalence of psychological distress in university students is widespread. In our sample of 5,572 students from 12 countries we found that almost 29% had considered and 7% had attempted to kill themselves at some point in their lives. Moreover, more than 1/3 of students reported experiencing psychological distress to the extent that they could be classified as a psychiatric case. These numbers speak for themselves: young adults enrolled in higher educational institutions can feel psychologically distressed to the extent that they contemplate and attempt to end their lives despite the potential for a long fulfilling life ahead.

Suicidal behavior presents a large inter-societal variation (Nock et al., 2008; Värnik, 2012; Weissman et al., 1999) and multifaceted etiology (Mann et al., 2005). The present paper reports the prevalence rates of nonfatal suicidal behavior and psychological distress in samples of young adults from 12 countries with varying levels of suicidal mortality. Except the two non-Arab nations (Iran and Turkey), the Arab Muslim countries have the lowest rates while Japan, the United States, and Austria have the highest rates. Therefore, we anticipated that the prevalence rates of nonfatal suicidal behavior would vary between countries and our anticipation was confirmed. Previous research has indicated that suicide ideation and attempts are proximal risk factors for suicidal mortality and indicators of severe psychopathology (Beautrais, 2003; Ostamo & Lönnqvist, 2001; Reinherz, Tanner, Berger, Beardslee, & Fitzmaurice, 2006). On the basis of the observed national suicide rates, we anticipated that the prevalence rates of suicide

ideation and attempts would be lower in Arab countries than those in the traditionally high suicide rate countries plus in two non-Arab Muslim nations (Iran and Turkey).

Odds Ratios between suicidal behavior and country in Table 4 partially support our anticipation. Heightened odds ratios for suicide ideation were observed for participants from Austria, the UK and to some extent the United States but not for participants from Japan. Reduced ORs for suicide ideation were observed for participants from China, Italy, Saudi Arabia, Tunisia, and Turkey. But, interestingly, the picture is reversed for suicide attempts. Higher ORs were observed for suicide attempts for participants from Jordan, Palestine, Saudi Arabia, and to some extent for Turkey. In a similar fashion, previous comparative investigations (Eskin, 1995; Eskin, 1999; Eskin et al., 2011; Eskin, Palova, & Krokavcova, 2014) found that while the percentages of Turkish adolescents and young adults reporting suicide ideation were similar to or lower than percentages of adolescents and young adults in Slovakia, Sweden, and Austria but higher percentages of Turkish youth reported attempting suicide than their Slovak, Swedish, and Austrian peers.

Why do participants from Muslim countries report lower rates of suicide ideation but higher rates of attempting suicide and psychological distress? This contradiction deserves some attention. Three plausible explanations may be offered for this contradictory finding. First, participants from Muslim countries may be distorting their past personal memories to fit them in with the doctrines of their religious faith. The suicide attempt, however, as a concrete act may not be amenable for distortion. For Schacter, Guerin, and St Jacques (2011) memory is prone to distortions and is a reconstruction of the past into a meaningful personal narrative. It seems that scientific work documenting lower suicide

ideation rates in Muslim subjects is an artifact of memory distortion rather than a factual observation. Second, suicide rates are in fact not as low as officially reported in Muslim Arab countries. There is scientific evidence supporting this view, especially for Middle Eastern Arab nations. For instance, Pritchard and Amanullah (2007) have shown that most suicides are misclassified as Other Violent Deaths in Middle Eastern Muslim Arab nations but not in European Muslim nations such as Albania, Bosnia-Herzegovina, or Turkey. Third, prevailing social, economic, and political conditions in Muslim countries may be responsible for the higher percentages of suicide attempts and psychological distress. For instance, high rates of suicide attempts and psychological distress in Palestinian youth could be attributed to the psychological impact of living under occupation/conflict situation, siege and restrictions on movement, low prospect of peace and prosperity, as well as economic and social hardships (poverty, unemployment etc.). Though in varying degrees, another issue is the restrictions on freedom of expression and intimidation of demands for individual, liberal, and political rights in Muslim countries. This has been observed during the Arab Spring uprisings (Bellin, 2012) and Gezi protests in Istanbul (Göle, 2013). According to the latest Freedom in the World Report by Freedom House (2015) among the Muslim countries only Tunisia was classified as free and Turkey as partly free. Iran, Jordan, and Saudi Arabia are classified as not free. Likewise, China was also classified as not free in this report. Restrictions on freedom of expression might create a sense of hopelessness and helplessness which are the two most prominent emotional states in suicidality (Ellis & Rutherford, 2008). This line of reasoning, however, does not hold true for the Chinese and Iranian samples in our study. It is possible that restrictions on freedom of expression in

China and Iran are seen as ideologically legitimate.

The psychiatric disorders are the strongest predisposing factors for suicide (Garlow et al., 2008; Hawton, Casañas i Comabella, Haw, & Saunders, 2013). Findings from this study are in line with this assertion. The odds ratios given in Table 6 show clearly that participants having contemplated or attempted suicide scored above the three cut-off points of GHQ-12 in all countries. If psychological distress is the most potent proximal risk factor for suicide, then students from countries with high suicide rates would report psychological distress to a greater extent than those from low suicide rate countries. If, on the other hand, extremely low suicide rates in Muslim nations are due to misreporting then there would have been no difference. The results from the study show that except the Japanese sample, students from Muslim countries had high mean GHQ-12 scores and they also had elevated ORs for scoring above the three cut-off scores on the GHQ-12 (see Tables 3 & 4).

Suicidal behavior and psychological distress show a gendered pattern, with more women than men reporting suicidal ideation and attempts and more men actually killing themselves than women (Canetto & Sakinofsky, 1998). Gender differences in our data were not large. For suicide ideation, gender differences were observed in only four countries. Contrary to what might have been expected, more men reported suicide ideation than women in Iran, Italy, and Palestine while more women than men reported suicide ideation in China. For suicide attempts, gender differences emerged in two countries. More men than women reported having attempted suicide in Iran while more women than men reported having done so in Jordan. As for psychological distress, differences between men and women were observed in Austria, Japan, and Jordan.

In these three countries more women than men scored above the cut-off score of 4 on the GHQ-12. Not observing gender differences in most countries might be due to the nature of our sample. University students are the most educated segment of populations and hence differences in gender roles might be diminishing in this group.

It is well documented that adverse life conditions are associated with increased risk for suicide and poor mental well-being (Adam, Bouckoms, & Streiner, 1982; Jakobsen & Christiansen, 2011; Jeon et al., 2013; Kendler, Neale, Kessler, Heath, & Eaves, 1992). Findings from this cross-national study confirm and extend previous findings. According to our findings, both maternal and paternal loss were associated with increased risk for having attempted suicide and heightened scores for psychological distress but not having contemplated suicide. Parental separation was only related to reports of having thought of suicide.

Overall, our results have implications for policy, practice and scientific enquiry. First, both nonfatal suicidal behavior and psychological distress are frequent events among young adults and show considerable variation. Therefore, prevention strategies should be considered as a public health policy priority. Second, feelings of psychological distress are strongly related to the reports of suicide ideation and attempts. Third, for clinical suicide risk assessment and research purposes, enquiring only about suicidal thoughts in sociocultural contexts where suicide is culturally disapproved might miss those who are really at risk for suicide. Moreover, young adults' subjective experiences of deteriorations in self-efficacy and sleep disturbances are predictive of suicide ideation and attempts. Indeed, in a recent study, Nadorff, Nazem, and Fiske (2011) have shown that sleep disturbances in college students were associated with suicide ideation. Therefore, due attention should be given to these issues

when assessing risk for suicide in young adults. Fourth, elevated odds ratios for suicidal behavior and psychological distress were observed in Muslim countries where self-killing is strictly prohibited by the religious scripture. Therefore, policies directed at reducing levels of psychological distress and meeting mental health needs of young people in these countries should be considered a public health priority.

The findings from this cross-national investigation revealed that nonfatal suicidal behavior and psychological distress are common in university students in all countries and they also show considerable variation across 12 nations. Future studies aiming at investigating the underlying causes of these issues are warranted. While reporting lower levels of suicide ideation, participants in Arab Muslim countries reported heightened odds of attempting suicide. Is this discrepancy due to personal construction of past memories into a personal narrative coherent with their religious traditions? Or, is there a differential meaning attached to contemplating and attempting suicide for this apparent contradiction? These issues remain to be resolved by future scientific investigations. Given the widespread prevalence of nonfatal suicidal behavior and psychological distress, future scientific efforts should be directed to designing and testing the strategies that best meet mental health needs of young adults and best ways of reaching young adults with emotional problems.

Although current findings shed some light on the variation and the nature of mental health problems of university students, they should be approached with caution for a number of reasons. First, we have no claim that our samples are representative of the general populations of countries under scrutiny. The university students are representative of neither the young segments of countries nor the whole populations. Second, as it is asked in this study, what attempting suicide entails is

not clear. Does it involve a serious intention to kill oneself? Or did the attempt require medical attention? These issues are not clear from our data. Third, though anonymous, self-administered paper and pencil questionnaires may not be suitable for collecting data on culturally sensitive topics such as suicide. Fourth, the nature of the event by contextual sensitivities may influence the reports of suicidal behavior. One way to check this is to analyze the missing data. Ranges for the number of missing values in our data for five suicide ideation and suicide attempt questions were: Austria: 0–1; China: for all 1; Iran: none; Italy: for all 2; Japan: for all 3; Jordan: 11–27; Palestine: 2; Saudi Arabia: for all 283; Tunisia: 1; Turkey: 5–8; UK: none; United States: none. Extremely high numbers of missing values in the Saudi Arabian data may be due to religious views about suicide and clearly jeopardizes the validity of the findings from the Saudi Arabian data set.

In closing, we would like to raise some points that may have significance for our findings. Besides practical difficulties, some methodological challenges are an inherent part of scientific investigations involving cross-national comparisons. The challenges are related to the very validity of the obtained results from such studies. In order to interpret the results from cross-national comparisons one should be able to make the assumption that measures across the groups are equal. According to He and van de Vijver (2012) and Van de Vijver and Poortinga (1997) there are three kinds of bias that may endanger the validity and the generalizability of results in cross-cultural comparisons. They are: 1) construct bias, 2) method bias, and 3) item bias. Construct bias indicates that the construct measured is not identical across cultures. Method bias relates to sampling procedures, instrument characteristics, response style, and administration processes. Item bias involves the differential

psychological meaning of items across cultures. These three biases might have been involved in this study in varying degrees. We are of the opinion that our study is prone to method and item biases. Our results therefore should be regarded as tentative but informative at this stage. Therefore, future studies with methodologically sound sampling procedures are warranted.

AUTHOR NOTE

Except the first author, the first eleven authors are by random order and the last twelve authors are by alphabetical order.

Mehmet Eskin, Faculty of Medicine, Department of Psychiatry, Adnan Menderes University, Aydin, Turkey.

Jian-Min Sun, Department of Psychology and School of Labor and Human Resources, Renmin University of China, Beijing, China.

Jamila Abuidhail, Faculty of Nursing, The Hashemite University, Zarqa, Jordan.

Kouichi Yoshimasu, Department of Hygiene, School of Medicine, Wakayama Medical University, Wakayama, Japan.

Omar Kujan, Department of Oral and Maxillofacial Sciences, Al-Farabi College for Dentistry and Nursing, Riyadh, Saudi Arabia.

Mohsen Janghorbani, School of Public Health, Isfahan University of Medical Sciences, Isfahan, Iran

Chris Flood, School of Health Sciences, City University of London, London, UK

Mauro Giovanni Carta, Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Cagliari, Italy.

Ulrich S. Tran, Department of Basic Psychological Research and Research Methods, School of Psychology, University of Vienna, Vienna, Austria.

Anwar Mechri, Department of Psychiatry, University hospital of Monastir, Monastir, Tunisia.

Motasem Hamdan, School of Public Health, Al-Quds University, Jerusalem, Palestine.

Senel Poyrazli, School of Behavioral Sciences and Education, Pennsylvania State University-Harrisburg, Middletown, PA, USA.

Khouala Aidoudi, Department of Psychiatry, University hospital of Monastir, Monastir, Tunisia.

Seifollah Bakhshi, School of Public Health, Isfahan University of Medical Sciences, Isfahan, Iran.

Hacer Harlak, Faculty of Arts and Sciences, Department of Psychology, Adnan Menderes University, Aydin, Turkey.

Maria Francesca Moro, Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Cagliari, Italy.

Hani Nawafleh, Princess Aisha Faculty of Nursing and Health Sciences, Al-Hussein Bin Talal University, Ma'an, Jordan.

Louise Phillips, School of Health Sciences, City University of London, London, UK.

Amira Shaheen, Faculty of Medicine and Health Sciences, An-Najah National University, Nablus, West Bank, Palestine.

Shahama Taifour, Department of Oral and Maxillofacial Sciences, Al-Farabi College for Dentistry and Nursing, Riyadh, Saudi Arabia.

Kanami Tsuno, Department of Hygiene, School of Medicine, Wakayama Medical University, Wakayama, Japan.

Martin Voracek, Department of Basic Psychological Research and Research Methods, School of Psychology, University of Vienna, Vienna, Austria.

Correspondence concerning this article should be addressed to Mehmet Eskin, Department of Psychiatry, Faculty of Medicine, Adnan Menderes University, Aydin, Turkey. E-mail: meskin48@gmail.com or eskin_mehmet@yahoo.com.tr

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