



# The Role and Comparison of Stressful Life Events in Suicide and Suicide Attempt: A Descriptive-Analytical Study

Mostafa Farahbakhsh <sup>1</sup>, Ali Fakhari<sup>1</sup>, Elham Davtalab Esmaeili <sup>1</sup>, Hosein Azizi <sup>1,2,3,\*</sup>, Mohammad Mizapour<sup>4</sup>, Vahab Asl Rahimi<sup>5</sup> and Leila Hashemi<sup>1</sup>

<sup>1</sup>Research Center of Psychiatry and Behavioral Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>2</sup>Department of Epidemiology and Biostatistics, School of Health, Tehran University of Medical Sciences, Tehran, Iran

<sup>3</sup>Social Determinants of Health Research Center, Health Management and Safety Promotion Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>4</sup>Malekan Health Center, Tabriz University of Medical Sciences, Malekan, Iran

<sup>5</sup>Unit for Adolescence Health, Province Health Center, Tabriz, Iran

\*Corresponding author: Department of Epidemiology and Biostatistics, School of Health, Tehran University of Medical Sciences, Tehran, Iran. Tel/Fax:+98-4133826512, Email: epid\_azizi@yahoo.com

Received 2019 July 13; Revised 2020 January 04; Accepted 2020 March 24.

## Abstract

**Background:** In recent years, suicide in Iran has become a growing concern. Although stressful life events (SLEs) are increasing as a global prevalence, suicide attempters (SAs) and the impact and association between suicide and SLEs are poorly understood.

**Objectives:** This study aimed at examining the role and effect of SLEs in suicides and SAs.

**Methods:** This descriptive-analytical study was performed during 2014 to 2016 based on 186 records (through random quota sampling) of suicidal behaviors (SBs), including 154 SAs and 32 suicide cases in Malekan County, East Azerbaijan, Iran. A valid semi-structured Life Event questionnaire (LEQ) with 43-items of common types of SLEs in the last year before SBs was used by trained interviewers through single sitting and face to face interviews. The point-biserial correlation and multiple logistic regression analysis were utilized to estimate the adjusted odds ratios and confidence intervals for suicide risk.

**Results:** A significant correlation was found between SLEs scores and suicide ( $R = 0.739$ ). Comparing SLEs types between the two groups of SAs and suicides, it was revealed that the highest odds ratios were related to financial problems ( $OR = 11.9$ ; 95%  $CI = 4.00 - 35.85$ ), early marriage ( $OR = 4.97$ ; 95%  $CI = 1.68 - 14.65$ ), exposure to new conditions ( $OR = 8.79$ ; 95%  $CI = 1.3 - 59.22$ ), and family conflicts ( $OR = 2.53$ ; 95%  $CI = 1.23 - 6.53$ ), respectively.

**Conclusions:** SLEs are most strongly associated with committing suicide. Suicide determinants are different from SA. SLEs management by health systems is imperative to improve life skills in suicide prevention.

**Keywords:** Attempt Suicide, Self-Injury Behaviors, Stressful Life Events, Suicide, Iran

## 1. Background

Suicide is the act or an instance of taking one's own life voluntarily and intentionally that may lead to a non-fatal or fatal outcome (1). It is the tenth leading cause of death worldwide (2). In recent decades, the average annual rate of suicide attempts (SA) was estimated from 2.6 to 1100 per 100,000 persons per year, and the annual mortality rate of suicide is 14.5 deaths per 100,000 people (3, 4). Also, 10% - 18% of the general population has suicidal thoughts, and 3% - 5% of them have a history of SA during their lifetime (5). Suicide and SA were considered as the most important social problems in developed countries; however, it is increasing in developing countries, as well. As an instance, among the general population of the United States, the rate of SA was reported 0.3 to 4.6% (6).

According to recently published studies with an overall trend of 20 years, Iran, as a developing country, suffers from an enhancement in suicidal deaths with an estimated average rate of 9.9 per 100,000 persons per year (7). In Iran, on average, it was 200 years of life lost (YLL) per 100,000 individuals due to suicide behaviors (SBs) and self-inflicted violence (8). It is noteworthy that the most frequent method of suicide in Iran is drug use and the prevalence of suicide is greatest in the summer with a 35.2% occurrence, which is almost 13% higher than other seasons. Regarding gender, females are much more likely to SA. Compared with the rural attempters, the urban population has shown more likely to commit suicide (9). There is an association between natural disasters and committing suicide due to mental distress. Therefore, there might be a relationship between exposure to natural disasters and

suicide (10).

As mentioned, stressful life events (SLEs) as one of the main risk factors for SBs are increasing as a global prevalence, and often have been linked to impulsive SA (11-13). Individuals with a history of suicide or SA are at high risk for SLEs in their lifetime (11). SLEs, such as family or marital disagreement and conflicts, unexpected loss of loved ones, early marriage, serious financial problems, and other stress factors are increasing in Iran and worldwide and are extremely associated with suicide and SA (9). Studies conducted in Iran have indicated that early marriage and family conflicts are the most stressful social problems with high prevalence; unfortunately, more than 7.7% of girls in Tehran and 40% in Sistan and Baluchestan Province got married before the age of 18 (14, 15). Although an association was found between SLEs and risk of cancers (16), very few studies have been done to explore the role of various types of SLEs, particularly on suicide and suicide prevention in Iran and developing countries. Although the predictors and causality of suicide and SA are different, few studies have addressed this issue, at least in developing countries (17).

## 2. Objectives

As noted above, the number of studies on the correlation between SLEs and suicide or SA is limited and most of them have been conducted in western societies (11, 13). Also, studies in western countries have focused on investigating the relationship between SLEs and SA rather than suicide. Likewise, the current study aimed at assessing the role of SLEs in suicide and SAs while making comparisons among different factors in Malekan County, East Azerbaijan Province, Iran.

## 3. Methods

### 3.1. Study Design

This descriptive-analytical study was performed based on SBs records obtained from the registration system of the bureau of mental health service in Malekan County, East Azerbaijan, Iran, from 2014 to 2016. In Iran, all SBs were registered in the national registration system, which has been launched since March 2009. Out of 624 cases with a history of suicidal behaviors, 186 samples were selected through random quota sampling based on the frequency of SBs occurred. Among these samples, 32 cases committed suicide, and others (154) only had SAs. Individuals who did not reside in the studied geographical location, and those who were not willing to participate in the study were excluded.

### 3.2. Data Collection

A standard checklist was used to collect primary data from all cases with a history of SB by Farabi Hospital, health homes, and health centers. Since the primary data of SBs were collected at the time of the occurrence of the event by emergency or community health workers in health homes, all SBs data were registered.

Semi-structured interviews were conducted using a valid and reliable Life Event questionnaire (LEQ), developed by Holms and Rahe, with a Cronbach's Alpha of 0.762 to assess SLEs, which previously was used in its Persian version (16). This self-report LEQ is a 43-item of various common types of SLEs in the last 12 months, including loss of loved ones (parents, offspring, spouse, and first-degree relatives), any family-oriented problems or conflicts (with first- and second-degree family members), marital conflicts (disputes, divorce, or separation), unemployment for more than 6 months, serious financial and occupational problems, failures in (studying or working), exposure to new conditions, early marriage (before the age of 18), being immigrant or refugee, and emotional problems with the opposite sex.

After each SB, the subjects were invited to the health center or a hospital in order to conduct semi-structured face to face interviews by trained interviewers (clinical psychologists) one day later. The face to face interview lasted at least half an hour; each interview was done separately and confidentially at a single sitting to identify the risk factors and motivations for SA. Furthermore, to make an attempt to delve into minds of those who died after suicide, we consulted with native community health workers (Behvarz in Persian) to obtain the initial information, especially, facts concerning the closest emotional person to deceased cases, such as their family members, including parents, spouse, or siblings to be interviewed. It is worth mentioning that native community health workers (Behvarz) in Iranian rural areas who are available in all villages in health homes are fully aware of socio-demographic and health situations of all people living in the village or covered area.

### 3.3. Statistical Analysis

The SPSS software (version 19.0, Chicago, IL, USA) was used for data analysis. Also, the Kolmogorov-Smirnov test was applied to check the normal distribution of data, chi-square ( $\chi^2$ ) test to assess the relationship between suicide and dichotomous and nonparametric variables, and independent *t*-test and Man-Whitney test to compare SLEs scores between two groups of SA and suicide. In addition, the point-biserial correlation coefficient was utilized for measuring the association between SLEs scores and the outcome of SA. Multiple logistic regression analysis was

used to estimate the adjusted odds ratio (OR) with a 95% confidence interval (CI) for the risk factors and suicide. In all tests, the confidence interval was considered 95%, and P value < 0.05 was significant.

### 3.4. Ethical Approval

This study was funded by the Social Determinants of Health Research Center (SDHRC) and approved by the Ethics Committee of Tabriz University of Medical Sciences (code: IR.TBZMED.REC.1394.674). Informed consent was obtained from all subjects before the interview. All participants' names and information were entered into the computer as a code, and the names were anonymous, and the information kept strictly confidential.

## 4. Results

According to the findings, out of 186 SBs in this study, 154 cases had SAs, and 32 individuals committed suicide. Women were found roughly two times more likely to attempt suicide (64.2% of SAs); however, men were approximately three times more likely to die from suicide (71.8%).

The prevalence of SA was highest among individuals aged 10 - 25 years, which was over half of the incidences (61.68%), whereas the age group of 26 - 40 years suffered from the most frequent rate of suicide (56.25%). Age and sex had a significant association with suicide ( $P = 0.003$ ,  $P = 0.001$ ). Significant differences were also found between occupation, marital disagreement, income level, place of residence, and suicide. Additionally, no participant was younger than the age of ten or over 75 years (Table 1).

Table 2 presents various types of SLEs in SAs and suicides. In univariate analysis, family conflicts, marital disagreement, financial problems, emotional problems, migration, and exposure to new conditions, and early marriage indicated a statistically significant relationship with suicide.

Similarly, mean and standard deviation (12) of the SLEs scores in suicide ( $447 \pm 27.06$ ) were found to be significantly ( $P$  value < 0.001) more than SA ( $552 \pm 23.75$ ). The point-Biserial correlation was 0.739 in the association between suicide and SLEs scores (Table 3).

Table 4 demonstrates the results of multiple logistic regression analysis for adjusted ORs and 95% CIs for suicide and demographic characteristics with a  $P$  value of < 0.2. After adjusting for marital status, a significant association was found between suicide and the age of 26 - 40 years (OR = 6.34; 95% CI = 2.1 - 19.15), male gender (OR = 3.48; 95% CI = 3.48 - 9.24), income level (more than 20 million per month) (OR = 9.5; 95% CI = 1.49 - 60.29), and being self-employed (OR = 6.88; 95% CI = 1.73 - 27.53).

**Table 1.** Selected Socio-Demographic Characteristic of the Studied Participants<sup>a</sup>

Variables	Suicide Attempts (N = 154)	Suicides (N = 32)	P Value
<b>Gender</b>			0.001
Female	99 (64.28)	9 (28.12)	
Male	55 (35.72)	23 (71.9)	
<b>Age</b>			0.003
10 - 25	95 (61.69)	9 (28.125)	
26 - 40	45 (29.22)	18 (56.25)	
≥ 40	14 (9.1)	5 (15.63)	
<b>Occupation</b>			0.001
Student	34 (22.08)	7 (21.87)	
Farmer or agricultural-related jobs	4 (2.6)	2 (6.25)	
Housewife	102 (66.23)	5 (15.63)	
Others	14 (9.09)	18 (56.25)	
<b>Marital status</b>			0.028
Single	26 (16.88)	10 (31.25)	
Married	115 (74.67)	21 (65.63)	
Widow and divorced	13 (8.45)	1 (3.12)	
<b>Educational level</b>			0.247
Primary school	52 (33.76)	10 (31.25)	
Secondary school	80 (51.95)	19 (59.38)	
High school and academic	22 (14.28)	3 (9.37)	
<b>Family size</b>			0.445
≤ 2	29 (18.83)	4 (12.5)	
3 - 4	83 (53.9)	16 (50.00)	
≥ 4	42 (27.27)	12 (37.5)	
<b>Income<sup>b</sup></b>			0.006
< 500	72 (46.75)	8 (25.00)	
500 - 1000	57 (37.01)	13 (40.62)	
1000 - 2000	17 (11.04)	4 (12.5)	
> 2000	8 (5.19)	7 (21.88)	
<b>Resident</b>			0.039
Urban	31 (20.13)	2 (6.25)	
Rural	123 (79.87)	30 (93.75)	
<b>Living alone</b>			0.188
Yes	8 (5.2)	0 (0)	
No	146 (94.8)	32 (100)	

<sup>a</sup>Values are expressed as No. (%).

<sup>b</sup>Per 10000 Iranian Rials.

Final analysis by multiple logistic regression analysis for adjusted ORs and 95% CIs indicated that among various types of SLEs, financial problems had the largest OR (OR = 11.9; 95% CI = 4.00 - 35.85) and significantly increased the odds of suicide 11.9 times more than SA. Other types of SLEs, such as early marriage (OR = 4.97; 95% CI = 1.68 - 14.65), be-

**Table 2.** Comparison of Various Types of Stressful Life Events and Their Scores in Suicide Attempts and Suicides<sup>a</sup>

Variables	Suicide Attempts (N = 154)	Suicides (N = 32)	P Value
<b>Stressful life events score</b>	447 ± 27.06	552 ± 23.75	0.001 <sup>b</sup>
<b>Family conflict</b>			0.001
Yes	38 (24.67)	19 (59.38)	
No	116 (75.33)	13 (40.62)	
<b>Marital disagreement</b>			0.028
Yes	59 (38.31)	19 (59.38)	
No	95 (61.69)	13 (40.62)	
<b>Loss of dears</b>			0.295
Yes	31 (20.13)	4 (12.50)	
No	123 (79.87)	28 (87.50)	
<b>Financial problems</b>			0.001
Yes	10 (6.50)	15 (46.88)	
No	144 (93.50)	17 (53.12)	
<b>Life failures</b>			0.653
Yes	7 (4.55)	2 (6.25)	
No	147 (95.45)	30 (93.75)	
<b>Emotional problems</b>			0.003
Yes	9 (5.84)	8 (25.00)	
No	145 (94.15)	24 (75.00)	
<b>Exposure to the new conditions</b>			0.064
Yes	3 (1.95)	3 (9.37)	
No	151 (98.05)	29 (90.63)	
<b>Early Marriage<sup>c</sup></b>			0.011
Yes	20 (12.98)	10 (31.25)	
No	134 (87.01)	22 (68.75)	
<b>Unemployment of &gt; 6 months</b>			0.134
Yes	22 (14.28)	8 (25.00)	
No	132 (85.72)	24 (75.00)	

<sup>a</sup>Values are expressed as No. (%).<sup>b</sup>Mann-Whitney test.<sup>c</sup>Before the age of 18.**Table 3.** Correlation<sup>a</sup>, Mean ± SD of Stressful Life Events Scores in Suicide Attempts and Suicides<sup>b</sup>

Variable	Values	R	P Value
<b>Stressful life events</b>		0.739	0.001
Suicide	552 ± 23.75		
Suicide attempt	447 ± 27.06		

<sup>a</sup>Point biserial.<sup>b</sup>Values are expressed as mean ± SD.

ing exposed to the new conditions (OR = 8.79; 95% CI = 1.3 - 59.22), and family conflicts (OR = 2.53; 95% CI = 1.23 - 6.53) increased the odds of suicide after adjusting for marital

conflicts, emotional problems, and unemployment of > 6 months (Table 5).

## 5. Discussion

This study aimed at investigating the association between SLEs, and suicide and SA in Malekan County, Iran. After adjusting for the confounders, the findings revealed that SLEs were strongly associated with committing suicide. SLEs were found as one of the main predictors for suicide and SA risk. However, the highest SLEs scores were recorded for subjects who had suicide outcomes.

Only a few studies have been carried out to assess the relationship between SLEs and risks of suicide, and this study is one of them on SLEs and suicide in Iran. Some other relevant studies have been conducted worldwide, including a study in China (18, 19), a population-based study in Denmark (12), and a study in the USA (11). Also, most of the studies in western countries have examined SLEs in SAs (3, 12, 20), whereas the current study explored both suicide and SAs. The same results were found in the present study and Paul and Wang studies in the USA (18, 21), as well as in a meta-analysis study (22). Findings of the European surveys have shown a positive relationship between the history of SLEs and SB (12, 23). Likewise, other studies have pointed out that psychological distress and SLEs were highly associated with SBs among university students (24). However, there are few studies that could not observe any correlation between suicide and stressful events; for instance, Jaiswal et al. (25) in India realized that suicide was associated with help-seeking behavior.

Although suicide rates appear to be lower in most of the Islamic countries (13), not only suicide-related deaths are increasing in Iran but also it has one of the highest rates among Eastern Mediterranean Region and Islamic countries during the recent decade (7, 26). Ten years trend (2006 - 2015) of years of life lost due to suicide in Iran was estimated to be 23.35 per 1000 persons in both sexes (27).

In this study, financial problems had a higher prevalence in the suicide group than those in the SA group. This relationship was also seen for the households' economic levels. In addition, while individuals with an income of fewer than ten million Rials per month had the highest rate of SAs, but suicide was highly frequent among high-income individuals, which was significant. In this regard, Ahmadi et al. (28) have reported financial problems as one of the major determinants and risk factors for SBs. Besides, other studies have shown a significant and positive relationship between financial problems, unemployment, and income level, and suicide (29, 30).

The present study, as well as other studies (18, 31-34) suggest that marital conflicts and family disputes are the most

**Table 4.** The Association Between Suicide and Selected Demographic Characteristic by Multiple Logistic Regression Analysis<sup>a</sup>

Variables	Suicide Attempts (N = 154)	Suicides (N = 32)	Crude OR (95% CI)	Adjusted OR <sup>b</sup> (95% CI)
<b>Age</b>				
10 - 25	95 (61.69)	9 (28.125)	<sup>b</sup>	<sup>b</sup>
26 - 40	45 (29.22)	18 (56.25)	4.22 (1.75-10.15)	6.34 (2.1-19.15)
P value			0.001	0.001
≥ 40	14 (9.1)	5 (15.63)	3.76 [1.1 - 12.92]	4.92 [0.8 - 30.58]
P value			0.035	0.088
<b>Gender</b>				
Female	99 (64.28)	9 (28.12)	<sup>b</sup>	<sup>b</sup>
Male	55 (35.72)	23 (71.9)	4.6 (1.99 - 10.63)	3.48 (1.32 - 9.24)
<b>Income, million Rial</b>			0.001	0.012
≤ 5	72 (46.75)	8 (25.00)	<sup>b</sup>	<sup>b</sup>
5 - 10	57 (37.01)	13 (40.62)	2.05 (0.79 - 5.3)	2.68 (0.76 - 9.41)
P value			0.138	0.123
10 - 20	17 (11.04)	4 (12.5)	2.11 (0.56 - 7.88)	1.68 (0.29 - 9.67)
P value			0.263	0.562
≥ 20	8 (5.19)	7 (21.88)	7.87 (2.24 - 27.57)	9.5 (1.49 - 60.29)
P value			0.001	0.017
<b>Occupation</b>				
Student	34 (22.08)	7 (21.87)	<sup>b</sup>	<sup>b</sup>
Farmer or agricultural-related jobs	4 (2.6)	2 (6.25)	2.42 (0.36 - 16.03)	2.49 (0.138 - 45.05)
P value			0.357	0.535
Housewife	102 (66.23)	5 (15.63)	0.23 (0.07 - 0.80)	0.198 (0.045 - 0.86)
P value			0.021	0.032
Self-employed	8 (5.19)	7 (21.88)	6.24 (2.13 - 18.29)	6.88 (1.73 - 27.53)
P value			0.001	0.006

<sup>a</sup>Values are expressed as No. (%).<sup>b</sup>Ref, adjusted for marital status.

important risk factors for SAs in Iranian communities; particularly, among couples who suffer from early marriages with the lack of skills for life management and poor levels of education. Some systematic reviews (32, 33) and a case-control study (34) in Iran have revealed that the family and marital conflicts are the most important factors for SA. Forced marriages at a young age often lead to separation from family members, friends, lack of freedom and interaction with peers, and losing educational opportunities, which can result in SAs or SBs.

Other risk factors identified for suicide and SA in this study were being exposed to new conditions, such as new living conditions, migration, being a refugee, and changing in the workplace, or work responsibilities. Park et

al. (35) study conducted in six countries, including China, South Korea, Malaysia, Singapore, Thailand, and Taiwan showed that exposure to new conditions in life was associated with SAs and suicide. Studies on the relationship between employment status and suicide have also confirmed our findings (36).

The current study had several limitations. First, we investigated and compared SLEs association between those committed suicide and SA. However, those committed suicide were not accessible and had died. Accordingly, we interviewed their closest family members, such as parents, spouses, siblings, etc. The other limitation arose from the uncommon nature of some of the events in the studied subjects that resulted in high CIs in ORs. Therefore, we

**Table 5.** Crude and Adjusted ORs and 95% CIs of the Association Between Suicide and Various Types of Stressful Life Events by Multiple Logistic Regression Analysis<sup>a</sup>

Variables	Suicide Attempts (N = 154)	Suicides (N = 32)	Crude OR (95% CI)	Adjusted OR (95% CI) <sup>b</sup>
<b>Family conflicts</b>			4.46 (2.01 - 9.9)	2.53 (1.23 - 6.53)
Yes	38 (24.67)	19 (59.38)		
No	116 (75.33)	13 (40.62)		
P value			0.001	0.041
<b>Financial problems</b>			12.7 (4.92 - 32.71)	11.9 (4 - 35.85)
Yes	10 (6.50)	15 (46.88)		
No	144 (93.50)	17 (53.12)		
P value			0.001	0.0001
<b>Expose to new conditions</b>			5.2 (1 - 27.2)	8.79 (1.31 - 59.22)
Yes	3 (1.95)	3 (9.37)		
No	151 (98.05)	29 (90.63)		
P value			0.050	0.028
<b>Early marriage<sup>c</sup></b>			3.04 (1.25 - 7.38)	4.97 (1.68 - 14.65)
Yes	20 (12.98)	10 (31.25)		
No	134 (87.01)	22 (68.75)		
P value			0.014	0.004

Abbreviations: CI, confidence interval; OR, odds ratio.

<sup>a</sup>Values are expressed as No. (%).

<sup>b</sup>Adjusted for spouse disagreement, emotional problems, and unemployment of > 6 months.

<sup>c</sup>Before the age of 18.

assessed SLEs quantitatively with a valid and efficient tool among suicide and SA groups of the participants.

Based on the obtained findings, it seems that SLEs management and interventions made by health systems may be imperative to prevent SBs and suicide. Prevention of early marriages, marital skills training for accommodation, and coping with negative life events and crises seem to be essential to reduce suicide rates and SBs in high-risk groups. Longitudinal and holistic studies are highly recommended for better understanding and assessing SLEs effects and suicide prevention program with case management of people with SBs in the primary health care system.

### Acknowledgments

The authors would like to thank all participants for their kind contribution.

### Footnotes

**Authors' Contribution:** HA and MF contributed to the protocol development and interpretation of the data, data analysis, data collection, and drafted all sections of the manuscript. EDE and AF conceived of the study, participated in the design and coordination of the measurement, performed the measurement, and assisted to draft

the manuscript. MM developed the original idea and the protocol, abstracted, and contributed to the manuscript development. LH and VA contributed to the development of the protocol, data collection, and drafting of the discussion.

**Conflict of Interests:** The authors declare that there is no conflict of interest.

**Ethical Approval:** This study was funded by the Social Determinants of Health Research Center (SDHRC) and approved by Tabriz University of Medical Sciences (code: IR.TBZMED.REC.1394.674). Informed consent was obtained from all subjects before the interview.

**Funding/Support:** This study was approved and funded by the Social Determinants of Health Research Center (SDHRC) of Tabriz University of Medical Sciences.

**Informed Consent:** Informed consent was obtained from all participants before the interview. All participants' names and information were entered into the computer purely as a code, and the names were anonymous, and the information kept strictly confidential.

### References

1. Turecki G, Brent DA. Suicide and suicidal behaviour. *Lancet*. 2016;**387**(10024):1227-39. doi: [10.1016/S0140-6736\(15\)00234-2](https://doi.org/10.1016/S0140-6736(15)00234-2).

- [PubMed: 26385066]. [PubMed Central: PMC5319859].
2. Phillips MR, Cheng HG. The changing global face of suicide. *Lancet*. 2012;**379**(9834):2318–9. doi: [10.1016/S0140-6736\(12\)60913-1](https://doi.org/10.1016/S0140-6736(12)60913-1). [PubMed: 22726503].
  3. Karanovic J, Svikovic S, Pantovic M, Durica S, Brajuskovic G, Damjanovic A, et al. Joint effect of ADAR1 gene, HTR2C gene and stressful life events on suicide attempt risk in patients with major psychiatric disorders. *World J Biol Psychiatry*. 2015;**16**(4):261–71. doi: [10.3109/15622975.2014.1000374](https://doi.org/10.3109/15622975.2014.1000374). [PubMed: 25732952].
  4. Weissman MM, Bland RC, Canino GJ, Greenwald S, Hwu HG, Joyce PR, et al. Prevalence of suicide ideation and suicide attempts in nine countries. *Psychol Med*. 1999;**29**(1):9–17. doi: [10.1017/S0033291798007867](https://doi.org/10.1017/S0033291798007867). [PubMed: 10077289].
  5. Pirkis J, Burgess P, Dunt D. Suicidal ideation and suicide attempts among Australian adults. *Crisis*. 2000;**21**(1):16–25. doi: [10.1027//0227-5910.21.1.16](https://doi.org/10.1027//0227-5910.21.1.16). [PubMed: 10793467].
  6. Johnson GR, Krug EG, Potter LB. Suicide among adolescents and young adults: A cross-national comparison of 34 countries. *Suicide Life Threat Behav*. 2000;**30**(1):74–82. [PubMed: 10782720].
  7. Hassanian-Moghaddam H, Zamani N. Suicide in Iran: The facts and the figures from nationwide reports. *Iran J Psychiatry*. 2017;**12**(1):73–7. [PubMed: 28496505]. [PubMed Central: PMC5425355].
  8. Hajebi A, Ahmadzad-Asl M, Ershadi M, Nikfarjam A, Davoudi F. National registration system of suicide behaviors in Iran: Barriers and challenges. *Arch Suicide Res*. 2013;**17**(4):416–25. doi: [10.1080/13811118.2013.803445](https://doi.org/10.1080/13811118.2013.803445). [PubMed: 24224674].
  9. Mirhashemi S, Motamedi MH, Mirhashemi AH, Taghipour H, Darnal Z. Suicide in Iran. *Lancet*. 2016;**387**(10013):29. doi: [10.1016/S0140-6736\(15\)01296-9](https://doi.org/10.1016/S0140-6736(15)01296-9). [PubMed: 26766345].
  10. Rezaeian M. Epidemiology of suicide after natural disasters: A review on the literature and a methodological framework for future studies. *Am J Disaster Med*. 2008;**3**(1):52–6. [PubMed: 18450280].
  11. Buchman-Schmitt JM, Chu C, Michaels MS, Hames JL, Silva C, Hagan CR, et al. The role of stressful life events preceding death by suicide: Evidence from two samples of suicide decedents. *Psychiatry Res*. 2017;**256**:345–52. doi: [10.1016/j.psychres.2017.06.078](https://doi.org/10.1016/j.psychres.2017.06.078). [PubMed: 28675860]. [PubMed Central: PMC5603385].
  12. Fjeldsted R, Teasdale TW, Jensen M, Erlangsen A. Suicide in relation to the experience of stressful life events: A population-based study. *Arch Suicide Res*. 2017;**21**(4):544–55. doi: [10.1080/13811118.2016.1259596](https://doi.org/10.1080/13811118.2016.1259596). [PubMed: 27849449].
  13. McFeeters D, Boyda D, O'Neill S. Patterns of stressful life events: Distinguishing suicide ideators from suicide attempters. *J Affect Disord*. 2015;**175**:192–8. doi: [10.1016/j.jad.2014.12.034](https://doi.org/10.1016/j.jad.2014.12.034). [PubMed: 25638792].
  14. Matlabi H. Factors responsible for early and forced marriage in Iran. *Sci J Public Health*. 2013;**3**(5). doi: [10.11648/j.sjph.20130105.17](https://doi.org/10.11648/j.sjph.20130105.17).
  15. Montazeri S, Gharacheh M, Mohammadi N, Alaghband Rad J, Eftekhar Ardabili H. Determinants of early marriage from married girls' perspectives in Iranian Setting: A qualitative study. *J Environ Public Health*. 2016;**2016**:8615929. doi: [10.1155/2016/8615929](https://doi.org/10.1155/2016/8615929). [PubMed: 27123012]. [PubMed Central: PMC4829716].
  16. Azizi H, Esmaeili ED. Stressful life events and risk of colorectal cancer: A case-control study of Iran. *Asian Pac J Cancer Prev*. 2015;**16**(6):2403–7. doi: [10.7314/apjcp.2015.16.6.2403](https://doi.org/10.7314/apjcp.2015.16.6.2403). [PubMed: 25824772].
  17. Sharif-Alhoseini M, Rasouli MR, Saadat S, Haddadi M, Gooya MM, Afshari M, et al. Suicide attempts and suicide in Iran: Results of national hospital surveillance data. *Public Health*. 2012;**126**(11):990–2. doi: [10.1016/j.puhe.2012.06.006](https://doi.org/10.1016/j.puhe.2012.06.006). [PubMed: 23040468].
  18. Wang Y, Sareen J, Afifi TO, Bolton SL, Johnson EA, Bolton JM. A population-based longitudinal study of recent stressful life events as risk factors for suicidal behavior in major depressive disorder. *Arch Suicide Res*. 2015;**19**(2):202–17. doi: [10.1080/13811118.2014.957448](https://doi.org/10.1080/13811118.2014.957448). [PubMed: 25559346].
  19. Zhang WC, Jia CX, Zhang JY, Wang LL, Liu XC. Negative life events and attempted suicide in rural China. *PLoS One*. 2015;**10**(1). e0116634. doi: [10.1371/journal.pone.0116634](https://doi.org/10.1371/journal.pone.0116634). [PubMed: 25611854]. [PubMed Central: PMC4303417].
  20. Panadero S, Martín R, Vázquez JJ. Suicide attempts and stressful life events among homeless people in Madrid (Spain). *J Commun Appl Soc Psychol*. 2018;**28**(4):200–12. doi: [10.1002/casp.2351](https://doi.org/10.1002/casp.2351).
  21. Paul E. Proximally-occurring life events and the first transition from suicidal ideation to suicide attempt in adolescents. *J Affect Disord*. 2018;**241**:499–504. doi: [10.1016/j.jad.2018.08.059](https://doi.org/10.1016/j.jad.2018.08.059). [PubMed: 30149338].
  22. Liu RT, Miller I. Life events and suicidal ideation and behavior: A systematic review. *Clin Psychol Rev*. 2014;**34**(3):181–92. doi: [10.1016/j.cpr.2014.01.006](https://doi.org/10.1016/j.cpr.2014.01.006). [PubMed: 24534642].
  23. Pritchard C, Amanullah S. An analysis of suicide and undetermined deaths in 17 predominantly Islamic countries contrasted with the UK. *Psychol Med*. 2007;**37**(3):421–30. doi: [10.1017/S0033291706009159](https://doi.org/10.1017/S0033291706009159). [PubMed: 17176500].
  24. Tang F, Byrne M, Qin P. Psychological distress and risk for suicidal behavior among university students in contemporary China. *J Affect Disord*. 2018;**228**:101–8. doi: [10.1016/j.jad.2017.12.005](https://doi.org/10.1016/j.jad.2017.12.005). [PubMed: 29245090].
  25. Jaicwal SV, Faye AD, Gore SP, Shah HR, Kamath RM. Stressful life events, hopelessness, and suicidal intent in patients admitted with attempted suicide in a tertiary care general hospital. *J Postgrad Med*. 2016;**62**(2):102–4. doi: [10.4103/0022-3859.180556](https://doi.org/10.4103/0022-3859.180556). [PubMed: 27089109]. [PubMed Central: PMC4944339].
  26. Kiadaliri AA, Saadat S, Shahnavazi H, Haghparast-Bidgoli H. Overall, gender and social inequalities in suicide mortality in Iran, 2006–2010: A time trend province-level study. *BMJ Open*. 2014;**4**(8). e005227. doi: [10.1136/bmjopen-2014-005227](https://doi.org/10.1136/bmjopen-2014-005227). [PubMed: 25138804]. [PubMed Central: PMC4139655].
  27. Hajebi A, Ahmadzad-Asl M, Davoudi F, Ghayyomi R. Trend of suicide in Iran During 2009 to 2012: Epidemiological evidences from national suicide registration. *Iran J Psychiatry Behav Sci*. 2016;**In Press**(In Press). doi: [10.11795/ijpbs-4398](https://doi.org/10.11795/ijpbs-4398).
  28. Ahmadi A, Schwebel DC, Bazargan-Hejazi S, Taliee K, Karim H, Mohammadi R. Self-immolation and its adverse life-events risk factors: Results from an Iranian population. *J Inj Violence Res*. 2015;**7**(1):3–8. doi: [10.5249/jivr.v7i1.549](https://doi.org/10.5249/jivr.v7i1.549). [PubMed: 25618437]. [PubMed Central: PMC4288291].
  29. Platt S. Unemployment and suicidal behaviour: A review of the literature. *Soc Sci Med*. 1984;**19**(2):93–115. doi: [10.1016/0277-9536\(84\)90276-4](https://doi.org/10.1016/0277-9536(84)90276-4). [PubMed: 6382623].
  30. Asevedo E, Ziebold C, Diniz E, Gadelha A, Mari J. Ten-year evolution of suicide rates and economic indicators in large Brazilian urban centers. *Curr Opin Psychiatry*. 2018;**31**(3):265–71. doi: [10.1097/YCO.0000000000000412](https://doi.org/10.1097/YCO.0000000000000412). [PubMed: 29528901].
  31. Bazargani Z, Anvar M. Risk factors of suicide attempt in Tabriz, Iran. *World Fam Med J*. 2017;**15**(10):28–31. doi: [10.5742/mewfm.2017.93133](https://doi.org/10.5742/mewfm.2017.93133).
  32. Nazarzadeh M, Bidel Z, Ayubi E, Soori H, Sayehmiri K. Factors related to suicide attempt in Iran: A systematic review and meta-analysis. *Hakim Res J*. 2013;**15**(4):352–63.
  33. Nazarzadeh M, Bidel Z, Ayubi E, Asadollahi K, Carson KV, Sayehmiri K. Determination of the social related factors of suicide in Iran: A systematic review and meta-analysis. *BMC Public Health*. 2013;**13**:4. doi: [10.1186/1471-2458-13-4](https://doi.org/10.1186/1471-2458-13-4). [PubMed: 23289631]. [PubMed Central: PMC3627903].
  34. Golshiri P, Akbari M, Zarei A. Case-control study of risk factors for suicide attempts in Isfahan, Iran. *Int J Soc Psychiatry*. 2017;**63**(2):109–14. doi: [10.1177/0020764016685347](https://doi.org/10.1177/0020764016685347). [PubMed: 28084153].
  35. Park S, Hatim Sulaiman A, Srisurapanont M, Chang SM, Liu CY, Bautista D, et al. The association of suicide risk with negative life events and social support according to gender in Asian patients with major depressive disorder. *Psychiatry Res*. 2015;**228**(3):277–82. doi: [10.1016/j.psychres.2015.06.032](https://doi.org/10.1016/j.psychres.2015.06.032). [PubMed: 26160206].
  36. Cecon RF, Meneghel SN, Tavares JP, Lautert L. [Suicide and work in Brazilian metropolises: An ecological study]. *Cien Saude Colet*. 2014;**19**(7):2225–34. doi: [10.1590/1413-81232014197.09722013](https://doi.org/10.1590/1413-81232014197.09722013). [PubMed: 25014301].