Original Article

Risk and Protective Factor for Suicide Attempt in Iran: A Matched Case-Control Study

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Abstract

Objective: In order to generate local evidence, a case-control study was designed to explore risk factors for suicide attempts (SA) in one of the larger cities in the southeast of Iran–Kerman.

Methods: From one of the main referral hospitals, 300 cases and 300 age- and sex-matched controls were recruited. On top of demographic variables, the following variables were compared in the two groups: personality traits, psychological condition, religiosity, coping skills, general health, and recent stressful events.

Results: Having adjusted for recent stressful events as the most important factor (OR = 1.66, *P*-value < 0.001), the main significant variables were: general health (1.04, *P* = 0.02), the support of friends (OR = 0.95, *P*-value = 0.04), being problem-focused mentality (OR = 0.88, *P*-value = 0.005), and intrinsic religiousness (OR = 0.86, *P*-value = 0.01).

Conclusions: Although, recent stress increased the risk of SA considerably, other factors such as general health, friends' support, and being problem-focused may predispose subjects independently. Conversely, intrinsic religious beliefs and close social networks may have protective effects. Therefore, a multi-disciplinary approach is recommended to minimize the burden of SA in Iran.

Keywords: Psychiatric distress, socio-economic, stress, suicide

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Introduction

Suicide behaviors include: suicidal ideation, planning, attempting, and, in worst cases, completing suicide.[1,2] According to the World Health Organization, every year almost one million people die by suicide[3] and 10 – 20 million people attempt suicide globally. Besides this, 50 – 120 million others are affected by their relatives' suicide or attempted suicide.[4] In 1998, suicide comprised over 2% of the total disease burden, a figure which is estimated to rise to 2.4% by the year 2020.[5] Therefore, suicide is a major public health problem worldwide.[6,7]

In addition, the burden of suicide in developing countries is much higher than in developed ones.[8] The rate of suicide is 11.6 per 100,000 in the global population. South Asia at 15.6 has the highest rate, and the eastern Mediterranean countries appear to have the lowest rate (5.6). However, Iran with a rate which increased from 3.1 to 6.4 per 100,000 between 1985 and 2003, has a far higher rate compared to other countries in the eastern Mediterranean region.[9,10]

Suicide is associated with the interaction of a variety of factors such as cultural tradition, religion, socio-economic status, and political issues.[11,12] Other related factors are demographic, such as marital status[13,14] and recent stressful life events (such as divorce or a close relative's death). Drug use and psychiatric illnesses (such as depression), as indicators of being under high level of stress, are other risk factors for suicide.[15,16]

Due to the abovementioned evidences, attempted suicide has been explored as a multifactorial phenomenon in different studies; however to the best of our knowledge, few of these published papers assessed the impact of different factors simultaneously in Iran. In order to address this in our study, a multidimensional approach was used to assess the effects of different demographic factors, socio-economic status, psychiatric diagnosis, stressful life events, and religious attitudes to suicide in the study setting.

Materials and Methods

This study was conducted in the city of Kerman (population 700,000), which is situated in the center of the largest province in Iran. Kerman is located on a high margin of Kavir-e Lut (the Lut Desert) in the south east of Iran. People living in Kerman tend to have a middle socio-economic status.

Subjects were recruited from the only referral hospital in Kerman, Afzalipoor, which cares for many internal medicine and gynecological cases in the Kerman province. All subjects were recruited from Afzalipoor hospital, the referral center for all suicide attempters, except for self-immolation

This matched case control study was conducted between March and June 2013. In order to gain access to the hospital and interview patients, the proposal of the study was approved by the ethics committee at the Medical University of Kerman, ethics code: k/92/21. Participants provided their verbal informed consent to participate in this study. Informed consent was also obtained from the caretakers

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and guardians on behalf of the minors/children enrolled in the study. Approval was stated verbally, and the information provided by the patients was kept confidential. This consent procedure was approved by ethics committees/IRBs. To conduct the study, the permission letter was issued by the head of the hospital, who was informed of the aims and objectives of the study. Eligible cases were defined as follows: they had to be more than 15 years of age; be conscious; and have attempted suicide by any means except self-immolation. Cases of self-immolation were not approached due to practical issues. Control group members were defined as those who had no history of attempted suicide, and were selected among people who accompanied patients admitted to the same hospital with any diagnosis except suicide. They were recruited by individual matching for age (within 3 years) and gender. Subjects in both case and control groups were excluded if they were not permanent residents of Kerman. Finally, the aims and objectives were explained to the eligible subjects. Those who were willing to be interviewed (92% in cases and 77% in controls) were given a consent form.

The interviewer was notified of newly-admitted cases at the hospital by either telephone contacts from the hospital or occasional visiting of the hospital in different shifts. However, cases admitted from 2 AM to 8 AM, who were also released by 8 AM of the same day, were not interviewed. Interviews were conducted in a private room at the hospital.

A comprehensive questionnaire was designed that included demographic details, personality traits, religiosity, coping skills, stressful life events, socio-economic status, psychiatric distress, and questions about perceived support (details are given below). Data were collected through face-to-face interviews.

Assessment tools

The Persian version of the Eysenck Personality Revised short-form questionnaire (EPQRS) was used to assess personality traits.[17] EPQRS consists of 36 items which assess neuroticism, extraversion, and psychoticism (12 items for each trait). The Chronbach`s alpha for these three dimensions were 0.69, 0.73, and 0.52, respectively. The internal consistency of the questionnaire was acceptable in other studies as well.[18]

Religiosity was assessed by the Persian version of the Duke University Religion Index (DUREL).[19] This questionnaire includes five questions and assesses three dimensions of religiosity including organizational, non-organizational, and intrinsic religious activities. The Chronbach`s alpha reported by Saffari, et al. was between 0.86 to 0.92 for the Persians version.[20]

Coping skills were assessed by the Persian version of the Billings and Moos Coping questionnaire.[10] This questionnaire consists of 19 questions, which assesses problem focusing and emotion focusing skills. This questionnaire was translated into Persian language by Pourshahbaz and colleagues. The Cronbach's alpha was reported 0.74 to 78.[21]

An extensive literature review was conducted to measure the most stressful events, which occur in Iranian. Consequently, we used a checklist consisting of the top 10 stressful events with a Chronbach`s alpha 0.67.

Socio-economic status was assessed through a checklist consisting of 30 items, which was developed and used in a relevant Iranian study. The Choronbach`s alpha for the tool was 0.66.

In addition, the Persian version of the General Health Questionnaire (GHQ-28) was used for the detection of psychiatric distress related to general medical illness.[22] GHQ-28 is a self-reporting questionnaire consisting of 28 items assessing psychiatric distress in four aspects of distress (depression, anxiety, social impairment, and hypochondriasis). Cronbach's α for the GHQ28 questionnaire in our study was 0.94. The reliability of this questionnaire was confirmed in other studies as well.[23]

Social support was measured through the Persian version of the Multidimensional Scale of Perceived Social Support (MSPSS). This assesses social support through 12 items. The alpha reliabilities of this questionnaire in Iranian population by Joshanlooand colleagues reported 0.89 to 0.93.[24]

Descriptive statistics are reported as mean ± SD for continuous, and frequency (%) for categorical variables. Continuous and categorical variables were compared between cases and controls using paired *t*- test and Mc-Nemar tests. Conditional logistic regression was used to investigate the association between measured factors and the outcome. In a multi factorial model, the odds ratio and its 95% confidence interval were derived and reported. Alpha was set at 5% and all probability tests were two-tailed. Data were managed and analyzed by SPSS version 21.

Results

During the study period, a total of 325 eligible cases were identified. Having excluded 25 cases and 88 controls from the list, mainly due to their refusal to answer the questions, the data of 600 age- and sex-matched subjects were analyzed (male to female ratio = 0.75; mean age was 25.86 for males and 24.48 years for females).

Comparison of groups in terms of means (for continuous) and proportions (for categorical variables)

A higher proportion of the cases were divorced or widowed, compared with the controls (6.7% vs. 1%). In addition, the proportion of less educated cases was about two times that of controls (23% vs. 11.3%).

A significant association was observed between general condition of health and suicide attempts. About three-quarters of cases and one-third of controls had general health conditions (75.3% versus 36.3%), giving a *P*-value < 0.001).

The mean ± SD score of perceived social support in cases was lower than in controls (42.9 ± 16.3 versus 61.7 ± 13.6, *P*-value < 0.001). This was also the case for all three subcategories.

The mean score of stress coping strategies in cases was significantly lower than controls (24.1 ± 7.7 versus 30.3 ± 7.6, *P*-value < 0.001). The mean difference between cases and controls in terms of mean of problem-based and emotion-based strategies scores was about 5 and 1.5, respectively ($P < 0.001$).

The mean of stressful life events in cases was two times higher than in controls (4.9 ± 2.1 versus 2.2 ± 2.7 respectively-values < 0.001).

Also, there was a significant association between religion index, where mean score in cases was significantly lower than in controls (15.3 ± 5.8 versus 19.6 ± 4.9, *P*-value < 0.001) (Table 1).

Comparison of groups in terms of odds ratio

Two groups were compared in terms of 7 prospects. The crude ORs revealed that all studied independent variables are significantly associated with suicide attempts (*P*-values < 0.001). However, after adjustment via multivariate analyses, the significant

Table 1. The comparison of demographic and psychological characteristics in case and control groups.

Characteristics	Groups		*P*-Value
	Case (300)	Control (300)	
Age (year)	24.9 ± 8.3	25.4 ± 7.9	0.45
Gender (number of Males)	137	137	0.93
Marital Status			0.001
Single	160 (53.3)	175 (58.3)	
Married	120 (40.0)	122 (40.7)	
Divorced / Widowed	20 (6.7)	3 (1)	
Education			< 0.0001
Illiterate & elementary	69 (23)	34 (11.33)	
Middle & high school	169 (56.33)	132 (44)	
Diploma & above	62 (20.66)	134 (44.66)	
General Health Condition (% positive)[+]	226 (75.3)	109 (36.3)	< 0.001
Perceived Social Support (Score)	42.9 ± 16.3	61.7±13.6	< 0.001
High Acuity	13 (4.3)	104 (34.7)	
Moderate Acuity	102 (34)	143 (47.7)	
Low Acuity	185 (61.7)	53 (17.7)	
Stress Coping Strategies (Score)	24.1 ± 7.7	30.3 ±7.6	
Problem-focused	8.8 ± 4.4	13.6 ± 4.5	< 0.001
Emotion-focused	15.3 ± 4.4	16.7 ± 4.4	< 0.001
Stressful life event score[++]	4.9 ± 2.1	2.2 ± 2.7	< 0.001
Religious score	15.3 ± 5.8	19.6 ± 4.9	< 0.001
Organizational	2.87 ± 1.52	3.75 ± 1.56	< 0.001
Non-organizational	2.77 ± 1.93	3.48 ± 1.66	< 0.001
Intrinsic Religious	9.69 ± 3.72	12.39 ± 2.86	< 0.001
Personality			
Neuroticism	8.799 ± 2.5	5.762 ± 2.9	< 0.001
Psychotics	4.896 ± 2.2	3.513 ± 2.02	< 0.001
Extraversion	6.68 ± 3.08	8.756 ± 2.5	< 0.001

· Cases: Suicide Attempters; Controls: Non-Attempters (patients who never attempted suicide); Data are Mean ± SD, and N (%); [+] Based on GHQ-28 Likert sum score. A total score of 23/24 is the threshold for the presence of psychological distress; [++] Stressful events that had been experienced over the past year according to the Holmes and Rahe Stress Scale; *P*-values derived from paired t-test, and McNamara.

variables retained were psychological distress and stressful life events. Those who experienced a general health conditions were 4% more likely to commit suicide, OR = 1.04 (95% CI: 1 – 1.07). Moreover, one point increase in stressful life events was associated with a 66% increase in risk of attempting to suicide (OR = 1.66 (95% CI: 1.34 – 2.05).

In addition, some categories of other variables were significant. For example, while family and other social support were not associated with the outcome, one point increase in friends' social support led to a 5% reduction in risk of an outcome (OR = 0.95 (95% CI: 0.90 – 0.99)). Those with a higher score in problem-based stress coping strategies were less likely to commit suicide (OR = 0.88 (95% CI: 0.80 – 0.96). Finally, out of the three religious dimensions, only the intrinsic religious dimension was negatively associated with the outcome (OR = 0.86 (95% CI: 0.76 – 0.97).

Discussion

Given that attempted suicide is a multidimensional event,[25] the current study took into consideration different factors, affecting suicide attempts in the study setting. The results found that stressful life events and general health condition were positively associated, while social support, religiosity, and coping skills were negatively associated, with attempting suicide.

Stressful life events such the death of a spouse, detention in jail, confrontation within the family, financial problems, and interpersonal problems[26] have been related to attempting suicide.[27] Whether the life stress is in itself a risk factor for attempting suicide is explored in previous studies, whose results suggested that genetic[28] and psychological factors such as personality disorders mediate the role of stress in attempting suicide.[29]Also, the effect of stressful events can be different based on individuals' problem-solving skills.[30] It is found that having problem-solving skills could decrease the level of stress and depression related to stressful life events.[31] Effective problem-solving is discussed as being related to having a sense of control over one's own life. People who believe their lives are out of their control have fewer problem-solving resources.[32] In our study, cases indeed had lower problem-solving skills. In one study on suicide attempters, the results found that cases had difficulty gaining information to solve problems and understand their role in those issues.[33]

The lack of social support is related to occurrence of many dis-

Table 2. Univariate and multivariable conditional logistic regression analyses to identify factors associated with suicide attempt

	OR	95% CI	*P*–value	OR	95% CI	*P*–value
general health condition	1.04	1.07–1.03	< 0.001	1.04	1.07–1.005	0.02
Perceived social support						
Family	0.51	0.6–0.44	< 0.001	0.96	1.009–0.90	0.10
Friends	0.66	0.74–0.59	< 0.001	0.95	0.99–0.90	0.04
Significant Other	0.66	0.73–0.59	< 0.001	1.04	1.09–0.98	0.20
Stress coping strategies						
Problem focused	0.79	0.84–0.75	< 0.001	0.88	0.96–0.8	0.005
Emotion–focused	0.93	0.97–0.9	< 0.001	1.03	1.13–0.94	0.54
Stressful life events Duke University Religion Index	2.04	2.4–1.75	0.001	1.66	2.05–1.34	<0.001
Organizational	0.69	0.78–0.62	< 0.001	0.99	1.36–0.73	0.96
Non–organizational	0.81	0.89–0.74	<0.001	1.10	1.41–0.87	0.40
Intrinsic Religious	0.78	0.83–0.73	< 0.001	0.86	0.97–0.76	0.01
Personality[++]						
Neuroticism	1.53	1.69–1.39	< 0.001	1.14	1.32–0.99	0.07
Psychoticism	1.39	1.53–1.26	< 0.001	1.07	1.26–0.91	0.40
Extraversion	0.77	0.83–0.70	< 0.001	1.10	1.29–0.96	0.19
Socioeconomic status (SES)[+++]						
Social–economic component	0.54	0.65–0.45	< 0.001	0.97	1.48–0.64	0.89

OR: Odds ratio; CI: Confidence interval; [+]Based on General Health Questionnaire (GHQ-28); [++]Based on Eysenck personality questionnaire (EPQ); +++Based on PCA Method; ++++ *P*-values derived from Univariate and Multivariate by using conditional logistic regression

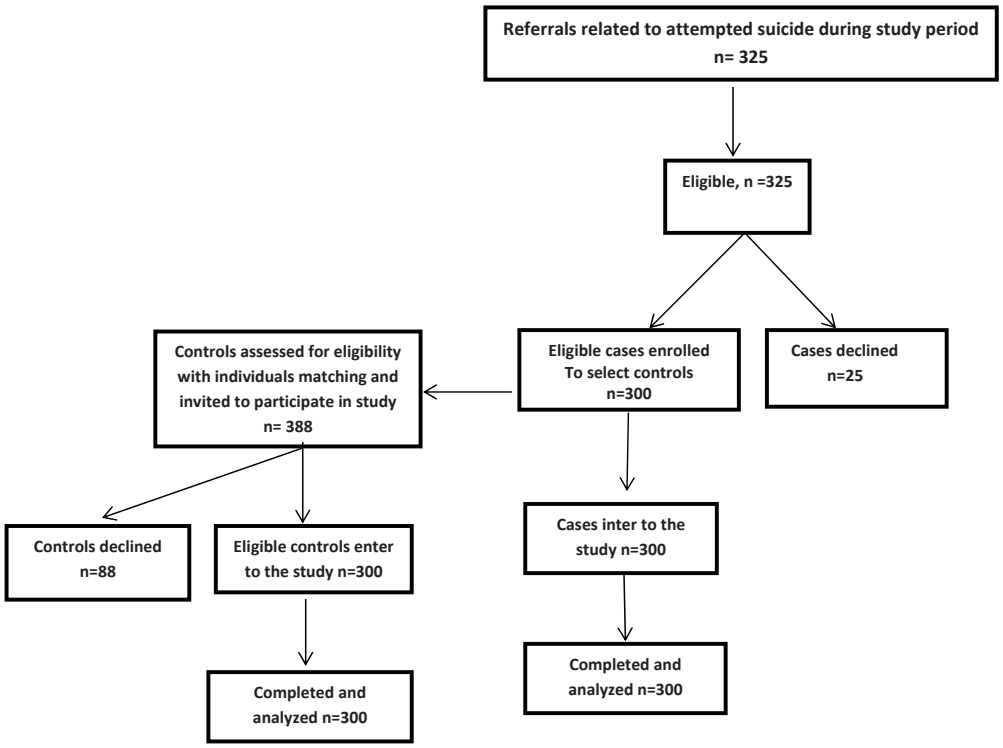

Figure 1. Flowchart of recruitment

eases such as coronary heart disease, complications in pregnancy, emotional illness and suicide.[34,35] Social support in general is associated with better mental health and self-efficacy, which in turn could decrease the rate of attempted suicide.[36] However, a prospective study showed that men and women might benefit differently from social support; for example esteem support is more beneficial to women than to men.[37]

In terms of the role of religion on suicide, we found a protective role in intrinsic religiousness against suicide attempts. There are controversies over the role of religion on mental health and level of stress.[38,39] Religion is discussed as having a role in the practice of good health behaviors and better mental health.[40] However, in a study conducted in Turkey, the extrinsic religious type was found as a predictor for hostility, anxiety, and depression among students.[41] Also, the aforementioned study showed that the role of intrinsic religiousness on mental health is mediated through social support.[42] Since that is the case for Iran, a religious country, people with higher levels of religiousness might receive higher support from relatives and friends.

As with our study, other studies found that psychiatric disorders have an imperative role. Many studies confirm the role of psychiatric disorders in attempting suicide; it is observed that 95% of people who attempt suicide suffer from depressive or anxiety disorders.[43–45]

Owing to gender matching, we were not able to examine the effect of gender on attempting suicide; however we observed a higher proportion of females among our cases. This is confirmed in previous studies.[46,47] Higher proportion of women could be explained in two ways: first, female hormones are believed to be related to some psychiatric disorders such as depression.[48] Second, social factors such as gender stereotype, cultural and social norms could increase life stress for women.[18]

There are some limitations to our studies: first we did not include self-immolation due to their refusal to participate. Therefore, our results might not be applicable to this group. Also, owing to stigma related to suicide, some cases might be reported it as accidental events and not be included in the study. As with many case-control studies, it was not possible to blind the interviewers. Therefore interviewer bias may have occurred.

Although there are some limitations, this study has the advantage of having explored different aspects of suicide attempts, whereas in previous studies only limited variables were explored. Compared with previous studies, this study has a substantial sample size to generate effective factors. The current study highlights that stressful life events are related to attempted suicide. Therefore, people with such conditions should be targeted for receiving protective treatment such as social support. In a religious society like Iran, religion could be a protective factor. Also, people with higher psychiatric distress should be addressed as a high-risk group for specific support and interventions. Having a problem-focusing skill, as an intervention could benefit all individuals, including those with psychiatric problems, to prevent them from attempting suicide.

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Author Contributions

Conceived and designed the experiments for this manuscript: A. A. H., M. A., F. Z. performed the experiments for this manuscript: M. A. analyzed the data for this manuscript: M. A., M. R. B., and A. A. H. Contributed reagents/materials/analysis tools for this manuscript: M. A., A. B., F. Z.; Wrote the manuscript: M. A., F. Z., A. A. H., and M. R. B.

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