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# Identification of the Suicid Attempt Risk Factors among Patients Admitted in a Central Trauma Hospital in Fars, Iran

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**Abstract**

**Background:** Suicidal attempt is considered to be a major health problem around the world. Recent statistics in Iran indicate the rising trend of committing suicide in recent years.

**Objectives:** The aim of this study was to determine the risk factors in subjects who attempted suicide and were admitted in Shahid Rajaee (Emtiaz) Trauma Hospital, Shiraz, Iran from 2010 to 2015.

**Methods:** In a cross-sectional study, 81 out of 243 suicidal attempt patients were selected to participate in the study and interviewed and 81 patients with unintentional injuries were selected by systematic random sampling from trauma patients who referred to the above-mentioned hospital by other mechanisms of injury in the same period. Demographic data and risk factors were evaluated through a data collection form.

**Results:** In this study, in suicidal attempt patients group, 87.7% were men and 12.3% women and for the unintentional injury group, 25.9% were women and 74.1% were men. Mean age for patient in case and control group were respectively 27±10.41 and 37.28±16.85. Age <30 (OR=0.89), gender (male: OR=6.17), and self-employment (OR=3.94), medication history (OR=10.17), beating history (OR=0.17), history of educational problem (OR=22.78), and living situation (unmarried: OR=36.06, alone: OR=35.93) were significant risk factors for attempting suicide.

**Conclusion:** Youth is an important risk associated with suicidal attempt. Therefore, suicide prevention strategies are important in this vulnerable group. Also, most suicides were attempted by males. Self-employment, medication history, educational problems, a positive history of psychiatric disorder, and living alone or being unmarried were important risk factors for suicide and suicidal attempts.

*Keywords:* Patient, Risk Factor, Suicide Attempt

## 1. Background

Suicide is a multi-stage process consisting of suicidal ideation, planning and attempting, and in the worst case it leads to death. Suicidal attempt is considered to be a major health problem around the world (1, 2). According to the last version of international classification of diseases (ICD) code, suicide methods include overdose, gases, hanging, drowning, firearms and explosives, others, and unspecified (including jumping from a high place, cutting and piercing) (3).

More recently, in 2008, suicide was identified by the World Health Organization as a priority condition in the Mental Health Gap Action Program (mhGAP), the program to scale up care for mental, neurological and substance use disorders, particularly in low- and middle-income countries (World Health Organization, 2008a) (4). The mortality rate of suicide is about one million deaths every year, based on World Health Organization report (5). In addition to the people attempting suicide (about 10-20 million yearly), about 50 -120 million people are affected by their relatives' suicide each year1. The total disease burden of suicide is estimated to increase from 1.8% in 1998 to 2.4% in 20202. It is estimated that developing countries are affected by suicide much more than the developed ones (6). Most suicidal attempts in Asia are related to Southeastern countries, while the Eastern Mediterranean countries have the lowest rate (7). Results of Hassanian Moghadam's suicide review on the assessment of original articles published during 20 years on committed suicides searching Iranian scientific databases indicated an overall increased trend of deaths after suicide in Iran (8). Evaluation of the risk factors of suicide is difficult due to its multi-factorial causation and nature. A large number of risk factors associated with suicidal attempts are serious psychological disorders, especially depression, bipolar disorder, schizophrenia, and alcohol addiction. Also, personality disorders have a significant correlation with suicidal ideation and attempt. In addition to mental health disorders, cultural, biological, socioeconomic, and environmental factors are important (9-12). As a confirmed risk factor, mental disorders are present in up to 90% of people dying from suicide in high-income countries compared with the suicidal attempts in some Asian countries that seem to be less affected by this factor (about 60%) (13, 14). Stressful life events such as the death of a spouse,

imprisonment, conflicts within the family, financial problems, interpersonal problems, and hopelessness remained as independent risk factors of suicide (15). Alcohol, drug and other substance abuse disorders are associated with increased risk of suicide (16). Determination of suicidal attempt risk factors is important and helps to design preventive programs and reduce injuries and deaths, especially in young people.

## 2. Objectives

The aim of this study was to identify suicidal attempt risk factors among patients admitted to a central trauma hospital in Iran.

## 3. Methods

This cross-sectional study was carried out in Shahid Rajaee (Emtiaz**)** Central Trauma Hospital in Shiraz, Iran from 2010 to 2015. In order to access the patients, we attended the hospital and interviewed with them. This study was approved by the ethics committee of Shiraz University of Medical Sciences.

*2.1. Sampling*

A total of 243 patients attempting suicide were admitted to this hospital; of them, 81 patients had the inclusion criteria and were willing to answer the questions in an interview. For comparison, 81 patients with unintentional injuries were selected by systematic random sampling from trauma patients who referred to this hospital due to other types of injury such as road traffic accident or falling down injuries in the same period. The participants signed the informed consent.

Of the total number of people who had committed suicide, 81 were selected based on a census and the inclusion criteria. After extracting the national card number and the number of contacts from the file using a telephone call, the required information was collected using a checklist. Inclusion criteria for the suicidal attempts group were defined as follows: age more than 15 years, being conscious, and having one or more suicidal attempts (ICD-10X60-X84). The exclusion criteria for the suicidal attempts group were defined as follows: being self-infected or having attempted suicide using toxic substances and having no willingness to be interviewed. Suicidal attempt by any means those ingesting a substance at toxic level or self-immolation. Inclusion criteria for comparing the unintentional group were as follows: age more than 15 years, being conscious, being referred to hospital with code ranging from s00- t97.79 (base on ICD10 code). The exclusion criteria for this group were as follows: having a history of suicidal attempt, being referred to hospital with code ranging from T15.0 - T19.9, effect of foreign body entering through natural orifice, burns, and corrosion injuries (T20.0 - T32.9), environmental exposures (T33.0 - T35.7, T66 - T75.8), poisonings (T36.0 - T65.9), complications of medical care, and late effects of injury (T80 - T98)

*2.2. Measures*

A data collection form was used containing demographic information and data on suicidal attempt risk factor items: birth place, marital status, religion, educational level, occupational status, location, number of children, history of injury and suicide, type of injury, history of psychiatric medication, alcohol consumption, history of hospitalization for mental disease, prison history, financial problem, educational problem, history of mental illness in family, history of experiencing bereavement or a breakup, number of siblings, a psychiatric distress, and status (Living or relationship condition) of the parents . Data were collected through face-to-face interviews by trained hospital staff. All patients' data were collected by a trained interviewer prior to the interview, the interviewer was provided with the necessary training, and the questionnaire was then given to the person who was eligible to enter the study. The interviewer collected the information after he had contacted them.

*2.3. Statistical Analysis*

Quantitative data are expressed as mean and standard deviation (SD) while the qualitative data are presented in frequencies and percentages. Both suicidal attempts and unintentional groups were classified based on certain variables. These variables included sex, age, marital status, job, educational level, medication history, alcohol abuse history, psychiatric disorder history, chewing nail history, beating history, imprisonment history, educational problem history, financial problem history, occupational problem history, and living status. At first, descriptive statistics were used to determine the frequency, mean, standard deviation. Comparison of the quantitative data was done using the Independent T test. Multivariate logistic regression was performed to assess the effect of each variable on suicidal attempts after they were adjusted for confounding. A p-value of less than 0.05 was considered significant in this study. Data were collected and analyzed using SPSS 21 (Chicago, USA).

## 4. Results

In this study, of the 81 subjects who had attempted suicide, 87.7% (N=71) were men and 12.3% (N=10) women. In the unintentional injury group, 25.9% (N=21) were women and 74.1% (N=60) men. As to occupation, self-employed patients had the most suicidal attempts in the two groups. Also, patients with diploma and under diploma

education attempted more suicides than others. Table 1 shows the other characteristics of the participants.

*Multivariate analysis*

After adjusting for covariates in backward stepwise logistic regression analysis, it was found that the risks of suicidal attempts were significantly high in subjects with psychiatric disorder (p=0.008, OR=7.02, 95%CI=1.64-29.97), a history of anti-psychiatric medication (p=0.01, OR=10.17, 95%CI=1.62-63.73), male gender (p=0.02, OR=6.17, 95%CI=1.29-29.34); self- employment (p=0.04, OR=3.94, 95%CI=1.01-15.27), and a history of educational problem (p=0.02, OR=22.78, 95%CI=1.56-330.98). Furthermore, living condition was a risk for suicidal attempts; the highest risk was living with parents (p=0.01, OR=36.06, 95%CI=1.88-689.16) followed by living alone (p=0.002, OR=35.93, 95%CI=3.89-331.90). Also, the results showed that age (p=0.001, OR=0.89, 95%CI=0.84-0.95) and beating history (p=0.003, OR=0.17, 95%CI=0.05-0.55) were the protective factors for attempting suicide (Table 2).

**Table 1.** Suicidal attempt and unintentional patients by study variables

| Variables | Suicidal attempt Patients (%)(N=81) | Unintentional patients (%)(N=81) | p |
|---|---|---|---|
| Age (Mean age) | 27±10.41 (SD) | 37.28±16.85(SD) | <0.001 |
| Sex | | | |
| Male | 71 (87.7%) | 60(74.1%) | 0.02 |
| Female | 10 (12.3%) | 21 (25.9%) | |
| Marital status | | | |
| single | 52(64.2%) | 40(49.4%) | 0.11 |
| Married | 26 (32.1%) | 39 (48.1%) | |
| Relict and divorced | 3 (3.7%) | 2(2.5%) | |
| Employment | | | |
| Jobless | 14 (17.3%) | 25 (30.9%) | <0.001 |
| Student | 21(25.9%) | 6 (7.4%) | |
| Government job | 6 (7.4%) | 21 (25.9%) | |
| Self-employed | 40 (49.4%) | 29 (35.8%) | |
| Educational level | | | |
| Illiterate | 3 (3.7%) | 11 (13.6%) | 0.009 |
| Diploma and under diploma | 71(87.7%) | 55 (67.9%) | |
| Licentiate ,MS ,MD ,PHD | 7 (8.6%) | 15 (18.5%) | |
| Medication history(anti-depressant, anti-anxiety and psychotic) | | | |
| No | 62 (76.5%) | 73 (90.1%) | 0.01 |
| Yes | 19(23.5%) | 8 (9.9%) | |
| Alcohol abuse history | | | |
| No | 56 (69.1%) | 61(75.3%) | 0.24 |
| Yes | 25 (30.9%) | 20 (24.7%) | |
| Psychiatric disorder history | | | |
| No | 50 (61.7%) | 71(87.7%) | <0.001 |
| Yes | 31 (38.3%) | 10 (12.3%) | |
| Chewing nail history | | | |
| No | 66(81.5%) | 69 (85.2%) | 0.33 |
| Yes | 15(18.5%) | 12 (14.8%) | |
| Beating history | | | |
| No | 62(76.5%) | 52 (64.2%) | 0.06 |
| Yes | 19 (23.5%) | 29 (35.8%) | |
| Jail history | | | |
| No | 71 (87.7%) | 80 (98.8%) | 0.005 |
| Yes | 10 (12.3%) | 1 (1.2%) | |
| Educational problem history | | | |
| No | 51 (63% ) | 79 (97.5%) | <0.001 |
| Yes | 30 (37%) | 2 (2.5%) | |
| Financial problem history | | | |
| No | 50(61.7%) | 61(75.3%) | 0.04 |
| Yes | 31(38.3%) | 20(24.7%) | |
| Occupational problem history | | | |
| No | 71(87.7%) | 66 (81.5%) | 0.019 |
| Yes | 10 (12.3%) | 15 (18.5%) | |
| living situation | | | |
| With Father, Mother, Grand Parents | 62 (76.5%) | 40(49.4%) | <0.001 |
| alone | 14 (17.3%) | 8 (9.9%) | |
| Wife or husband | 5 (6.2%) | 33 (40.7%) | |

Cases: Suicide Attempters; Controls: Non-Attempters (patients who never attempted suicide).MS: Master of Science, MD: Medical doctor, PHD: Doctor of Philosophy.

**Table 2.** Independent predictors of suicidal attempts (Binary Logistic Regression Model)

| Predictive factors | OR | 95% CI | P-Value |
|---|---|---|---|
| Age | 0.89 | 0.84-0.95 | 0.001 |
| Sex | | | |
| Female (index) | 1 | - | - |
| Male | 6.17 | 1.29-29.34 | 0.02 |
| Job | | | |
| Jobless (index) | 1 | - | - |
| Student | 4.39 | 0.77-24.95 | 0.09 |
| Government job | 0.57 | 0.07-4.34 | 0.58 |
| Self-employed, driver, worker | 3 .94 | 1.01-15.27 | 0.04 |
| Psychiatric disorder history | | | |
| No(index) | 1 | - | - |
| Yes | 7.02 | 1.64-29.97 | 0.008 |
| Anti-psychiatric Medication history | | | |
| No(index) | 1 | - | - |
| Yes | 10.17 | 1.62-63.73 | 0.01 |
| beating history | | | |
| No (index) | 1 | - | - |
| Yes | 0.17 | 0.05-0.55 | 0.003 |
| Educational problem history | | | |
| No (index) | 1 | - | - |
| Yes | 22.78 | 1.56-330.98 | 0.02 |
| Living situation | | | |
| Wife or husband (index) | 1 | - | - |
| unmarried, with Grandparents | 36.06 | 1.88-689.16 | 0.01 |
| alone | 35.93 | 3.89-331.901 | 0.002 |

OR: Odds ratio; CI: confidence interval

## 5. Discussion

Based on the results of the study, male gender, self-employment, medication history, educational problem, positive history of psychiatric disorder, living alone or being unmarried and being young were the risk factors of suicidal attempts.

This study revealed that the mean age of suicidal attempt groups was 27 years; this is consistent with the findings of other studies in Iran. In a study on 318 cases in Mazandaran, the most suicidal attempts occurred among 20-29 year old group (17). In an integrated analysis, the data from all studies carried out in Islamic Republic of Iran from 1981 to 2007 indicated that young people with a mean age of 25 were the individuals with most suicidal attempts (18). A study by Annette in New Zealand showed that the mortality rate of suicide in the age 35 years was higher than old ages (19). This is different from the findings of Lee's study, in which 74.7% of the suicide mortality was reported in people aged over 64 years old (20). Most suicidal attempts among old people in other countries may be due to loneliness and psychological problems.

In the present study, the number of suicidal attempts in males was higher than females; this agrees with other studies in different countries. In a study by Sharghi in Ardabil, Northwest of Iran, most of the 185 death cases as the result of suicide were males (21). In another study in Taiwan, 67.6% of deaths due to suicide occurred in men20. Similar findings were obtained by Rocchi et al. in Italy where the average rate of annual suicide by males and females was 2374 and 882, respectively (22). However, this was not the case when we compared two studies from northeast of Iran. In a study on 106 cases in Sabzevar, northeast of Iran, females were responsible for 60% of suicidal attempts (23). Also, in another study, most of the suicide cases were females (24, 25). Such controversy may be due to local conditions dealing with the selected subjects like unemployment and educational problems.

As to occupation, the highest rate of suicidal attempt was among self-employed subjects. Job is a primary source of material, social, and psychological security within the family (26). Undesirable economic condition may lead to recession cuts in health and social services (27). Similarly, social and financial security of having a job is important to mental health. Among occupations examined in our study, self-employment can gain the risk of suicide through induced anxiety and tension. Actually, this high rate of suicidal attempts may be due to high levels of stress associated with coping to social and occupational environment, unstable financial condition, inadequate social support, and other conflicts (28).

In our study, the positive history of educational and psychiatric problems, beating and medication history were significantly associated with more

suicidal attempts. These findings are in the same line with those of a study conducted by Zhao in 7 general hospitals in the northwestern China, showing that study problems and the history of mental disorders were significantly associated with suicidal attempts (29). In another study by Fegg, 18.9% of all suicidal attempts were made by people with psychiatric problems (30). A systematic review in Iran conducted by Ghafarian showed that 42% of subjects with attempted suicide had a psychiatric disorder history (18).

Similar to the current study, Almeida et al. (2012) indicated that the use of some medications was independently associated with suicidal ideation (31). It seems that some patients need to use drugs, especially psychiatric drugs, but availability of these drugs can increase the risk of suicidal attempt for some susceptible individuals.

In terms of living conditions, in the present study, feeling of loneliness was a significant factor in attempting suicide. Lonely people and also those who were unmarried had attempted more suicides than subjects living with their wife/ husband. Support of friends and having close social networks were found to be protective factors of suicide according to a study in the southeast of Iran, Kerman (32). Living alone is a risk factor for suicidal attempts. In the current social and economic conditions where family and social bonds are generally not strong, loneliness seems to increase the rate of suicide. According to studies, patients who reported greater family bonds were significantly less likely to report suicide ideation; this protective effect was strongest for those living with others. Also, in this study it was indicated that the history of family conflicts, problems in or lower maternal-paternal attachment, lower familial adaptability and cohesion can be associated with suicidal ideations and attempts.

The identification of suicidal attempt risk factors is an essential component of a suicide prevention strategy and can help to determine the type of interventions required. This study highlighted the role of age, male, self-employment, medication history, educational problem, a positive history of psychiatric disorder, living alone or being unmarried in suicidal attempt.

*Limitations and strong points of the study*

The strength of the present study, based on our knowledge, is that it is the first study of multiple risk factors for suicidal attempts carried out in a trauma hospital in our region. There were some limitations in our study. The first one was low sample size due to a lack of reliable suicide registries in Iran. On the other hand, the socio-religious ideas among Iranians may prevent the suicidal attempters from committing suicide since it is considered a sin. Also, in this investigation only those suicide attempters who were admitted in trauma hospital were considered while they do not represent all suicide attempters in Shiraz population. It is suggested that similar studies should be carried out in other regions of Iran with more sample size to reveal common suicide risk factors in Iran. Also, suicide methods, differentiated by gender and sex- specific reviews in further investigation are recommended.

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## Authors' contributions

All authors participated in the study concept and design, acquisition of data, data analysis, drafting of the manuscript, and critical revision of the manuscript for important intellectual content.

## Conflicts of interest

None.

## Footnote

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