

# Epidemiology of Suicide Attempts and Deaths: A Population-Based Study in the South of Iran (2012–2017)

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## Abstract

**Background:** Suicide is a multi-factorial phenomenon whose patterns can vary even from one place to another in one country; the purpose of this study was to determine the causes of suicide attempt in a 6-year period in Larestan County in the period between 2012 and 2017.

**Methods:** The present study was a descriptive-analytic cross-sectional study. In order to investigate the epidemiological condition of suicide attempters in Larestan, all files of suicide cases registered in the period between 2012 and 2017 in this city were investigated, and finally 723 cases were included in the study. For statistical analysis, independent t-test, chi-square and logistic regression models were used. A significance level of 5% was considered.

**Results:** Of the total 723 suicide attempts recorded in the health network of Larestan, the mean age at suicide attempt was 26.08±7.88 years and 3.73% of them had died as a result of suicide attempt. Drug abuse and poisoning were the most common methods of suicidal attempt. Based on the regression model, Increase in age, male sex, and physical problems were the most important factors in predicting suicide death ( $P<0.05$ ).

**Conclusion:** Various factors including age, male gender and physical problems contribute to suicide and deaths associated with it; therefore, the implementation of educational and counseling programs for these individuals, especially in adolescence and youth, and people with physical and psychological problems is essential.

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**Keywords:** Epidemiology, Iran, Mortality, Suicide

## Introduction

The spectrum of suicidal behavior includes suicidal ideation (Having thoughts without attempting suicide or preparatory behavior for suicide), attempted suicide (Unsuccessful attempt to kill own self), suicide (Successful attempt to kill own self), or other preparatory acts (Like buying a gun or writing to kill own self).<sup>1</sup> The important point in suicidal behavior is that it is conscious, without forcing someone else for his/her own destruction.<sup>1,2</sup>

Today, suicide is one of the major health problems in the world.<sup>3</sup> Suicide is a multi-factorial phenomenon whose patterns can vary even from one place to another in one country.<sup>4</sup> This phenomenon is influenced by various factors such as culture, politics, economy, religious beliefs, and demographic and geographical features of the region,<sup>5-8</sup> so its pattern and trend vary across different countries.<sup>9-12</sup>

Suicide is dramatically on the rise all over the world as in the past 45 years, suicide or attempted

suicide has increased by approximately 60% globally.<sup>2, 13</sup> Analysis of the trends of the suicide rate from 1950 to 2009 showed that the global suicide death rate as a whole was estimated at 11.6 per 100,000,<sup>14</sup> and more than 800,000 deaths a year due to suicide.<sup>15</sup> It is predicted that in 2020, there will be approximately one and a half million suicide cases and more than ten to twenty times as many worldwide suicide attempts.<sup>15, 16</sup> This indicates that there is one suicide-related death every 20 seconds and one suicide attempt every 1 to 2 seconds.<sup>17</sup>

Studies have shown that suicide rates vary across countries, and can range from 1 to 10.70 cases per 100,000 people;<sup>13, 18</sup> for example, in the United States, deaths due to suicide account for 12 cases per 100,000,<sup>19</sup> whereas suicide rates have reached 15.6 in Southeastern Asia and 5.6 in in the Eastern Mediterranean region.<sup>14</sup>

Research shows that overall suicide rates in Iran are on the rise.<sup>20</sup> In this respect, the data of national rates of suicide show that the rate of suicide has reached 6.2 per 100 000 in 2003, which is almost 31 times greater than 1991.<sup>21</sup> Also, suicide-related mortality in Iran has reached 4.7 per 100,000 in 2015 which is more than 2006.<sup>20</sup> Overall, the suicide surveys show that Iran has had the highest increase in suicide-related deaths among Eastern Mediterranean Region and Islamic countries in recent decades.<sup>21, 22</sup>

According to international research, about 10 percent of people who attempt suicide will have successful suicides.<sup>23</sup> One of the basic necessities of suicide prevention programs is to know the current conditions of suicide methods and factors. On the other hand, this phenomenon has imposed a lot of costs on the health system of different cities of the country, so the present study aims at identifying and evaluating various epidemiological factors in the period between 2012 and 2017 related to suicide to prevent and control this phenomenon.

## Materials and Methods

This is a cross-sectional descriptive-analytical study that was conducted to investigate the epidemiological status of suicide attempters in Larestan County, south of Fars province, between 2012 and 2017. The present study was endorsed by the code of ethics NO IR.LARUMS.REC.1396.9.

The researcher initially reviewed the entire documents which were recorded on the Larestan Health center between 2012 and 2017 and incomplete or corrupted files (incomplete information entry or inaccurate registration) were

excluded from the study. Therefore, only the files in which the registered information was complete and correct were included in the study. From 893 cases reviewed, only 723 were included the study. In all stages of the study, patient information was kept confidential.

A researcher-made checklist was used to collect the data, which consisted of two general sections. The first part included demographic information such as age, sex, marital status, education, occupation, residence, and the second included other suicide information such as history of suicide attempt by the person and his/her family, history of physical and mental illness, suicide method, suicide cause, season and year of occurrence.

Frequency (percentage), mean and standard deviation were used to report descriptive statistics. Independent Chi-square and independent t-tests were used to assess the relationship between demographic variables and suicide information. Finally, logistic regression model was used to predict the factors related to suicide and death. Data were analyzed using SPSS software version 25. Significance level was considered 5%.

## Results

From 723 suicide attempters registered in the Larestan Health center, 3.73% had died as a result of suicide attempt. The majority of deaths occurred for men (66.70%) and city dwellers (74.10%). In terms of occupational status, the unemployed and the housewives had the highest proportion of deaths from suicide. There was a significant difference between the deceased and survivor groups in terms of age and sex, with the mean age of the deceased (33.44±11.49 years) significantly higher than the survivors (26/08±7/88 years) ( $P < 0.05$ ) (Table 1).

Logistic regression model indicated that the variables of age, sex and having physical problems were significantly associated with suicide death ( $P < 0.05$ ). The model showed that with increase in age, the odds of dying from suicide also increased by 10%, and men were also committing suicide leading to death at a rate of 3.39 times more likely than women (Table 2).

Figures 1 and 2, respectively, show the trend of suicide attempt results by the year and season of occurrence and. Accordingly, most of the suicide cases were in 2013 and most of the deaths occurred in summer. Figure 1 shows that the trend of suicide attempts has been on increase and that of suicide deaths has been almost downward since 2013.

The reasons for attempting suicide are shown

**Table 1:** Comparison of demographic characteristics and information about suicide in two groups of deceased and survivors due to suicide in Larestan county during 2012-2017

Variables	People who died as a result of suicide (n=27)	People who have survived (n=696)	P value
Age (year), Mean±SD†	33.49±11.49	26.08±7.88	< 0.001
Gender, n (%)			< 0.001
Male	18 (6.8)	245 (93.2)	
Female	9 (2.0)	451 (98.0)	
Marital status, n (%)			0.834
Single	13 (3.4)	368 (96.6)	
Married	14 (4.3)	315 (95.7)	
Divorced	0 (0.00)	9 (100.0)	
Deceased wife	0 (0.00)	4 (100.0)	
Address, n (%)			0.532
City	20 (4.0)	476 (96.0)	
Village	7 (3.1)	220 (96.9)	
Job status, n (%)			0.006
Unemployed	7 (12.3)	50 (87.7)	
Housewife	7 (2.2)	317 (97.8)	
Employee	1 (5.0)	19 (95.0)	
Student	5 (2.9)	168 (97.1)	
Free	7 (4.7)	142 (95.3)	
Education level, n (%)			0.166
Illiterate	3 (6.1)	46 (93.9)	
Under the diploma	24 (4.0)	580 (96.0)	
Academic	0 (0.00)	70 (100.0)	
Individual history of suicide, n (%)			0.413
Yes	5 (5.2)	91 (94.8)	
No	22 (3.5)	605 (96.5)	
Family history of suicide, n (%)			0.332
Yes	2 (7.1)	26 (92.9)	
No	25 (3.6)	670 (96.4)	
Physical problems, n (%)			0.011
Yes	7 (8.9)	72 (91.1)	
No	20 (3.1)	624 (96.9)	
Psychotic problems, n (%)			0.008
Yes	9 (8.1)	102 (91.9)	
No	18 (2.9)	594 (97.1)	

† Standard Deviation

**Table 2:** Predicting logistic regression model of the factors related to suicide mortality

Variables	OR†	95 % CI‡	P value
Age	1.10	(1.06–1.23)	<0.001
Gender			0.004
Male	3.39	(1.47–7.82)	
Female	1.00		
Physical problems			0.013
Yes	3.01	(1.26–7.18)	
No	1.00		

† Odds Ratio, ‡ Confidence Interval

in Figure 3, citing the survivors' histories and reports of suicides. According to this Figure, it was found that most people committed suicide due to family problems (more than 40%). Figure 4 shows that the most common suicide attempt is drug abuse, and the least method used was the firearm.

## Discussion

The present study showed that the suicide rate (successful suicide) was about 3.7%, which was lower than other studies.<sup>24</sup> Men had a higher mortality rate than women,

which is consistent with the study by ElHak and colleagues in Egypt.<sup>25</sup> In terms of marital status, married people were more likely to commit suicide, which is consistent with the study by Zhao et al. in China.<sup>26</sup> On the other hand, our study showed that suicide was more common in women, young and single. A study by Khan et al. in Pakistan showed that suicide attempts were less common at the age of 30 and more common among the married ones,<sup>27</sup> whereas Mechri's study showed that suicide attempts were more common in divorced ones than in other groups.<sup>28</sup> The results of our study showed differences in the methods used to commit suicide, with the most common method of suicide attempt being

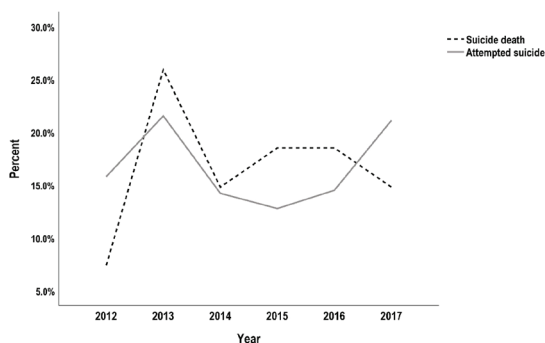


Figure 1: Comparison of the annual distribution of suicide attempt in Larestan County from 2012 to 2017

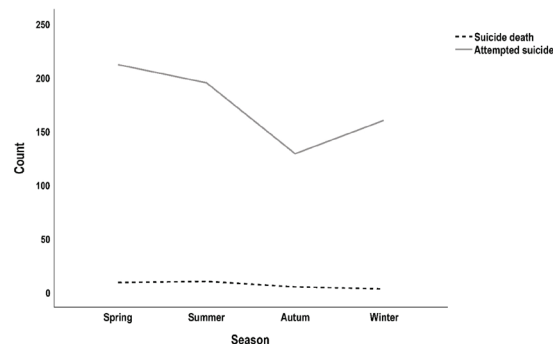


Figure 2: Comparison of the seasonal trend of suicide attempt in Larestan County from 2012 to 2017

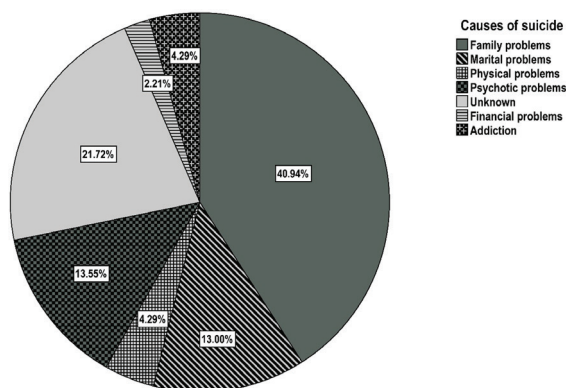


Figure 3: Comparison of the causes of suicide in suicide attempters in Larestan County from 2012 to 2017

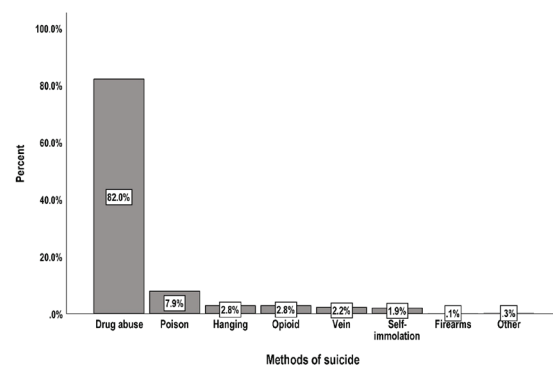


Figure 4: Comparison of suicide attempt methods in suicide attempters in Larestan County from 2012 to 2017

drug abuse and self-poisoning, which is similar to the study by Zhao et al. in China.<sup>26</sup> Given the easy access to prescription drugs as well as agricultural pesticides, people seem to have chosen the two most likely ways to commit suicide. In terms of physical condition, people with physical problems were more likely to commit suicide. Khodabandeh and colleagues in their study showed that about 51 percent of those who committed suicide had physical problems.<sup>29</sup> The study of Shokrzadeh in Iran showed high rates of psychological problems in suicide attempters, which is in the same line with the results of the present study; family disputes, emotional breakdowns, and lack of healthy social relationships in a person make them susceptible to suicide.<sup>30</sup> In terms of occupational status, homeless people and housewives were the most common suicide attempters, while housewives and students had the highest rate of unsuccessful suicide attempts. Veisani et al. in their study showed that housewives and unemployed persons were the most important occupational status groups in both suicide and suicide attempts.<sup>31</sup> The results of the present study showed a seasonal trend in suicide statistics as spring and summer were the most important seasons in suicide attempts and deaths respectively, whereas a systematic review study by Jafari et al. cites the seasonal pattern of suicide in Iran as being more related to spring and summer seasons;<sup>32</sup> Shaker's study suggests that the most important season in suicide attempt is winter.<sup>33</sup> Climate change seems to contribute to suicide attempts,

with the warm seasons in the southern region of Fars province, especially in the city of Larestan, changing the mood of people and making them more likely to commit suicide. The results of this study showed the irregular distribution of the number of suicide attempts during the years 2012 to 2017 that can be reduced by implementing prevention programs in Iran.

One of the limitations of the study is the use of data in the health records of individuals with problems related to the quality and integrity of the report, including inadequate reporting or data tampering.

### Conclusion

The results of this study showed that as people's age increase, suicide death also increases. Men and people with physical problems were also more likely to commit suicide. On the other hand, younger people, single people, women and people with physical and mental problems were more likely to commit suicide. Therefore, during preventive measures, it is necessary to be aware of the counseling of adolescents and young people. Treatment and counseling for people with psychiatric disorders need to be put on the agenda and preventive and control programs are generally necessary given the high financial and life costs of suicide. The most common suicide attempts included drug abuse and



taking agriculture pesticides. Therefore, care should be taken in the delivery of medicines and pesticides to individuals.

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**Conflict of Interest:** None declared.

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