

# Epidemiologic Study of Suicidal Attempt Cases in Fars Province, South of Iran, 2010-2011

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## Abstract

**Background:** The reduction of suicidal attempts as one of the most important goals is improvement of societies' health status. The present study aimed to assess the epidemiologic aspects of suicide cases in Fars province in 2010-2011.

**Methods:** A total of 9714 suicide cases in Fars province, south of Iran, in 2010-2011 were enrolled in this cross-sectional study through census. The study data were collected using suicide registry forms in the health centers affiliated to Fars province department of health services and analyzed using SPSS, version 17.

**Results:** The rate of suicide attempts was 116.5 per 100,000 population in Fars province (93 per 100,000 among men and 141.5 per 100,000 among women). The results showed significant differences between the suicide rates based on sex, age group, place of living, and season of the year ( $P < 0.001$ ). Most of these cases were female (59.4%), single (52.9%), 15-24 years old (56.4%), had high school education (25.8%), lived in urban areas (69.6%) and were female homemakers (30.3%). Based on the data, however, the largest number of suicide deaths resulted from self-immolation (56.7%).

**Conclusion:** The present study findings revealed different rates of suicidal attempts based on sex and age group. Also, the importance of education and mental support, especially among women and singles, and also preventive measures in the context of uncontrolled immigration from the countryside to the large cities seems to be essential more than ever. Yet, defects in some findings, particularly information about etiology, suggest that more researches should be conducted and suicide data registry and reporting systems should be improved.

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**Keywords:** Suicide, Epidemiology, Fars province, Iran

## Introduction

Suicide is a global concern in general health and the increasing rate of suicidal attempts nowadays has caused a major concern for societies.<sup>1</sup> Nearly one million individuals around the world attempt to commit suicide annually and this figure is expected to reach 1.5 million by 2020.<sup>2</sup> Suicide is considered as the 11<sup>th</sup> cause of death in developed countries<sup>3</sup> and the second cause of death in 15-29 year age group.<sup>4</sup> Over the past 45 years, the rate of suicide has increased by 60% around the world.<sup>5</sup>

Based on the report of World Health Organization (WHO), more than 800,000 individuals die due to suicide every year. Among adults, one out of every 20 suicidal attempts leads to death.<sup>4</sup>

According to the reports by Centers for Disease Control and Prevention in the United States, women attempt to commit suicide 2-3 times more than men, but the rate of completed suicide is 4 folds higher among men compared to women.<sup>6</sup>

Suicide is an ominous multi-factorial problem.

Biological and psychological factors, either alone or together, play roles in the incidence of suicide.<sup>7</sup> Various studies have indicated that the probability of suicidal attempts was significantly associated with mental disorders, history of suicidal attempts, alcohol and drug abuse, history of suicidal attempts among relatives, disabling physical diseases accompanied by mental disorders, loneliness, and social isolation.<sup>8</sup> Besides, divorced and widowed individuals comprised a large number of suicide cases and the rate of suicidal attempts among such individuals was 4-5 folds higher compared to married ones. On the other hand, the lowest rate of suicidal attempts was related to the couples with children.<sup>9</sup> Studies have also demonstrated a significant relationship between increase in the rate of suicidal attempts and unemployment.<sup>10,11</sup> These studies have revealed that jobless individuals might be at risk of suicide up to two folds more than normal people.<sup>12</sup> Moreover, evidence has shown firearms as the most common (56%) method of suicide among men.<sup>6</sup> Some other studies have also mentioned drug toxicity as the main method of suicide.<sup>13</sup> Yet, drug toxicity has been reported as the most common method of committing suicide among women in some researches.<sup>6,14</sup>

Iran also is not safe from this psychosocial problem due to experiencing quick developmental changes as well as the features of the developing world. Young population, high rate of unemployment, economic conditions, process of urbanization, and other factors can also increase concerns about the incidence of social pathologies, including suicide.<sup>8</sup>

The incidence rate of suicide in Iran has been reported to be 6.2% and according to statistics, it is in the 58<sup>th</sup> rank in the world in this respect.<sup>2</sup> Based on the reports provided by Iranian Forensic Medicine Organization in 2001, the rate of suicide among men and women was 5.7 and 3.1 per 100,000 population, respectively.<sup>8</sup> Besides, the main method of suicide was hanging oneself among men and self-immolation among women. This implies that Iranian men and women make use of violent methods for committing suicide.<sup>8</sup>

Investigation of years of potential life lost due to various reasons in different age groups in 10 provinces of Iran in 2000 showed that committing suicide in 15-24 years of age comprised almost 40% of these years. This must be of great importance for healthcare planners and health policymakers of the country.<sup>8</sup>

Up to now, some studies have been conducted in Hamadan,<sup>5</sup> Golestan,<sup>15</sup> West Azerbaijan,<sup>16</sup> Semnan,<sup>17</sup> and Kerman,<sup>18</sup> indicating various statistics. However, no comprehensive study has been performed on epidemiology of suicide in Fars province. Yet, based on the informal and unpublished reports of the mental health unit of Vice-chancellor for Health of Fars Province University of Medical Sciences, raw data

of suicide are increasing in this province.<sup>19</sup>

Based on IMoH data, Ilam province had the highest rate of suicide whilst based on ISC data, Lorestan province had the highest rate of suicide.<sup>20</sup> The findings of Bakhsha in Golestan indicated that the prevalence of suicide was higher among single individuals, females and those with lower education.<sup>15</sup>

In the study of Hormozgan, most suicidal attempts were in 15-34 year old age group, consisting of 89.2% of all cases. Incidence of suicide was higher in the summer. Drug poisoning was the main method of suicide (77.7%); then, hanging (8.8%) and poisoning (8.3%) had a high incidence. 9.6% of men and 2.4% of women who had attempted suicide had died.<sup>21</sup>

In general, accurate statistics obtained through scientific researches are necessary to provide the ground for improving the society's health, including improvement of mental and social health and prevention of suicide. Therefore, the present study is an epidemiologic investigation on suicidal attempt cases in Fars province in 2010-2011.

## Materials and Methods

This cross-sectional study aimed to conduct an epidemiologic investigation of suicide cases in Fars province, Iran in 2010-2011. The study population included all the cases that had attempted to commit suicide in Fars province in 2010-2011 and had medical records in the centers affiliated to Shiraz University of Medical Sciences. Thus, a total of 9714 cases were enrolled in the study through census.

The study data were collected using the suicide forms completed at Fars province hospitals which were regularly gathered by the Health Vice-chancellor of the University every month. It should be noted that the researchers did not have access to the suicide data at the Forensic Medicine Organization. The information recorded in the suicide forms was transferred to specific research forms and in the case of incomplete information, it was completed through phone contact. Yet, this was not possible in most cases due to wrong or changed addresses. The variables under the study included the cases' demographic characteristics, such as age, sex, marital status, occupation, and education level, and some information about suicide, including history of suicidal attempts, method of suicide, and its outcomes.

After all, the data were analyzed in SPSS statistical software (v. 17), using descriptive statistics, including frequency distribution, mean, and standard deviation. Besides, Chi-square test was used to assess the relationship between suicidal attempts and the study variables.

This study was approved by the Health System

Research (HSR) of Shiraz University of Medical Sciences. Considering ethical issues, the suicide cases' information was analyzed anonymously.

## Results

According to the data recorded in health centers affiliated to Fars province department of health services, 9714 individuals had committed suicide in 2010-2011. With respect to the population of the province in 2010 (N=4162273), the annual rate of suicidal attempts was 116.5 per 100,000 population. This rate was 93 and 141.5 per 100,000 person in men and women, respectively. In addition, women comprised most of the suicide cases (59.4%).

The highest rate of suicidal attempts (246.5 per 100,000 persons) was related to 15-24 year old age group. This rate was 128.5 and 83.5 per 100,000 persons in urban and rural areas, respectively. Additionally, the highest and lowest rates of suicidal attempts were related to winter (33 per 100,000 population) and summer (24 per 100,000 population), respectively. It should be noted that due to unavailability of the population information in different seasons of the year, the total population of the province in 2010 (4162273) was considered as the denominator in all the seasons. The results showed significant differences between the suicide rates based on sex, age group, place of living, and season of the year ( $P<0.001$ ) (Table 1).

Frequency distribution of suicide cases indicated that 1.4% of the cases were illiterate and 12.3%, 25.8%, and 4.4% had primary, middle school, and academic education, respectively. Nonetheless, the education level of 52% of the cases was not known. With respect to occupation, 8.7%, 1.5%, 2.8%, 14.7%, 30.3%, and 16.8% of the cases were jobless,

employees, workers, self-employed, homemakers, and students, respectively. However, occupation of 25.1% of the cases was not known. Due to unavailability of the base population according to education level and occupation, comparison of the suicide rates based on these variables was not possible.

The highest rate of suicidal attempts was related to single subjects (52.9%) and the most common suicide method was drug toxicity (81.9%) (Table 2).

Out of the 9714 recorded cases of suicide, 271 (2.8%) had died, while 8357 cases (86%) had recovered. However, the outcome was unknown in 1086 cases (11.2%) (Table 3).

Frequency distribution of suicide cases based on marital status, suicide method, and outcome is presented in Table 4. In this section, also, accurate statistical analysis was not possible due to incomplete data and unavailability of precise population information. According to the obtained data, out of the 271 completed suicide cases, 127 were single and 120 married. In addition, the most common suicide method was self-immolation (97/271) followed by drug toxicity.

## Discussion and Conclusion

The annual rate of suicidal attempts in Fars province was 116.5 per 100,000 persons in 2010-2011. Najafi and colleagues estimated the rate of suicide attempts in Fars province to be 53 per 100,000 persons. That study was conducted on 10671 suicide cases between 2004 and 2009 and the data were gathered using the data of the hospitals affiliated to Shiraz University of Medical Sciences, death statistics presented by the Health Vice-chancellor of the University, and information obtained

**Table 1:** Comparison of the rate of suicidal attempts per 100,000 population based on some demographic variables and seasons of the year in 2010-2011

Variables		suicide attempts	population	Suicide rate (per 100 000) (Biennial)	Suicide rate (per 100 000) (Annually)	Chi-Square Test
Gender	Male	3941 (40.6)	2119119	186	93	$x^2=414.77$ df=1 $P<0.001$
	Female	5773 (59.4)	2043154	283	141.5	
	Total	9714 (100.0)	4162273	233	116.5	
Age group	Years<14	239 (2.5)	966547	25	12.5	$x^2=6065.8$ df=3 $P<0.001$
	15-24	5407 (56.4)	1095988	493	246.5	
	25-44	3442 (35.9)	1309278	263	131.5	
	45<years	500 (5.2)	790460	63	531.5	
	Total	9588 (100.0)	4162273	230	115	
Residence Status	Urban	6760 (72.5)	2632940	257	128.5	$x^2=344.81$ df=1 $P<0.001$
	Rural	2559 (27.5)	1529333	197	583.5	
	Total	9319 (100.0)	4162273	224	112	
Season	Spring	2587 (27.01)	4162273	62	31	$x^2=152.16$ df=3 $P<0.001$
	Summer	1981 (20.7)	4162273	48	24	
	Autumn	2248 (23.5)	4162273	54	27	
	Winter	2762 (28.8)	4162273	66	33	
	Total	9578 (100.0)	4162273	230	115	

**Table 2:** Frequency distribution of suicidal attempts by gender, marital status and method used in suicidal attempt in 2010-11

Variables		Male	Female	Total
Frequency (%)		Frequency (%)	Frequency (%)	
Marital status	Single	2535 (64.3)	2604 (45.1)	5139 (52.9)
	Married	1047 (26.6)	2717 (47.1)	3764 (38.7)
	Widow&Divorced	24 (0.6)	92 (1.6)	116 (1.2)
	Unknown	335 (8.5)	360 (6.2)	695 (7.2)
	Total	3941 (100.0)	5773 (100.0)	9714 (100.0)
Method of suicide	drug toxicity	3005 (76.2)	4947 (85.7)	7952 (81.9)
	Poisoning	264 (6.7)	335 (5.8)	599 (6.2)
	Firearm	164 (4.2)	75 (1.3)	239 (2.5)
	Self-burning	52 (1.3)	119 (2.1)	171 (1.8)
	Other	289 (7.3)	161 (2.8)	450 (4.6)
	Unknown	167 (4.2)	136 (2.4)	303 (3.1)
	Total	3941 (100.0)	5773 (100.0)	9714 (100.0)

**Table 3:** Frequency distribution of suicidal attempts by outcomes, gender, residence status and age group in 2010-2011

Variables		Death	Recovered	Unknown	Total
Frequency (%)		Frequency (%)	Frequency (%)	Frequency (%)	
Gender	Male	163 (4.1)	3310 (84.0)	468 (11.9)	3941 (100.0)
	Female	108 (1.9)	5047 (87.4)	618 (10.7)	5773 (100.0)
	Total	271 (2.8)	8357 (86.0)	1086 (11.2)	9714 (100.0)
Residence Status	Urban	140 (2.1)	5934 (87.8)	686 (10.1)	6760 (100.0)
	Rural	126 (4.9)	2141 (83.7)	292 (11.4)	2559 (100.0)
	Unknown	5 (1.3)	282 (71.4)	108 (27.3)	395 (100.0)
	Total	271 (2.8)	8357 (86.0)	1086 (11.2)	9714 (100.0)
Age group	Years<14	5 (2.1)	196 (82.0)	38 (15.9)	239 (100.0)
	15-24	105 (1.9)	4760 (88.0)	542 (10.0)	5407 (100.0)
	25-44	126 (3.7)	2939 (85.4)	377 (11.0)	3442 (100.0)
	45<years	32 (6.4)	410 (82.0)	58 (11.6)	500 (100.0)
	Unknown	3 (2.4)	52 (41.3)	71 (56.3)	126 (100.0)
	Total	271 (2.8)	8357 (86.0)	1086 (11.2)	9714 (100.0)

**Table 4:** Frequency distribution of suicidal attempts by outcomes, marital status and method used in 2010-2011

Variables		Death	Recovered	Unknown	Total
Frequency (%)		Frequency (%)	Frequency (%)	Frequency (%)	
Marital status	Single	127 (2.5)	4525 (88.1)	487 (9.5)	5139 (100.0)
	Married	120 (3.2)	3281 (87.2)	363 (9.6)	3764 (100.0)
	Widow & Divorced	7 (6.0)	91 (78.4)	18 (15.5)	116 (100.0)
	Unknown	17 (2.4)	460 (66.2)	218 (31.4)	695 (100.0)
	Total	271 (2.8)	8357 (86.0)	1086 (11.2)	9714 (100.0)
Method of suicide	drug toxicity	52 (0.7)	7153 (90.0)	747 (9.4)	7952 (100.0)
	Poisoning	29 (4.8)	478 (79.8)	92 (15.4)	599 (100.0)
	Firearm	11 (4.6)	184 (77.0)	44 (18.4)	239 (100.0)
	Self-burning	97 (56.7)	50 (29.2)	24 (14.0)	171 (100.0)
	Other	65 (14.4)	330 (73.3)	55 (12.2)	450 (100.0)
	Unknown	17 (5.6)	162 (53.5)	124 (40.9)	303 (100.0)
	Total	271 (2.8)	8357 (86.0)	1086 (11.2)	9714 (100.0)

from Forensic Medicine Organization.<sup>22</sup> Moreover, Ghafarian and colleagues reported that the weighted average rate of suicide in Iran was 26.5 per 100,000 persons from 1981 to 2007.<sup>11</sup> The study by Ghaleiha also showed the rate of suicide to be 8.3 per 100,000 persons in Hamadan.<sup>5</sup> Besides, a study performed in Jamaica

showed the incidence rate of suicide to be 2.1 per 100,000 people.<sup>23</sup> Amiri and colleagues conducted a study on all suicide cases in Hamadan (N=5414) and revealed that the incidence rate of completed suicide was 14.68 and 12.15 per 100,000 individuals in 2008 and 2009, respectively.<sup>24</sup> Based on the Statistical Center of Iran, the population of

Hamadan province was 1758268 in 2011.<sup>25</sup> Accordingly, the mean rate of suicide attempts in this province was 154 per 100,000 persons, which is higher than that of Fars province.

In the current study, the highest rate of suicidal attempts was related to 15-24 followed by 25-44 year old age groups and the largest number of completed suicides was detected in the age range of 25-44 years. Ghafarian and colleagues reported the mean age of suicide to be 25 years in Iran.<sup>11</sup> Similarly, Salari and colleagues reported that the highest rate of suicidal attempts in West Azerbaijan province (62.1%) was related to 15-24 year old age group.<sup>16</sup> Also, in the study by Ghaleiha and colleagues in Hamadan, this rate was 63.7% for the 15-25 year old age group.<sup>26</sup> Mert performed a research in Turkey and demonstrated that committing suicide was increasing among 15-24 year-old individuals.<sup>27</sup> Other studies have also indicated 15-24 year old age range and female sex as two potential risk factors for committing suicide. It seems that women and adolescents lose their self-confidence more quickly due to their psychological conditions and exposure to familial problems and pressures.<sup>28,29</sup>

In the current study, most suicide cases were single. In the study conducted by Ghafarian and colleagues on the suicide cases in Iran between 1981 and 2007, singles comprised 50.5% of the cases, but this finding was different from those of other studies.<sup>11</sup> In the studies by Kurkuran and Najari in Northern Ireland<sup>30</sup> and Yamauchi and colleagues,<sup>31</sup> marriage was stated as a protective factor against committing suicide, while separation was significantly associated with the risk of committing suicide especially among young men.<sup>32</sup> Overall, being single, divorced, or widowed was related to higher rates of suicide and depression.<sup>33</sup> In the study by Amiri and colleagues, the rate of committing suicide was higher among single ones, but the rate of completed suicide was higher among married individuals (5.7%) compared to single ones (4%).<sup>24</sup>

It seems that marital status affects men and women differently in committing suicide in such a way that being married in women and being single in men are more strongly associated with committing suicide. Yet, this pattern is different depending on suicide cases; most women committing suicide were married, while most men committing suicide were single. These findings were in agreement with those obtained by Nojumi and colleagues in Karaj<sup>10</sup> and Saber Zafarghandi in Semnan.<sup>17</sup>

According to the results of the present study, the rate of suicidal attempts was higher among women (59.4%) compared to men (40.6%); this is consistent with the results of most studies conducted inside and outside the country.<sup>16,17,22,34-36</sup> In the study by Ghafarian and colleagues, the rate of suicidal attempts

was 1.39 folds higher among women compared to men.<sup>11</sup> Although the rate of suicidal attempts was higher among women, the mortality rate of suicide attempts was higher among men. Najafi<sup>22</sup> and Amiri<sup>24</sup> also conducted studies in 2013 and demonstrated a significant relationship between sex and completed suicide. They also indicated that the rate of suicidal attempts was higher among women, while that of completed suicides was higher among men.

Our study findings revealed that the rate of suicidal attempts was higher in urban areas, but the rate of completed suicides was higher in rural ones. Other researches have also confirmed the higher prevalence of committing suicide in urban societies, which might be attributed to higher rate and intensity of stress in these areas.<sup>5,37</sup> Ghafarian and colleagues reported the rate of suicidal attempts to be 70% in urban areas.<sup>11</sup> Similar results were also obtained in the studies carried out in Hamadan<sup>26</sup> and West Azerbaijan.<sup>16</sup> Najafi and colleagues investigated suicide cases between 2004 and 2009 and disclosed that the rate of completed suicides followed an ascending trend in urban areas, but had a slight change in rural ones.<sup>22</sup> Moreover, Amiri and colleagues reported that although the rate of suicide attempts was higher in urban areas, the rate of completed suicides was not different in urban and rural areas.<sup>24</sup>

Considering occupation, most of the men committing suicide in our study were self-employed and jobless, while most of such women were homemakers. Homemaking is the dominant job among women in Iranian societies. In the previous studies, joblessness comprised the largest percentage of suicide cases.<sup>10,38</sup> In the study by Ghafarian and colleagues, most of the individuals who had committed suicide were homemakers (54.2%), students (24.5%), and jobless men (21%).<sup>11</sup> Amiri and colleagues also mentioned joblessness as one of the factors of completed suicides.<sup>24</sup>

Some studies have shown low education levels as a risk factor for committing suicide.<sup>39,40</sup> In the present study, however, most of the individuals committing suicide had middle school and high school education and only a small number of them were illiterate. This was in line with the results of the studies conducted in Turkey,<sup>41</sup> Spain,<sup>42</sup> and Iran.<sup>11</sup> In the studies by Nock,<sup>43</sup> Butris,<sup>44</sup> and Amiri,<sup>24</sup> illiteracy or low education levels were accompanied by higher prevalence rates of suicide attempts.

The current study findings showed that the highest rate of suicidal attempts was related to spring and winter. Ghaleiha and colleagues also conducted a study in Hamadan and reported that the highest rate of suicide attempts was observed in spring, March, and September.<sup>26</sup> In the research by Yasemi and colleagues, the largest number of suicidal attempts

was detected in spring followed by summer, winter, and autumn, indicating higher suicide attempts in warmer seasons of the year.<sup>18</sup> Amiri and colleagues also showed that the percentage of suicide cases was higher in spring and summer compared to autumn and winter.<sup>24</sup> In the same line, Ghafarian and colleagues demonstrated that the rate of suicide attempts was 13% higher in summer compared to other seasons.<sup>11</sup>

In our study, the most common method of suicide was drug toxicity which was significantly higher among women compared to men. This was consistent with the results of the studies performed in West Azerbaijan,<sup>16</sup> Kerman,<sup>18</sup> Kurdistan,<sup>34</sup> Semnan,<sup>17</sup> Golestan,<sup>15</sup> and Hamadan.<sup>24</sup> However, the results of a study conducted in Eastern Mediterranean countries showed hanging followed by drug toxicity, self-immolation, and drowning as the most common suicide methods.<sup>45</sup> Drug toxicity was also the most common suicide method in Britain, which might be due to the accessibility of medicines.<sup>46</sup> In the present study, the largest number of completed suicides was found to be among those committing self-immolation (56.7%). In the study by Amiri and colleagues, the highest rate of completed suicides was related to hanging (83.6%) and self-immolation (74.2%) methods.<sup>24</sup> Furthermore, Taghadossinejad and colleagues performed a research in 2009 and reported that self-immolation mostly occurred among women, youth, individuals with low education levels, and those living in urban areas.<sup>47</sup>

### Limitations

Due to unavailability of some data, some statistical tests were not possible to be performed, so findings cannot be generalized to other studies. In addition, the causal relationships among the variables could not be analyzed due to the cross-sectional design of the study. Another limitation of this study was lack of access to the suicide data in Forensic Medicine Organization; therefore, the study results might be different from the real statistics of suicidal attempts in the province. Beside, some forms were incomplete and loss of the related data restricted their future analysis.

### Conclusion

High rate of suicidal attempts in Fars province compared to the rates of the past years and those of other provinces in the country is considered as a health concern in the society. In addition, the high rate of suicidal attempts among the youth recommends planners and health policymakers to make necessary decisions and have comprehensive long-term plans. Also, the importance of education and mental support, especially among women and singles, and also preventive measures in the context of uncontrolled immigration from the countryside to the big cities is felt more than ever. Yet, defects in some

findings, particularly information about etiology, suggest that further researches should be conducted and suicide data registry and reporting systems should be improved.

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**Conflict of Interest:** None declared.

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