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*Original Article*

## Investigating the related factors on suicide methods and suicide attempts in Yazd, Iran

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### **Abstract**

**Introduction:** Suicide is a global health concern with a growing prevalence in most countries including Iran. The increasing rate of suicide despite the suicide prevention programs indicates the need for evaluation of the effective factors on suicide attempts. Therefore, the present study aimed to evaluate the relationship between different risk factors including age, gender, addiction, mood of residence, marital status, history of psychiatric illnesses, history of suicide attempts in the patient and the family, time and season of suicide attempt, and methods of suicide in Yazd province in Iran.

**Materials and Methods:** The present cross-sectional study conducted in educational Hospitals of Yazd and Legal Medical Organization of Yazd city June 2018-June 2019. Every individual with complete suicide attempts enrolled. The medical records of these individuals were documented and the relationship between the method of suicide and demographic factors were evaluated.

**Results:** Sixty individuals with the mean age of 37.43 years enrolled in the present study and most of them were female (68.3%). Major part of the individuals had a history of suicide attempts (54.5%) and most of the suicides occurred during nights (42.4%). Moreover, most of the complete attempts occurred in summer (46.7%), and hanging (55%) was the most common type of suicide attempt. Only the gender was significantly correlated with the method of suicide ( $P=0.001$ ).

**Conclusion:** The present study demonstrated that most of the suicides committed by females and self-hanging were the most common method of suicide. The gender was the only factor related to the method of suicide.

**Keywords:** Behavior, Psychiatry, Suicide

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## Introduction

Suicide is considered an important health concern in every country, with increasing prevalence globally (1). Suicide mortality is an indicator of sustainable development goal 3.4.2, and since January 2018, 28 of 194 world health organization members have planned suicide prevention strategies (1). The suicide mortality rate is widely variable among different locations and depends on various factors. Some countries, including the Islamic countries, have a lower rate of suicide (2). It has been demonstrated that suicide mortality varies among different cities of a country (3). Each population has specific cultural and social characteristics directly affecting suicidal behaviors and thoughts. People living in urban cities are at greater risk of performing suicide than those living in rural areas (3). Moreover, many other factors, including family conflicts and economic and marital problems, are considered common risk factors of suicide (4). In the Islamic Republic of Iran, the suicide mortality rate has been reported to be 5.3 persons per 100000, with a male: female ratio of 2:1 (2). According to the most recent report of Iranian forensic medicine in two years since 2016, 71.2% of suicide patients were male (6424 individuals from 9021) and married individuals (52.6%) (5). Like many other countries, Iran is also facing an increase in suicide rates despite running suicide prevention programs. A recent epidemiological study from southern Iran demonstrated that 18.6% of burn patients were documented as suicide attempts, and self-immolation was considered as a highly prevalent method of suicide (6). Among the management strategies for reducing the suicide rate, paying specific attention to suicide risk factors among every population is an important issue. Various complex variables are causing suicidal behaviors, which are studied in different provinces resulting in controversial findings (7). Predisposing factors of suicide are different among specific populations, and some of these factors are preventable (8). For example, a recent study about suicide-related deaths among elderly people demonstrates that the suicide rate is rising in this population and psychosocial illnesses are the main reason for suicide (9). On the other hand, previous studies from our country evaluated the suicide determinant, and it has been reported that these factors and stressful life events are the most

important factor related to suicide (10). Other studies reported that religion, spirituality, and beliefs are influential factors in suicide attempts (11). Moreover, the relationship between choosing different methods of suicide and different individual factors has not been widely studied in our country. While self-immolation has been reported to be a common method of suicide in southern Iran, a recent study from Sirjan, one of the cities with a considerable suicide rate in Iran, reported that hanging is the most common method of suicide (6,12). Therefore, studying the most common risk factors in every province and determining the factors related to specific types of suicide will be helpful for health services planning specific suicide prevention programs (13,14). The present study aimed to evaluate the relationship between different risk factors and methods of suicide among individuals with suicide in Yazd city's educational hospitals.

## Material and Methods

The present descriptive cross-sectional study was approved by the Islamic Azad University of Yazd ethics committee (IR.IAU.YAZD. REC. 1399.006). Medical records of every documented suicide referred to any of the University Hospitals of Yazd province (including Shah Vali hospital, Taft Shahid Beheshti hospital, and legal medicine center of Yazd Province) were evaluated for 12 months since June 2018. The included medical records were every medical record of individuals who attempted suicide regardless of age, gender, or previous medical history. The medical records without complete medical information regarding the method of suicide or other medical and demographic information, including the age, gender, marital status, level of education, the mood of residence, history of psychiatric or other medical illnesses, history of previous suicidal attempts, family history of suicidal attempts, time and season of suicide were not included. Instead, this medical information was documented in a checklist by a researcher, and the study data was kept confidential according to the Islamic Azad University of Yazd ethics committee protocol. The relationship between these variables and the method of suicide was then evaluated. The study data analyzed by SPSS software (version 16) using the Fisher exact tests and  $P < 0.05$  considered a statistically significant result.

**Results**

Among the 60 individuals with suicide, most of them were female (41, 68.3%). The mean age of the study population was 37.43±15.81, and 57.9% (33 individuals) were married while 5.3% (3 individuals) were widowed. Only 3.6% (2 individuals) of the study population were jobless while most of them (76.4%) had jobs, 3.6% (2 individuals) were students, and 16.4% (9 individuals) were housewives. The rest of the participants' demographic data is summarized in figure 1. Most of the individuals had a history of suicide attempts (54.5%). Most of the suicides occurred during nights (42.4%), following evenings (27.1%), mornings (23.7%), and mid-day

(6.8%). Moreover, most of the complete attempts occurred in Summer (46.7%), following Spring (23.3%), Autumn (21.7%), and Winter (8.3%). Hanging (55%) was the most common type of suicide among the study population. Table 1 summarizes the frequency of different methods of suicidal attempts based on the study variables. While gender was correlated with the method of suicide ( $P= 0.001$ ); age ( $P= 0.868$ ), addiction ( $P= 0.398$ ), the mood of residence ( $P= 0.179$ ), history of psychiatric illness ( $P= 0.446$ ), history of suicidal attempts ( $P= 0.307$ ), time of the suicide attempts ( $P= 0.080$ ) and season of suicide ( $P= 0.348$ ) were not correlated with the method of suicide.

**Table 1.** Frequency of different suicidal methods based on demographic variables

Demographic variable	Drugs		Self-poisoning		Hanging		Self-immolation		Suicidal self-injuries		
	N.	%	N.	%	N.	%	N.	%	N.	%	
Age	<30 years	2	8.7	3	13	14	60.9	3	13	1	3.4
	30-84 years	2	5.4	9	24.3	19	51.4	5	13.5	2	5.4
	Total	4	6.7	12	20	33	55	8	13.3	3	5
Gender	Male	0	0	7	17.1	26	63.4	5	12.2	3	7.3
	Female	4	21.1	5	26.3	7	36.8	3	15.8	0	0
	Total	4	6.7	12	20	33	55	8	13.3	3	5
Addiction	Yes	0	0	4	33.3	6	50	1	8.3	1	8.3
	No	4	8.7	6	13	27	58.7	7	15.2	2	4.3
	Total	4	6.9	10	17.2	33	56.9	8	13.8	3	5.2
Residency	Urban	4	8.5	10	21.3	27	57.4	5	10.6	1	2.1
	Rural	0	0	2	15.4	6	46.2	3	23.1	2	15.4
	Total	4	6.7	12	20	33	55	8	13.3	3	5
History of psychiatric illness	Yes	1	7.7	4	30.8	6	46.2	2	15.4	0	0
	No	3	6.8	5	11.4	27	61.4	6	13.6	3	6.8
	Total	4	7	9	15.8	33	57.9	8	14	3	5.3
History of suicide attempts	Yes	1	16.7	4	66.7	0	0	0	0	1	16.7
	No	1	20	2	40	2	40	0	0	0	0
	Total	2	18.2	6	54.5	2	18.2	0	0	1	9.1
Time of suicide attempt	Morning	0	0	1	7.1	12	85.7	1	7.1	0	0
	Noon	0	0	1	25	1	25	1	25	1	25
	Afternoon	3	18.8	4	25	4	25	4	25	1	6.3
	Night	1	4	6	24	15	60	2	8	1	4
Season of suicide attempt	Spring	3	21.4	2	14.3	9	64.3	0	0	0	0
	Summer	1	3.6	7	25	14	50	4	14.3	2	7.1
	Fall	0	0	3	23.1	6	46.2	3	23.1	1	7.7
	Winter	0	0	0	0	4	80	1	20	0	0
History of previous illness	Yes	1	50	1	50	0	0	0	0	0	0
	No	2	3.8	7	13.5	33	63.5	8	15.4	2	3.8
	Total	3	5.6	8	14.8	33	61.1	8	14.8	2	3.7

## Discussion

The present study demonstrated that most of the suicides were made by females, and 54.5% of individuals with suicide had a previous history of suicide attempts. Self-hanging was the most common type of suicide in our population. While gender was correlated with the method of suicide, other factors, including age, previous history of suicide, or psychiatric illness, were not correlated with the type of suicide attempts.

Despite the suicide prevention programs, the suicide rate has been rising in Iran. There are plenty of management strategies proposed for reducing the rate of suicide, including providing religious intervention and services, teaching life skills, improving economic status, and providing mental health supports for patients with psychiatric disease (7). While the suicide rate and its influential factors are variable among different populations and mainly depend on the specific regional variables, including the socioeconomic status, a mood of residency, and religious beliefs, therefore, planning the prevention and management programs based on such specific factors in every population will provide more favorable results. Various complex variables cause suicidal behaviors among different populations. Our study demonstrated that most of the individuals with suicide were females, and the gender was successfully related to the methods of suicide. A worldwide study evaluating the prevalence of suicide attempts (1990 to 2016) demonstrated that except for the age group of 15 to 19 years, suicide attempts were more common in males (1). A previous report from the world health organization demonstrated that the suicide rate is higher in the male population in Iran (2). Moreover, a study from our country demonstrated that women experienced a more significant decrease in suicide mortality rate (4). The most recent meta-analysis on Iranian studies demonstrated that females are most likely to commit suicide younger than males (15). Regarding most of the studies suggesting the dominance of the male gender in those with suicide from our country (16) and the male: female ratio of 1:2 for suicide in our study, we may suggest an unknown effect on the female gender Yazd leading them to perform suicide. Further researches are warranted to address this important issue in our region.

Shirazi et al. study reporting the suicide rate in Iran (1981 to 2007) demonstrated that most suicide attempts occur in summer and those living in urban areas (3). Another study on 252911 individuals performing suicide attempts in Iran demonstrated that women living in rural populations showed a higher rate of suicide attempts while the male gender had a higher rate of suicide in contrast to urban countries showing lower rates of both suicide attempts and complete suicide (16). We demonstrated that most of the complete attempts occur in summer and that the rural: urban ratio of lethal suicide in our region is 1:3. We believe that the higher stress of living in urban areas is responsible for the higher suicide rate than in rural areas. However, some studies, including the Vijayakumar et al. report, suggest that living in rural areas may be a risk factor of suicide due to lack of social support, especially in developing Asian countries (17).

The main goal of the present study was the determination of different methods of suicide and their influential factors. Based on our results, the most common method of suicide was hanging. A recent meta-analysis on the Iranian population demonstrated that common methods of suicide are using drugs (18). Hajebi et al. study evaluating the suicide attempts in Iran (2009 to 2012) demonstrated that the most common method of incomplete suicide was hanging, while most suicide attempts were made by medication overdose (16). A possible explanation for using drugs as a method of suicide is the ease of access in every house. Among our study population, self-immolation and using drugs were the third and fourth common methods of fetal suicide, while the first and second most common methods were self-hanging and self-poisoning. Our result is mainly similar to a study from Ilam reporting that the most common methods of lethal suicide were hanging and self-immolation, while the least common methods were using drugs and cutting (19). The most common method of suicide mainly depends on cultural and social factors. Self-immolation, a rare method of suicide in developed countries, is mainly seen in developing and underdeveloped countries as there are flammable materials in houses used for cooking and producing heat during cold seasons (2). Similar to our study demonstrating a relationship between gender and method of

suicide, Shojaei et al. study demonstrated that gender is related to suicide (20). While we demonstrated that hanging is common in both genders, they demonstrated that the male gender is more likely to attempt suicide by hanging and females' attempts by self-immolation. In contrast to our study, they demonstrated a significant relationship between the method of suicide and age and education level (20). Another study reporting gender as a factor related to the suicide method was conducted by Tsirigotis et al. in Poland (21). They demonstrated that females tend to have suicide attempts by drugs and exsanguination among their population while males choose to hang themselves (21).

In conclusion, suicide is a multicausal phenomenon, and comparison of different populations from different ethnicities with different religious beliefs and socioeconomic status. Regardless of the controversial reports regarding the influential factors on suicide and the methods of suicide, it has been suggested that the prevention strategies should be at least gender-specific. While it has been suggested that females have less serious intent to perform complete suicide (22), our results demonstrated that most of the suicides were attempted by females, and both genders used hanging as a common method of suicide. The explanation of

this finding requires more detailed studies on both genders attempting suicide in Yazd, Iran. One of the main limitations of the present study is the small sample size. Moreover, the present study only included the individuals with suicide, and further studies may include individuals with suicide attempts and therefore provide a more direct relationship between the methods of suicide and the studied risk factors.

### Conclusion

The present study demonstrated that most individuals with suicide are females and had a previous history of suicide. The most common method of suicide in both genders was hanging. Among the risk factors for suicide, gender was correlated with the method of suicide among those who had suicide.

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