

Incidence of suicide in East Azerbaijan Province, Iran

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Abstract

Background: Suicide is a major problem world-wide. The aim of the present study was to determine the incidence of suicide in East Azerbaijan province, Iran.

Methods: The study used collected data from the Systematic registration within East Azerbaijan province from 2010 to 2011. We analysed some characteristics of the cases of suicide based on the health system database. Variables such as demographics, outcomes (fatal/nonfatal), and methods used were recorded. Data was analysed using Chi-square and T-test.

Results: A total of 3,768 reported cases of suicide were analysed. More cases were reported from married people. The incidence rate of suicide was 101.3 per 100,000. Most of the attempted suicides were observed in younger people. The number of attempted suicides was higher in women (63.7%) than in men (36.3%). The most frequent method of committing suicide in both sexes was drug overdose. A statistically significant relationship was observed between suicide's outcome and gender, job, marital status, and education ($P < 0.001$). The case fatality rate among males was significantly higher than that in females (OR=3.7, 95% CI: 2.5–5.8). Hanging (72.3%) and drug overdose (0.9%) had respectively the highest and the lowest case fatality rates. Drug overdose was slightly more frequent among women than in men (91.3% versus 84.2%). The rate of poisoning increased gradually until the age-group 45-54 years. Also, drug overdose was more prevalent among single individuals than in married people.

Conclusion: Due to the high incidence of completed suicides, it is recommended that counselling centres be established for mental ill-health, especially a suicide hotline with appropriate availability to all population.

Keywords: Attempted suicide; Completed suicide; Epidemiology; Incidence

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Introduction

Suicide is a major public health, mental, and social problem, which increases in many societies due to complicated relations and interactions (1, 2). Based on a World Health Organization (WHO) report, suicide is the 5th leading cause of death for people aged 15-29 and 30-44 years. It was also the 16th cause of death world-wide in 2004. It is estimated that committing suicide will rise to the 12th place among top causes of mortality in 2030 (3). In the United States, suicide is the second leading cause of death in people aged 25-34 years, and the 10th leading cause of death overall in 2010 (4). Moreover, it is the 2nd leading cause of death for people aged 15-34 years in Europe (5). Published statistics of WHO indicates that suicide prevalence is 16 per 100,000 people globally (6). Thus, about one million people annually attempt suicide world-wide. Several studies have reported that an attempted suicide occurs every three seconds, and on average one attempted suicide takes place every 40 seconds and every day 1,000 people die by suicide in the world (7, 9). Similarly, investigations regarding the two last decades in Iran indicate that attempted and completed suicides are growing in most regions of the country, particularly among adolescents (10). However, in most countries, due to a variety of legal, religious, ethnical, and cultural factors, the actual cases of suicide is not publically reported (11-13). In addition, most of the people and families repudiate the occurrence of suicide because of social stigma and attribute it to coincidences (11). Since suicide is not compatible with Iranian cultural values, under-reporting in Iran appears to be a valid claim (14).

Multiple factors such as age, gender, race, religion, marital status, job, drug abuse, and mental and physical diseases are regarded as risk factors of suicide (2, 15). In fact, the risk factors of suicide, and consequently how to manage it are different in different societies because it indicates a reflection of the mental and cultural history of the society (5, 16, 17). Although most efforts in reducing suicidal thoughts and attempts to suicide have so far been unsuccessful (2, 18), obtaining reliable information about epidemiology of suicide is very important for decision making and preventive strategies (2, 5, 16, 17).

Having in mind these notes, the incidence rate of total suicide (attempted and completed) and related factors in East Azerbaijan Province was not reported to date. The aim of the present study was to determine the epidemiology of attempted and completed suicides in East Azerbaijan province, Iran.

Methods

The present study used completed and attempted suicide data collected by the Systematic registration within East Azerbaijan province. The study area is one of the largest health regions in the northwest of Iran, with a population of about 3,691,270 million. This province has 19 counties with independent health and treatment networks. Each district health centre has a mental health section, which routinely collects data on suicide events from various resources such as the rural and urban health centres, general and mental hospitals, forensics, and the death registration system. Finally, data is sent to the health centre of the province where they organize the data again and double-check the data entry. In the present study, data from all completed suicide

cases accessible at the health centre of the Province from March 20, 2010 to March 19, 2011 were analysed. We had access to the primary data of suicide in the health centre of the province and included all cases of attempted and completed suicides. The Ethics Committee of Tabriz University of Medical Sciences approved the study (Code no. 90/1-6/7).

Variables such as demographic data (sex, age, job, education, residency, seasons of year, mental disease background, history of previous suicide, and marital status), outcome (fatal/nonfatal), and the method used were recorded. In case of incomplete information, patients' families were contacted on phone or using their addresses in order to complete the information. All data related to the cases were assured to remain confidential.

After removing repeated cases, data was inserted into Statistical Package for the Social Sciences (SPSS), version 16 columns and were analysed. Descriptive indices were calculated and reported. Qualitative variables were compared using the Chi-square test and quantitative data was analyzed using T-test. All P-values were two-sided with $P < 0.05$ considered as the level of significance.

Results

A total of 3,768 reported cases of suicide (attempted and completed) were studied. From among these cases, 3,665 (97.3%) were collected from hospitals, 85 (2.3%) from forensics, and 18 (0.5%) from health care centres. The total incidence rate was 102.07 per 100,000 people in East Azerbaijan. This rate was 99.34 and 2.73 per 100,000 people for attempted and completed suicides, respectively.

As shown by Table 1, of those who attempted/

completed suicide, 62.8% were males, 52.9% aged 15-24 years, and 51.9% were married. About 85.2% of the cases occurred among those aged < 35 years and only 3% were among those aged ≥ 55 years. There were more reported cases among married than among single individuals (51.9% versus 47.8%), although data about marital status was missing for 11 cases.

There was a statistically significant difference between marital status and suicide outcome ($P < 0.001$). In addition, drug overdose (88.7%) was the most commonly used method in attempted/completed suicides followed by poisoning (4.9%) and hanging (1.7%). The other variables studied were level of education, job, residency, suicide method, and history of mental and physical diseases. There was a significant difference between each of these variables and suicide outcome (fatal/nonfatal) ($P < 0.001$). There was also an association between history of previous suicide and suicide outcome ($P < 0.05$). The highest rate of suicide occurred in the summer (31.7%) and the lowest in the winter (19.2%), but the difference was not statistically significant ($P = 0.6$). There were 101 completed suicides with a case fatality rate of 2.7%. The fatality rate among males (4.9%) was significantly higher than that among females (1.3%) (OR=3.7, 95%CI: 2.5–5.8). The three most commonly used methods among the reported fatal cases were hanging (46.5%), drug overdose (29.7%), and self-burning and poisoning together (5.9%). The calculated case fatality rates for the different methods of suicide showed that hanging (72.3%), self-burning (60%), and jumping off (50%) were significantly more likely to lead to death than the other methods ($P < 0.001$). Poisoning had the lowest case

Table 1. Socio-demographic characteristics and outcome of cases of suicide (attempted and completed)

Variable		All cases N (%)	Attempted (n=3667) N (%)	Completed (n=101) N (%)	Case fatality rate	P
Total		3768 (100.0)	3667 (100.0)	101 (100.0)	2.7	
Sex	Male	1400 (37.2)	1331 (36.3)	69 (68.3)	4.9	<0.001
	Female	2368 (62.8)	2336 (63.7)	32 (31.7)	1.3	
Age-group	5-14	80 (2.1)	79 (2.2)	1 (1.0)	1.2	<0.001
	15-24	1992 (52.9)	1956 (53.3)	36 (35.6)	1.8	
	25-34	1139 (30.2)	1109 (30.2)	30 (29.7)	2.6	
	35-44	291 (7.7)	281 (7.7)	10 (9.9)	3.4	
	45-54	15 (4.1)	143 (3.9)	11 (10.9)	0.7	
	55-64	66 (1.8)	61 (1.7)	5 (5.0)	7.5	
	65<	46 (1.2)	38 (1.0)	8 (7.9)	17.4	
	Job	Unemployed	281 (7.5)	263 (7.2)	18 (17.8)	
Housewife	1703 (45.2)	1678 (45.8)	25 (24.8)	1.4		
Student	576 (15.3)	570 (15.5)	6 (5.9)	1		
Student at university	247 (6.6)	247 (6.7)	0.0 (0.0)	0.0		
Freelance job	653 (17.3)	622 (17)	31 (30.7)	4.7		
Labourer	66 (1.8)	60 (1.6)	6 (5.9)	9		
Employee	32 (0.8)	30 (0.8)	2 (2.0)	6.2		
Farmer	53 (1.4)	48 (1.3)	5 (5.0)	9.4		
Marital status	Other	156 (4.1)	148 (4.0)	8 (7.9)	0.5	<0.001
	Married	1957 (51.9)	1899 (51.8)	58 (57.4)	2.9	
	Single	1800 (47.8)	1761 (48)	39 (38.6)	2.1	
Education	Other	11 (0.3)	7 (0.2)	4 (4)	36.3	<0.001
	Illiterate	242 (6.4)	230 (6.3)	12 (11.4)	4.9	
	Under diploma	1734 (46)	1672 (45.6)	62 (61.4)	3.5	
	Diploma	1374 (36.5)	1353 (36.9)	21 (20.8)	0.1	
	Bachelor	266 (7.1)	265 (7.2)	1 (1)	0.04	
	Master and Doctorate	9 (0.2)	8 (0.2)	1 (1)	11.1	
Residency	Other	143 (3.8)	139 (3.8)	4 (4)	2.8	<0.001
	Rural	956 (25.6)	927 (25.3)	38 (37.6)	3.9	
Season	Urban	2803 (74.4)	2740 (74.7)	63 (62.4)	2.2	0.68
	Spring	967 (25.7)	940 (25.6)	27 (26.7)	2.8	
	Summer	1196 (31.7)	1168 (31.9)	28 (27.7)	2.3	
	Autumn	883 (23.4)	855 (23.3)	28 (27.7)	3.2	
Mental disease history	Winter	722 (19.2)	704 (19.2)	18 (17.8)	2.5	<0.001
	No	3601 (95.6)	3520 (96)	81 (80.2)	2.2	
Physical disease history	Yes	167 (4.4)	147 (4)	20 (19.8)	11.9	<0.001
	No	3734 (99.1)	3641 (99.3)	93 (92.1)	2.5	
History of previous suicide	Yes	34 (0.9)	26 (0.7)	8 (7.9)	23.5	0.44
	No	3616 (96)	3523 (96.1)	93 (92.1)	2.6	
Suicide method	Yes	152 (4)	144 (3.9)	8 (7.9)	5.2	<0.001
	Jumping off	2 (0.1)	1 (1)	1 (1)	50	
	Self-burning	10 (0.3)	4 (1)	6 (5.9)	60	
	Hanging	65 (1.7)	18 (5)	47 (46.5)	72.3	
	Cold weapon	54 (1.4)	53 (1.4)	1 (1)	1.8	
	Firearm	5 (0.1)	3 (0.1)	2 (2)	40	
	Drug overdose	3341 (88.7)	3311 (90.3)	30 (29.7)	0.9	
	Poisoning	186 (4.9)	180 (4.9)	6 (5.9)	3.2	
Other	105 (2.8)	97 (2.6)	8 (7.9)	7.6		

Case fatality rate=[fatal/(fatal+nonfatal)]×100. NS: not significant

As shown in Table 2, which includes the methods of attempted/completed suicide, poisoning and hanging was more often used by men than women ($\chi^2=2.3$, $P<0.1$ and $\chi^2=41.3$, $P<0.001$, respectively), whereas self-burning was used more often by women. However, there was no significant difference between sex and self-burning ($\chi^2=3.1$, $P=0.07$). Moreover, drug overdose was slightly more frequent among women than in men ($\chi^2=43.9$, $P<0.001$).

Age-specific analysis of methods showed that the rate of poisoning increased gradually until the 45-54 age group (from 3.8% for those aged

≤ 14 years to 6.5% for those aged ≥ 65 years) ($\chi^2=141.3$, $P<0.001$). The rate of using cold weapon increased until the age 35-44 years and then declined slightly ($\chi^2=4.7$, $P=0.5$). Besides, the rate of drug overdose decreased with age from 90.6% at age <25 years to 76.1% at >64 years ($\chi^2=34.4$, $P<0.001$). In accordance with the analyses of methods based on marital status, drug overdose was more prevalent among single (89.7%) than married (87.9%) ($\chi^2=43.9$, $P<0.001$) individuals, whereas poisoning was used more often by the married than the single ($\chi^2=2.3$, $P=0.1$).

Table 2. Methods of suicide (attempted and completed) by sex, age and marital status

Variable		All cases		Drug overdose		Poisoning		Hanging		Cold weapon		Self burning		Firearm		Jumping off		Other	
		N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Sex	Female	2368	2162	91.3	107	4.5	16	0.7	20	0.8	9	0.4	1	0.05	1	0.05	52	2.2	
	Male	1400	1179	84.2	79	5.6	49	3.5	34	2.4	1	0.1	4	0.3	1	0.1	53	3.8	
Age	5-14	80	71	88.8	3	3.8	0	0	1	1.2	0	0	0	0	0	0	5	6.2	
	15-24	1992	1805	90.6	87	4.4	1	0.1	27	1.4	5	0.3	4	0.2	1	0.1	40	2	
	25-34	1139	1001	87.9	53	4.7	0	0	22	1.9	1	0.1	1	0.1	0	0	40	3.5	
	35-44	291	253	86.9	22	7.6	0	0	3	1	0	0	0	0	0	0	7	2.4	
	45-54	154	125	81.2	10	6.5	1	0.6	1	0.6	0	0	0	0	1	0.6	10	6.5	
	55-64	66	51	77.3	8	12.1	0	0	0	0	2	0.3	0	0	0	0	2	3	
	65-<	46	35	76.1	3	6.5	0	0	0	0	2	4.3	0	0	0	0	1	2.2	
	Marital status	Married	1957	1720	87.9	109	5.6	9	0.5	26	1.3	9	0.5	1	0.1	2	0.1	55	2.8
	Single	1800	1615	89.7	76	4.2	0	0	28	1.6	0	0	4	0.2	0	0	50	2.8	

Discussion

The present study revealed that the incidence rate of total suicide was 102.07 per 100,000 people, and 2.73 per 100,000 people for completed suicides. For instance, the incidence rate for total and completed suicide in Belgium was 107.4 and 22.6 per 100,000, respectively (19), in Austria for completed suicide 21.3 per 100,000 (17), and in the United States 11 per 100,000 (20). Thus, the rates in these countries are higher than those found in the present study. Globally, statistics provided by WHO indicates that suicide prevalence is 16 per 100,000 people (6). The reason may be related to sociocultural differences in various countries.

In Iran, the incidence rate of total suicide differs in various provinces. In Kermanshah (21), the rate was reported 22 per 100,000 people, in Semnan (22) 115.8 per 100,000, and in Kashan 119 per 100,000 (10). The rate of completed suicide also changes in different provinces. In Kashan, this rate was 1.1 per 100,000 and in Iran, generally, it was 5.7 and 3.1 per 100,000 people in men and women, respectively (10, 23). Thus, the incidence rate of attempted suicides in East Azerbaijan seems to be lower than that in other provinces of Iran, except for Kermanshah province; the incidence rate for completed suicides also is lower in comparison with other provinces and the whole country. This may be, in part, due to differences in reporting and registry systems of different provinces, as well as cultural dissimilarities.

Our findings showed that attempted suicide is higher in women, which is in agreement with the previous studies (1, 10, 14, 17, 19, 24). However, our findings are contrary to those reported in two studies conducted in Hamedan province (25) and Thailand (26), i.e. attempted

suicide was reported to be higher in men than in women or almost equal in both genders. The higher rate of attempted suicide in women may be due to economic dependence, family insecurity, dearth of self-confidence, and the absence of social support systems. In the present study, unlike attempted suicide, completed suicide was higher in men than in women, similar to the findings reported in most of the studies conducted in Iran and in the world (27-29). This is probably because men use more efficient methods, compared with women, to commit suicide.

In our study, completed suicides showed a different demographic profile, with the case fatality rate higher among males and older people. On the other hand, attempted suicide was more prevalent among young (15-24 years) and single individuals. A study conducted in Egypt showed that the majority of completed suicide cases were young males (30). Other studies in the country have also reported that the rate of attempted suicide is higher among younger and single individuals (31). In a study conducted by Khan and Reza in Pakistan, 75% of non-fatal suicides were reported to be among those aged under 30 years old (32).

In the present study, the commonest age-group for committing suicide was those aged 15-34 years (83.1%). Our results are in line with those of the previous studies (10, 22, 25, 30) in Iran as well as those reported in the studies from other countries (1, 9, 29). The main reasons for high prevalence of suicide in younger people may be attributed to failure in social communications, despair about the future, and joblessness.

The method of suicide differs in various societies and cultures. The most frequent method of suicide (attempted and completed) in the present study was drug overdose (88.7% of

the cases), which probably is due to availability of drugs, familiarity with different drugs, and the conception that this method is less painful. The methods with the highest and lowest case fatality rate were related to hanging (72.3% of all cases) and drug overdose (0.9% of all cases), respectively. Using drugs for committing suicide was reported in men and self-burning in women (14). In Belgium, the most common method for attempted suicide in both sexes is reported to be drug overdose, and for completed suicide hanging or self-burning to be the commonest method in other provinces (10, 22) as well as in the whole country (14). However, the most frequent method for completed suicide was hanging in men and drug overdose in women (19). As for completed suicide, hanging is the most common method in both genders in Austria (17) and Jamaica (29) and in men in Turkey (9, 28). However, the most common method in Turkish women is reported to be taking drugs (28). A study carried out in the United States reported that poisoning is the most common method among those attempting suicide and firearms the most common method used by those dying by suicide (23). Perhaps popularity of the methods in various societies among men and women, availability of the methods, and decisiveness of attempters' decision are important factors to choose suicide methods (34).

Our results also revealed differences in methods of attempted and completed suicides based on some of the demographic factors. For instance, hanging and cold weapon were more prevalent among males and self-burning was more predominant among females. A study in India reported that males were more likely to use hanging and poisoning, whereas females used drowning and self-burning more (35).

Age specific analysis of methods showed that the rate of poisoning and using cold weapon increased until the age 35 years. However, a study conducted by Coronfel showed that the age of the victims had no effect on the choice of the suicide method (36). Analyses of the methods by marital status showed that drug overdose was more prevalent among single and poisoning was more common among married individuals. Our study showed some differences in the methods of suicide according to demographic factors, which may reflect differences in availability, accessibility, and popularity of methods.

In the present study, 4.4% of suicide cases had mental disorders. However, in a study conducted by the Iran Forensic Medicine, 23.5% of the cases were reported to have mental disorders (37). In another study conducted in Italy, having a mental disorder was found to be associated with a statistically significant increase in the risk of suicide attempt (24). The reason for the modest percentage of suicide cases among people with mental disorders may be related to a limitation of the present study. As for the fact that we collected data from registered suicide cases of the health centre of the province, it is probable that there are defects in registering some variables such as previous mental and physical disorders as well as history of previous suicide attempts.

Conclusions

The present study revealed some differences in the methods of suicide according to demographic factors, which may reflect differences in availability, accessibility, and popularity of methods. Our studies also showed that the most frequent method of suicide is drug overdose. It seems

necessary that more strict rules on drug prescription must be at work, and people must be educated to consume drugs more rationally. Thus, due to the high incidence of completed suicides, it is recommended that counselling centres be established for mental ill-health, and in particular a suicide hotline with appropriate availability to all population.

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Conflict of interest

Authors declare no conflict of interests.

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