Suicide pattern in Kermanshah Province, West of Iran: March 2012- March 2013

Mehran Rostami (1)
Abdollah Jalilian (2)
Ramin Rezaei-Zangeneh (3)
Teimour Jamshidi (4)
Mohsen Rezaeian (5,6)

(1) Mehran Rostami (MSc); Deputy for Treatment, Kermanshah University of Medical Sciences, Kermanshah, Iran
(2) Abdollah Jalilian (PhD); Department of Statistics, Razi University, Kermanshah, Iran
(3) Ramin Rezaei-Zangeneh (MD); Deputy for Treatment, Kermanshah University of Medical Sciences, Kermanshah, Iran
(4) Teimour Jamshidi (BSc); Head of Research and Training in Forensic Medicine Organization of Kermanshah province, Kermanshah, Iran
(5) Epidemiology and Biostatistics Department, Rafsanjan Medical School, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
(6) Occupational Environmental Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

Corresponding author:
Professor Mohsen Rezaeian (PhD)
Epidemiology and Biostatistics Department, Occupational Environmental Research Center
Rafsanjan Medical School, Rafsanjan University of Medical Sciences, Rafsanjan-Iran
Tel: +983434331315
Fax: +983434331315
Email: moeygmr2@yahoo.co.uk

Abstract

Background: Kermanshah province (the most populated province in the west of Iran) has one of the highest suicide rates among Iran's provinces. This study aims to update the existing knowledge of suicide situations in the province in order to take the first step towards designing preventive interventions.

Methods: Data were extracted from the electronic files of the Forensic Medicine Organization (FMO) of Kermanshah province during the course of one-year. The chi-squared test and Cramer's V statistic were used to assess the associations between the demographic variables.

Results: 265 confirmed cases (65.7% males and 34.3% females) of suicide were registered during the study period. The overall annual rate of suicide in Kermanshah province was 13.6 persons per 100,000 residents. Approximately, 45% of the cases were between 20 and 29 years old. Hanging in males (50%) and self-immolation in females (43%) were the dominant suicide methods.

Conclusion: Compared to the average suicide rate in Iran, Kermanshah province has a noticeably higher rate. Focusing on social determinants of health in the population should be seriously considered by the health system's policy-makers regarding practical approaches to be used for the purposes of reducing suicide.

Key words: Measure of association,
Social determinants of health, Suicide, Iran

Introduction

Suicide is one of the most complex aspects of human behavior where a person ends his/her life with a deliberate and conscious effort (1, 2). According to suicide statistics reported to World Health Organization (WHO), suicide rates vary greatly among countries (3). There are several problems and difficulties in accurately defining, measuring, recording, reporting and scientific studying of suicide (4). Most of the problems are related to social stigma associated with this phenomenon which is prevalent, more or less, in every community (2). Also, the official suicide registration system in different communities varies (3, 5), including in Iran (6, 7). Furthermore, in some communities, more than one organization is active in identification and registration of suicide data and this issue can cause obvious differences between statistics submitted on suicide cases (2, 7).

In Iran, suicide has shown an increasing trend from 1990 to 2010 (8, 9) and distribution of suicide mortality across the country is more prevalent among the western provinces (10). Based on the information obtained from the death registration system of the Ministry of Health and Medical Education, the statistics related to completed suicide in the first nationwide study of mortality profile in 29 provinces of the country in 2004 showed that Kermanshah province accounted for 14.0 per 100,000 and stood at the 3rd place in the country in terms of high rates of mortality caused by suicide. It should be mentioned that the said national average has been estimated as much as 5.2 per 100,000 in the same year (11). Moreover, Kermanshah province was second highest in terms of suicide mortality rate in the country during 2006-2010 (10). Another nationwide study of mortality profile in 29 provinces of the country in 2010 showed that hanging and self-immolation stood at 5th place among the leading causes of death among males and females aged from 15 to 49 years, respectively (12).

With due observance to the above-mentioned subjects, analyzing the current situation of suicide among various age and gender groups of people in Kermanshah province and evaluating the suicide rates in these groups are the main objectives of this study. Based on this issue, not only can the vulnerable groups be identified, but also a giant stride can be taken in this province in order to reduce rates of suicide through updating knowledge and information required for healthcare and medical treatment planning and to use the results to take the first step towards designing preventive interventions and mental health promotion.

Methods

Ethics Statement

Before reviewing data, burial permit number, name and surname of the deceased were omitted due to respect to the principle of medical secrecy. No private information of the deceased who committed suicide was used in conducted analysis and obtained results and hence no informed consent was required for this study. The study protocol was approved by the research committee of Kermanshah University of Medical Sciences (No. 93213).

Socio-demographic Characteristics

Kermanshah province is the most populated province in the west of Iran with 14 counties, 31 cities and towns and 86 rural districts. Based on the 2011 Census of Population and Housing, Kermanshah province has 1,945,227 people and accounts for 2.7% share of total population of the country with approximately 70% of urbanization rate and nearly 16% of unemployment rate (13).

Data source

In this cross-sectional study; electronic files of confirmed committed suicide data of the Forensic Medicine Organization (FMO) of Kermanshah province collected from March 21, 2012 to March 20, 2013 were used. This electronic file contains the following variables: death time, permanent residence of the deceased including urban or rural regions. Suicide methods included hanging, self-immolation, firearms, intentional drug-poisoning, self-poisoning from toxic substances (toxic-poisoning), and others. The other methods category included cutting, drowning, jumping from a high place, and other unspecified means. The age of the deceased has been calculated according to birth year. It is worth mentioning that all identified cases were older than 10 years of age at the time of the committed suicide; hence, the age variable was grouped in four categories including 10-19 years, 20-29 years, 30-39 years, and 40 years and above. Marital status consisted of single, married and unknown. Educational status was classified into four groups: illiterate, primary and middle schools, high school and diploma, and university degrees. Previous history of attempting suicide includes yes, and no options. Consistent with previous researchers, occupational status variable was grouped in six categories including: housewife, worker and farmer, unemployed people, school/college student, self-employment and others (military man, soldier, driver, retired, other businesses and so on).

To accurately evaluate the incidence rate of suicide in Kermanshah, the first important step was to determine some criteria for inclusion in the study. For example, an autopsy performed in one of the forensic medical centers in the province by a forensic pathologist to determine the cause of death was not a sufficient inclusion criterion for participating in the study. Therefore, the cases indicating permanent postal address of the deceased person living in one of the cities or villages at the jurisdiction of Kermanshah province were analyzed in this study. Also, to quantify the data, the common procedure for recording the suicide cases was modified in this study to the effect that when the subjects of the study were diagnosed with the death caused by suicide using medical examination and pathological tests, the number of subjects of the study was registered in statistical forms of the suicide data of the same month; i.e., if the result of pathological tests of a person verifies that he/she has died due to suicide several months after the real time of death, the relevant information is recorded in the statistics related to the month when the result is specified and not in the statistics of the real time of death. Thus, to correct this procedure and prevent misclassification bias in data analysis, the researcher

had to reset the statistics of suicide cases based on the real time of death. The above-mentioned modifications resulted in the improvement of the quality of the numerator of annual suicide rates.

Incidence rates were calculated as the number of suicide cases divided by the corresponding estimated population, multiplied by 100,000. The population of Kermanshah province estimation extracted from provincial statistical yearbook for 2013 was used as denominators.

Data analysis

We first examined the distribution of completed suicide within each of the independent variable categories. The Pearson's chi-square test of independence at the 0.05 significance level and the Cramer's V measure of association were used to assess the associations between each pair of the demographic variables. The Cramer's V statistic varies from 0 (no association) to 1 (complete association) and measures the strength of relationship between nominal variables. According to this method, qualitative descriptions are associated with the following intervals: less than or equal to 0.40, poor agreement; 0.41-0.60, moderate agreement; 0.61-0.80, good agreement; 0.81-1.00, excellent agreement (14). All statistical analyses were conducted using Stata software version 12 (StataCorp LP, College Station, TX, USA).

Results

A total of 265 confirmed cases of death by suicide have been registered from March 2012 to March 2013 in the population residing in Kermanshah province, including 174 men (65.7%) and 91 women (34.3%) with a mean age of 31.3±14 years (Mean±SD). The sex ratio (male-to-female) of the deceased stands at 1.9:1 and more than 91% of women were housewives. In addition, 195 persons (73.6%) and 70 persons (26.4%) of the deceased resided in urban and rural regions, respectively. There is no significant difference (Chi2(1)=0.2, p-value=0.662) between married and single deceased (excluding 8 cases with unknown marital status). More detailed information about variables related to the completed suicide cases are presented in Table 1. For example, it can be observed that approximately 45% of the deceased who committed suicide were in the 20-29 year age group. Since the provincial statistical yearbook had no estimates for the population of the province in each age group during the study period, calculation of suicide rate in each age group was impossible. Nevertheless, Figure 1 shows the absolute frequency of suicide methods by age groups. It can be seen that intentional drug-poisoning is notably higher in the 20-29 age group.

The absolute frequency and percentage of suicide methods by gender and living area are presented in Table 2. Overall, the most common suicide methods in Kermanshah province were hanging (42%) followed by intentional drug-poisoning (20%), and self-immolation (18.5%). The most common suicide method was hanging (50%) for men and self-immolation (43%) for women. Based on contents of this table, 68.4% of males have committed suicide using violent methods (hanging, self-immolation, firearms) and 79.1% of females have committed suicide using the same three violent methods.

The overall annual suicide rate in Kermanshah province is estimated at 13.6 per 100,000 residents during the study period. Figure 2 shows the annual suicide rate of each county of the province. This figure shows that Qasr-e Shirin county with 27.2 and Harsin county with 7.0 per 100,000 residents respectively have the highest and lowest annual suicide rate in the province. Thus, there is an almost four times difference between incidences of suicide in these counties.

Results of Pearson's chi-square tests and Cramer's V values are reported in Table 3. According to the results, suicide method is significantly associated with gender, living area, occupation, age group, education and marital status. The corresponding Cramer's V values indicate that the association between suicide method and gender is stronger than the association between suicide method and any other factor. Similarly, we can see that gender is significantly associated with occupation, education, marital status and living area. More than 17% of the deceased had a history of previous suicide attempts but there was no statistically significant association between history of previous suicide attempts and other variables of the study.

Table 4 shows the frequency and percentage of committed suicide in weekdays. According to this table, although Monday has a slightly higher frequency based on the chi-square test for homogeneity, there is no statistically significant difference (Chi2(6)=12.44, p-value=0.053) between the frequencies of suicide in different weekdays.

Table 1: Demographic characteristics of completed suicide cases in Kermanshah province, Iran (March 2012 to March 2013)

Variable	N	(%)	Variable	N	(%)
Gender	$Chi^2(1)=26.0$ p-value < 0.001		**Living area**	$Chi^2(3)=58.9$ p-value < 0.001	
Male	174	65.7	Urban	195	73.6
Female	91	34.3	Rural	70	26.4
Age group (year)	$Chi^2(3)=61.7$ p-value < 0.001		**Educational level**	$Chi^2(3)=120.9$ p-value < 0.001	
10-19	32	12.1	Illiterate	38	14.3
20-29	118	44.5	Primary & Middle school	130	49.1
30-39	64	24.2	High school & Diploma	84	31.7
≥ 40	51	19.2	University	13	4.9
Method	$Chi^2(5)=159.2$ p-value < 0.001		**Occupational status**	$Chi^2(5)=51.7$ p-value < 0.001	
Hanging	111	41.9	Housewife	83	31.3
Drug-poisoning	53	20.0	Worker/ Farmer & shepherd	37	14.0
Self-immolation	49	18.5	Unemployed	45	17.0
Firearms	31	11.7	School/ College student	27	10.2
Toxic-poisoning	14	5.3	Self-employment	49	18.5
Other	7	2.6	Other	24	9.0
Marital status	$Chi^2(1)=0.20$ p-value=0.662		**Previous suicide attempt**	$Chi^2(1)=104.2$ p-value < 0.001	
Single	132	49.8	Yes	46	17.4
Married	125	47.2	No	209	82.6
Unknown	8	3.0			

Table 2: Suicide methods among completed suicide cases by gender and living area, Kermanshah province, Iran (March 2012 to March 2013)

Method		Gender		Living area	
		Male	Female	Urban	Rural
Hanging	Count	87	24	85	26
	(%)	50.0	26.4	43.6	37.1
Drug-poisoning	Count	39	14	49	4
	(%)	22.4	15.4	25.1	5.7
Self-immolation	Count	10	39	27	22
	(%)	5.8	42.9	13.8	31.4
Firearms	Count	22	9	16	15
	(%)	12.6	9.9	8.2	21.4
Toxic-poisoning	Count	9	5	13	1
	(%)	5.2	5.5	6.7	1.4
Others	Count	7	0	5	2
	(%)	4.0	0.0	2.6	2.9
Total	Count	174	91	195	70
	(%)	100	100	100	100

Table 3: Chi-squared statistic and p-value for the test of independence between the variables with their corresponding Cramer's V measure of association

	Living area	*Age group*	*Education*	*Occupation*	*Marital status*	*Previous attempt*	*Method*
Gender	$Chi^2(1)=6.9$ ***p*-value=0.009** **V=0.162**	$Chi^2(3)=5.9$ *p*-value=0.116 V=0.149	$Chi^2(3)=20.0$ ***p*-value<0.001** **V=0.275**	$Chi^2(5)=240.0$ ***p*-value<0.001** **V=0.952**	$Chi^2(2)=8.3$ ***p*-value=0.016** **V=0.176**	$Chi^2(1)=1.9$ *p*-value=0.167 V=0.0	$Chi^2(5)=58.0$ ***p*-value<0.001** **V=0.468**
Living area		$Chi^2(3)=1.5$ *p*-value=0.680 V=0.076	$Chi^2(3)=7.0$ *p*-value=0.073 V=0.162	$Chi^2(5)=21.7$ ***p*-value=0.001** **V=0.286**	$Chi^2(2)=0.3$ *p*-value=0.858 V=0.034	$Chi^2(1)=2.1$ *p*-value=0.146 V=0.0	$Chi^2(5)=29.2$ ***p*-value<0.001** **V=0.332**
Age group			$Chi^2(9)=58.7$ ***p*-value<0.001** **V=0.272**	$Chi^2(15)=93.2$ ***p*-value<0.001** **V=0.342**	$Chi^2(6)=59.1$ ***p*-value<0.001** **V=0.334**	$Chi^2(3)=2.3$ *p*-value=0.507 V=0.096	$Chi^2(15)=39.6$ ***p*-value=0.001** **V=0.223**
Education				$Chi^2(15)=78.8$ ***p*-value<0.001** **V=0.307**	$Chi^2(6)=26.0$ ***p*-value<0.001** **V=0.221**	$Chi^2(3)=5.4$ *p*-value=0.143 V=0.146	$Chi^2(15)=32.6$ ***p*-value=0.005** **V=0.203**
Occupation					$Chi^2(10)=49.6$ ***p*-value<0.001** **V=0.306**	$Chi^2(5)=9.6$ *p*-value=0.086 V=0.194	$Chi^2(25)=87.1$ ***p*-value<0.001** **V=0.256**
Marital status						$Chi^2(2)=3.6$ p-value=0.166 V=0.119	Chi2(10)=21.0 ***p*-value=0.021** **V=0.199**
Previous attempt							$Chi^2(5)=4.4$ *p*-value=0.496 V=0.131

Table 4: Absolute frequency and percentage of completed suicide according to days of week, Kermanshah province, Iran (March 2012 to March 2013

		Male	Female	Total
Saturday	Frequency	22	12	34
	Percentage	12.64%	13.19%	12.83%
Sunday	Frequency	19	10	29
	Percentage	10.92%	10.99%	10.94%
Monday	Frequency	33	18	51
	Percentage	18.96%	19.77%	19.25%
Tuesday	Frequency	31	11	42
	Percentage	17.82%	12.09%	15.85%
Wednesday	Frequency	29	17	46
	Percentage	16.67%	18.68%	17.36%
Thursday	Frequency	15	12	27
	Percentage	8.62%	13.19%	10.19%
Friday	Frequency	25	11	36
	Percentage	14.37%	12.09%	13.58%
Total	Frequency	174	91	265
	Percentage	100%	100%	100%

Figure 1: Age-distribution of completed suicide cases by suicide methods, Kermanshah province, Iran (March 2012 to March 2013)

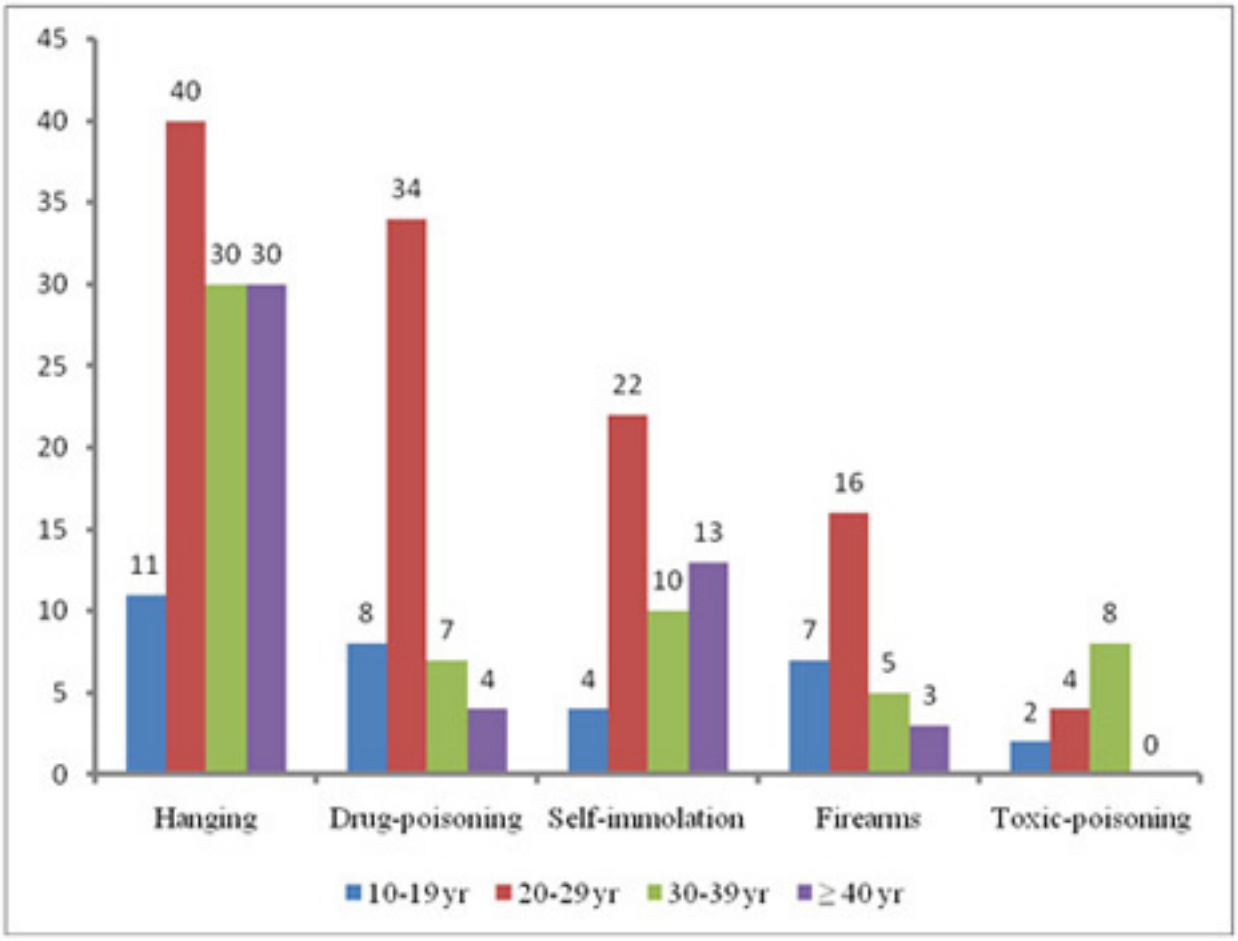
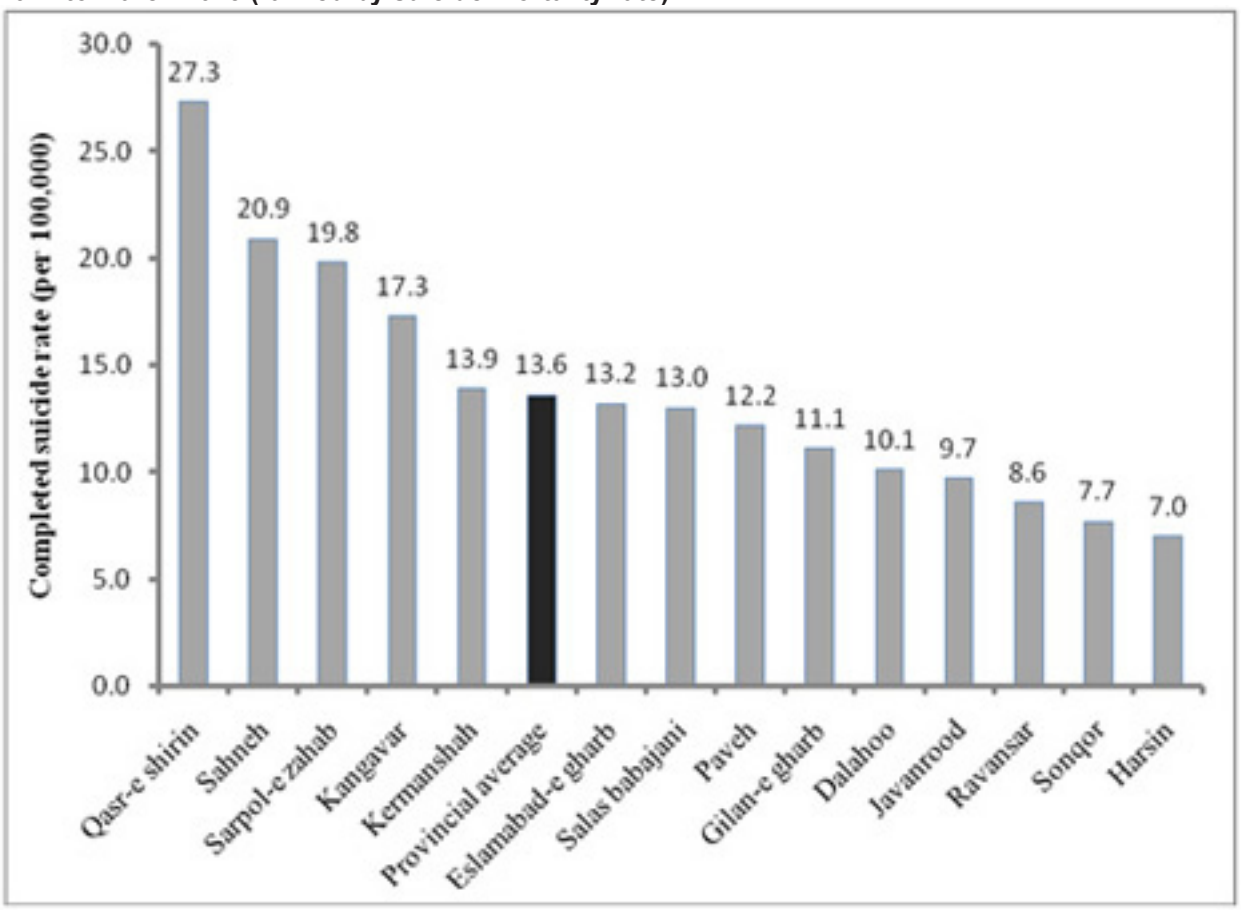


Figure 2: Annual rates of completed suicides according to the counties, Kermanshah province, Iran, March 2012 to March 2013 (ranked by suicide mortality rate)



Discussion

As it is observed from results of this study, completed suicide has been focused on in the present study. The completed suicide statistics had appropriate reliability, because the records and reports of the death due to completed suicide had higher accuracy in comparison to attempted suicide statistics (15, 16). Based on the obtained results, the overall annual rate of completed suicide in this province stood at 13.6 persons per 100,000 people, and suicide rate was observed more in urban regions than rural regions. One of the most important causes for this event could be increased level and rate of urbanization in the province as a result of rapid migration of rural inhabitants to urban areas. Such change in the living environment has not been adequately coupled with concomitant cultural adaptation. In this regard, the completed suicide rate in this province is much higher than that of the national suicide rate (10, 17, 18). Some of the main reasons for the high rate of committing suicide in western provinces of Iran have been mentioned in previous research (2, 7, 10, 17). The ratio of males who died by suicide was higher than that of females, so this finding is consistent with the results of previous studies (16). The present study showed that the majority of the females who committed suicide were housewives. The reason for that is most middle- and old-aged females in Iran are housewives without income. Therefore, it seems rational that the majority of the females who committed suicide are housewives (16). The noticeable point is that Kermanshah province stood at the 3rd place in the country in 2004 in terms of death rate due to suicide, while four counties of Sarpol-e Zahab, Sahneh, Harsin and Qasr-e Shirin (all located in Kermanshah province) were among the highest death rate caused by suicide across the country (11). In the present study, three counties of Qasr-e Shirin, Sarpol-e Zahab and Sahneh are among the highest suicide rate yet (approximately 20 persons per 100,000 residents and higher).

High unemployment rate in this province, compared to the other provinces, has been cited as one of the main probable reasons for the high rate of suicide in Kermanshah province. Of course, relationship between economic problems and unemployment with suicide in Kurdish ethnicity has previously been mentioned (16, 17, 19, 20).

As mentioned, hanging and self-immolation are the main methods of committing suicide among males and females respectively; this finding is consistent with the pattern of suicide methods observed in previous years in this province (16) and also with the governing pattern on the whole country (21, 22) and in Middle Eastern countries (23). Based on this study, intentional drug-poisoning is the 2nd most common method that leads to deaths due to suicide. This method is frequently used in young female attempters and also is one of the main methods of suicide in males (24). Frequently use of violent methods in western provinces of the country such as Kermanshah province may be due to post-war problems between the Iran and Iraq. This is an important issue since, the outbreak of the Iran-Iraq war in most parts of western provinces of the country including Kermanshah province has been cited as the one of the main reasons for occurrence of violent behaviors including suicide (19, 25). The reasons for the high incidence of suicide by hanging have been studied, the results of which indicate that hanging is a more acceptable method, and death caused by hanging is less likely to be misclassified in the death group with ambiguous reasons or accidental death due to the transparency of death method (24, 26). If we study self-immolation as the main cause of death, it can be mentioned that this aggressive and violent suicide method is mostly common in developing countries such as Iran and other Middle Eastern countries (2, 24, 27). Among the main factors that influence the acceptability of suicide by self-immolation, we can refer to Kurdish ethnicity, female gender, young adult age (19), adjustment disorder (19, 28, 29), cultural differences in attitude towards self-immolation, storage and accessibility of inflammable liquids at home and also storage of kerosene at home for cooking usage (18). All of these factors play an important role in highlighting this violent suicide method in Kermanshah province and even “copycat” phenomenon can be influential with regard to the acceptability of this violent suicide method (17). It should be kept in mind that like other societies suicide is a phenomenon that conflicts with religious and socio-cultural values in Iran (2, 15, 20); so the true suicide incidence rate might have been underestimated (16). Undoubtedly, increasing mutual cooperation and collaboration among official organizations involved in registration of suicide statistics is one of the most effective measures to promote quality of death registration system’s data in Iran (6).

Our results furthermore highlighted that most cases of suicide in this province occur in age group of 20-29 years. Also this finding is consistent with the results of previous studies (9, 16, 17, 25, 27, 30), and the average age of the study subjects at the time of death is similar to the age of the deceased from completed suicide in this province (11).

It should be noted that the previous history of attempting suicide is one of the recognized risk factors of subsequent suicide (18, 31). In this study, more than 17% of the deceased caused by suicide had a previous history of attempting suicide, so that activation of mental health services after attempting suicide for the doer and his/her family (15, 31) is similar to launching an online telephone line by psychiatrist or hospital admissions for high risk cases (31) which can play an important role in prevention of re-attempting suicide coupled with reduced rate of suicide as well.

In western countries, most suicide cases occur on Mondays and Tuesdays (32, 33). In our study, there is no significant difference among the frequencies of suicide in weekdays. It should be noticed that the pattern observed in western countries may be related to the early days of the business weeks but Monday in Iran is the middle of the weekdays. The pattern should be taken into reconsideration within the longer time frame using suicide data of other regions of the country.

Considering the above-mentioned issues, substantial efforts for preventing suicides are needed in western provinces of the country (10, 18). The policymakers of the health system of the country must seriously take into consideration the revision of suicide prevention programs and treatment of mental and reactive disorders, especially major depression, substance use disorders, bipolar disorders, mood and anxiety disorders (9). We further suggest that more information needs to be gathered specially within suicide prevention programs. These might at the very least include: "the causes for suicide", "any preceding psychological disorders among suicidal cases" and "the types of any medical treatment they received".

The following are considered as the main reasons influence on the increase in suicide cases in the Middle Eastern countries: Lack of success of regional countries in accurate and suitable transfer of Islamic values and principles to the young generation; superficial attention to the Islamic rules and not paying due attention to the depth of these rules (such as inattention to the fair distribution of wealth in society and its role in prevention of suicide); inferior position of women in some Middle Eastern countries dating back to the old culture and tradition of the countries, such as forced marriage (23). It can be understood easily that suicide is a very complex and multidimensional problem and tackling this problem requires joint efforts of all people, society and governments.

There are several practical strategies to reduce the completed suicide rate and to promote the mental health of society across the province. All of these effective strategies and community-based interventions should be taken into consideration by policy-makers of the health system to reduce the incidence of suicide in the west of Iran:

- Paying enough attention to enhancing social equity and alleviation of economic problems and unemployment rate;
- Dissemination of culture of simple living in society, especially among young couples;
- Increasing the number of family counseling centers and training at-risk individuals about coping skills;
- Making effort in line with promoting position of females in society with emphasis on increasing participation of women in the workforce;
- Making effort in line with adjusting conflicts as a result of incongruousness and clash of modern and traditional values.

Acknowledgments

The authors would like to thank Mr. Shahab Rezaeian (PhD student of Epidemiology, Shiraz University of Medical Sciences, Iran) and Mrs. Hadis Asadi (MSc of Nursing); as well as the chairman and personnel of Imam Khomeini hospital (Eslamabad-e Gharb, Kermanshah, Iran) for their collaboration throughout this work.

References

1. Bertolote JM, Wasserman D. Development of definitions of suicidal behaviours. In: Wasserman D, Wasserman C, editors. Oxford Textbook of Suicidology and Suicide Prevention. 1 ed. New York: Oxford University Press; 2009. p. 87-90.
2. Rezaeian M. Epidemiology of Suicide. In: Hatami H, Razavi SM, Eftekhar AH, Majlesi F, Sayed Nozadi M, Parizadeh SM, editors. Textbook of Public Health. 3rd ed. Tehran: Arjmand publications; 2013. p. 1968-93.
3. Liu KY. Suicide Rates in the World: 1950-2004. Suicide Life Threat Behav. 2009;39(2):204-13.
4. Rezaeian M. Methodological issues and their impacts on suicide studies. Middle East J Business. 2012;7(2):17-9.
5. Hawton K, van Heeringen K. Suicide. Lancet. 2009;373(9672):1372-81.
6. Jafari N, Kabir MJ, Motlagh ME. Death Registration System in I.R.Iran. Iranian J Publ Health. 2009;38(1):127-9.
7. Rezaeian M. Comparing the Statistics of Iranian Ministry of Health with Data of Iranian Statistical Center Regarding Recorded Suicidal Cases in Iran. J Health Syst Res. 2013;8(7):1190-6.
8. Forouzanfar MH, Sepanlou SG, Shahraz S, Dicker D, Naghavi P, Pourmalek F, et al. Evaluating causes of death and morbidity in Iran, global burden of diseases, injuries, and risk factors study 2010. Arch Iran Med. 2014;17(5):304-20.
9. Naghavi M, Shahraz S, Sepanlou SG, Dicker D, Naghavi P, Pourmalek F, et al. Health transition in Iran toward chronic diseases based on results of Global Burden of Disease 2010. Arch Iran Med. 2014;17(5):321-35.
10. Kiadaliri AA, Saadat S, Shahnavazi H, Haghparast-Bidgoli H. Overall, gender and social inequalities in suicide mortality in Iran, 2006-2010: a time trend province-level study. BMJ Open. 2014;4(8):e005227.
11. Naghavi M, Jafari N. Mortality profile for 29 provinces of Iran (2004). Tehran: Iranian Ministry of Health and Medical Education-Deputy of Health; 2007.
12. Khosravi A, Aghamohamadi S, Kazemi E, Pourmalek F, Shariati M. Mortality Profile in Iran (29 Provinces) over the Years 2006 to 2010. Tehran: Ministry of Health and Medical Education; 2013. p. 413-4.
13. Statistical Center of Iran. Population and housing census 2011 Tehran2011 [2015 Mar 10]. Available from: http://www.amar.org.ir/Default.aspx?tabid=1208].
14. Liebetrau AM. Measures of association. Beverly Hills, CA: Sage Publications Inc,; 1983.
15. Najafi F, Hasanzadeh J, Moradinazar M, Faramarzi H, Nematollahi A. An epidemiological survey on the trends of the suicide incidence in the southwest Iran, 2004-2009. Int J Health Policy Manag. 2013;1(3):219-22.
16. Poorolajal J, Rostami M, Mahjub H, Esmailnasab N. Completed suicide and associated risk factors: a six-year population based survey. Arch Iran Med. 2015;18(1):39-43.
17. Ahmadi AR. Suicide by self-immolation: comprehensive overview, experiences and suggestions. J Burn Care Res. 2007;28(1):30-41.

18. Ghafarian-Shirazi HR, Hosseini M, Zoladl M, Malekzadeh M, Momeninejad M, Noorian K, et al. Suicide in the Islamic Republic of Iran: an integrated analysis from 1981 to 2007. East Mediterr Health J. 2012;18(6):607-13.
19. Ahmadi A, Mohammadi R, Stavrinos D, Almasi A, Schwebel DC. Self-Immolation in Iran. J Burn Care Res. 2008;29(3):451-60.
20. Groohi B, Rossignol AM, Barrero SP, Alaghehbandan R. Suicidal behavior by burns among adolescents in Kurdistan, Iran. Crisis. 2006;27(1):16-21.
21. Saberi-Zafarghandi MB, Hajebi A, Eskandarieh S, Ahmadzad-Asl M. Epidemiology of suicide and attempted suicide derived from the health system database in the Islamic Republic of Iran: 2001-2007. East Mediterr Health J. 2012;18(8):836-41.
22. Shojaei A, Moradi S, Alaeddini F, Khodadoost M, Barzegar A, Khademi A. Association between suicide method, and gender, age, and education level in Iran over 2006-2010. Asia Pac Psychiatry. 2014;6(1):18-22.
23. Rezaeian M. Suicide in the middle-eastern countries: Introducing the new emerging pattern and a framework for prevention. Middle East J Business. 2014;9(3):45-6.
24. Leenaars AA, Lester D. Domestic integration and suicide in the provinces of Canada. Crisis: The Journal of Crisis Intervention and Suicide Prevention. 1999;20(2):59.
25. Alaghehbandan R, Lari AR, Joghataei M-T, Islami A, Motavalian A. A prospective population-based study of suicidal behavior by burns in the province of Ilam, Iran. Burns. 2011;37(1):164-9.
26. Rezaeian M, Mohammadi M, Akbari M, Maleki M. The most common method of suicide in Tehran 2000-2004: implications for prevention. Crisis. 2008;29(3):164-6.
27. Rezaeian M. Suicide among young middle eastern muslim females. Crisis. 2010;31(1):36-42.
28. Ahmadi A, Mohammadi R, Schwebel DC, Yeganeh N, Hassanzadeh M, Bazargan-Hejazi S. Psychiatric disorders (Axis I and Axis II) and self-immolation: a case-control study from Iran. J Forensic Sci. 2010;55(2):447-50.
29. Ahmadi A, Mohammadi R, Schwebel DC, Yeganeh N, Soroush A, Bazargan-Hejazi S. Familial risk factors for self-immolation: a case-control study. J Womens Health (Larchmt). 2009;18(7):1025-31.
30. Amiri B, Pourreza A, Rahimi-Foroushani A, Hosseini SM, Poorolajal J. Suicide and associated risk factors in Hamadan province, west of Iran, in 2008 and 2009. J Res Health Sci. 2012;12(2):88-92.
31. Schwartz-Lifshitz M, Zalsman G, Giner L, Oquendo MA. Can we really prevent suicide? Curr Psychiatry Rep. 2012;14(6):624-33.
32. Ajdacic-Gross V, Tran US, Bopp M, Sonneck G, Niederkrotenthaler T, Kapusta ND, et al. Understanding weekly cycles in suicide: an analysis of Austrian and Swiss data over 40 years. Epidemiol Psychiatr Sci. 2014;23:1-7. [Epub ahead of print].
33. Miller TR, Furr-Holden CD, Lawrence BA, Weiss HB. Suicide deaths and non-fatal hospital admissions for deliberate self-harm: temporality by day of week and month of year, United States. Crisis. 2012;33(3):169-77.