



Socio-demographic factors associated with choosing violent methods of suicide, 2011–2016, Ilam province

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ABSTRACT

Background: In new strategies towards of suicide prevention the best approach currently is based on specific method had specific risk factors. Therefore in this study we aimed to find out the association between socio-demographic factors and methods in completed suicide, 2011–2016, Ilam province.

Methods: A cross-sectional study, 2011–2016, was conducted. A total of 540 completed suicides were recruited to the study. Data were collected by systematic registration suicide data (SRSD) and Legal Medicine Organization (LMO). After performs of descriptive statistics, to analysis of effects of each independent variable to the methods Multinomial Logistic Regression (MLR) was used, also adjusted odds ratio (AOR) was used to reporting of associations.

Results: According to the result (55.8%) of deaths were occurred by hanging and self-immolation also a majority of suicides were occurred in females (60%). The important methods in males and females were hanging (70.6%) and self-immolation (72.8%), respectively. The self-immolation vs. others was significantly higher in cases that have mental disorders (AOR) = 2.05, 95% CI: 1.11, 3.78); also in cases with financial problem (AOR) = 2.70, 95% CI: 1.28, 5.71).

Conclusion: According to the finding age groups, gender, marital status, residence, and mental disorders are the important risk factors that effects on choosing of methods. Therefore consideration of this excess risk by this mentioned factors in prevention programs can be reducing the risk of death from suicide in society.

1. Background

Recently, suicide accounted for about 1.5% of all deaths worldwide, also suicide is the 15th leading of death between deaths in all of causes of death in the world (WHO, 2014). In United States (US) suicide is the third, second, fourth and the fifth leading cause of death among persons aged 10–14, 15–34, 35–44 and 45–54 years, respectively (Rostami et al., 2016). Also attempt was accrued about 10–20 times more than completed suicide and about 10% of attempters finally will kill themselves (World Health Organization, 2011). According to WHO report in 2012 the suicide rate for male, females and both gender were 5.2, 6.7 and 3.6 per 100,000, respectively (World Health Organization, 2012).

To conduct and advising of prevention programs, as well reduce of suicide rates suicidal behavior risk factors should be assigned (O'Carroll and Silverman, 1994; Pil et al., 2013). Methods that attempters have committed to suicide are different according to region context,

therefore probably the social background is effects on methods choosing (Rostami et al., 2016). In addition, the availability of methods, age and gender of attempters have considered as other decisive factors (Steck et al., 2015). Self-immolation, hanging, firearm are the common violent methods of suicide in Iran, beside to these drug overdose and self-poisoning are the common nonviolent suicide (Rasouli et al., 2011). In one previous study in Iran 8.8% of males and 4.2% of females were used from violent methods, also a majority of deaths were occurred due to violent methods, so that 64.7% of suicide deaths in males and 35.3% in females, was occurred due to violent methods (Veisani et al., 2017). The rate of nonviolent methods was increasing in recent decades, the common nonviolent methods in Iran is drug overdose (67%), but the case fatality rate (CFR) of this method was lower than 2% (Veisani et al., 2017), also CFR in self-immolation was 44%, and in hanging was 31% in 2014 (Veisani et al., 2016). The reasons for these differences in outcome by methods should be assessing and updated, but the socio-

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Fig. 1. Location of Ilam Province in Iran.

demographic characteristics, attempts history, and having a psychological disorders in attempters are provable causes for this diversity, also neurobiological, and neuropsychological characteristics are other etiologies (Shojaei et al., 2014; Ahmadi et al., 2015).

Therefore in new strategies towards of prevention also studying of suicidal behavior, the best approach is based on specific method had specific risk factors. Therefore in this study we aimed to find out the association between methods and socio-demographic factors in completed suicide, across Ilam counties from March 2011 to March 2016.

2. Materials and method

2.1. Study population

By a cross-sectional study all of 540 completed suicides during six years, 2011–2016, were included to the study in Ilam Province. Ilam province population according to statistics provided by the health system was 623,235 people, in 2016, of which 80% lived in urban areas and all of residents are Moslem. The Location of Ilam Province in Iran was shown in Fig. 1.

2.2. Data sources

Data were obtained by two databases; the systematic registration suicide data (SRSD) in Ilam University of medical sciences, which has registered data for all attempts, subsequent to this completed suicide was approved by Forensic Medicine Organization (FMO). All of suspected suicide cases that referred to FMO were assessing by autopsy test to confirm that the death has been by suicide, which will then be recorded in the suicide registry.

2.3. Definition of variables

The outcome was the completed suicide by different methods (hanging, fall, medicine, gas, self-immolation, gun, and addictive substances) that was attempts which died after they committed to suicide. The independent variables were including; age (< 35, 35–49 and > 50), gender (male and female), residence (urban, countryside, and rural), marital status (Single, Married, and others), season (spring, summer, autumn, and winter), Family problem (yes or no), Mental disorder (yes or no), Financial problem (yes or no).

2.4. Statistical analysis

We used from Stata software version 12 (StataCorp, College Station, TX, USA). After performs of descriptive statistics, to analysis of effects of each independent variable to the methods Multinomial logistic regression was used. This technique when the dependent variable is nominal with more than two levels is preferred in other ways. Hosmer & Lemeshow strategy were used for model building and model fitted with all variables that had *P*-value less than 0.2 in self-immolation vs. others or hanging vs. others. *P*-value ≤ 0.05 was considered statistically significance.

3. Results

In overall 540 completed suicides were enrolled during of six-year period of the study. 60% of all deaths were occurred in males. Two thirds of completed were in 35 > years age group, also a majority of suicides were happened in urban area. Most of the cases (53.8%) were married persons and (28.2%) of deaths occurred in spring. In regarded to prevalence of methods among completed suicides hanging, self-immolation, drug-overdose, firearm, suicide by gases, and addictive substances with the 34.0%, 21.8%, 18.5%, 15.9%, 6.1%, 2.9%, and 0.5% were the common methods among suicide methods (Fig. 2).

In the Table 1 we examined relation between independents (gender, age group, location, marital status and season) with methods (hanging, self-immolation, drug-overdose, firearm, suicide by gases, and addictive substances). We found that there is different methods ratio according to all of independent variables. The ratio of hanging was higher in males, while the ratio of self-immolation was higher in females ($p < 0.001$). The majority of hanging, fall, drug-overdose and firearm was happened in 35 > years age group ($p = 0.016$). Hanging and firearm had a higher ratio in rural area compared to urban and countryside's ($p < 0.001$). Hanging, Self-immolation, and suicide by gas were more occurred in married cases, while drug-overdose, firearm, and fall were more observed in single ($p = 0.008$). Also according to season the hanging was higher in autumn, fall was higher in summer, also self-immolation and firearm had more ratio of incident in winter ($p = 0.027$).

In this study multinomial logistic regression was conducted to examine of association between main characteristics of completed suicides with hanging and self-immolation (Table 2). In our model the other methods except of hanging and self-immolation were covariate and adjusted. We hypothesized that hanging and self-immolation are different according to demographic and related factors. The risk of self-immolation vs. others in females was five times higher compared to males (adjusted odds ratio (AOR) = 5.97, 95% CI: 3.56, 10.01, $P < 0.001$). The odds of hanging vs. others was higher in rural compared to urban (AOR) = 1.32, 95% CI: 1.06, 1.63, $P = 0.012$). The risk of self-immolation and hanging vs. others in > 50 years age group compared to < 35 (AOR) = 2.55, 95% CI: 1.36, 4.79, $P = 0.004$) and (AOR) = 1.97, 95% CI: 1.14, 3.42, $P = 0.016$), respectively. Self-immolation vs. others in cases that have mental disorders compared to cases that not to have was significantly higher (AOR) = 2.05, 95% CI: 1.11, 3.78, $P = 0.002$), also the odds of Self-immolation vs. others in financial problem was higher than cases that no financial problem (AOR) = 2.70, 95% CI: 1.28, 5.71, $P = 0.001$).

4. Discussion

This study was conducted to assessing of association between socio-demographic factors and different methods of suicide in 540 completed suicides which were approved by FMO center in Ilam city. According to the result about two-thirds of deaths were occurred by hanging and self-immolation (55.8%), also a majority of suicides were occurred in females (60%).

In overall (71.7%) of all completes were happened by violent methods. Among violent methods hanging was significantly higher in

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