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Evaluating the temporal trend of completed suicides referred to the Iranian Forensic Medicine Organization during 2006–2010

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ABSTRACT

Objective: The objective of the present study was to determine the temporal trend of the rate of completed suicides in Iran during 2006–2010.
Material and methods: Data on completed suicides were collected from the national suicide registry of the Iranian Forensic Medicine Organization. The rates were calculated for males and females for each year of the study period, from which the temporal trends were determined. Statistical analyses were conducted using SPSS software, using chi-squared and analysis of variance (ANOVA) tests.
Results: The overall rate of suicide was 4.7/100,000, with a male/female ratio of 2.4. The mean age of suicide was 31.9 years, which was significantly higher in males. Hanging was the most common method, followed by poisoning and self-immolation. During the study period, the rate of drug poisoning almost doubled, while that of firearms halved. The rates of hanging and self-immolation also increased in the last years of the study period.
Conclusion: According to the results of this study, it can be concluded that Iran has had a constant rate of completed suicides over the past decade. Our study also indicated the need for future nationwide studies on the risk factors of suicidal behavior and on different suicide methods in the entire Iranian population.

1. Introduction

Both suicide and attempted suicide are complicated, an emerging significant concern in both developing and developed countries (Schmidtke, 1997). Most individuals with suicidal behavior are believed to suffer from some mental disorder, including depression and schizophrenia.[1] However, other factors, such as gender, age, religion, and climate, have also been found to be important factors leading to suicide.[2–4] Studies by the World Health Organization (WHO) have reported approximately 90,000 suicide deaths worldwide in 2002, with the major contribution from developing and developed countries.[5–7]

Therefore, a large number of studies have been conducted in both developed and developing countries to investigate the prevalence and time trend of suicide. For example, Bridge et al. (2010) studied the changes in the rate of suicide among the 10–24-year age group in the United States between 1992 and 2006, finding decreases in the overall rate of suicide[8]; however, the rates of hanging/suffocation significantly increased during the study period, particularly among females. Large and Nielssen[9] conducted a study in Australia to investigate the time trend of changes in the rate of suicide between 1988 and 2007; they also observed a significant decline in the overall rate of suicide. Similar studies have been conducted in other countries, such as England,[10] Italy,[11] Turkey,[12,13] Saudi Arabia,[14] Brazil,[15] and Mexico,[16] with the same purpose.

In Iran, few studies have been conducted on the prevalence or temporal trend of suicide. For example, Moradi and Khademi[17] collected data on suicides in Iran in 2001 and reported an overall rate of 4.4 per 100,000. They also reported that males most commonly use hanging (56%), whereas females tend to use self-immolation. Khademi et al.[18] studied completed suicides by firearms in Iran in 2002 and found an overall rate of 0.42 per 100,000. They also found that approximately 78% of the individuals who committed suicide by firearms were between the ages of 16 and 25 years. Finally, Janghorbani and Sharifirad[19] conducted a study to determine the rates of attempted and completed suicide in Ilam, west of Iran, from 1995 to 2002. The results indicated that the mean

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annual rates of completed suicide were 10.0 and 26.4 per 100,000 for males and females, respectively, with a male/female ratio of 0.38. They also reported that the corresponding rates for attempted suicide were 41.8 per 100,000 and 64.5 per 100,000. However, these studies are limited either to a small population in a specific part of the country or to a specific method of suicide. Therefore, the aim of the present study was to assess the temporal trend of the rate of completed suicides across Iran during 2006–2010, based on the consecutive record of completed suicides confirmed by autopsy investigation.

2. Methods

The Iranian Forensic Medicine Organization maintains a nationwide suicide registry recording all cases of suicide across the country. For this purpose, one forensic medical center has been established in the capital of each province (i.e., 31 centers); additional centers have also been established in smaller cities to record the suicide cases in remote areas. A death case is referred to a forensic medicine center if it is either reported as suicide by at least a family member or considered suspicious by the physician in charge of issuing the death certificate. In the latter case, that is, suspicious deaths, it is worth noting that the doctor is not legally permitted to issue the death certificate. This, in combination with the complete geographical coverage of the centers across the country (as mentioned earlier), ensures that all possible cases are referred to the Forensic Medicine Organization. Then, all referred cases are subject to autopsy investigation. If the test results reveal death by suicide, the case is recorded in the registry; death due to factors other than suicide (such as homicide, accident, and natural death) is referred to the relevant authorities.

In the present trend analysis study, data on the suicide method used as well as those on age, gender, nationality, time and place where suicide had taken place, and finally time and place of death were recorded in a data collection form for the period 2006–2010. The methods of suicide were categorized as follows: hanging, self-immolation, drug poisoning, pesticide poisoning, firearms, and other methods. Drug poisoning was defined as a toxic condition caused by intentional ingestion of drugs or medicaments in excessive amounts. Pesticide poisoning was defined as a toxic condition caused by ingesting or inhaling a pesticide. Then, the statistical analyses were conducted using SPSS software. We performed the chi-squared test to compare the frequencies in different groups. In addition, we also applied *t*-test to compare the mean values in different groups. In line with the ethical criteria, the data were reported anonymously.

3. Results

A total of 15,822 completed suicides were recorded in the forensic medicine centers over the entire time period: 2997 cases in 2006, 2994 in 2007, 3339 in 2008, 2969 in 2009, and 3523 in 2010. Considering the total population of 67,500,000 at the time of the study, the trends of the rate of completed suicides, overall as well as by gender, are illustrated in Fig. 1. The male/female suicide ratio is also presented in this figure, which should be read from the right axis. As can be seen, the overall rate of completed suicides ranged from 4.4 to 5.2 per 100,000, with a mean value of 4.7 per 100,000. In addition, the rate of suicide was higher among males (a mean value of 6.6 per 100,000) than among females (a mean value of 2.7), with an average male/female suicide ratio of 2.4.

Fig. 2 indicates the temporal trend of the number of completed suicides from 2006 to 2010 with the corresponding number of deaths across the country. It also illustrates the trend of the relative contribution of completed suicides to the total number of deaths. As can be seen from the figure, the total number of deaths varied from 393,514 to 441,042; therefore, the relative contribution of completed suicides to the total number of deaths was always <1% (0.72–0.80%).

Of all the cases, 15.6% were aged <19 years, 42.1% were aged 20–29 years, 18.9% were aged 30–39 years, 10.6% were aged 40–49 years, 6.6% were aged 50–59 years, and 6.3% were aged >59 years. In addition, the overall mean age of suicide cases was 31.9 years. The mean age of suicide was higher for males (32.68 years) than that for females (29.92 years); the results of the *t*-test also revealed a statistically significant difference ($P = 0.048$).

Fig. 3 illustrates the temporal trend of the relative contribution of different genders to the total cases of completed suicide during 2006–2010. As can be seen, the number of completed suicides was higher among males than among females, as previously observed in Fig. 1. In addition, the relative contribution of females was found to be higher in 2008 than in other years; the results of the chi-squared test indicated that this difference is statistically significant ($P < 0.0001$).

Finally, Fig. 4 illustrates the temporal trends of the relative contributions of different suicide methods to the total number of completed cases over the entire study period. As can be seen from the figure, hanging had the highest relative contributions during the study period, followed by self-immolation and pesticide poisoning. In addition, the rate of hanging was almost constant during the period 2006–2009, with a sudden increase in 2010; according to the chi-squared test, the relative contribution of hanging in 2010 was significantly higher than that during 2006–2009 ($P < 0.0001$). The relative contribution of self-immolation increased from about 15% in 2007 to 19% in 2008, which remained almost constant subsequently; this increase was statistically significant according to the results of the chi-squared test ($P < 0.0001$). Significant trends were also observed for drug poisoning and firearms; the former increased constantly during the study period, whereas the latter showed a stable decreasing trend (chi-square $P < 0.0001$). For pesticide poisoning, however, a constant trend was observed over the entire study period (chi-square $P > 0.05$).

4. Discussion

The aim of the present study was to determine the rate of completed suicides in the Iranian population from 2006 to 2010, based on the data from the national suicide registry of the Iranian Forensic Medicine Organization. The overall rate of completed suicides was found to be 4.7 per 100,000, which is highly comparable to that reported in 2001 by Moradi and Khademi.[17] In addition, we found a statistically significant difference in the age of suicide cases between males and females, the males being significantly older than females. However, the overall rate of completed suicides reported here is considerably lower than that reported by Janghorbani and Sharifirad,[19] that is, 4.7 per 100,000 versus 36.4 per 100,000. There may be different reasons for this large difference. First, our study presents the overall rate of suicide across the country, whereas the study by Janghorbani and Sharifirad[19] only involves the completed cases in Ilam, a western province infamous for its high rates of attempted and completed suicides, particularly self-immolation among females.[20,21] Second, suicide was confirmed based on the autopsy investigation results in the former study, and on the information collected from different sources, such as scene of crime, police inquest, and emergency medical services, which may have added uncertainty to the collected data, in the latter study.

A recent study suggested that suicide is less common among Muslim populations than among other religious affiliations.[4] For