

# Types of Poisoning in a Tertiary Care Hospital in Center of Iran (2014 to 2017)

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## ABSTRACT

The global problem of acute poisoning has steadily increased over the past decade. It is an important cause of morbidity and mortality in developing countries. Better preventive and management strategies can be developed if the incidence and pattern of acute poisoning is known. The study aims at analyzing the pattern, cause and mortality rate of poisoning. The study was conducted in urban and rural area in the center of Iran. This retrospective study was conducted from January 2014–March 2017. The data was analysed using descriptive and analytical statistics. Out of the 1329 cases 754 were males and 575 females. Poisoning was common in the age group of 21–30 years. The poisons consumed were as follows: 63.8% were suicides, 17.8% accidental and 18.4% had a variety of different reasons. Mortality rate was 6.5%. The results of the study showed that the highest rate of poisoning in the young age group was due to suicidal ideation. Accurate training for youth and counseling is of particular importance. Establishment of strict policies against the sale and availability of pesticides and over the counter drugs is an effective way to control drug poisoning

**Key Words:** Poisoning, Suicide, Mortality rate

## INTRODUCTION

Poisoning is a global health problem and has been considered as one of the common causes for attending emergency department (ED) of hospitals. According to World Health Organization (WHO) estimates, in 2004, 346,000 people died worldwide from unintentional poisoning of which 91% occurred in developing countries (1). Poisoning constitutes an important entity among the seriously ill patients admitted in every hospital. The causes, pattern and outcome of poisoning in a particular community depends on a variety of factors such as easy availability of a particular poison, stress pattern and the standard of the emergency medical care (2). Acute intoxication is a major public health problem and one of the most common causes for referral to emergency centers around the world (3, 4). Acute toxicity refers to exposure to a toxic substance at random or in a short period of time, which can be deliberately or unintentionally (5). Most of the acute

poisoning visits to the hospital are intentional poisoning, which, regardless of its intentions and motives, potentially threatens one's life and sometimes leads to death (6). Randomized poisoning is the fourth most common cause of death among unhealthy people aged 15 to 15 around the world (7). In poisoning cases, several factors contribute to the mortality and morbidity, including the toxic potential of the poison, the speed with which the person seeks clinical attention following exposure to poison, and the availability of effective medical treatment. The most prevalent cause of poisoning in adults in developing countries is intentional poisoning (8). The prevalence of suicide has the highest rates among the intentional poisoning (9). The majority of poisoning cases in Iran are intentional. Which is predominantly in the range of 21 to 30 years old, and the most important causes of drug-induced death are insecticides and narcotics (10). The

pattern of poisoning in a country depends on a variety of factors, including access to various toxins, social, economic, cultural and religious beliefs of the community(11, 12).Awareness of the pattern of poisoning in a particular region will play a role in identifying risk factors and early detection of poisoning(13).Also, understanding the pattern of poisoning in designing suicide prevention strategies and reducing the risks of accidental poisoning will be helpful(14).In Iran, there is no accurate data on the

incidence of poisoning and its related factors, but according to reports published, it is estimated that the death rate from poisoning is 8 per 1,000 hospitalized patients. Poisoning is the most common cause of hospitalization and is the second leading cause of death for hospitalized patients in Iran(15).Poisoning in general can affect any age group. However, people in the age group of 15 to 40 years are the most likely to be referred to treatment centers due to poisoning(16).

**Table 1. Sex distribution and marital status of the patients with poisoning**

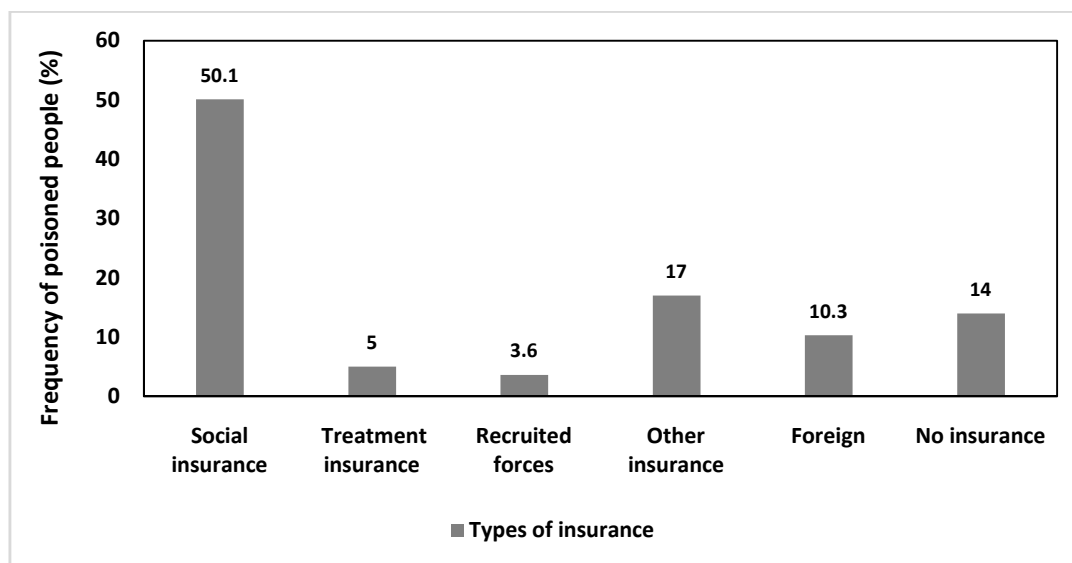
Sex	Total patients(%)	Married(%)	Unmarried(%)
<b>Males</b>	754(57%)	410(31%)	344(26%)
<b>Females</b>	575(43%)	334(25%)	241(18%)
<b>Total</b>	1392 (100%)	744 (56%)	585 (44%)

Among the 1329 patients who had consumed the poison,410(31%) was married males and 344(26%) was unmarried males. Among the females, 334(25%)was married and 241(18%)was unmarried.The pattern of poisoning in men and women was significantly different. Table 2showsThe

pattern of poisoning in men and women according to age group.The types of poisoning in females were more than males during the three-year period. Most of the people who were poisoned (half of them) had social insurance.Fig 1 shows the frequency of types of insurance for poisoned people.

**Table 2. The pattern of poisoning in males and females according to age group**

Age group	Males	Females
<b>0-10</b>	131	77
<b>11-20</b>	75	82
<b>21-30</b>	159	117
<b>31-40</b>	96	81
<b>40-60</b>	162	88
<b>&gt;60</b>	131	130
<b>Total</b>	754	575



**Figure 1. Frequency of types of insurance for poisoned people**

**METHODS**

This study was conducted by the departments of Pharmacology and Medicine of shahidbehesht hospital in kashsancity. This is a tertiary care

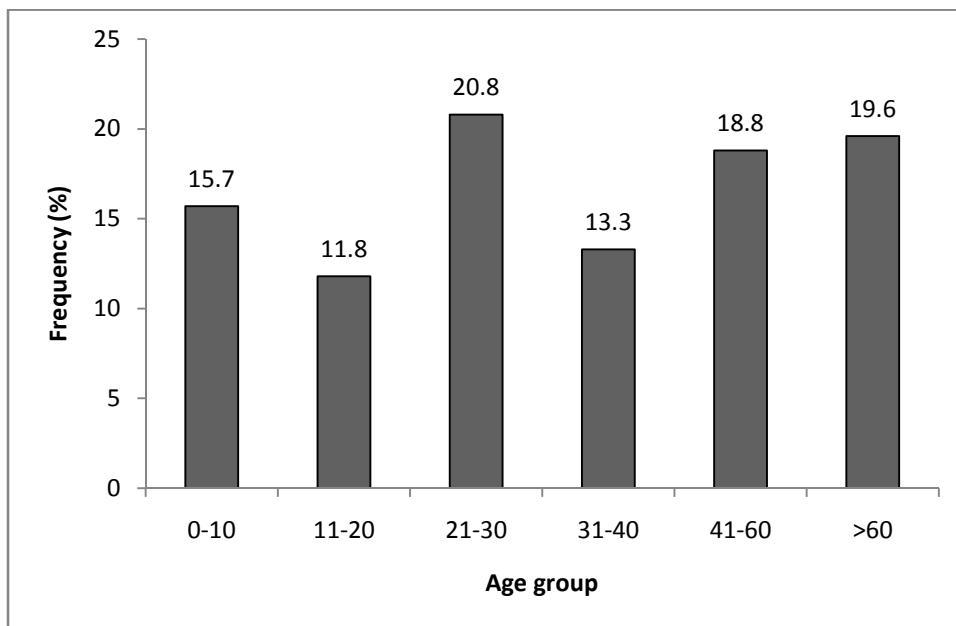
hospital situated in a urban area in Kashan, center Iran. Kashan is a historical city which is a city center and is part of Isfahan province. The city is located in the center of Iran 220 km south of the capital, 90 km

to Qom and 200 km to the center of the province. There are nearly 400,000 inhabitants. This study is a Case-series. All patients admitted to the medicine department with history of poisoning during January 2015 to March 2017 were 1329 people. The patients were analyzed for age, sex, socioeconomic status, cause, type of poisoning and the mortality rate. The data was collected in a proforma which was specially designed for the study. Statistical analysis was done using descriptive statistics. To determine the relationship between the variables under study

together, tests Chi square and Independent T-test was used.

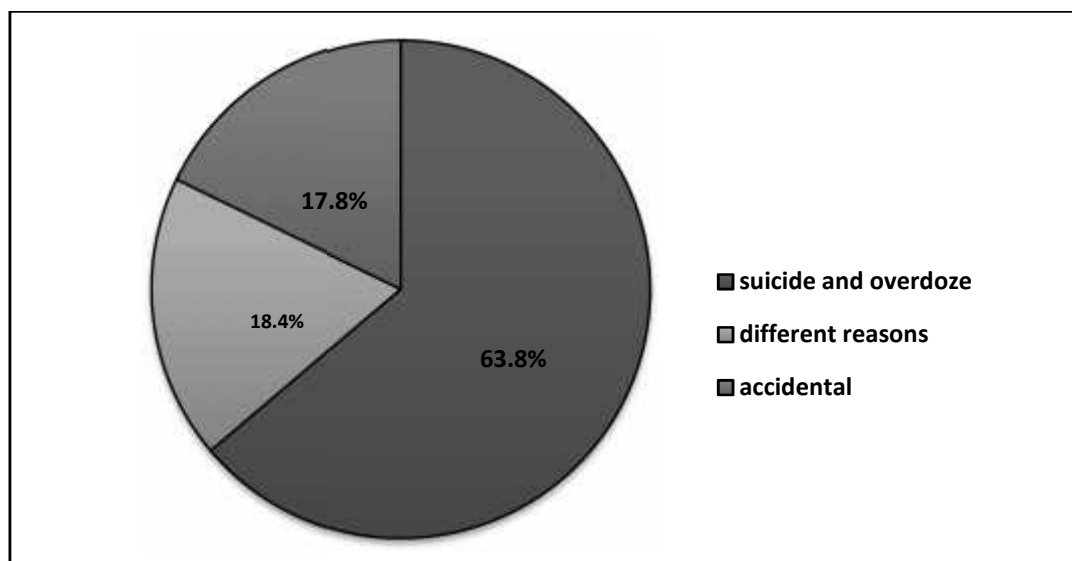
**RESULTS**

A total of 1329 patients with poisoning were included in the study. Table 1 shows sex distribution and marital status of the patients with poisoning. Out of these 754 patients (57%) were males and 575 (43%) were females. Figure 2 shows that most of cases are between the age group of 21–30 years i.e. 276 cases (20.8 %) which was followed by >60 years i.e. 261 cases (19.6%).



**Figure 2. Frequency percentage of poisoned people**

Figure 2 shows that 848 (63.8%) cases were suicidal and 236 (17.8%) accidental and 245 (18.4%) had a variety of different reasons.



**Figure 3. Poisoning distribution according to causes of consumption.**

The causes of suicide were poverty, unemployment, marital conflicts, financial problems and the students it had stress due to exams. The most common

poisoning kinds were drug to 1122 (84.5%), sting to 103 (7.7%) and chemicals to 65 (4.9%). The most common poisoning agents were clonazepam,

diazepam and methadone. Fig.3 shows poisoning distribution according to kind of poisoning.

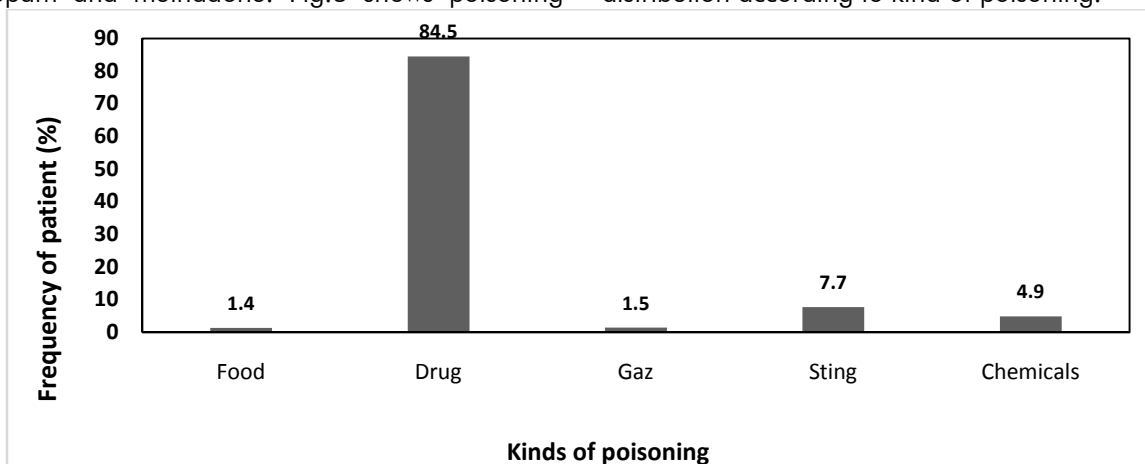


Figure. 3 Poisoning distribution according to kind of poisoning.

Figure 4 shows that the majority of patients referring to the hospital were from urban areas.

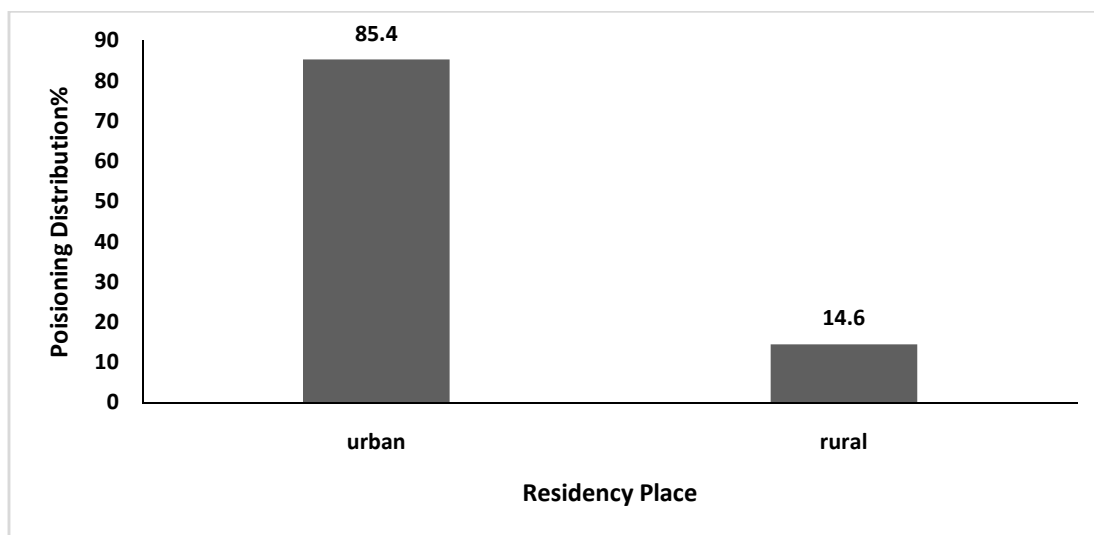


Figure 4. Poisoning distribution according to residency place

Figure5 shows the frequency of poisoned people during the year 2015-2017. The number of poisoned people has risen, with their number doubled from 2015 to 2017.

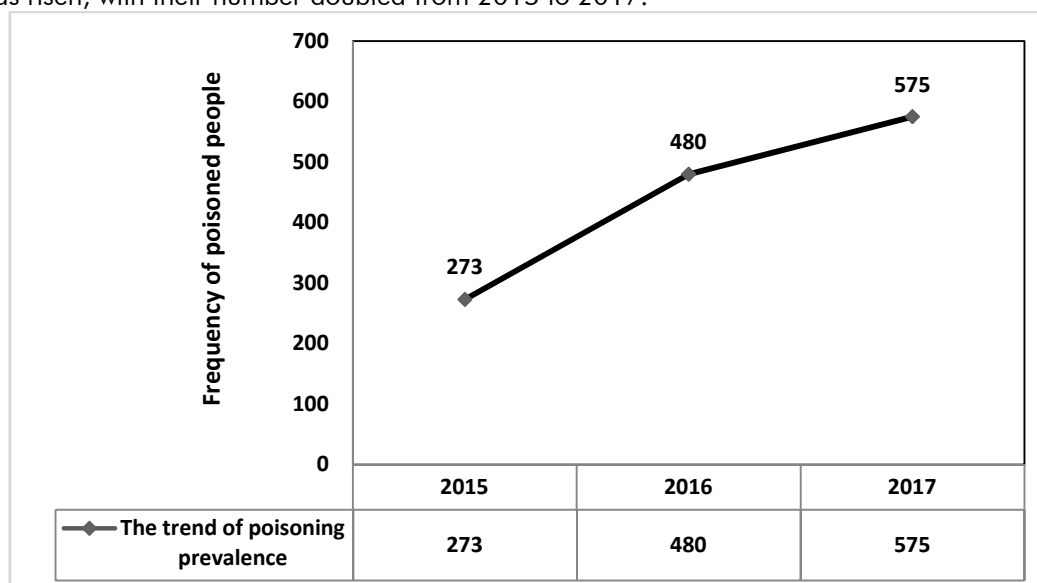


Figure5. Annual Changes of poisoning during the years 2015 -2017

The results show of poisoning. Top 60% of patients were hospitalized for one to two days, 23.7% for three to five days and 12.3% for more than five days. Eighty-six patients in the study population died. The prevalence of poisoning in all seasons is almost the same. The summer season was the largest with 356

cases (27.7%) and autumn with 348 (27.1%). In the fall of 2015 and 2016-2017, the summer season had the highest rates of poisoning. Figure 6 shows the most patients recovery with illness and discharged themselves from hospital.

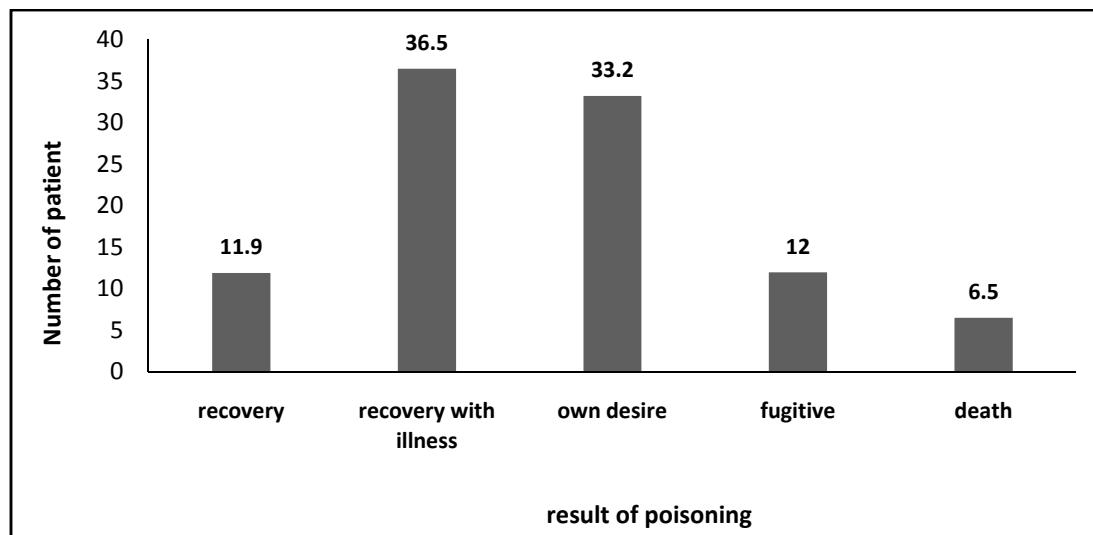


Figure 6. Results of poisoning

## DISCUSSION

In our study, the total number of patients considered was 1329 which was higher than earlier studies conducted with similar intent(17). Majority of the patients in the present study were of young age with a mean  $\pm$  SD of  $36.32 \pm 7.78$  years. Similar results were obtained in the studies conducted in India(18). However, in the study conducted in Nepal(19). (19) majority of the patients were greater than 40 years of age. The males outnumbered male patients with female: Men ratio of 1:1.31 in the present study. Similar finding was obtained in the study done in India Andhra Pradesh(18) and Tamil Nadu (M:F = 1.58:1)(12). In the study conducted in Nepal(19) (M:F = 1:1.35) males preponderated over female patients. This gender ratio contrasted with international studies which report higher rates of attempted suicide by drug overdoses among females(20), but was consistent with the reports from other developing countries where the gender ratio for non-fatal self-poisoning by pesticide ingestion is roughly 50/50(21, 22). However, this gender pattern now appears to be changing in Sri Lanka, with more women being admitted to hospital as a result of the ingestions of medicines and other substances(23, 24). Similar patterns of change have been reported in other countries in the Asian regions such as Pakistan and Vietnam(25, 26). With increasing urbanization, patterns of non-fatal self-poisoning in South Asian countries may be changing to resemble that of developed countries, accompanied by an increasing proportion of attempted suicides among

females(23-26). International studies have reported age, childhood adversity, recent life events and psychiatric morbidity such as depression, hopelessness and alcohol misuse, to be associated with increased risk of suicidal attempts among men and women(27-29). International studies also indicate that violent methods of self-harm, alcohol use disorders and economic stressors are associated with suicide attempts in males, whereas a history of sexual trauma and anxiety disorders are commonly associated with suicide attempts among females(30-32). Key findings of this study are that a majority of those who present to hospital due to non-fatal self-poisoning are males. In this study, a greater proportion of males (55.8%) than females presented to hospital. This is different to findings from other recent Sri Lankan and Asian studies(33, 34). The intentional poisoning with 64% in Hong Kong(35), 69.9% in India(36), 78% in Turkey(37), and in national studies with 86% in Urmia(38), 89.9% in Isfahan(39), 86% of Tehran(40) was the most common type of poisoning that is consistent with the results of this study. The observed difference in the amount of intentional poisoning in different regions can be due to cultural issues and differences in methods of suicide in societies. In some studies, intentional poisoning has been reported in single individuals and in another study in married couples. In this study, the intentional poisoning was significantly higher in married than single. The increase in psychological pressure and the problems

caused by the breakdown of the family foundation can be a factor in suicidal attempts in this group(41, 42).This study shows the majority of cases of poisoning in the age group of 21-30 years old (276 cases) with (20.8%), after which the age group was 60 years old with 261 cases and (19.6%). Problems such as unemployment, hopelessness, loneliness, and the lack of plans for the future are among the problems of this age group that could be the cause of suicide in these people.In the Fiji study, 73/8 percent of the cases were poisonous in the age group of 15-30 years(43).Torkshond study in Rafsanjan showed that more than half of the cases of accidental poisoning were in the age group of ten or less. About three quarters of poisoning cases occurred in this age group in children younger than 5 years of age. The intentional poisoning in adolescents and youths was 11-30 years more than other age groups(44).In this study, poisoning (intentional / unethical) was more than that of villages. In spite of the industrial and economic development in cities, the existence of psychological problems and lack of communication development are among the most important reasons.One of the limitations of this study can be a low level of reporting on suicide attempts. Also, the variables under investigation may be prone to misclassification bias(45-47).On the other hand, the need for a system for recording suicide has been carried out, or it is necessary to do so in a care system, in order to design population-based studies(47, 48).The most common poisoning kinds were drug to 1122(84.5%), sting to 103(7.7%) and chemicals to 65(4.9%). There was a significant relationship between the location of residence and the poisoning factor based on the Chi-square test.In the present study, like most studies in different regions of Iran, including Shiraz(8), Isfahan(39), Tabriz(49), Sari(50), and Some parts of the world like China(51), Oslo(52), and Turkey(37, 53, 54)was the most common cause were drug poisoning. Doctors' inadequate drug administration, easy access, and over-the-counter sales of drugs can be the cause of more drug toxicity(49).

## CONCLUSION

From the study's limitations, there were cases of poisoned people who were treated during the first few hours or were transferred to the Emergency Immunity Center of Isfahan due to their deterioration, and as a result, the statistics were not recorded. Also, some cases, such as marriage, number of children and the level of education of individuals were not recorded in their case.Considering the high rates of poisoning in the age group of 21-30 and over sixty years old, which are considered as the most sensitive groups in the community, it is necessary to study the high prevalence of poisoning in these two groups. Iran is one of the countries with a high youth population. Over the past decade, due to poverty, rising

unemployment, and the lack of plans for the future and marital conflicts in the youth group, loneliness and frustration in the sixty-six year-old age group have been linked to a twofold increase in intentional poisoning over the past three years. By advising and improving working conditions, it is hoped to reduce the trend of poisoning.

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