The Open Public Health Journal
DOI: 10.2174/0118749445387076250527064007, 2025, 18, e18749445387076
ISSN: 1874-9445
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RESEARCH ARTICLE **OPEN ACCESS**

The Epidemiology of Poisoning in the Central Region of Iran: A Cross-sectional Study of Main Determinants

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Abstract:

Background: Poisoning is one of the main medical emergencies. This study aimed to investigate the epidemiology of poisoning and factors influencing intentional poisoning in Yazd, Iran.

Methods: In this cross-sectional study, data from 456 poisoning cases recorded at the Emergency Medical Services were included. Duplicates were removed based on patients' names and national codes. Frequency and percentage were used to describe the data. Binary logistic regression was employed to examine the factors influencing intentional poisoning.

Results: Of all cases, 231 (50.7%) were women and 182 (39.9%) were in the 25-55 age group. Medication poisoning accounted for 290 (63.6%) of the cases. The incidence rate of poisoning was 36.98 per 100,000 people, with a case fatality rate of 1.53%. Women were 2.11 times more likely to experience intentional poisoning than men (OR=2.11, 95%CI: 1.34-3.32), and individuals with a university degree had 3.72 times higher odds of intentional poisoning compared to illiterates (OR=3.72, 95%CI: 1.39-9.88).

Discussion: Intentional poisoning was more prevalent among women, young adults, and individuals with higher education levels, the majority of them were caused by Medications and illicit drugs.

Conclusion: Intentional poisoning was found to be more prevalent among women, young adults, and individuals with higher education levels, the majority of which were caused by medications and illicit drugs. Appropriate health policies and public education programs for high-risk groups are needed to reduce the incidence and mortality.

Keywords: Injury Epidemiology, Suicide, Incidence, Accident, Illicit drug, Emergency Medical Services, Binary Logistic Regression, Intentional Poisoning.

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Cite as: Tarfiei A, Tavakolian N, Motamed-Jahromi M, Jafari-Khounigh A. The Epidemiology of Poisoning in the Central Region of Iran: A Cross-sectional Study of Main Determinants. Open Public Health J, 2025; 18: e18749445387076. http://dx.doi.org/10.2174/0118749445387076250527064007

Received: January 21, 2025
Revised: April 11, 2025
Accepted: April 16, 2025
Published: June 02, 2025

1. INTRODUCTION

Poisoning is a serious issue that can be classified into two primary categories: intentional and unintentional. Each type has its causes and implications, and understanding them can help in prevention and response. Intentional poisoning refers to the deliberate self-administration of a toxic substance with the intent to harm oneself [1]. It is a significant public health problem in many countries, encompassing suicide, suicide attempts, and self-harm behaviors [2]. On the other hand, unintentional poisoning occurs when persons are poisoned without the intent to harm themselves. Unintentional poisoning can be further subdivided into three categories: accidental (childhood poisoning, medication errors, and recreational use), environmental (plant poisoning, venomous bites and stings, and food poisoning), and occupational exposure [3].

Poisoning is a serious medical emergency and a common cause of morbidity and mortality worldwide [4]. Many individuals suffer from a wide range of problems due to poisoning, ranging from mild illness to hospitalization in the Intensive Care Unit (ICU) and death, imposing a significant economic, physical, and psychological burden on the individual, their family, and society [5]. According to previous research, poisoning remains a common medical problem and accounts for 15-20% of emergency department visits in hospitals and healthcare centers. It is estimated that more than half a million people worldwide lose their lives each year due to poisoning [6, 7]. The clinical presentation of patients with severe poisoning varies from one place to another. In high-income countries, increased access to medications has led to a significant increase in hospital admissions due to drug poisoning. However, in low- and middle-income countries, the incidence of pesticide poisoning has increased dramatically in recent decades, and a significant proportion of deaths due to poisonings belongs to pesticides [8, 9].

In recent years, the prevalence of poisoning has increased due to changes in its pattern and nature in low- and middle-income countries, including Iran [10]. In this regard, most increments in poisonings have been reported in the age group of 21 to 30 years [11]. The mortality rate due to poisoning was reported to be 8 per 1000 patients in hospitals' general wards and 109 per 1000 patients in ICUs, with drugs and pesticides being the most important causes [12]. Most studies have reported the highest percentage of poisonings as intentional (suicide), which occurs more frequently in adults between the ages of 15 and 40 years. However, unintentional or accidental poisoning is more common in children and causes disability and mortality in these age groups [13]. Approximately 30% of intentional poisoning cases involve individuals with a history of previous suicide attempts [14], and its reasons are usually multifactorial, which include biological, psychological, and social factors.

The status of patients in terms of demographic characteristics, causes of poisoning, and the type of poisoning (intentional or unintentional) varies across regions, depending on each community's culture, habits, and lifestyle. Information on the epidemiology and key determinants of poisoning is essential for improving treatment, prevention programs, and policymaking. Therefore, due to the lack of such data in Yazd Province, this study aimed to investigate the epidemiological characteristics and main determinants of poisoning in 2020.

2. METHODS

2.1. Study Design and Participants

In this cross-sectional study, data from all patients registered in the Emergency Medical Service (EMS) of Yazd Province were analyzed. The target population included all patients diagnosed with poisoning in 2020, who were enrolled using the census sampling method. According to the latest data published by official authorities, the Yazd Province emergency system is the primary system for recording acute poisoning cases. Available evidence indicates that this system covers between 65% and 80% of poisoning cases requiring immediate medical intervention.

The data collection tool was a checklist designed based on the information available in the poisoning report forms. To maintain confidentiality, the checklists were completed on-site at the EMS location. The collected data included age, gender, occupation, education, place of residence, type of poisoning (intentional or unintentional), length of hospital stay (days), and cause of poisoning.

Data management involved identifying and removing duplicate entries using patients' names and national codes. Additionally, missing or incomplete data were addressed by contacting the registrar or patients' families. Ultimately, 456 individuals diagnosed with poisoning were identified and included in the study.

Data collection and management were performed according to the following steps. In the first step, a tabular checklist was designed based on the required variables to extract data from the patients' files in the EMS. In the second step, the files were sorted by year, and after the necessary checks, the files that did not qualify for the study were excluded. In the third step, a number was assigned to each case, and all necessary data were extracted and entered into the checklist. In the next step, items of variables were coded and entered into the SPSS version 22.

2.2. Statistical Analysis

Descriptive statistics, including frequency, percent, mean, and standard deviation, were used to describe the data. To determine the cumulative incidence of poisoning in Yazd province, the total number of poisoning cases reported in 2020 was divided by the population of the province for the same year, and to calculate the case fatality rate of poisoning, the total number of deaths due to poisoning was divided by total poisoning cases. Binary logistic regression was used to identify the factors affecting the incidence of intentional poisoning, and multivariable logistic regression was performed to control

confounding variables. All analyses were performed in SPSS version 22, and the significance level was considered at 0.05.

3. RESULTS

Out of the total 456 patients enrolled in the study with a diagnosis of poisoning, 231 (50.7%) were women. The highest percentage of poisonings occurred in the 25-55 age group (39.9%). The age range of poisoned patients spanned from one to 84 years. Among the poisoned patients, 217 (47.6%) had a university degree, and 111 (24.3%) were students. A total of 290 patients (63.6%) were poisoned with medications. Out of the 456 patients, 297 (65.1%) were intentionally poisoned, and 167 (36.6%) were hospitalized for three or more days. The majority of patients (98.5%) were discharged from the hospital after recovering. The case fatality rate of poisoning was calculated to be 1.53% (Table **1**).

The incidence of poisoning in Yazd province was 36.98 per 100,000 people, and the cities of Yazd (48.97 per 100,000 people), Mahriz (40.38 per 100,000 people), and Ardakan (31.89% per 100,000 people), respectively, had the highest incidence of poisoning (Fig. **1**).

Table **2** displays the distribution of different variables based on the type of poisonous substance. In both sexes, medications were the most common cause of poisoning, followed by illicit drugs. However, the proportion of women affected by medications was significantly higher than that of men (77.9% *vs.* 48.9%). On the other hand, alcohol poisoning only occurred in men (8.0%), with no reported cases in women. Across all age groups, medication poisoning was the most prevalent. In the age group of 55 and older, poisoning due to illicit drugs (48.4%) was slightly higher than medication poisoning (45.2%). Among illiterates, the percentage of medication poisoning (42.9%) and illicit drug poisoning (40.0%) was nearly equal, whereas in people with diplomas and academic education, the proportion of medications was higher.

Additionally, in all occupational groups, medications were the leading cause of poisoning. Specifically, medications were the primary cause of intentional poisoning (73.4%), while a smaller proportion of intentional poisoning was attributed to illicit drugs (12.5%). However, illicit drugs were more frequently involved in unintentional poisonings (33.3%) than intentional ones (12.5%). In total, seven cases of poisoning led to death, with five cases (71.4%) linked to medication poisoning. None of the poisonings caused by illicit drugs, alcohol, agricultural chemicals, and detergents resulted in death. Lastly, in all cities of Yazd province, medications were the predominant cause of poisoning Table **2**.

Table 1. Characteristics of the poisoned population.

Variables		Frequency	Percent
Gender	**Female**	231	50.7
	Male	225	49.3
Age group	**<15**	77	16.9
	15-24	166	36.4
	25-55	182	39.9
	>55	31	6.8
Education	**Illiterates**	35	7.7
	Diploma	204	44.7
	Academic	217	47.6
Job	**Student**	111	24.3
	Self-employed	86	18.9
	Housewife	55	12.1
	laborer	28	6.1
	Employee	13	2.9
	Unemployed	11	2.4
	Other	152	33.3
Type of materials	**Medications**	290	63.6
	Illicit Drugs	90	19.7
	Alcohol	18	3.9
	Agricultural chemicals	13	2.9
	Detergents	3	0.7
	Other	42	9.2
Poisoning type	**Intentional**	297	65.1
	Unintentional	159	34.9
Hospitalization days	**<1 day**	58	12.7
	1 day	113	24.8
	2 days	118	25.9
	≥ 3 days	167	36.6
Outcome	**Recovery**	449	98.5
	Death	7	1.5

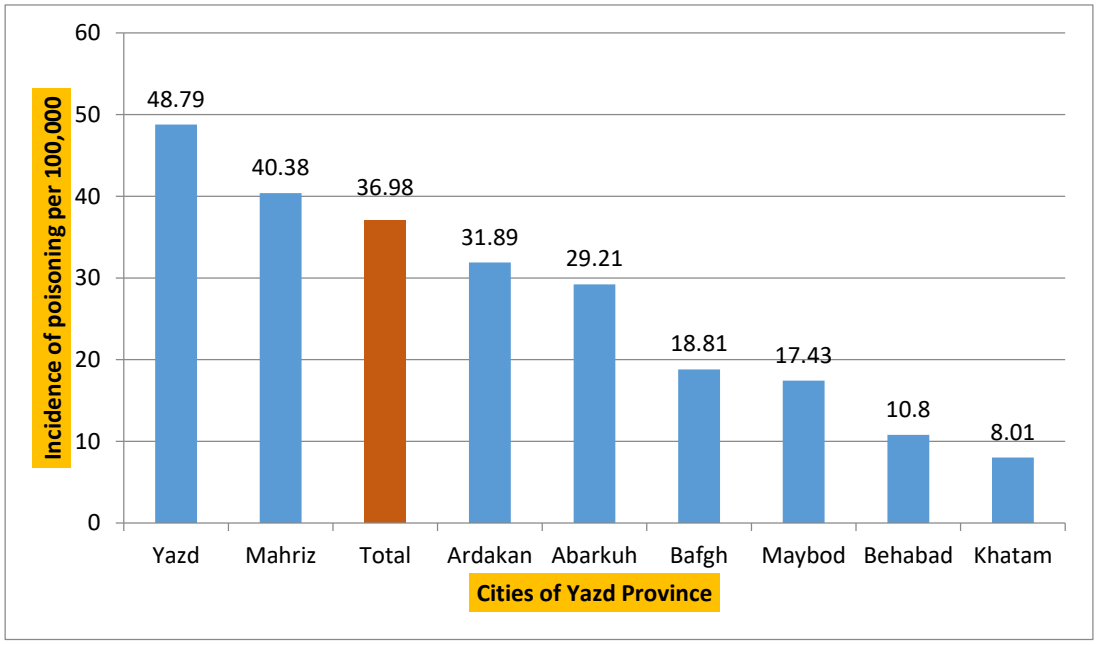

Fig. (1). The incidence of poisoning per 100,000 people in Yazd province by city.

Table 2. Distribution of variables based on the type of poisonous substance.

Variables		Type of Substance, N (%)					
		Medications [290 (63.6)]	Illicit Drugs [90 (19.7)]	Alcohol [18 (3.9)]	Agricultural Chemicals [13 (2.9)]	Detergents [3 (0.7)]	Other [42 (9.2)]
Gender	Female	180 (77.9)	21 (9.1)	0 (0)	8 (3.5)	1 (0.4)	21 (9.1)
	Male	110 (48.9)	69 (30.7)	18 (8.0)	5 (2.2)	2 (0.9)	21 (9.3)
Age group	<15	48 (62.3)	15 (19.5)	2 (2.6)	2 (2.6)	1 (1.3)	9 (11.7)
	15-24	118 (71.1)	20 (12.0)	10 (6.0)	3 (1.8)	1 (0.6)	14 (8.4)
	25-55	110 (60.4)	40 (22.0)	6 (3.3)	7 (3.8)	1 (0.5)	18 (9.9)
	>55	14 (45.2)	15 (48.4)	0 (0)	1 (3.2)	0 (0)	1 (3.2)
Education	Illiterates	15 (42.9)	14 (40.0)	0 (0)	1 (2.9)	0 (0)	5 (14.3)
	Diploma	129 (63.2)	40 (19.6)	12 (5.9)	6 (2.9)	1 (0.5)	16 (7.8)
	Academic	146 (67.3)	36 (16.6)	6 (2.8)	6 (2.8)	2 (0.9)	21 (9.7)
Job	Student	76 (68.5)	15 (13.5)	6 (5.4)	2 (1.8)	0 (0)	12 (10.8)
	Self-employed	50 (58.1)	22 (25.6)	6 (7.0)	1 (1.2)	1 (1.2)	6 (7.0)
	Housewife	38 (69.1)	7 (12.7)	0 (0)	3 (5.5)	0 (0)	7 (12.7)
	laborer	11 (39.3)	10 (35.7)	1 (3.6)	2 (7.1)	0 (0)	4 (14.3)
	Employee	9 (69.2)	3 (23.1)	1 (7.7)	0 (0)	0 (0)	0 (0)
	Unemployed	9 (81.8)	1 (9.1)	0 (0)	0 (0)	0 (0)	1 (9.1)
	Other	97 (63.8)	32 (21.1)	4 (2.6)	5 (3.3)	2 (1.3)	12 (7.9)
Type of Poisoning	Intentional	218 (73.4)	37 (12.5)	9 (3.0)	9 (3.0)	0 (0)	24 (8.1)
	Unintentional	72 (45.3)	53 (33.3)	9 (5.7)	4 (2.5)	3 (1.9)	18 (11.3)
Hospitalization days	<1 day	39 (67.2)	10 (17.2)	4 (6.9)	0 (0)	0 (0)	5 (8.6)
	1 day	77 (68.1)	12 (10.6)	5 (4.4)	3 (2.7)	2 (1.8)	14 (12.4)
	2 days	73 (61.9)	28 (23.7)	4 (3.4)	1 (0.8)	0 (0)	1 2(10.2)
	≥ 3 days	101 (60.5)	40 (24.0)	5 (3.0)	9 (5.4)	1 (0.6)	11 (6.6)
Outcome	Recovery	285 (63.5)	90 (20.0)	18 (4.0)	13 (2.9)	3 (0.7)	40 (8.9)
	Death	5 (71.4)	0 (0)	0 (0)	0 (0)	0 (0)	2 (28.6)
Townships	Abarkuh	9 (56.3)	4 (25.0)	1 (6.3)	1 (6.3)	0 (0)	1 (6.3)
	Ardakan	23 (63.9)	8 (22.2)	0 (0)	1 (2.8)	1 (2.8)	3 (8.3)
	Bafgh	7 (63.6)	3 (27.3)	0 (0)	0 (0)	0 (0)	1 (9.1)
	Behabad	1 (50.0)	1 (50.0)	0 (0)	0 (0)	0 (0)	0 (0)
	Khatam	1 (33.3)	1 (33.3)	0 (0)	0 (0)	0 (0)	1 (33.3)
	Mahriz	14 (60.9)	3 (13.0)	3 (13.0)	1 (4.3)	0 (0)	2 (8.7)
	Maybod	8 (42.1)	5 (26.3)	1 (5.3)	2 (10.5)	0 (0)	3 (15.8)
	Yazd	227 (65.6)	65 (18.8)	13 (3.8)	8 (2.3)	2 (0.6)	31 (9.0)

In Table **3**, the distribution of variables based on the type of poisoning is presented. The data indicate that 74.5% of women and 55.6% of men intentionally poisoned themselves. Among individuals younger than 15 years and over 55 years of age, 53.2% and 61.3% were unintentionally poisoned, respectively. However, in other age groups, intentional poisonings were more common. Regarding education, 74.3% of illiterate individuals were unintentionally poisoned, while 66.2% of diploma holders and 70.5% of university graduates were intentionally poisoned. Across all occupational groups, the majority of poisonings were intentional, with the highest percentages found among housewives (76.4%) and unemployed individuals (72.7%). The case fatality rate for intentional poisoning was 2.02%, while it was 0.63% for unintentional poisoning.

The results of binary logistic regression for the type of poisoning showed that the odds of intentional poisoning in women were more than twice that of men (OR=2.11, 95%CI: 1.34-3.32). People aged 15 to 24 years had 2.52 times more intentional poisoning compared to people under 15 years old (OR=2.52, 95%CI: 1.15-5.49). Also, the odds of intentional poisoning in the age group of 55 and above were 26% lower than in the group less than 15 years old; However, this relationship was not statistically significant (OR=0.74, 95%CI: 0.25-2.17). In all occupational groups, the odds of intentional poisoning were lower than that of the unemployed, but these relationships were not statistically significant (P>0.05). The odds of intentional poisoning were 3.69 times higher in people with a diploma (OR=3.69, 95%CI: 1.50-9.11) and 3.72 times higher in people with a university degree (OR=3.72, 95%CI: 1.39-9.88) compared to illiterates Table **4**.

Table 3. Distribution of variables based on the type of poisoning.

Variables		Type of Poisoning, N (%)	
		Intentional [297 (65.1)]	Unintentional [159 (34.9)]
Gender	Female	172 (74.5)	59 (25.5)
	Male	125 (55.6)	100 (44.4)
Age group	<15	36 (46.8)	41 (53.2)
	15-24	124 (74.7)	42 (25.3)
	25-55	125 (68.7)	57 (31.3)
	>55	12 (38.7)	19 (61.3)
Education	Illiterates	9 (25.7)	26 (74.3)
	Diploma	135 (66.2)	69 (33.8)
	Academic	153 (70.5)	64 (29.5)
Job	Student	64 (57.7)	47 (42.3)
	Self-employed	49 (57.0)	37 (43.0)
	Housewife	42 (76.4)	13 (23.6)
	laborer	18 (64.3)	10 (35.7)
	Employee	7 (53.8)	6 (46.2)
	Unemployed	8 (72.7)	3 (27.3)
	Other	109 (71.7)	43 (28.3)
Outcome	Recovery	290 (64.7)	158 (35.3)
	Death	6 (85.7)	1 (14.3)

Table 4. Results of multivariable logistic regression analysis for the type of poisoning.

Variables		Logistic Regression Model		
		OR	95%CI	*P*-value
Gender	Male	Ref		
	Female	2.11	1.34 - 3.32	**0.001**
Age group	<15	Ref		
	15-24	2.52	1.15 - 5.49	**0.020**
	25-55	1.99	0.84 - 4.71	0.116
	>55	0.74	0.25 - 2.17	0.594

(Table 4) contd.....

Variables		Logistic Regression Model		
		OR	95%CI	*P*-value
Job	Unemployed	Ref		
	Self-employed	0.56	0.12 - 2.45	0.442
	Housewife	0.78	0.16 - 3.69	0.754
	Student	0.84	0.17 – 3.97	0.826
	Laborer	0.74	0.14 - 3.68	0.714
	Employee	0.36	0.05 - 2.29	0.285
	Other	0.87	0.20 – 3.76	0.863
Education	Illiterates	Ref		
	Diploma	3.69	1.50 – 9.11	**0.004**
	Academic	3.72	1.39 – 9.88	**0.008**

Dependent variable: Type of poisoning (Unintentional=0, Intentional=1); OR: Odds ratio; 95%CI: 95% Confidence interval

4. DISCUSSION

Poisoning is a significant public health challenge. Identifying epidemiological characteristics and examining risk factors associated with poisonings can greatly influence the development and implementation of preventive and therapeutic measures. The present study aimed to investigate the causes of poisonings and their epidemiological characteristics in Yazd Province in 2020. The findings of this study revealed that most poisonings were intentional and occurred mainly in women, young individuals, and educated people. Medications, illicit drugs, and alcohol were the most commonly reported agents.

In this study, the most commonly used substances in poisonings were medications, illicit drugs, and alcohol, respectively. In the research conducted by Kabiri *et al*. and Payvar *et al*., who studied poisonings in northeastern Iran, the three main causes of poisoning were identified as drugs, opioids, and pesticides [15, 16]. This can be attributed to the easy access and over-the-counter delivery of medications, especially benzodiazepines, from pharmacies, as well as the excessive prescription of medications by physicians, leading to an increase in medication poisoning [16]. Additionally, the poisoning agent in different parts of Iran can vary depending on the type of access and climatic conditions [2].

The overall incidence of poisoning in Yazd Province was 36.98 per 100,000 people, and the case fatality rate was calculated to be 1.53%. This rate was 2.02% for intentional poisonings. In a study by Mahdavinejad *et al*., which investigated acute benzodiazepine poisoning in patients referred to Loghman-e Hakim Hospital in Tehran, the case fatality rate due to poisoning was found to be 1.7% [17]. In a study conducted in East Azerbaijan, the case fatality rate caused by poisoning was 3.2% [18]. Additionally, this rate was reported to be 3% in Bangladesh [19]. Geographic, cultural, and socioeconomic characteristics in different regions may influence the choice of poisoning agent, prevention principles, management of affected cases, and the consequences of poisoning [20, 21]. Furthermore, the differences in the incidence of poisoning in different regions are the result of a complex interaction of social, economic, environmental, and legal factors, each of which plays a significant role in this field.

In the present study, there was no significant difference in the frequency of poisoning cases between men and women (49.3% *vs*. 50.7%). Additionally, in both men and women, most poisonings were intentional (55.6% in men *vs*. 74.5% in women). Most studies show that intentional poisonings were more common in women, while unintentional poisonings were more common in men [2, 22]. A study conducted in Yazd in 2015 revealed that most poisonings were unintentional and occurred more frequently in men [23]. This study reported that the chance of intentional poisoning in women was more than twice that of men. This could be attributed to women's psychological and emotional characteristics, higher prevalence of depression, economic dependence, family insecurity, lack of self-confidence, and the absence of social support systems [8, 24]. A study in India indicated that most intentional poisonings occurred in men and suggested that in countries with more economic problems, economic problems are the main motivation for poisoning in men [25].

This study indicated that individuals in the age groups of 15-24 years and 25-55 years experienced more intentional poisoning, with medications being the most common agent. Individuals under 15 years and over 55 years were more likely to be unintentionally poisoned, with medications being the poisoning agent for those under 15 years and illicit drugs for those over 55 years. Logistic regression results showed that individuals aged 15-24 years were more than 2.5 times more likely to experience intentional poisoning compared to those under 15 years. In a study conducted in Babol, a city in the north of Iran, the highest frequency of intentional poisoning was reported in the age group of 16-25 years [24]. Additionally, in another study, 41.4% of intentional poisonings occurred in the age group of 20-29 years, which were reported to be due to the consumption of illicit drugs [1]. These findings indicate that most intentional poisonings occur during adolescence and young adulthood and are probably due to increased exposure to issues, such as unemployment and family tensions, as well as easy access to medications and illicit drugs [26].

The present study revealed that individuals with a university degree accounted for a larger proportion of poisonings (47.6%), which contradicts the findings of Vakili *et al*. [23]. Logistic regression results showed that the odds of intentional poisoning increased with increasing education

levels. The odds of poisoning were 3.69 times higher for individuals with a high school diploma and 3.72 times higher for those with a university degree compared to those with no education. A study by Chowdhury *et al.* showed that the highest number of poisoned individuals was at the high school level and then at the university level [27]. Another study in Colombia reported that most cases of chemical poisoning, including intentional suicide, occurred among individuals with a university education [28]. However, a study in Malaysia reported that 60% of pesticide poisoning cases were intentional, most of which occurred among individuals with lower levels of education [29]. In general, individuals with higher levels of education are usually employed in jobs with greater responsibilities and psychological pressure; therefore, they are under greater social pressure to meet higher expectations and standards. As a final result, these pressures can lead to feelings of failure and despair, ultimately resulting in intentional poisoning [30].

According to the findings of the study, in all occu-pational groups, intentional poisoning had the highest percentage. In general, employment is considered a preventive factor in intentional poisoning, although not significantly. However, previous studies have confirmed this finding [16, 31, 32]. Unemployment can act as a stressor, leading to increased feelings of hopelessness and depression. This situation can lead to self-harming behaviors and intentional poisoning. Studies have shown that unemployed individuals, especially in younger age groups, are more likely to engage in suicide and intentional poisoning [33, 34]. Research also indicates that individuals in unstable employment conditions are more prone to depression and anxiety, and these mental health problems can lead to intentional poisoning and suicide [35, 36].

Furthermore, the study's strength lies in its comp-rehensive investigation of poisonings and their influencing factors in Yazd Province, an area that has not been thoroughly researched before. This will greatly aid policymakers and relevant officials in developing plans to prevent poisonings and increase public awareness. However, this study is limited by its reliance on medical records from the Emergency Medical Services Center, which may contain inaccuracies or incomplete information, as these reports were primarily collected for clinical, not research, purposes. Additionally, data from the emergency department does not capture all poisoning cases and only includes those requiring medical intervention. For example, mild cases of food poisoning or poisoning occurring in remote rural areas may be underreported, potentially leading to an underestimation of the true incidence of poisoning.

CONCLUSION

The findings of this study revealed that most poisonings were intentional and occurred mainly in women, young individuals, and educated people. Medications, illicit drugs, and alcohol were the most commonly reported agents. In order to reduce the incidence and death rate due to poisoning, it is essential to implement effective prevention policies, public education programs, and awareness campaigns targeted at families, especially women, adolescents, and other at-risk groups. Additionally, conducting more comprehensive studies on cultural and socio-economic factors, as well as other key determinants affecting vulnerable populations, is recommended to inform and improve future prevention efforts.

AUTHORS' CONTRIBUTIONS

The authors confirm their contributions to the paper as follows A.T. contributed to the methodology, wrote the original draft, supervised the project, and managed the administration. N.T. contributed to the methodology and wrote the original draft. M.M.J. was involved in the methodology and writing of the original draft. A.J.K. contributed to the methodology, performed data analysis, provided supervision, and was responsible for reviewing and editing the manuscript. All authors reviewed the results and approved the final version of the manuscript.

LIST OF ABBREVIATIONS

ICU	=	Intensive Care Unit
EMS	=	Emergency Medical Service

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This project was approved by the Research Ethics Committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran. The approval ID is IR.SSU.REC.1400.212.

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was waived due to the retrospective nature of this study.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in the Zenodo repository at https://doi.org/10.5281/zenodo.15579036, reference number 15579036.

FUNDING

This work was supported financially in part by Shahid Sadoughi University of Medical Sciences, Yazd, Iran. (Project number: 10695. IR.SSU.REC.1400.212).

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

The authors are grateful to the Emergency Medical Service (EMS) of Yazd province for their help in providing

data and to Shahid Sadoughi University of Medical Sciences for their financial support.

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