

## Clinical and Socioeconomic Factors Associating with Opium Poisonings in Children and Adolescents

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### Abstract

**Background:** Use of opium and derivatives is one of the major health, psychosocial and socioeconomic problems and can lead to complications for societies. The present study aimed to assess clinical and socioeconomic factors associated with the poisonings by Opium and its Derivatives (O&D) in children and adolescents.

**Methods:** This retrospective study was carried out to review the recorded clinical information of children and adolescents admitted to the pediatric emergency department of the Ali Ibn Abi Talib Hospital due to acute poisoning by O&D during a seven-year period since 2014. Demo-economic information was taken from the patient's guardians at the time of discharge. Collected data were analyzed by SPSS 20 considering 0.05 as the significant level.

**Results:** From among 227 poisoned children, 50.7% were female and 75.8%, 8.8% and 15.4% were in age groups of <8 year, 8-12 and 12-18 years, respectively. About 42.7% of the children poisoned by industrial substances, compared to the traditional substances. Respectively, 87.7%, 11% and 1.3% of the children were poisoned accidentally, intentionally, and due to family challenges or schooling problems. Variables of the children's gender, age, and father's age were associated with self-poisoning. The samples' heart rate, blood pressure and seizure were affected by the type of narcotic.

**Conclusion:** Overall, the majority of poisoned children were girls and young. Those with very young and very old parents had more tendency to self-poison due to family challenges. Types of narcotic substances significantly correlated with irregular changes in the size of the pupil, heart rate, blood pressure and seizure.

**Key Words:** Children, Emergency, Opium, Poisoning.

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## 1- INTRODUCTION

Opium and derivatives (O&D) play a significant role in many of the critical problems and sometimes in the health status of societies; their consumption is one of the major health, psychosocial and socioeconomic problems in the world (1). There is a sex gap in the consumption of O&D in the communities with higher rates in men that is decreasing gradually (2). Iran is one of the countries with an increase in O&D prevalence in recent years due to various reasons such as its neighborhood with Afghanistan on the Eastern border. As one of the largest producers of O&D, Afghanistan attempts to smuggle its products to Europe through Iran (3). This has led to the high rate of opium abusers in Iran (4, 5). Pediatric poisonings are the most common global medical emergencies with a mortality rate of 3% - 5% (6-8); and the most common causes of pediatric poisoning is O&D in the globe (9) and in Iran (10). And it has been reported that 45,000 children and adolescents die from poisoning under the age of 20, every year around the world (11).

From all suicides among children or adolescents about 85% to 95% are due to poisonings (12). Some factors such as alcoholism, financial difficulties, family disputes, physical and psychological problems have been identified as the main reasons for self-poisoning and these factors in teen population are associated with loneliness and anger with others (13).

Due to the large illegal attempts on the part of the Afghan Opium producers as the main supplier of Europe to use Iran's borders for transmitting their goods (14). Regarding the strategic location of Zahedan the capital city of Sistan and Baluchestan province, this city and its population have easy access to this types of narcotics and this issue makes them most at consumption risk (15) due to the behavioral, cultural, economic, and health

results of opium and derivatives, and since they have been subjected to international drug control in the beginning of the 20th century, global attention is required to enhance Iran's attempts in resisting against these illegal exports damaging the whole globe. In this regard, the present study aimed to assess the association of O&D poisoning with different clinical and socioeconomic factors.

## 2- METHODOLOGY

This retrospective study was conducted in 2020. The sample of the study included all 227 children poisoned by opium and its derivatives such as heroin, morphine, methadone and pethidine. They were selected from among 636 poisoned children admitted to the emergency department of Ali Ibn Abi Talib Hospital In Zahedan; and were submitted to the Children and Adolescents' Health research Center of the Zahedan University of Medical Sciences, Zahedan, Iran in 2014. Data collection performed until the year of 2020. After evaluating the information of each poisoned child, those with missed data and ages above 18 years were excluded from the study. The children poisoned by causes other than O&D including medicinal, stung or bitten by snake and scorpion, toxins, detergents, kerosene, pipe adhesive, etc. were also excluded.

### 2-1. Ethical consideration

The study is approved by the Zahedan University of Medical Sciences, coded as IR.ZAUMS.REC.1398.375, and dated 10.11.2019. After study approval, the researchers prepared a standardized form to collect the required information which was completed after the admission and at the time of discharge. The form consisted of the demographic and socioeconomic data of the poisoned child, as well as the parents and household information, type of O&D (Traditional, Industrial), the poisoning reason, symptoms and signs at

the time of admission and the outcome. Demographic and economic information including the parents' education and occupation, along with the number of children in the family were taken from the patients or guardians after discharge. Data regarding the age, gender, past medical history, history of opium abuse were also recorded in the provided check lists.

The treatment details, duration of admission, and final outcome of all patients were also recorded. The symptoms and signs of the central nervous system (CNS) such as low consciousness and seizure, cardiovascular system (CVS) such as heart rate and blood pressure, and gastrointestinal system (GIS) such as vomiting and nausea were also classified at the time of admission.

## 2-2. Statistical Analysis

Data were analyzed using SPSS 18 (SPSS Inc, Chicago, Ill, USA), considering mean and SD for descriptive statistics and Pearson chi-square for inferential statistics to assess association between two specific categorical variables. The level of significance was considered 0.05.

## 3- RESULTS

From among 227 poisoned children, 50.7% were female and 75.8%, 8.8% and 15.4% were in age groups of <8 year, 8-12 and 12-18 years, respectively. About 42.7% of the children poisoned by industrial substances, compared to the traditional substances. Respectively, 87.7%, 11% and 1.3% of the children were poisoned accidentally, intentionally, and due to family challenges or schooling problems. **Table 1** shows that the child's gender, age and the father's age had significant association with self-poisoning. From 25 children who committed self-poisoning due to family challenges, 3 (12%) and 22 (88%) were boys and girls respectively, while this trend for schooling problems was 1 (33.3%) boys and 2 (66.7%) girls. The

gender distribution of the poisoned children was significantly associated with poisoning reasons ( $X^2=16.189$ ,  $p<0.001$ ). The children were categorized in three age groups of <8, 8-12 and 12-18 years such that from the 25 children with family challenges, 0(0.00%), 5 (20%) and 20(80%) belonged to the mentioned age groups, respectively with a significant association ( $X^2=109.016$ ,  $P<0.001$ ). From the three children with schooling problems, 1 belonged to the second age group and 2 belonged to the third age group. Father's age was categorized as  $\leq 25$ , 26-30, 31-35, 36-40 and  $>40$  years. The analysis showed a significant association ( $X^2=16.183$ ,  $P=0.04$ ) between this factor and the reasons of poisoning such that the children self-poisoned due to family challenges had very young or very old fathers.

**Table 2** presents the association between the type of Opium and derivatives (traditional- industrial) and the factors of gender and age of the children, place of residence, mother's and father's education, occupation and age, number of siblings, status at the discharge time, Staying duration in hospital, ICU admission and clinical manifestations. From the mentioned factors, only four clinical manifestations had a significant association with the type of O&D, such that from 130 children who used traditional O&D, 4.62% had no changes in pupils when the remainder (95.38%) had myosis. An increase or decrease in heart rate was another clinical manifestation significantly influenced ( $X^2=33.825$ ,  $p<0.001$ ) by the type of O&D, such that among the 130 children poisoned by the traditional O&D, 113 (86.92%) showed decreases in heart rate when the remained had no changes. From among the 97 children poisoned by industrial drugs, 26.8%, 56.7% and 16.5%, respectively, showed no change, decrease and increase in heart rate.

**Table-1:** The association between the cause of poisoning and the demographic/socioeconomic variables

Factor	Groups	Statistics	Reason of poisoning			X <sup>2</sup>	P	Factor	Groups	Reason of poisoning			X <sup>2</sup>	P			
			accidentally	Family challenge	school challenge					accidentally	Family challenge	school challenge					
Gender	Boy	n	108	3	1	16.189	<0.001	No children in household	1.00	80	13	1	4.675	0.322			
		%	96.4%	2.7%	.9%					85.1%	13.8%	1.1%					
Girl	n	91	22	2	1.738	0.419	2.00		62	8	0	109.061			<0.001		
		%	79.1%	19.1%					1.7%	88.6%	11.4%					0.0%	
Place of residence	Urban	n	162	18	2	4.85	0.901		Children age groups	3.00	57	4			2	11.923	0.155
		%	89.0%	9.9%	1.1%						90.5%	6.3%			3.2%		
Rural	n	36	7	1	6.13	0.804	<8	170		0	0	26-30	39	4	1		
		%	81.8%	15.9%				2.3%		100.0%	0.0%		0.0%	88.6%	9.1%		
illiterate	n	22	3	1	31-35	32	9	0		>36	64	5	2				
		%	84.6%	11.5%		3.8%	71.4%	23.8%			4.8%	78.0%	22.0%				
Primary (1-5)	n	38	5	1	Mother age groups	15-20	33	6	0								
		%	86.4%	11.4%			2.3%	84.6%	15.4%			0.0%					
Secondary (6-8)	n	42	7	1	8-12 years	15	5	1									
		%	84.0%	14.0%		2.0%	71.4%	23.8%			4.8%						
High school (9-12)	n	32	4	0	12-18 years	14	20	2									
		%	88.9%	11.1%		0.0%	38.9%	55.6%			5.6%						
Diploma	n	31	4	0	15-20	33	6	0									
		%	88.6%	11.4%		0.0%	84.6%	15.4%			0.0%						
Academic	n	34	2	0	21-25	31	1	0									
		%	94.4%	5.6%		0.0%	96.9%	3.1%			0.0%						
Father's	illiterate	n	37	6	1	6.13	0.804	>36	64	5	2						

Factor	Groups	Statistics	Reason of poisoning			X <sup>2</sup>	P	Factor	Groups	Reason of poisoning			X <sup>2</sup>	P			
			accidentally	Family challenge	school challenge					accidentally	Family challenge	school challenge					
education		%	84.1%	13.6%	2.3%	6.517	0.59	Father age groups		90.1%	7.0%	2.8%	16.183	0.04			
	Primary (1-5)	n	32	6	0				<25	41	4	0					
		%	84.2%	15.8%	0.0%					91.1%	8.9%	0.0%					
	Secondary (6-8)	n	31	4	1				26-30	20	1	0					
		%	86.1%	11.1%	2.8%					95.2%	4.8%	0.0%					
	High school (9-12)	n	31	4	0				31-35	32	3	1					
		%	88.6%	11.4%	0.0%					88.9%	8.3%	2.8%					
	Diploma	n	25	2	1				36-40	17	2	2					
		%	89.3%	7.1%	3.6%					81.0%	9.5%	9.5%					
	Academic	n	43	3	0				>40	89	15	0					
%		93.5%	6.5%	0.0%	85.6%	14.4%	0.0%										
Father's occupation	Self - job	n	35	5	1	6.517	0.59	Mother occupation	Housewife	45	8	0	10.439	0.107			
		%	85.4%	12.2%	2.4%					84.9%	15.1%	0.0%					
	worker	n	29	7	0				government job	52	8	3					
		%	80.6%	19.4%	0.0%					82.5%	12.7%	4.8%					
	farmer	n	30	3	1				Self-job	46	3	0					
		%	88.2%	8.8%	2.9%					93.9%	6.1%	0.0%					
	Government Job	n	43	3	1				Hangover job	56	6	0					
		%	91.5%	6.4%	2.1%					90.3%	9.7%	0.0%					
	Non- Governmental job	n	62	7	0				Total	n	199	25			3	227	-
		%	89.9%	10.1%	0.0%					%	87.7%	11.0%			1.3%	100.0%	-

**Table-2:** The association between the types of Narcotics and the demographic/clinical manifestations

Factors	Groups	Statistics	O&D		X <sup>2</sup>	P	Factors	Groups	O&D		X <sup>2</sup>	P
			Traditional	Industrial					Traditional	Industrial		
Gender	Boy	n	60	52	1.235	0.266	PICU admission	No	83	66	0.433	0.51
		%	53.6%	46.4%					55.7%	44.3%		
	Girl	n	70	45				47	31			
		%	60.9%	39.1%				60.3%	39.7%			
Pupil	Not changed	n	6	6	33.586	<0.001	Days stay in hospital	1	29	27	2.951	0.889
		%	50.0%	50.0%					51.8%	48.2%		
	Myosis	n	124	69				55	39			
		%	64.2%	35.8%				58.5%	41.5%			
	Medirias	n	0	22				25	14			
		%	0.0%	100.0%				64.1%	35.9%			
Heart Rate	Not changed	n	17	26	33.825	<0.001	Days stay in hospital	4	11	7	2.951	0.889
		%	39.5%	60.5%					61.1%	38.9%		
	Decreased	n	113	55				3	2			
		%	67.3%	32.7%				60.0%	40.0%			
	Increased	n	0	16				1	1			
		%	0.0%	100.0%				50.0%	50.0%			
Blood Pressure	Not changed	n	82	62	15.852	<0.001	Days stay in hospital	7	3	2	4.141	0.387
		%	56.9%	43.1%					60.0%	40.0%		
	Low	n	47	23				>=8	3	5		
		%	67.1%	32.9%				37.5%	62.5%			
	High	n	1	12				15-20	20	19		
		%	7.7%	92.3%				51.3%	48.7%			
low consciousness	No	n	62	40	0.936	0.333	Mother age groups (Years)	21-25	18	14	4.141	0.387
		%	60.8%	39.2%					56.3%	43.8%		
	Yes	n	68	57				26-30	31	13		
		%	54.4%	45.6%				70.5%	29.5%			
Fever	No	n	130	96	1.346	0.246	31-35	23	18			

Factors	Groups	Statistics	O&D		X <sup>2</sup>	P	Factors	Groups	O&D		X <sup>2</sup>	P
			Traditional	Industrial					Traditional	Industrial		
		%	57.5%	42.5%					56.1%	43.9%		
	Yes	n	0	1				>36	38	33		
		%	0.0%	100.0%					53.5%	46.5%		
Seizure	No	n	93	94	24.628	<0.001	Father age groups (Years)	<25	25	20	1.736	0.784
		%	49.7%	50.3%					55.6%	44.4%		
	Yes	n	37	3				26-30	10	11		
		%	92.5%	7.5%					47.6%	52.4%		
vomiting and nausea	No	n	72	53	0.012	0.911		31-35	20	16		
		%	57.6%	42.4%					55.6%	44.4%		
	Yes	n	58	44				36-40	14	7		
		%	56.9%	43.1%					66.7%	33.3%		
Place of residence	Urban	n	102	80	0.836	0.361	Child age groups (Years)	>40	61	43	0.232	0.891
		%	56.0%	44.0%					58.7%	41.3%		
	Rural	n	28	16				<8	98	72		
		%	63.6%	36.4%					57.6%	42.4%		
Outcome	Discharge with good status	n	53	47	1.425	0.49		[8,12)	11	10		
		%	53.0%	47.0%					52.4%	47.6%		
	Discharge with satisfied status	n	73	48				≥12	21	15		
		%	60.3%	39.7%					58.3%	41.7%		
	Death	n	4	2			Total	130	97			
		%	66.7%	33.3%				57.3%	42.7%			

Blood pressure had a significant association ( $X^2=15.852$ ,  $P<0.001$ ) with the type of O&D. The results, further, revealed that from among the 130 children who used traditional O&D, 63.08%, 36.15% and 0.77% had no changes, hypotension and hypertension, respectively, while this trend was 63.92%, 23.71% and 12.37%, in the given order, among the 97 children poisoned by O&D. At the time of admission, seizure cases observed in traditional drugs were significantly more than those in the children poisoned by the industrial drugs ( $X^2=24.628$ ,  $P<0.001$ ).

**Table 3** demonstrates the percentages of the poisoned children in each year from the year 2014 to 2020 such that the year 2016 had the highest percentage (47, 20.7%) followed by the year 2018 (35, 15.4%). Boys had a decrease in frequency by year even with fluctuation in the mentioned period, while the trend was vice versa for the girls. This trend showed a significant change in the gender distribution of poisoned children by year ( $X^2=20.41$ ,  $P=0.002$ ). The table also shows that the reasons for the poisoning and the type of O&D consumption did not change by the years.

To assess the trend of poisoning by month, **Table 4** presents the percentages of the poisoned children in each month of the year. The gender and type of O&D distribution did not change by the months, but the reasons for poisoning showed changes in different months. Most of the 199 accidentally poisoned cases were recorded in the first six months of each year, such that the highest frequencies of the poisoned children were in the 4th, 3rd and 5th months of each year. Approximately all the 25 cases of self-poisoning due to family challenges had occurred in the second six months of each year, especially in the 7th, 8th and 11th months in the given order. 2 of the 3 self-poisonings due to school problems had

happened in the first six months and 1 in the second six month.

#### 4- DISCUSSION

Abusing O&D has extended to a global epidemic and transformed to an important health issue (16), and poisoning due to these substances is very harmful for children (3). The number of individuals involved with O&D abuse shows an increasing trend globally and in Iran (17). As shown in the results of the present study, 50.7% of the poisoned children were girls and 75.8% were in the age group of less than 8 years. Near half of the poisoned children used the industrial types of O&D. And only 12.3% self-poisoned due to family challenge (11%) and schooling problems (1.3%). Variables of gender and age of the child and his/her father's age had significant associations with self-poisoning. From the 25 cases, self-poisoned due to family crisis, 88% were girls while this percentage was 66.7% for schooling problems. Children with very young and very old fathers had more tendency to self-poisoning. Type of O&D (Traditional or Industrial) had a significant association with changes in the size of pupil, heart rate, blood pressure and seizure. Previous studies have had different reports regarding the association between gender and poisoning due to O&D. Some have shown a higher rate in boys (7), and some have reported higher rates of self-poisoning and death in girls (9, 16, 18, 20 and 26), similar to the present study. Overdose uses and the mortality rate in children and teens can be decreased by improving the cultural beliefs and encouraging early referring to the specialist centers; because being exposed to the exhale of the parents or guardians can be one of the main causes of overdose in young children. In line with the present study, in studies by Disfani et al.,(9), Shokrzadeh et al.,(16), Ghaemi et al.,(18) and Khajehe et al (19), the majority of the poisoned children were

under 5 years of age with no significant difference between the genders. Among different Opium and derivatives, methadone is the major opioid substance followed by tramadol, codeine, diphenoxylate and buprenorphine. In this regard, Ghaemi et al. (18), reported that about 2.3% of the poisoned children died due to severe toxicity and 1.59% due to methadone ingestion. They reported that addicted parents, because of low knowledge, give these substances to the child instead of sedative medicines or for calming them. The present study showed that from the 6 deaths (2.6%), 2 were intoxicated by methadone (industrial type) and four by opium (traditional type).

In a more recent population-based study, opium consumption had no significant association with hypertension in either occasional or dependent users (20). Inconsistent to that study, Yousefzadeh et al., (21) revealed that hypertension was significantly more prevalent in opium users than in non-users. The present study found that the type of O&D has a significant association with blood pressure such that those poisoned with industrial substances had higher blood pressure. Ghaemi et al. (18) found that opium poisoning in children is characterized by meiosis, reduced bradypnea and level of consciousness. In this regard, Zamani et al., (22) reported that meiosis followed by a decreased level of consciousness is the main symptom. Brady pnea ranks the third and then seizure. In another study, it has been reported that bradypnea, convulsion, low consciousness and meiosis are the most common symptoms of poisoning in children (23). In a study by Benedict et al. (24), the patients mostly had normal blood pressure, normal pulse, oxygen saturation, temperature and respiratory rates. Sharif et al. (25) observed the signs and symptoms of drowsiness, miosis, vomiting, ineffective breathing, apnea, cyanosis, seizure, ataxia and delirium in children who were poisoned by methadone. The

present study with a little difference in methodology, found that myosis, heart rate, blood pressure and seizure were significant signs in poisoned children.

Shokrzadeh et al. (16) found that most of the self-poisoned children had a conflict with family members and more than half of them were young girls. Benedict et al., (24) revealed that half of the patients had troubled relationships; and the present study demonstrated that from all poisoned children, only 12.3% were self-poisoned due to family challenge and schooling problems where the impact of family challenges was more significant. Alizadeh et al. (7) assessed poisoning during 2011–2013 and found that most of the poisoned children were boys when the mean age was about 5 years. The percentage of the poisoned children to the admitted children in total increased by age with a more frequency in the year of 2013. The youngest child was a 3-day-old infant who was intoxicated by opium and the oldest one aged 168 months who had antidepressant drug overdose. All admitted children were discharged except an 18-month child who was intoxicated by methadone and expired. The poisonings increase annually and represent a frequent cause of admission to emergency services worldwide (26). Titidez et al. (11) found that most frequent deaths had occurred in males during the summer season, and most of them were hospitalized. Shokrzadeh et al. (16) observed the highest incidence of poisoning in summer, while the lowest was seen during winter and the maximum number of poisoning cases were observed during the months of August and February. Overall, most of the mentioned studies (7, 11, 26) seem to be in line with the present study in regard to the finding that distribution of gender and the type of O&D did not change by the months but the reasons for poisoning showed changes in different months.

**Table-3:** Distribution of the poisoned children's genders, reasons of poisoning, and types of narcotics in different years

Factors	Groups	Statistics	Years							Total	X <sup>2</sup>	P
			2014	2015	2016	2017	2018	2019	2020			
Gender	Boys	n	14	11	32	20	14	10	11	112	17.975	0.116
		%	12.5%	9.8%	28.6%	17.9%	12.5%	8.9%	9.8%	100.0%		
	Girls	n	18	11	15	8	21	23	19	115		
		%	15.7%	9.6%	13.0%	7.0%	18.3%	20.0%	16.5%	100.0%		
Reasons of poisoning	Accidentally	n	30	19	45	26	27	26	26	199	17.975	0.116
		%	15.1%	9.5%	22.6%	13.1%	13.6%	13.1%	13.1%	100.0%		
	Family challenge	n	2	2	1	2	8	7	3	25		
		%	8.0%	8.0%	4.0%	8.0%	32.0%	28.0%	12.0%	100.0%		
	school challenge	n	0	1	1	0	0	0	1	3		
		%	0.0%	33.3%	33.3%	0.0%	0.0%	0.0%	33.3%	100.0%		
Types of narcotics	Traditional	n	17	15	22	19	18	22	17	130	6.363	0.384
		%	13.1%	11.5%	16.9%	14.6%	13.8%	16.9%	13.1%	100.0%		
	Industrial	n	15	7	25	9	17	11	13	97		
		%	15.5%	7.2%	25.8%	9.3%	17.5%	11.3%	13.4%	100.0%		
Total		n	32	22	47	28	35	33	30	227	-	-
		%	14.1%	9.7%	20.7%	12.3%	15.4%	14.5%	13.2%	100.0%		

**Table-4:** Distribution of the poisoned children’s genders, reasons of poisoning, and types of narcotics in different months

Factors	Groups	Statistics	Months of the year												Total	X <sup>2</sup>	P
			The first	The second	The third	The forth	The fifth	The sixth	The seventh	The eighth	The ninth	The tenth	The eleventh	The twelveth			
Gender	Boys	n	9	6	13	29	11	5	6	7	4	5	7	10	112	12.545	0.324
		%	8.0%	5.4%	11.6%	25.9%	9.8%	4.5%	5.4%	6.3%	3.6%	4.5%	6.3%	8.9%	100.0%		
	Girls	n	9	9	11	12	13	5	10	9	3	8	14	12	115		
		%	7.8%	7.8%	9.6%	10.4%	11.3%	4.3%	8.7%	7.8%	2.6%	7.0%	12.2%	10.4%	100.0%		
Reasons of poisoning	Accidentally	n	18	12	24	40	23	10	10	10	5	11	16	20	199	47.982	0.001
		%	9.0%	6.0%	12.1%	20.1%	11.6%	5.0%	5.0%	5.0%	2.5%	5.5%	8.0%	10.1%	100.0%		
	Family challenge	n	0	3	0	0	0	0	6	6	2	2	4	2	25		
		%	0.0%	12.0%	0.0%	0.0%	0.0%	0.0%	24.0%	24.0%	8.0%	8.0%	16.0%	8.0%	100.0%		
	school challenge	n	0	0	0	1	1	0	0	0	0	0	1	0	3		
		%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	100.0%		
Type of opiod	Traditional	n	8	8	14	23	13	4	8	13	5	9	13	12	130	8.342	0.682
		%	6.2%	6.2%	10.8%	17.7%	10.0%	3.1%	6.2%	10.0%	3.8%	6.9%	10.0%	9.2%	100.0%		
	Industrial	n	10	7	10	18	11	6	8	3	2	4	8	10	97		
		%	10.3%	7.2%	10.3%	18.6%	11.3%	6.2%	8.2%	3.1%	2.1%	4.1%	8.2%	10.3%	100.0%		
Total	n	18	15	24	41	24	10	16	16	7	13	21	22	227			
	%	7.9%	6.6%	10.6%	18.1%	10.6%	4.4%	7.0%	7.0%	3.1%	5.7%	9.3%	9.7%	100.0%			

Mansori et al. (27) manifested that inaccessibility of poisoning products was a protective factor, and addiction in the family, previous history of poisoning by O&D and maternal occupation were the main risk factors of accidental childhood poisoning. They found that addiction in the family had the strongest effect on accidental poisoning. As mentioned above, poisoning by methadone was the most common type of O&D poisoning.

Norman et al., reported the most influential factors in forming and initiating risky behavior in the home, as being the social and economic status of the family, child age and sex, mother age, the parents' education and family size (28).

Shahkolai et al. (29) showed that most of the mothers of the poisoned children were in the age group of 26-30 years and most of the fathers were in the age group of 31-35 years. Probably it reveals that children with younger parents are not at a considerable risk of poisoning. The majority of the mothers were from urban areas. Most of the parents were at the secondary school education level. Most of the fathers (42.1%) were self-employed and most of the mothers were housewives (94.8%). Mothers had mostly only one child or one child under 5 years of age. They found a significant relationship between the mothers' behavior and the individual characteristics of the father, gender of children, place of residence, mother's education level, father's education level, father's occupation, and the child's nursing manner. Similarly, the present study found a significant association between the father's socioeconomic/cultural factors and the causes of children's poisoning. Despite the differences in methodologies and targets, all the findings of Shahkolai et al.'s (29) study are comparable to the present study and mostly similar.

In Soori et al.'s (31) study, factors such as paternal education, paternal smoking,

mental illness in the family and size of the household were identified as confounding factors, Mansori et al. (27) demonstrated that the mother's occupation and education, father's education, existence of an addicted person in the family, and size of household have significant impacts on the incidence of poisoning in children; however, the present study revealed that from among factors related to the parents, only the age of the fathers was significantly associated with self-poisoning. Moreover, in some studies, a significant association was found between poisoning and the babysitter which was not assessed in the current study (30).

The present study found six deaths, two due to methadone and four due to opium and from among the children who were discharged in good status, 53.00% had used opium derivatives while this percentage was 60.3% for those who were discharged in a satisfied status, revealing that the children poisoned by traditional substances had better feeling with less complications at the discharge time. In this regard, Benedict et al. (24) reported no deaths due to O&D and 62.3% were discharged directly from the emergency.

Despite some preventive strategies such as drug distribution in containers that children cannot open, marking toxic medicines with warning labels, or forcing pharmacists to explain about the medicines, still there have been some cases of poisoning or even death from methadone in different parts of the world (32).

In the study by Bilal et al. (33), making the poisonous products unavailable to children and keeping them in an inconvenient location were identified as protective measures with regards to the incidences of poisoning. Educating parents about the proper storage place of these substances so that they are kept out of reach of children, educating methadone users themselves as well as encouraging

doctors to provide adequate explanations about this drug can all be very useful (23).

Social and economic consequences direct the young people to the tendency of industrial narcotic substances abusing. Moreover the existence of an addicted person in the family leads the teens to abuse traditional narcotic substances. It has also been reported that an addicted person in the family may cause accidental poisoning in very young children (23, 27), as we revealed in our study that the majority of the poisoned children aged <8 years, particularly those with accidental poisoning.

## 5- CONCLUSION

Overall, the majority of poisoned children were female and young. From among the self-poisoning cases, 11% were due to family challenges that were associated with gender, child's age and father's age. Children with young or old parents had more tendency to suicide by poisonings due to family challenges. Type of opium and derivatives had significant association with irregular changes in the size of the pupils, heart rate, blood pressure and seizure at the time of administration. To prevent such poisonings, community education about the dangers of these substances and reducing their accessibility are recommended. The risk factors identified in this study could stimulate further research.

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## 7- CONFLICT OF INTERESTS

None.

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