

Pattern of Poisoning In Upper Egypt (Ministry of Justice): Retrospective, Epidemiological Study from 2005 to 2010

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Abstract Poisoning is a great problem affecting people in the all age stages and may lead to death, disease or disability, which may continue throughout the life. **Methods:** Retrospective study in the Forensic Medicine Laboratory Institute in Upper Egypt from 2005 to 2010. Age, sex, residence and type of poisons were analyzed to determine the toxicity pattern in this area. **Results:** the study revealed that the toxicity is more common in males than females (62.5% and 37.5% respectively). Age distribution of toxicity is (30 - <40 y) followed by (20 - <30y) (34.83% and 34.22% respectively). The most common toxins spread in Upper Egypt is Pesticides toxicity (25%), and drug of abuse (22.96%). **Conclusion:** Pesticides exposure and drug abuse are two big problems in our community. Drug abuse is a growing problem should be dealt with quickly because it affects the youth group.

Keywords Poisoning, drug abuse, pesticides

Introduction

Poison is a substance capable of producing damage or dysfunction in the body by its chemical activity. It can enter the body in various ways to produce general or local effects. Poisoning is a qualitative term used to define the potential of a chemical substance in acting adversely or deleteriously on the body (Pokhrel et al., 2008).

Poisoning is now a worldwide problem. Increased tendency to use synthetic chemicals and over the counter drugs has resulted in a significant rise in toxicity in all countries (Ghaznawi et al., 1998; Chen et al., 2010). Acute chemical poisoning is a major public health concern. The World Health Organization estimates that total number of acute unintentional poisonings throughout the world ranges from 3.5–5.0 million cases annually, of which 3 million severe poisonings are resulting in 20,000 deaths annually, while the estimated annual intentional poisonings number 2 million resulting in 200,000 suicides (Moazzam et al., 2009).

Exposure to chemicals can be accidental or iatrogenic in young children, whereas it is usually

deliberate among adults. The increased tendency to use over-the-counter drugs has resulted in a significant rise in the numbers of patients admitted to hospital suffering from overdose. Intentional self-poisoning is a major problem worldwide. In industrial countries, it predominantly occurs in young people impulsively responding to stressful events who have little desire to die (Eddleston et al., 2005).

The WHO estimates, based on 2001 data, that 849,000 people die globally from self-harm each year (WHO, 2002). A review of poisoning studies reveals that pesticides are the commonest means of self-poisoning in many rural areas and associated with a high mortality rate (Eddleston et al., 2002).

The epidemiological properties differ from one country to country and from community to community in the same country. Thus, a special and periodical surveillance for each country is necessary to throw light on the magnitude of the problem in order to establish the necessary preventive and management policies (Gamaluddin, 2004). In most cases, poisoning occurs in the home, is acute and accidental, and

involves children under the age of 6 years. Personal care products (e.g., cosmetics, creams, lotions, mouthwash), household cleaning products and chemicals (e.g., pesticides), and over-the-counter or prescription medications (e.g., pain relievers, cough and cold medicines, vitamins) are common causes for acute childhood poisoning. Some types of childhood poisoning develop over time, due to repeat or chronic (i.e., long-lasting) exposure to small amounts of the toxic substance. Lead poisoning, which is more common in young children and can cause serious neurological damage, usually develops slowly over time when a child is exposed to lead. According to the American Association of Poison Control Centers, approximately 1.5 million cases of poisoning occur in children and adolescents under the age of 20 each year in the United States. More than 50% of all poisonings occur in children under the age of 6 years. Peak incidence of childhood poisoning occurs between 1 and 3 years of age (Stanley and Swierzewski, 2008).

Aim of the study is to:

- (1) Determine the toxicity pattern in Upper Egypt as regard age, sex, residence and type of toxin.
- (2) Investigate the most common type of toxicity among people live in Upper Egypt.
- (3) Compare most common type of poison among male and female victims.

Type of the study: retrospective study

Subjects and Method

Data collection

Demographical data on toxicity cases (dead or alive) numbers, age, sex, residence (urban or rural), were collected retrospectively from the Forensic Medicine laboratory Institute, Ministry of Justice, in Upper Egypt during the period from 2005 to 2010.

The Forensic Medicine Laboratory Institute reports included full toxicological analysis, to differentiate between positive and negative cases.

The study was carried out in Upper Egypt which is a narrow strip of land that extends from the cataract boundaries of modern-day Aswan to the area between El-Aiyat and Zawyet Dahshur, south of modern-day Cairo (www.wikipedia.com; www.en.wikipedia.org/wiki/Governorates_of_Egypt).

All query cases of toxicity in Upper Egypt studied by the Forensic Medicine Laboratory Institute and differentiated into positive and negative cases, these cases conversed to the toxicology laboratory from the forensic medicine authority (Ministry of Justice) to prove toxicity as a cause of death, or in case of motorcar accidents to prove toxicity of the drivers .

Then all positive cases were studied to determine the causative agents.

Ethical considerations in the research according to the rules of Assiut University were followed, as no data about the names of the cases were mentioned in the research.

Statistical analysis

Collected data was expressed as percentage and sorted according to age group, sex, residence (urban – rural), and collected samples (blood – urine – stomach wash-viscera – bottles – and vomit), toxins detected among the positive cases. Chi – square test was carried out using SPSS program version 15.

Results

Studied toxicological cases in the period from 2005 to 2010 and the percent of positive cases are shown in table (1) and figure (1). This table and figure show all studied cases of suspected toxicity in the period from 2005 to 2010 in Upper Egypt which was 1709 cases, 488 cases were positive cases (28.55%). Figure (2) and table (2) show the percent of dead and live cases in the positive toxicity cases in the same area and same period, it shows that toxicity as a cause of death is more common in the studied period. Table (3) age distribution in the positive toxicity cases, it shows that the cases was concentrated in the middle age group (30 - ≤ 40 years) 34.83% followed by the age group (20 - ≤ 30 years) 34.2%. Table (4) and figure (3) show that toxicity in male more than in female (62.5%, 37.5% respectively).

Table (5, and 6) show the distribution of toxicity cases in urban and rural areas, they show that there was a significant increase in the toxicity cases in urban areas if compared with those in rural areas (83.4%, 16.6% respectively). Table (6) shows the difference in toxicity cases among the different urban areas, Assiut, Sohag, El Minia, New Valley, Luxor, Aswan, Qena and Red Sea cities (31.1%, 15.7%, 9.5%, 2.7%, 2.7%, 4.7%, 15%, 2.3% respectively)

Table (7) pattern of toxins detected among the positive toxicity cases, it shows that the most common toxins studied in the period from 2005 to 2010 is organophosphate and carbamate (25%), followed by drug abuse (22.96%) and ethyl alcohol toxicity (20.5%), , then hair dyes (14.3%).

Table (8) samples studied in analysis process for toxins, it shows that the most common sample to the laboratory was viscera from dead victims (46.7%), followed by blood from live victims and bottle samples in both dead and live victims (13.3%, and 13.3%) then stomach wash from live victims (11.5%).

Table (1): Distribution percentage of all studied cases in the period from 2005 to 2010.

Year	No of all cases	No of positive cases	(%)
2005	251	84	33.5
2006	333	119	35.7
2007	263	65	24.7
2008	265	68	25.6
2009	290	69	23.8
2010	307	83	27
Total	1709	488	28.55

Table (2): Dead and live cases studied in the period from 2005 to 2010.

Year	Dead		Live		Total	
	No	% from total positive cases	No	% from total positive cases	No.	%
2005	41	8.4	43	8.8	84	17.2
2006	74	15.2	45	9.3	119	24.5
2007	29	5.9	36	7.4	65	13.3
2008	34	6.9	34	6.9	68	13.8
2009	28	5.7	41	8.4	69	14.1
2010	53	10.9	30	6.2	83	17.1
Total	259	53	229	47	488	100

Table (3): Age distribution in the positive toxicity cases in the period from 2005 to 2010 (descriptive frequency test).

Year Age group	2005	2006	2007	2008	2009	2010	Total	
							No.	%
0 - < 10 years	1	0	0	0	3	1	5	1.02
10 < 20 years	7	9	2	1	1	20	40	8.19
20 - < 30 years	29	34	27	26	27	24	167	34.22**
30 - < 40 years	26	46	23	29	23	23	170	34.83**
40 - < 50 years	18	25	8	9	12	14	86	17.62*
50 - < 60 years	3	5	5	3	3	1	20	4.09
> 60 years	0	0	0	0	0	0	0	0
Total	84	119	65	68	69	83	488	

P value: * significant < 0.005, ** highly significant < 0.001

Table (4): Sex distribution in the positive toxicity cases in the period from 2005- to 2010 (descriptive frequency test).

Year Sex	Male		Female		Total
	No	%	No	%	No
2005	49	10.04	35	7.17	84
2006	90	18.44	29	5.94	119
2007	39	7.99	26	5.33	65
2008	38	7.79	30	6.15	68
2009	41	8.40	28	5.74	69
2010	48	9.84	35	7.17	83
Total	305	62.5*	138	37.5	488

P value: * significant < 0.005

Table (5): Governorates distribution of positive toxicity cases in the period from 2005 – to 2010 (descriptive frequency test).

Residence \ Year	Year						Total	
	2005	2006	2007	2008	2009	2010	No	%
Assiut City	15	50	17	29	25	16	152	31.1*
Abnoub and Elfath	2	5	1	1	3	0	12	2.5
Sedfa	0	1	0	0	0	0	1	0.2
Abutieg	1	5	3	0	0	0	9	1.8
El-Badary	0	0	0	0	0	0	0	0
Sahel Selim	0	3	2	0	0	0	5	1.1
Manfalout	2	2	2	1	0	1	8	1.6
El-Quosia	0	2	1	0	0	0	3	0.6
Dayrout	0	0	0	0	0	0	0	0
El-Ghanaime	1	0	0	0	0	0	1	0.2
Sohag	12	10	13	12	14	15	76	15.7
Tema/saqlta	1	2	0	0	0	0	3	0.6
Tahta	2	1	1	3	0	1	8	1.6
Gerga	2	0	0	1	0	0	3	0.6
ekhmam	0	1	0	0	0	0	1	0.2
El monshaa and El oseyrat	0	0	0	0	0	0	0	0
El maragha	0	0	0	0	0	0	0	0
Dar el salam	0	0	1	0	0	0	1	0.2
El Minia	10	10	8	6	4	8	46	9.5
Samalot and banyazar	0	1	0	0	0	1	2	0.4
Maghaga	0	0	0	0	0	2	2	0.4
Abu korkas	1	0	2	0	0	0	3	0.6
El adwa	1	0	0	0	0	0	1	0.2
Qena	1	18	9	8	13	24	73	15
Naga Hamady	0	0	0	0	0	0	0	0
Nagada and Farshoot	0	0	0	0	2	0	2	0.4
Kaft and koos	0	0	0	0	0	1	1	0.2
deshna	0	0	0	0	0	1	1	0.2
Luxor	6	0	4	0	0	3	13	2.7
Armant	0	0	0	0	0	2	2	0.4
Aswan	10	0	1	5	3	4	23	4.7
Wady Gaded	6	4	0	1	1	1	13	2.7
Red sea	5	3	0	1	1	1	11	2.3
Orghada	5	0	0	0	0	0	5	1.1
Al koseer	1	1	0	0	3	1	6	1.2
Total	84	119	65	68	69	83	488	

*P value: * significant < 0.005*

Table (6): Urban and rural distribution of positive toxicity cases in the period from 2005 – to 2010 (descriptive frequency test).

Year	Year						Total	
	2005	2006	2007	2008	2009	2010	No.	%
Urban	65	95	52	62	61	72	407	83.4**
Rural	19	24	13	6	7	11	81	16.6
Total	84	119	65	68	69	83	488	

*P value: ** highly significant < 0.001*

Table (7): Toxins detected among positive cases (Chi square analysis).

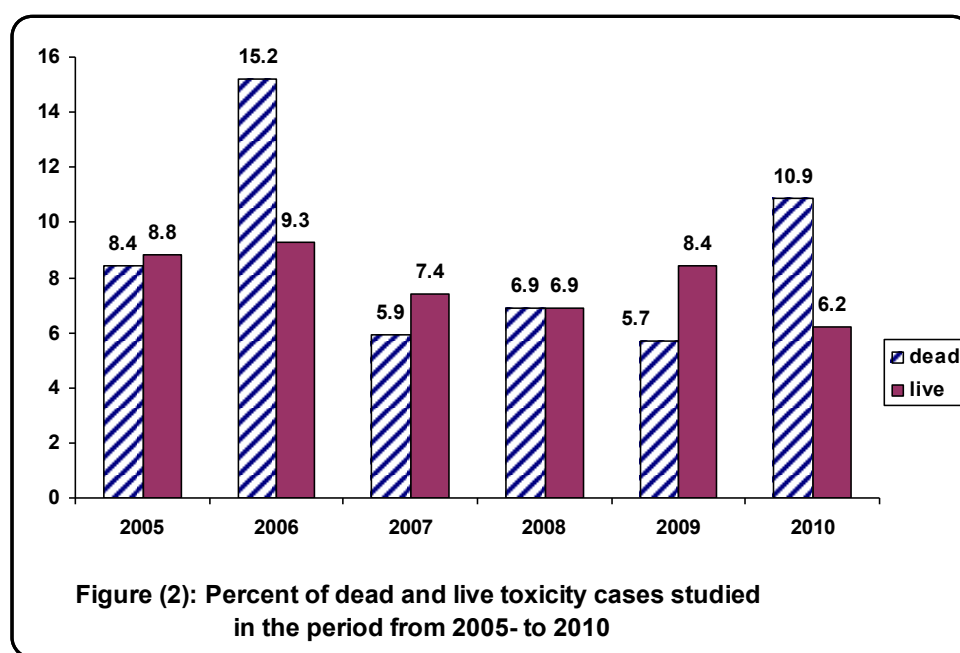
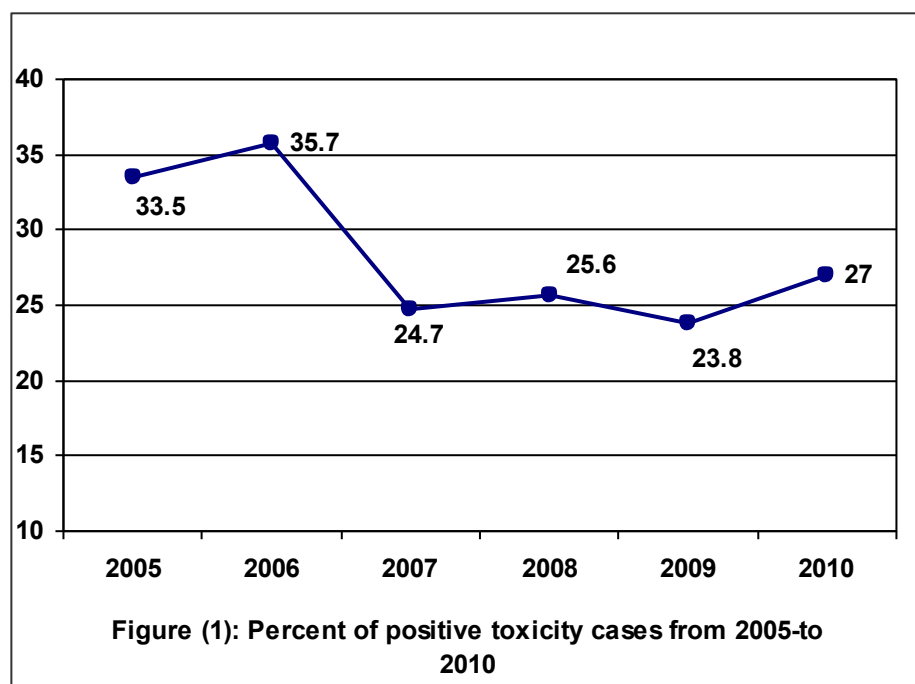
Toxin \ Year	2005	2006	2007	2008	2009	2010	Total	
							No.	%
Alcohol	15	47	8	6	5	19	100	20.5*
Ammonium phosphate	5	2	3	6	3	1	20	4.1
Co poisoning	4	1	1	0	3	1	10	2.04
Diazepam	4	0	0	5	1	3	13	2.7
HCl	1	1	0	0	0	0	2	0.4
Mercury	1	1	0	0	1	3	6	1.2
Organophosphate & carbamate	17	21	25	16	24	19	122	25*
Sulphuric acid	1	2	0	0	0	0	3	0.6
Hair dye	15	17	9	17	12	0	70	14.3
Corrosives	1	0	1	0	0	0	2	0.4
Dexomethicin	0	1	0	0	0	0	1	0.2
Antibiotics	0	0	0	0	3	2	5	1.02
Hydrocarbons	0	2	2	1	4	6	15	3
Methylalcohol	0	1	0	0	2	0	3	0.6
Sodium chloride	0	0	1	0	0	0	1	0.2
Anti hepertensive	0	0	0	0	0	1	1	0.2
Nalophin	0	0	0	2	0	0	2	0.4
Parkinol	0	0	0	2	1	0	3	0.6
Cannabis	4	2	6	3	6	6	27	5.5
Heroin	5	1	3	3	0	5	17	3.5
Tramadol	6	3	3	6	2	13	33	6.8
Benzodiazepins	0	4	0	1	0	0	5	1.02
Carbamezepin	0	10	0	0	0	0	10	2.04
Clonazepam	0	1	1	0	2	0	4	0.8
Tranquilizers	0	0	2	0	0	0	2	0.4
Alkylation material	5	2	0	0	0	4	11	2.3
Drug abuse total (without alcohol)	20	23	15	15	11	28	112	22.96*
Total	84	119	65	68	69	83	488	

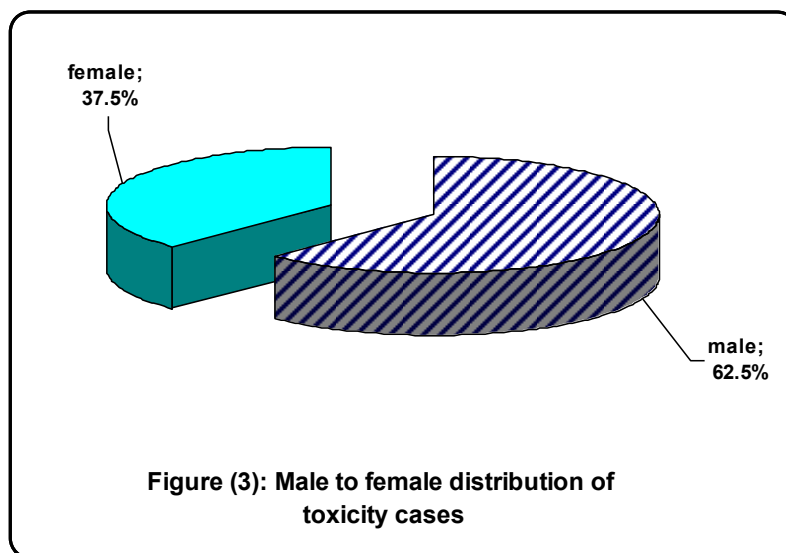
*P value: * significant < 0.005*

Table (8): Samples studied in positive toxicity cases in the period from 2005 to 2010 (Chi square analysis).

Sample \ Year	2005	2006	2007	2008	2009	2010	Total	
							No	%
Blood	16	16	6	7	17	3	65	13.3
Vomitus	1	0	0	0	0	0	1	0.2
Stomach wash	7	12	9	15	8	5	56	11.5
Urine	4	3	1	0	14	11	33	6.8
Viscera	35	22	38	32	51	50	228	46.7**
Clothes	1	0	1	3	3	2	10	2
Juice	1	1	0	2	1	1	6	1.2
Meat	0	1	0	0	0	0	1	0.2
Bread	0	0	0	1	0	0	1	0.2
Powder	0	1	0	0	0	0	1	0.2
Tablet	0	1	0	1	0	0	2	0.4
Paste	0	4	0	0	0	0	4	0.8
Bag	0	0	2	0	0	3	5	1.02
Glass	1	1	2	0	6	0	10	2
bottle	17	7	9	4	19	9	65	13.3
Total	83	69	68	65	119	84	488	

*P value: ** highly significant < 0.001*





Discussion

The present study revealed the toxicity pattern in Upper Egypt in the period from 2005 to 2010. Poison became the leading cause of death in the United States in 2008 and nearly 9 out of 10 poisoning deaths are now caused by drugs, according to a December 2011 Centers for Disease Control and Prevention report (Mpiorunski, 2012). In addition, poison is the fourth leading cause of death in Russia. According to the World Health Organization, there are more deaths by poison in Russia than by traffic accidents and 9 out of the top 10 countries in death rate by poison are former members of the Soviet Union (LeDuc, 2012). In Egypt and according to the world health ranking, death due to drugs is the 25th cause of death, but Egypt considers the 17th in the world in death due to drugs (WHO report, 2010).

In the present study, all studied toxicity cases were 1709, from which 488 (28.55%) were positive. Age distribution for toxicity cases appeared to be distributed in the age group (30 - <40 years) followed by (20 - < 30 years) which is the age of work and exposure to occupational toxins, over the counter drugs, drugs of abuse and other environmental toxins. Ghaznawi et al., (1998), in his study about poisoning problem in Jeddah region reported that the most common age of toxicity is the children below 5 years, and explained that by curiosity at this age. On the other hand, Abd - Elhaleem and Abd Elkarim (2011) reported in their study about the food poisoning in Egypt, that the most common age of toxicity is the middle age followed by the school age. This indicates differences between countries in the age distribution of such toxicity. According to the Alabama poisoning center, adult is responsible for about 80% of poisoning and around 90% deaths due to poison (www.alapoisoncenter.org).

In the present study, it was found that males are predisposed to poisoning and toxicity than females (62.5% - 37.5% respectively). This is due to that male

are more exposed to the occupational hazards more than females, Also, male having more tendency to drug abuse more than females. Lee et al., (2012) in agreement with the present results, they found that the incidence of exposure to poison is more common among male than females. Also, the office for National statistics referred that death in male due to drug and poison exposure are more common than females, most deaths in females are intentional or suicide, but for males most cases of poison exposure s due to drug over dose, or occupational poisoning (National Statistics Office, 2010).

Distribution of toxicity cases in the present study followed the distribution of industrial regions, where the poison is more common in urban areas than in rural areas (83.4% - 16.6% respectively). The pattern of poison distribution in the study from 2005 to 2010 also followed the industrial areas where the organophosphates and carbamates were the most common toxins found (25% of all positive cases) followed by drug abuse and alcohol (22.96% and 20% respectively) then hair dyes (14.3%). The National Capital Poison Center showed that the most common poisons among adults in Washington, 2011 were pain relievers, sedatives, hypnotics, and alcohols followed by pesticides, cosmetics and personal care products. These data explained a growing problem in Upper Egypt which is the wide spread of drug abuse and alcohol among the middle age group. Yassa et al., (2009) found that bango (cannabis leaves in Egypt) abuse consider a big problem in Upper Egypt especially in the middle age group. Risk, (2005); World drug report, (2011) reported that the drug abuse is a problem in Egypt need more study because it is becoming a serious problem. Pesticides as a cause of toxicity are an old problem in Egypt, as an unintentional toxicity due to occupational exposure, or as a suicidal cause of toxicity especially in females. Eddleston et al., (2005) reported the same problem of

pesticides use as a self-poisoning in rural areas of Sri Lanka. In addition, Lee and Cha (2009) reported that the pesticides have a great problem as an occupational cause of toxicity. Hair dyes is a rare cause of death but can be used especially by female for suicidal attempt, or accidentally used by children. Jain et al., (2011) reported in their study hair dye as a cause of death in India and other developing countries, it usually leads to myocarditis or renal failure.

Conclusion

Toxins play an important role all over the world especially in the third world countries. Pesticides use has increased in recent years, and have many hazards due to their misuse as an occupational toxins, or as self harm poison. Drug abuse considers a very large problem in Egypt, increasing in intensity especially among the youth and middle aged male. These hidden problems must be clarified to the community and try to find a solution, as health educational programs, schools and colleges curricula.

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الملخص العربي

نمط التسمم في صعيد مصر دراسة مرجعية في الفترة من 2005 إلى 2010

هبة عطية يسي¹ و صفاء ماهر جورج¹ و نادي سيد علي عبد الدايم² و فهد عبد العظيم محمد²

التسمم مشكلة كبيرة تؤثر على الناس في جميع مراحل العمر، وربما تؤدي إلى الوفاة أو الأمراض أو الإعاقة التي يمكن أن تستمر من خلال الحياة. هذه الدراسة هي دراسة مرجعية في مصر العليا في الفترة من 2005 إلى 2010. وقد تم تحليل البيانات من حيث العمر والجنس والإقامة، ونوع السم لتحديد مشكلة التسمم. وقد أظهرت الدراسة أن التسمم أكثر شيوعاً في الذكور عن الإناث (62.5% و 37.5% على التوالي). وبالنسبة للعمر كان التسمم أكثر انتشاراً في الفترة العمرية من 30 إلى أقل من 40 عاماً، يليه الفترة العمرية من 20 إلى أقل من 30 عاماً (34.83% و 34.22% على التوالي). وكان سبب التسمم الأكثر شيوعاً في صعيد مصر هو التعرض للمبيدات الحشرية (25%)، و يليه تعاطي المخدرات (22.96%). وخلص البحث إن المبيدات الحشرية وتعاطي المخدرات مشكلتان كبيرتان في كما إن تعاطي المخدرات مشكلة كبيرة وينبغي التعامل معها بسرعة لأنه تؤثر على الشباب.

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