



Knowledge, Attitude and Practice about Household Poisoning in Saudi Arabia

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Authors' contributions

This work was carried out in collaboration among all authors. Author SSB designed the study, wrote the protocol, performed the statistical analysis and wrote the first draft of the manuscript. Author AET did the literature search, and revised the questionnaire. Author HAAJ distributed the questionnaire electronically and collected the data. All authors read and approved the final manuscript.

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ABSTRACT

Background: Food poisoning, household poisoning, and cosmetic poisoning are becoming a very important health problem both worldwide and locally at the level of the Kingdom of Saudi Arabia (KSA). The aims of this study was to assess knowledge, attitude and practice about the storage and utilization patterns of household poisoning in Saudi Arabia and assess the adverse and toxic effects that respondents have experienced upon utilizing these products. Also, we attempted to identify risks imposed on the community due to improper storage and exposure to household belongings.

Methods: Cross-sectional survey was designed and distributed electronically in Saudi Arabia. The questionnaire was conducted on 503 Saudi Arabian subjects, aged from 18-70 years old in March, 2015. It included questions regarding demographic characteristics, storage, utilization habits, and adverse effects experienced by respondents upon handling the household products.

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Results: It was found that the main reasons of poisoning were the lack of knowledge, the easy access to household product, and the unsafe storage of these products. The majority of accidental events occurred with food products, cleaning agents, cosmetics products and pesticides, respectively. Respondents stored household products in different places in their homes, but most of these storage places were suboptimal and were within reach of children. The majority of cases experienced adverse and toxic effects of cleaning products and pesticide and petroleum distillates were children younger than 6 years of age. While the majority of cases experienced adverse and toxic effects of food poisoning and cosmetics were between 12-18 years and more than 18 respectively. Most of respondents reported mixing of cleaning products. Most of respondents (60.52%) were careless regarding taking safety precautions while dealing with pesticides and petroleum distillates. About 50.83% of respondents ignoring the content of any household product.

Conclusions: Correct utilization and safer storage of household products is encouraged. Several preventive strategies should be implemented in order to decrease the incidence of accidental harmful exposure that is due to cleaning agents. Improving the knowledge and educating the population regarding this type of poisoning will limit the cases of household poisoning among our country.

Keywords: Household poisoning; pesticide; food poisoning; cosmetics; storage.

1. INTRODUCTION

Poisoning is an important health problem worldwide. Occupational exposure to industrial chemicals, pesticides, accidental or intentional exposure to household, pharmaceutical products and poisoning due to venomous animals, toxic plants and food contamination, all contribute to morbidity and mortality. However, the magnitude of the problem, the circumstances of exposure and the types of poisoning vary from country to country. The variables include the degree of industrialization and urbanization, the type of agricultural activities and the available medical facilities and expertise to prevent and manage toxic exposures [1].

Among household products, cleaning products are present in most homes due to their wide variety of uses. Several of these products such as bleaches, pesticides, corrosive substances, surfactants and others are complex mixtures of chemicals with an extensive range of toxic potentials. Unlike medicines and cosmetics, the containers of these household cleaning products are usually stored under sinks in kitchens and on floors in backyards, within the reach of children. In addition, parents often disregard the potential toxicity and the warnings on the labels of these products, or store them in new containers, thus increasing the risk of unintentional poisoning amongst children [2].

Cleaning products stored in homes are responsible for many accidental poisonings among children [3-5]. In the United States of America (USA), 229,040 poisoning cases were

attributed to accidental poisoning by cleaning products in the year 2004 [6].

Accidental ingestion of caustic agents may cause devastating injury in children. Strong alkalis are present in a wide range of household and industrial cleaners and beauty products, often attractively packaged and easily accessible to children, both at home and on low shelves in shops [7].

Among the sanitizing products, those containing caustic substances must be emphasized, as they cause serious injuries to the digestive tract, which can lead to an increased risk for developing esophageal cancer [8]. Chlorine bleach causes mucosal erosions, gastrointestinal irritation, ear, nose, and throat lesions, and it is also associated with asthma symptoms [9]. Usually bleach ingestion is benign; however, rare cases of fatal bleach ingestion induced hypernatremia, hyperchloremia, adult respiratory distress syndrome, and lung injury were reported [10].

Bleach reacts with acids to produce chlorine gas as a consequence of the storage of cleaning products in inadequate places and the way they are used have been identified as possible risk factors for these accidents to occur [11].

Food poisoning (also known as foodborne illness or foodborne disease) is an illness caused by bacteria or other pathogens in food. Food poisoning causes an estimated 48 million illnesses (1 out of 6 Americans), 128,000 hospitalizations and 3,000 deaths each year in

the United States, according to a 2011 study by the Centers for Disease Control and Prevention. Usually the most susceptible to food poisoning contaminated foods are infants, the elderly, pregnant women and people with weakened immune such as those with chronic diseases such as diabetes [12].

Many cosmetics have potentially toxic substances which pose risk to human when addressed in the mouth, in a manner unintended, because they may reach the digestive tract and cause some injuries, and may reach the blood, and then to some organs of the body such as the brain, kidney, heart and liver [13]. The use of leaded eye cosmetics have been observed to be strongly correlated with elevated blood lead levels [14-15]. Underarm cosmetics are being investigated as a possible cause of breast cancer [16]. Approximately 350,000–440,000 annual suicides by means of deliberate pesticide poisoning have been estimated to occur worldwide, and the numbers of victims of nonfatal pesticide poisoning are assumed to be much greater [17].

In 2007 the American Association of Poison Control Centers reported 1,588,948 pediatric poison exposures (65% of all exposures recorded). Children under the age of 6 years were involved in 51.3% of all cases; 99.4% of them were unintentional exposures. Moderate to severe poisoning occurred in 35,622 (2.2%) children and 133 (0.008%) died [18]. Poisonous agents show geographical variations influenced by economic status. In developed countries, poisoning mostly occurs because of drugs, cosmetics and beauty products, household cleansing products and alcohol, while for developing countries, where the economy is based on agriculture, common causes of poisoning are hydrocarbons, pesticides, traditional medicines and mushrooms [19].

The aim of our study was to assess knowledge, attitude and practice about the storage and utilization patterns of household poisoning in Saudi Arabia and assess the adverse and toxic effects that respondents have experienced upon utilizing these products. Also, to identify risks imposed on the community due to improper storage and exposure to household belongings.

2. METHODOLOGY

Cross-sectional survey was conducted in Saudi Arabia in March to April 2015. A

standardized, confidential questionnaire distributed electronically by internet. The questionnaire was designed in English and later translated to Arabic by a professional translator and reviewed for consistency by the investigator.

The questionnaire was composed of six sections. Questions in the first section were designed to assess the demographic characteristics such as age, sex, education, income, and type of work, place of residence, number of people living in the house, number of children younger than 6 years old, presence of housekeeper, if the mother works and the main reason of poisoning.

The second section was concerned with the cleaning products poisoning, in this section respondents were asked to indicate if there was an exposure to cleaning products poisoning in the family members, which age, and symptoms. Specific issues addressed the storage, reading of the instruction label for certain cleaning products and whether they consider the information written on the label enough for the proper use of the item. Respondents were asked to indicate whether they keep cleaning products in their original containers, or if they store them in other containers (such as empty water bottles, empty cleaning bottles, or empty soft drink bottles).

The third section of the questionnaire contained questions regarding the poisoning with pesticide, if respondents or any of their family members had encountered as a result of utilization of pesticide, which age, if using of protective clothes during utilization of pesticide (as gloves, mask, goggles, safety shoes, and gowns). Respondents were asked about storage places that they used to store pesticide, the ability of children in the home to reach these products and if closed well after use.

The fourth section of the questionnaire was about the food poisoning. Respondents were asked about if respondents or any of their family members had encountered as a result of food poisoning, which age, they were asked about the methods of preservation. If they read the food expired date and soaking fruits and vegetables before eating. Respondents were asked about if they ate uncovered food.

The fifth section of the questionnaire was about the cosmetics poisoning. Respondents were asked about if respondents or any of their family members had encountered as a result of cosmetics poisoning, which age. They were

asked about if they bought the products that appear to advertisement directly, if they put cosmetic far away from children after use and the expired date of cosmetics.

The six section of the questionnaire was about the safety. Respondents were asked about if they read precaution before use, if they kept the ambulance numbers or poison center and in case of swallowing of household poisoning the respondents were asked about giving the victim milk, water and salt, water, emetic drugs.

The questionnaire was pre-tested for validity and reliability. It was tested to check if it was easy for the interviewers to understand the instructions and follow of questions. Prior to pre-testing in the field, the interviewers were undergoing training and were provided with instructions about the survey.

The data analyzed by using excel sheet. The data were collected and tabulated. The recorded data were analyzed by using computer based statistical package for social science (SPSS v. 22, IBM Corp, USA, 2013).

3. RESULTS

The questionnaire was distributed electronically, 503 subjects provided response. Questionnaire from 80 subjects were excluded because they were incomplete. Thus, 423 questionnaire were used in the analysis. The mean age of respondent was 26 years (range 18-70, S.D.± 7.1). Interestingly, female subjects responded to the questionnaire at greater frequency than male subjects (86.32%, 13.68%, respectively).

From the education perspectives, we discovered that subjects who had acquired university/college degree were more respondent (68.40%), those with high school education (17.92%), followed by those with higher education (7.78%), and the little responder was with those of middle and primary school degree (4.72%, 1.18%, respectively). More individuals who responded to the questionnaire had children aged less than 3 years (41.04%) comparative from more than 3 years (4.25%).

With respect to house keepers, the majority (67.45%) of respondents had no house keepers. Furthermore, in the majority of respondents (64.15%) the mother did not work. Detailed demographic characteristics of respondents are shown in Table 1.

Table 1. Demographic description of the respondents

Demographic information of respondents	Frequency	(%)
Age (years)		
Less than 18	27	(6.37)
18-25	188	(44.34)
25-45	167	(39.39)
More than 45	42	(9.91)
Sex		
Male	58	(13.68)
Female	366	(86.32)
Education		
Primary school	5	(1.18)
Middle school	20	(4.72)
High school	76	(17.92)
University- college	290	(68.40)
Higher education	33	(7.78)
Family size (people)		
Less than 5	130	(30.66)
More than 5	294	(69.34)
Number of children less than 6 years		
None	232	(54.72)
Less than 3	174	(41.04)
More than 3	18	(4.25)
Presence of house keeper		
Yes	138	(32.55)
No	286	(67.45)
Is the mother working?		
Yes	152	(35.85)
No	272	(64.15)

With respect to the cleaning products the respondents who were poisoned were 13.24%. Among these incidents, children of less than 6 years were more prone to accidental poisoning, followed by those of the age 18 and above were subjected to the poisoning intentionally (46.43%, and 32.14%, respectively) as shown in Fig. 1.

With respect to the storage of household cleaning products, the highest percentage (52.48%) of respondents stored cleaning products in under-the-sink cabinets, while 108 respondents (25.53%) stored in store home, and 65 (15.37%) in the bathroom (Table 2).

The majority of respondents (67.38) were mixing two or more cleaning products when used. Approximately 4.96% of the respondents stored cleaning products in different container as in Table 3.

Also, we noticed that the incidence of pesticides and petroleum distillates poisoning were very

minimal 5.20%, and the majority of cases occurred in children less than 6 years of age (54.55%), followed by the age group more than 18 (27.27%) (Table 4).

Table 2. Storage of household cleaning product

Storage cleaning products in the house	N	(%)
Down the kitchen sink	222	(52.48)
Bathrooms	65	(15.37)
Store home	108	(25.53)
Others	22	(16.42)

Most of the respondents (60.52%) were careless regarding reading the safety precautions while dealing with pesticides and petroleum distillates while the percentage of those who took adequate precautions with such products were 39.48%. It was noted that 62.65% of respondents were keeping the household products in safe places. About 82.27% of respondents were not using these products in the presence of the children. 70.69% of respondents were used these products in well ventilated places to minimize any inhalation to its vapors, which is good mark. Also 97.64% of respondents were well oriented towards closing the containers immediately after its use (Table 5).

Also we shed the light on the food poisoning in our society and found that 47.52% of the

respondents had food poisoning which is considered a high percentage. The subjects affected were aged between 12-18 years (26.60%) and over 18 years (55.67%). This may be these age groups has more access to the restaurants than homemade food as shown in Fig. 2.

Table 3. Mixing two or more of the household cleaning products and storage in other than their original container

Practice by respondents	Yes	No
	N (%)	N (%)
Mixing two or more of the household cleaning products	285 (67.38)	138 (32.62)
Household cleaning products located in other than their original container	21 (4.96)	402 (95.04)

Table 4. Age distribution of reported injuries with household pesticides and petroleum distillates among respondents

Age	Pesticide and liquid petroleum distillates	
	N	(%)
0-6	12	(54.55)
6-12	2	(9.09)
12-18	2	(9.09)
More than 18	6	(27.27)

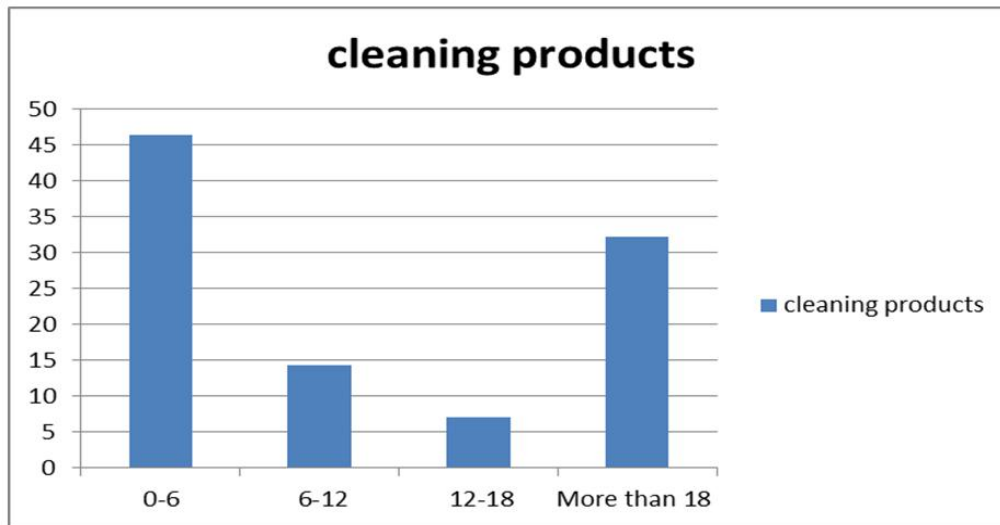
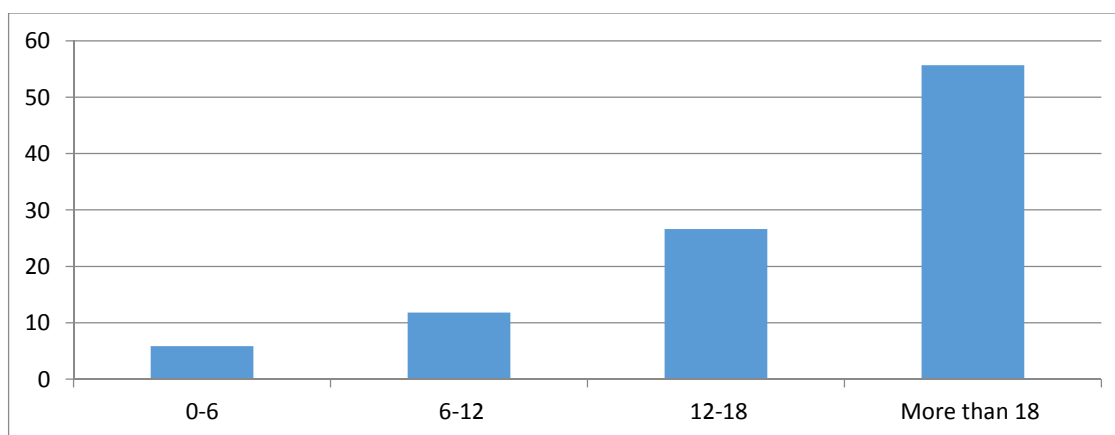


Fig. 1. Age distribution of reported injuries with household cleaning products among respondents

Table 5. Safety and storage of household pesticides and petroleum distillates

Practice by respondent	Yes	No
	N (%)	N (%)
Taking precautions and safety equipment (glove, mask, goggles, safety shoes) when using the pesticides and petroleum distillates	167 (39.48)	256 (60.52)
Keeping the pesticides and petroleum distillates in safe places	265 (62.65)	158 (37.35)
Using of pesticides and petroleum distillates in the presence of children	75 (17.73)	348 (82.27)
Using of pesticides and petroleum distillates in poorly ventilated places	124 (29.31)	299 (70.69)
Closure of the containers immediately after its use	413 (97.64)	10 (2.36)

**Fig. 2. Age distribution of reported injuries with food poisoning among respondents****Table 6. Storage and safety use of foods**

Practice by respondents	Yes	No
	N	(%)
Proper way of storing the food	262 (61.94)	87 (20.57)
Check the expiry date of the food before use it	400 (94.56)	23 (5.44)
Wash and soak the vegetables before eat	106 (25.06)	30 (7.09)
Leave these things to the person concerned (server)	74 (17.49)	349 (82.51)
Washed only	287 (67.85)	190 (22.15)

Table 6 and Fig. 4 showed that, the majority of respondents (61.94%) were aware of the proper way of storing the food to avoid poisoning, that's why it could be mostly from restaurants food rather than from home-made food. The concept of checking the expiry date of the food before using it occurred in high percentage of respondents (94.56%). Most of respondents (67.85%) were washing the vegetables before eating and only 25.06% were soaking it. Most of respondents refused to eat any uncovered food (45.86%).

Regarding cosmetics, we found that, the percentage of exposure to such products were

very minimal (5.91%). The majority of cases occurred in individuals aged greater than 18 years (62.96 %) followed by the age group 6-12 years (29.63%) as shown in Table 7.

Table 7. Age distribution of reported injuries with cosmetics among respondents

Age	Cosmetics	
	N	(%)
6-12	2	(7.41)
12-18	8	(29.63)
More than 18	17	(62.96)

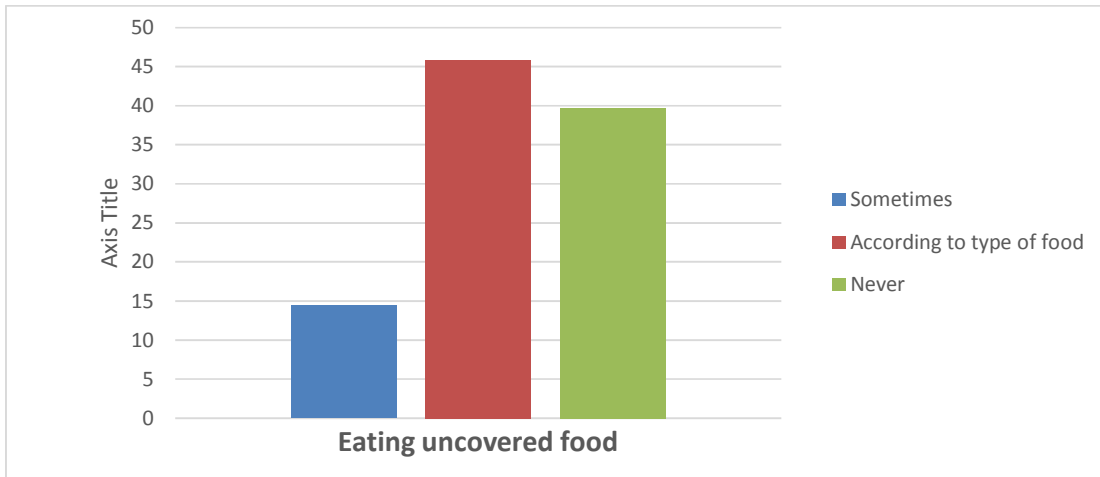


Fig. 3. Percentage of respondent eating uncovered food

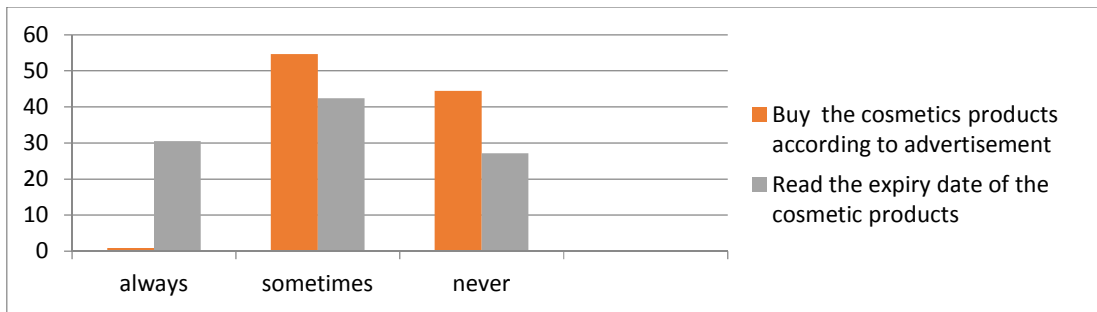


Fig. 4. The practice of respondents towards safety of cosmetic products

Most of respondents were affected by cosmetic advertisements since 54.61% of the subjects bought cosmetics prompted by advertisements, while the others did not (44.44%). Unfortunately a considerable percentage of cosmetic users (27.19%) do not read the expired date of these products, while the others read it “sometime” (42.32%) and the remainder never read it (30.50%) as in Fig. 5. The highest percentage of respondents (63.59%) stored the cosmetic products away from the children in comparison to 36.41% who did not store it away from children. It was discovered that the tendency towards knowing the contents of the any product in comparison of ignoring the content was similar (49.17%, 50.83%, respectively).

On the other hand, we investigated if our population were keen to keep the telephone number of poisoning center in order to contact in case of emergency, and we found that, the majority of respondents (72.10%) did not keep

the telephone number of poison control center, and that could be serious issue, since these centers should be contacted immediately in case of emergency to guide the caller to nearest emergency room and to provide him with the first aid instructions until the victim reaches the health-care facility.

The tendency to treat the poisoned person as first aid with milk was 44.21%, and 13.00% with water, 18.20% with antiemetic, 5.20% with salty water, and 19.39% with nothing as shown in Fig. 5.

In this study, the majority of respondents (38.63%) were reported that, the main reason for such household poisoning was the lack of knowledge among children regarding the hazards of household products. The second main reason was its accessibility was reported in (27.49%) of respondents, the 3rd reason was kid’s curiosity (21.80%) as in Fig. 6.

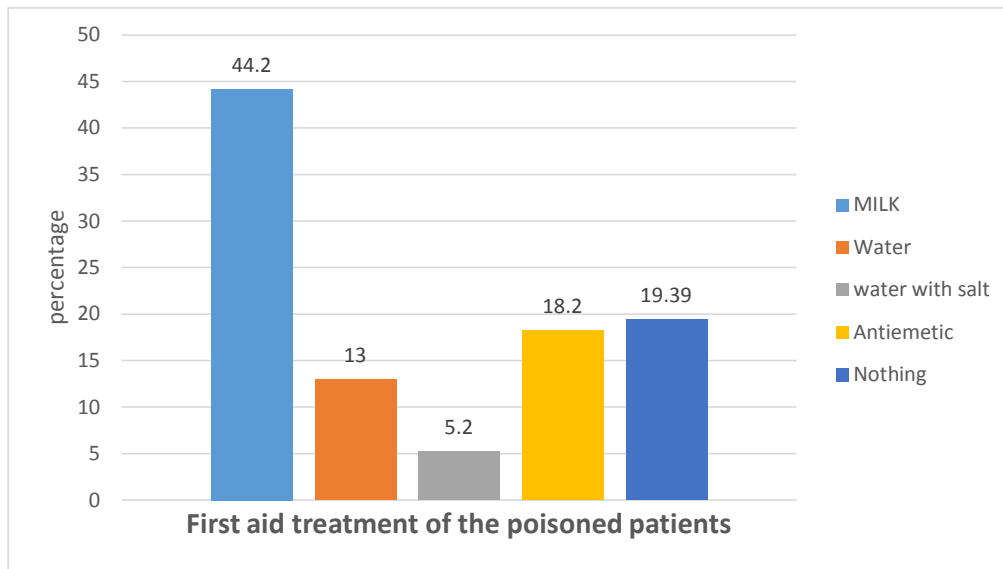


Fig. 5. First aid treatment of the poisoned persons

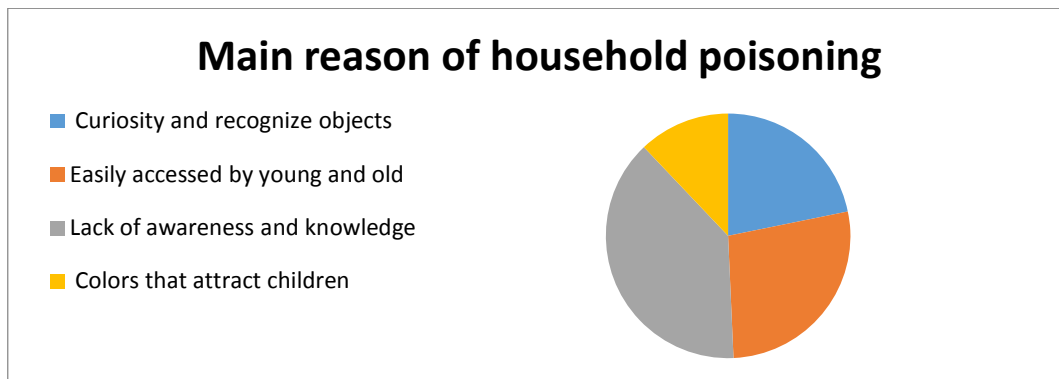


Fig. 6. The main reasons of household poisoning

4. DISCUSSION

Different types of household products are used and kept at home for our daily needs, and need to be stored in areas of easiest access and greatest visibility, such as cleaners, pesticides, food materials, and cosmetics. Lower or improper utilization and storage of these products might lead to different types of toxicity and large number of the population is exposed to such toxicity [11]. Several world-wide studies have shown that the storage of such hazardous materials improperly without keeping them in locked cabinets or secure areas away from the reach of children is considered one of the main reasons for such toxicity to occur so frequently [20].

In the present study, the mean age of respondent was 26 years (range 18-70, S.D.±7.1). Interestingly, females were more respondent than males (86.32%, 13.68%, respectively). From the education perspectives, we discovered that subjects with acquiring university/college degree were more respondent (68.40%), then those with high school education (17.92%), followed by those with higher education (7.78%), and the little responder was with those of middle and primary school degree (4.72%, 1.18%, respectively). Individuals who responded to the questionnaire had children less than 3 years (41.04%) comparative from more than 3 years (4.25%). As regards the presence of house keeper the majority (67.45%) of respondents had no house keeper and the majority of respondents (64.15%) the mother did not work.

Our results are consistent with the work of Al-Nahedh and Mohammed investigation [21] who reported systematic random sampling technique one tenth of all women attending pediatric and family medicine clinics in King Khalid University Hospital over two months were selected and interviewed to complete questionnaire. They were asked about history of poisoning due to detergents in their family in addition to their demographic-and practice regarding storage use and disposal of detergents. The sample consisted of 318 mothers with mean age 34.2+/-7 13 years. In this study, 55(17.3%) reported history of poisoning due to detergents in their families housewife mothers with around 5 children.

In this study, it was found that, the majority of respondents (38.63%) were reported that the main reason for such household poisoning was the lack of knowledge among children regarding the hazards of household products. The 2nd main reason was its accessibility which was reported in (27.49%) of respondents, the 3rd reason was kid's curiosity (21.80%). Also the highest percentage (52.48%) of respondent stored cleaning products in under-the-sink cabinets, while 108 (25.53%) stored in store home, and 65 (15.37%) in the bathroom.

These result agreed with a study in Palestine by Sawalha [11] who reported that exposure to hazardous materials could be due to the unsecure place that the products are kept in, or due to the lack of awareness regarding the hazardous of such products. It was proven that practicing safe storage habits at home has saved the lives of many children.

Another study was conducted in Saudi Arabia by Al-Sekait had shown that proper storage of drugs and chemicals, as well as the health education of parents, will help in reducing the incidence of poisonings at home [21].

In the present study we found that, the majority of respondents (67.38) were mixing two or more cleaning products when used. Approximately 4.96% of the respondents were storing cleaning products in different container.

This is consistent with Nahedh and Mohammed study in the reported cases of detergents poisoning, not reading detergents' labels, using detergents' containers for food and mixing different detergents; all were significantly associated ($P<0.05$) with higher rates of

detergents poisoning in families (24.6%, 25.3%, 30.6%, 35.7% and 50%, respectively) [22].

In Sawalha study, one hundred and sixty-three respondents reported mixing cleaning products. The cleaning products that were mixed included bleach with dishwashing detergent, bleach with hydrochloric acid, bleach with laundry detergent, and finally, bleach with floor cleaners. Among those respondents who mixed the cleaning products, 48 reported experiencing one or more adverse health outcomes; 20.5% of respondents reported reusing the empty containers of the cleaning products for different purposes, and 67.3% reported discarding such products in the municipal waste. The data indicated that 26.9% of the respondents stored cleaning products in something other than their original containers. A number of respondents (10.2%) reported storing some cleaning products in water and empty soft drinks bottles. One hundred and eighty-one respondents reported emptying the remaining contents in the sink before discarding or re-using the bottle [11].

When cleaning products are used improperly indoors, residents are exposed to ingredients and air pollutants that could lead to health risks [23]. Cleaning products have substantial perceived benefits, but can also produce toxicity both on short term and on chronic basis. The adverse and toxic effects resulting from acute exposure to cleaning products vary based on the cleaning agent of interest and the route of exposure. For example, ingestion of caustic cleaning products mainly leads to gastric and duodenal injuries. Inhalation of caustic agents, on the other hand, leads to a wide range of symptoms; it was found that different types of cleaning products produced undesirable health effects [24-25].

Another study which was conducted by Bert O'Malley in the USA found that alkalis (60–80%) were the most substances causing burns in pediatric as accidental poisonings while the rest were due to acids, Lysol (phenol-based), and bleach [26].

In many studies, cleaning product containers were kept unattended for a while, or stored in easy access to children which might lead to an accident to occur, other house hold products are discarded carelessly. Household wastes, when disposed of improperly, are hazardous to health and are major environmental contaminants [27-28].

On the other hand, food poisoning is one of the main causes of poisoning and emergency room visits. In our study, the majority of respondents (61.94%) were aware of proper storage of food material, however food poisoning cases were high (around 50%). This may be due to, our population rely heavily on restaurant foods, which might be a main reason for food poisoning.

Several studies were conducted in Saudi Arabia investigating the reasons behind several occasions of food poisoning. One study was conducted in Qassim by Al-Goblan and Jahan to determine the burden of foodborne illness, and to identify the specific foods and causative organisms responsible for foodborne illness outbreaks in Qassim, Saudi Arabia, during the year 2006. The study is a descriptive analysis of the surveillance data for foodborne illness outbreaks, collected by the Preventive Medicine Department, Primary Health Care Administration, and Qassim province. During the year 2006, 31 foodborne illness outbreaks, accounting for 251 cases, were reported. The highest proportion (64.5%) of outbreaks was reported during summer months of June to August. Men constituted 66.9% of the cases, and 68.1% were adults. *Salmonella* species was the commonest causative agent, followed by *Staphylococcus aureus*. The majority (68.9%) of the cases became sick after consuming commercially prepared foods. Meat intake caused 67.7% cases, and Middle Eastern meat sandwich was a commonly implicated food. The study concluded that food borne illness is an important public health problem in Qassim province [29].

Al-Mazrou, reviewed a paper to highlight the magnitude and determinants of food poisoning internationally and in KSA, and proposed some recommendations for its prevention. Clearly, they found a steady increase in the food poisoning accidents in KSA, especially during the summer months and Hajj season. Meat and chicken were the main items incriminated in these accidents [30].

To increase awareness we designed an awareness application in smart home technologies for the prevention of poisoning. It is a Smartphone's application for community awareness, it is supported by audio and video to assist an illiterate mothers or any person who is unable to read, it is the easiest way to provide poison information. It includes the types of poisoning cases which mostly occur. You can choose the type of poison case you may have, it

identifies all the symptoms. It provides tips to treat poisoned persons at home and identifies all the possible ways to prevent a poison situation. It enables the users to set up an alert for "medication expired dates" by register the name of medication and expired date. Eye droppers expire after one month of opening, so the application reminds the person about the expiration date after one month. The application is directly connected to poison emergency center. In case of important matters you can click on call to contact with a poison emergency center.

Lectures should be disseminated to high school students and the general public on safe methods of storing and using cleaning products and how to avoid their risks. Utilization of the services provided by the Drug and Poison Information Centers will result in significant savings of health care expenditures.

5. CONCLUSIONS

We found that the main reasons of poisoning were the lack of knowledge, the easy access to household product, and the unsafe storage of these products. The majority of accidental events occurred with food products, cleaning agents, cosmetics products and pesticides, respectively. Respondents stored household products in different places in their homes, but most of these storage places were suboptimal and were within reach of children.

Correct utilization and safer storage of household products is encouraged. Several preventive strategies should be implemented in order to decrease the frequency of accidental and harmful exposure induced by cleaning agents. Our study has limitations, it is a retrospective study conducted via a questionnaire to establish association and not causation. The methodology of this study was not designed to generate dose-effect relationships or to compare respondents' exposure with the acceptable daily threshold.

Children exposure to accidental poisoning by household products such as detergents, pesticides, insecticides, and cosmetics need to be reduced by collaborative efforts carried out by parents, the general public, the emergency rooms, drug information centers, and other governmental agencies. Educational sessions and awareness campaigns should be arranged and conducted to improve the poisoning knowledge, treatment skills, and preventive

measures among all population groups and regarding all common poisoning that could occur (household, food, and cosmetics).

Several measures should be exercised to protect children from this preventable cause of morbidity and mortality. Cleaning products and pesticides must be kept out of children's sight and reach, in their original containers and never in food or beverage containers, with child-proof caps.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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