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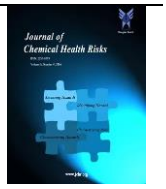

Statistical Analysis of Drug Intoxication and Chemical Intoxication in the Kingdom of Saudi Arabia (2021)

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KEYWORDS

intoxication, Drug intoxication, Chemical intoxication.

ABSTRACT:

The article analyzes the number of cases of drug intoxication and chemical intoxication in the Kingdom of Saudi Arabia in 2021 (3492 cases) 2125 cases of drug intoxication, and 1367 cases of chemical intoxication for the Kingdom's twenty health areas, which exceeded the cases last year (2838) by 23%. This study aims to find out whether there is a significant difference between female infections and male infections, between infections of drug intoxication and chemical intoxication, and between infections in different health areas, and to find out which areas is more affected. The study followed the analytical methodology to the data and used statistical measures t-test, analysis of variance, Chi Square test and percentages and means. The study showed that there is a significant difference between the number of infections in different areas, and there is no significant difference between male and female infections, and between drug intoxication, and chemical intoxication infections. The study also showed that cases of drug intoxication and chemical intoxication do not Affected by gender (males, females), also explained that all classifications show an increase in 2021; The rate of change in male infections is higher than the rate of infection among females by 4%, and the rate of change in drug infections is higher than the rate of chemical infections by 23%. These results indicate that infections in 2021 exceeded those in 2020, male infections exceeded female infections, and drug infections exceeding chemical infections in 2020 and 2021. The study also showed that the Riyadh area is the most exposed to drug and chemical intoxication (37.3). % and 24.2%, respectively, and also it is the highest percentage of infections among males and females (31.3% and 32.3%, respectively). The study concluded by recommending developing means of protection against intoxication and spreading awareness about preventing drug and chemical intoxication, especially in areas with high rates of drug and chemical intoxication. Population density.

Introduction:

Drug intoxication is what occurs because of taking an overdose of medication, whether these medications are prescribed or not, legal, or not. Drug intoxication may be accidental or intentional. Intoxication depends on the type of medication, the dose taken, and the sick or medical history of the infected person.

There are various reasons that lead to intoxication, especially accidentally; For example, when taking doses of a drug that the body's ability to tolerate has decreased on a regular basis, or in the case of taking doses that are stronger than what the body is accustomed to, or when taking more doses of a drug; Especially among misused medications, however, some may intentionally take excessive doses, and drug intoxication is a medical condition that requires emergency medical intervention. This is to prevent serious health complications. There are factors that increase drug intoxication such as Taking some types of medications without consulting a specialist doctor, taking more than one medication at a time, taking excessive doses of some medications, Improper storage of medications, Not knowing or following dosage instructions, History of abuse or addiction.[https://www.sfda.gov.sa/ar/awarenessarticle/80715].

Chemical intoxication It is produced when inhaling a chemical substance, such as petroleum products, pesticides, herbal pesticides, disinfectants, solvents, heavy metals, and chlorine. When they enter the body, they reduce the efficiency of the functional organs. Chemicals enter the body through several ways and means, including inhalation and digestion. They also enter through the skin. In all cases It exhausts the immune system and may lead to damage to both the kidneys and liver. Chemical intoxication has many

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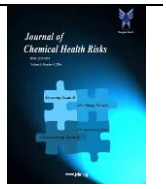

symptoms, signs and indications, [https://wiki.kololk.com/wiki77352-monawa3at-%D8%A3%D8%B9%D8%B1%D8%A7%D8%B6_%D8%A7%D9%84%D8%AA%D8%B3%D9%85%D9%85_%D8%A7%D9%84%D9%83%D9%8A%D9%85%D9%8A%D8%A7%D8%A6%D9%8A].

The number of cases of drug and chemical intoxication reached 3492 in 2021, an increase of 23% over the year 2020, which is a high percentage, which requires focusing on the causes and adopting appropriate control methods.

Mohamed AWahba (2021) [DOI: 10.1177/00368504211011339] made a study titled "Incidence and profile of acute intoxication among adult population in Najran, Saudi Arabia: A retrospective study" It examined the extent of acute intoxication in adults among the population residing in the Najran area of the Kingdom of Saudi Arabia Kingdom of Saudi Arabia, over the years (from January 2017 to December 2019). The study focused on identifying the causes of intoxication and concluded that pharmaceutical drugs constituted the most common causative agents in acute intoxication. Household chemicals, especially Clorox bleach, Flash and pesticides, are highly implicated in the acute toxicity problem. Drug abuse, especially amphetamine and alcohol, still represents a great threat facing people from the Najran area. It is crucial to deliver effective public health education programs to increase community awareness about the predisposing. risk factors of acute toxicity, whether as overdoses or suicide attempts.

Sami H alzahrani and others (2017)[Doi: https://doi.org/10.12669/pjms.335.13119] made a study titled " Drug intoxication and associated factors in Western Saudi Arabia: A five-year retrospective chart review (2011–2016)" and concluded that The drug intoxication cases involved females and young children (younger than 5 years old) and the most cases were accidental, and the most commonly used drugs were analgesics (Panadol), followed by antipsychotics, antihistamines, and antiepileptics (Tegretol).

The research differs from them in that it aims to analyze data on drug and chemical intoxication in KSA for the year 2021, taking the gender of those affected into account. The importance of the research comes from the fact that it clarifies the statistical differences between infections in health areas, between male infections and female infections, between cases of drug Intoxication and chemical Intoxication infections, and whether the infection is affected by sex or not, in addition to whether infections are increasing or not, which helps decision makers to develop a correct map to reduce infections. The reported data may be less than the actual as Rawan and others mentioned "Many social and cultural factors influence the lack of reporting of methanol intoxication cases in Saudi Arabia. We believe it is important to document these outbreaks to increase the knowledge among healthcare providers and promote public health awareness" (1)

Material and Methods:

Secondary data was used obtained from the yearly books issued by ministry of health in kingdom of Saudi Arabia (KSA), (2021). Page 218 (https://www.moh.gov.sa/Ministry/Statistics/book/Documents/1Statistical-Yearbook-2021.pdf) , and they are compiled in this table:

Table (1): Intoxication cases according to sex and type in KSA health areas

Health area	Sex	Cases	Infection type	Cases
Riyadh	Male	588	Drug Intoxication	792
Riyadh	Female	535	Chemical Intoxication	331
The Holy Capital	Male	78	Drug Intoxication	51
The Holy Capital	Female	48	Chemical Intoxication	75
Jeddah	Male	123	Drug Intoxication	167
Jeddah	Female	129	Chemical Intoxication	85
Ta'if	Male	99	Drug Intoxication	127
Ta'if	Female	75	Chemical Intoxication	47
Medinah	Male	29	Drug Intoxication	44
Medinah	Female	24	Chemical Intoxication	9
Qaseem	Male	30	Drug Intoxication	35
Qaseem	Female	25	Chemical Intoxication	20

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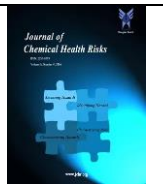

Eastern	Male	77	Drug Intoxication	60
Eastern	Female	43	Chemical Intoxication	60
Al-Ahsa	Male	118	Drug Intoxication	132
Al-Ahsa	Female	77	Chemical Intoxication	63
Hafr Al-Baten	Male	22	Drug Intoxication	25
Hafr Al-Baten	Female	24	Chemical Intoxication	21
Aseer	Male	56	Drug Intoxication	51
Aseer	Female	50	Chemical Intoxication	55
Bishah	Male	70	Drug Intoxication	70
Bishah	Female	76	Chemical Intoxication	76
Tabuk	Male	43	Drug Intoxication	57
Tabuk	Female	49	Chemical Intoxication	35
Ha'il	Male	116	Drug Intoxication	112
Ha'il	Female	109	Chemical Intoxication	113
Northern	Male	73	Drug Intoxication	60
Northern	Female	54	Chemical Intoxication	67
Jazan	Male	9	Drug Intoxication	4
Jazan	Female	7	Chemical Intoxication	12
Najran	Male	70	Drug Intoxication	80
Najran	Female	57	Chemical Intoxication	47
Al-Bahah	Male	24	Drug Intoxication	44
Al-Bahah	Female	27	Chemical Intoxication	7
Al-Jouf	Male	180	Drug Intoxication	161
Al-Jouf	Female	139	Chemical Intoxication	158
Qurayyat	Male	66	Drug Intoxication	42
Qurayyat	Female	58	Chemical Intoxication	82
Qunfudah	Male	7	Drug Intoxication	11
Qunfudah	Female	8	Chemical Intoxication	4

Analysis done by Statistical package for social sciences SPSS (version 22).For testing if there is significant difference within each classification (Intoxication infections in health areas, males' infection, female infections, drug infections and chemical infections), to do this one sample t-test used because the sample size is less than 30 **(2),** Then, testing if there is a significant difference between male and female Intoxication infections and between drug and chemical Intoxication infections, to do these tests, the two samples should be approximately equal, homogeneous and normal, for homogeneity F test used to test the null hypotheses (H0: samples are homogeneous) and accepted if the significant value (P-value) > 0.05 and for normality use skewness and its normal if its fall within the range ± 3**(3).** and to test whether there is independence between males and drug intoxication, males and chemical intoxication, females and drug intoxication, and females and chemical intoxication. To do this use the chi-square test of independence when you have two nominal variables, each with two or more possible values. You want to know whether the proportions for one variable are different to test the null hypotheses (H0 : the two variables are independent) among values of the other variable **(4)**. Also, percentages used for describing data and made some comparisons.

Results and discussion:

Firstly, from table (1) it can be shown that the total infections are 3492, the total infections by Drug Intoxication are 2125 (61%) and by chemical Intoxication are 1367 (39 %). Total infections for male are 1878 (54%) and total infections for female are 1614 (46 %). In most areas the infection among male is higher than females, the areas with female infections higher than male infections are Hafr Al-Baten, Bishah, tabuk, Al-

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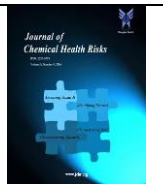

Bahah and Qurayyat. According to type of infection in most areas the drug Intoxication is higher than chemicals Intoxication, the areas with chemical Intoxication higher than drug Intoxication are, The Holy Capital, Aseer, bishah, Ha'il, Northen, Jazan and Qurayyat. Also,the highest infections in Riyadh 1123 (32.2%) and the lowest infections in Qunfudah 15 (0.4%). The following figure (1) compare between male and female infections and figure (2) compare between drug Intoxication and chemical Intoxication.

Secondly, testing if there is significant difference within each classification (Intoxication infections in health areas, males' infection, female infections, drug infections and chemical infections), the result showed P-value 0.004 for the within Intoxication infections in all health areas, indicating there is significant difference between them, since it less than 0.05 and for males' infection, female infections, drug infections and chemical infections are 0.003, 0.004, 0.011 and 0.00 respectively, indicating there is significant difference within each one, and then test if there is a significant difference between male and female Intoxication infections and between drug and chemical Intoxication infections,

The two samples are equal, F test showed P-value for males and females 0.769 and for Chemical and drug intoxication, indicating homogeneity between samples. The skewness for males, females, drug intoxication and chemical intoxication -excluding Riyadh health area because its extreme value- are 0.7, 1.4, 0.8 and 0.9 respectively, indicating normality of data. So, t test can be used.

The result showed there is no significant difference between male and female infections since P-value is 0.727 (> 0.05) and, there is no significant difference between drug and chemical infections since P-value is 0.36 (> 0.05).

Thirdly**,** it is important to know the ranking of health areas according to the percentage of cases of drug and chemical intoxication and intoxication among males and females separately, which helps decision makers in prioritizing action. Table (A) displays these ratios.

Table (2**):** Percentage of Chemical, Drug, male and female Intoxication to their totals, 2021.

Health area	Drug intoxication	% *	chemical intoxication	% **	Male intoxication	% ***	Female intoxication	% l****
Riyadh	792	37.3	331	24.2	588	31.3	535	32.3
The Holy Capital	51	2.4	75	5.5	78	4.2	48	2.9
Jeddah	167	7.8	85	6.2	123	6.5	129	7.8
Ta'if	127	6	47	3.4	99	5.3	75	4.5
Medinah	44	2.1	9	0.7	29	1.5	24	1.5
Qaseem	35	1.6	20	1.5	30	1.6	25	1.5
Eastern	60	2.8	60	4.4	77	4.1	43	2.6
Al-Ahsa	132	6.2	63	4.6	118	6.3	77	4.7
Hafr Al-Baten	25	1.2	21	1.5	22	1.2	24	1.5
Aseer	51	2.4	55	4	56	3	50	3
Bishah	70	3.3	76	5.6	70	3.7	76	4.6
Tabuk	57	2.7	35	2.6	43	2.3	49	3
Ha'il	112	5.2	113	8.3	116	6.2	109	6.6
Northern	60	2.8	67	4.9	73	3.9	54	3.3
Jazan	4	0.2	12	0.8	9	0.5	7	0.4
Najran	80	3.8	47	3.4	70	3.7	57	3.4
Al-Bahah	44	2.1	7	0.5	24	1.3	27	1.6
Al-Jouf	161	7.6	158	11.6	180	9.6	180	10.9

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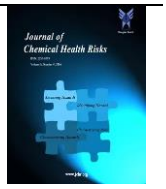

Qurayyat	42	2	82	6	66	3.5	58	3.5
Qunfudah	11	0.5	4	0.3	7	0.3	8	0.4
Total	2125		1367		1878		1655	

*From total of Drug intoxication (2125), ** From total of chemical intoxication (1367), *** From total of male intoxication (1878), **** From total of female intoxication (1655).

Table (2) shows that The Riyadh Health Area is the area with the highest incidence of drug intoxication and chemical intoxication, as well as the highest in terms of infections among males and females and it represent 32% out of total infection in Saudi Arabia, this may be attributed to the high population density in the area. The health area least affected by drug intoxication is Jazan and by chemical intoxication is Qunfudah and the least cases among males in Qunfudah and among females in Qunfudah. Health areas with hundred infections of drug intoxication or more are Riyadh, Jeddah, Al-jouf, Alahsa, Ta'if and Ha'il and health areas with hundred infections of drug intoxication or more are Riyadh, Al-jouf and Ha'il. So, it can observe that Riyadh, Al-jouf and Ha'il has more than hundred infections in both drug and chemical intoxication.

Fourth**ly,** comparing drug and chemical intoxication and infections among males and females in 2021 with 2020 as shown in table (3).

Table (3): Comparison between Intoxication infections in the years 2020 and 2021

year	2020	2021	Change rate
Male	1502	1878	25%
Female	1336	1614	21%
Drug	1592	2125	33%
chemical	1246	1367	10%
Total	2838	3492	23%

Table (3) showed that there is increase in all classifications in 2021, the change rate in male infections in 2021 is greater than female infections by 4% and in drug infections in 2021 is greater than chemicals infections by 23%, which indicate that infections in 2021 are greater than in 2020 and infections among males is greater than females and drug infections is greater than chemical infections in both 2020 and 2021.

Fifthly, testing whether there is independence between males and drug intoxication, males and chemical intoxication, females and drug intoxication, and females and chemical intoxication. The test showed significant values of 0.3, 0.2, 0.2. 0.3, respectively, which indicates that the cases of drug and chemical intoxication were independent of gender (males, females). From the previous discussion the following results obtained:

1. Ther is an increase in intoxication infections in 2021 compared to last year.
2. Intoxication is higher among males than among females.
3. Drug intoxication infections is higher than chemical intoxication infections.
4. Riyadh health area has the highest intoxication infections -both drug and chemical-
5. The lowest number of drug intoxication cases in the Jazan health area and the lowest number of chemical intoxication cases in the Qunfudah health area.
6. The lowest number of intoxication cases among males was in the Qunfudah health area, while the lowest number of intoxication cases among females was in the Jazan and Qunfudah areas.
7. There is significant difference between intoxication infections in all health areas and there is significant difference between infections within male and within female.
8. There is no significant difference between male and female infections and there is no significant difference between drug and chemical infections.

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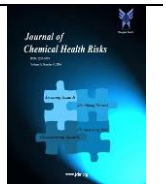

9. Drug and chemical intoxication were independent of gender (males, females).

Conclusion:

In conclusion, the research concluded that infections are concentrated in the Riyadh health area, and that infections are more common among males than females, and that infections are not affected by gender. And recommended that developing means of protection against intoxication and spreading awareness about the prevention of drug and chemical intoxication, especially in areas with high population density and do more research in this topic annually since the infection has an increasing function, total infections increased in 2021 by 23% more than 2020, drug infections increased in 2021 by 33% more than 2020 and chemical infections increased in 2021 by 10% more than 2020.

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