



## The Prevalence of Accidental Poisoning in Doguwa Local Government Area, Kano State Nigeria

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### Abstract

**Background:** Poisoning is one of the leading causes of morbidity and mortality to the individual, the family and the community. **Aim:** This study investigated the prevalence of poisoning accidents in the Doguwa General Hospital, Kano State, Nigeria. **Materials and methods:** This study retrospectively investigated a two-year record of all the cases of accidental poisoning attended to at the Accident and Emergency (A&E) Unit between 2010 to 2011; based on the available data in A&E unit patient admission records. **Results:** The study revealed 52 cases, the month with highest cases January 14 (26.9%), male genders were the majority 27(51.9 %) and females 25 (48.1%). The highest age range 27 (59.1%) were male <10 years. **Conclusion:** This study shows that the Doguwa community are exposed to accidental poisoning, the common agents include kerosene, pesticides (otapiapia) and herbicide. Accidental poisoning is a public health problem in the Doguwa Local Government Area, Kano State. It recommended that healthcare workers should organize periodic health education to sensitize the individual, the family and the community on the dangers of accidental poisoning, and how to prevent it.

**Keywords:** *Accidental poisoning, community, health education, sensitization*

### Introduction

Accidental poisoning is one of the leading causes of morbidity and mortality to the individuals, the family and the community. Poison is any substance that causes death or harm when introduced into or absorbed by a living organism (Oxford University Press 10<sup>th</sup> edition). A growing body of literature identified soap, cosmetics, fighter lighters, white spirit, bleach, glue, rat poison, paint strippers, garden sprays, drugs, organophosphate and insecticides to be poisonous (Abhulimhen-Iyoha and Israel-

Aina, 2018); Imoudu, Afegbua, Elike, Ishola and Abubakar, 2018).

The World Health Organization (2018) reported that accidental poisonings were responsible for over 100 000 deaths and are relatively high in low-income countries. Again, Donald, Adnams, Rother, Tsze, Brand and London (2015) and Asawari, Atmaram, Bhagwan, Priti, Kavya and Jabeer (2017) explained that the incidence of poisoning has been steadily rising due to the greater use of chemicals for agro-industries and domestic purposes. Numerous studies have reported

accidental poisoning as a common health problem in their studies. For instance, Khatoon, Kumar, Verma, Osawa, Verma and Shrivastava (2017) in India, Nicolai, Elena, Aniela, Mihaeala, Cristina and Violeta (2018) in Romania, Ahmed, AlJamal, Mohamed Ibrahim [...] Adheir (2015) in Qatar, Zhang, Yu, Wang and Li (2016) in China. Similarly, in Nigeria Abhulimhen-Iyoha and Israel-Aina (2018) reported in Benin. Ijezie, Megbelayin, Edem and Ijezie (2016) in Uyo, Olatunya, Isinkaye, Ogundare, Oluwayemi and Akinola (2015) in Ekiti, Imoudu, Afegbua, Elike, Ishola and Abubakar (2018) in Azare, Atanda, Yusuf & Faro (2018), and Sanusi, Ahmed, Farouk, Gadanya and Jimoh (2018) in Kano State. Reported same

A Kano study by Sanusi et al, (2018), reported incidence of kerosene poisoning among patients. Although several studies on accidental poisoning were conducted at different tertiary hospitals and at Aminu Kano Teaching Hospital, Kano (Abubakar et al, 2018) to our knowledge, none of the existing studies focused on a rural General Hospitals. Thus, due to the limited published data on accidental poisoning among General Hospitals in Kano state, this examined the prevalence of accidental poisoning in Doguwa local government area, Kano state. The following research questions guided this study.

1. In which month is accidental poisoning common in Doguwa Local Government Area, Kano state?
2. What are the common types of poisoning agents in Doguwa Local Government Area, Kano state?
3. What is the age range of patients commonly affected by accidental poisoning in Doguwa Local Government Area, Kano state?
4. What is the gender commonly affected by accidental poisoning in Doguwa Local Government Area, Kano state?

## Methods and Materials

The study was a descriptive retrospective survey. The population comprised all the 2-year cases of accidental poisoning patients records from January 2010 to December 2011 were included. Data was collected on months, patients' age, gender, and poison types in the A&E Unit.

## Study Setting

The Doguwa General Hospital is situated in the Doguwa town; the general hospital caters for all the primary healthcentres under the Doguwa Local Government Area. It is in the southern Kano, it has an area of 1,473 km<sup>2</sup> and it's made up of 10 political wards with a total population of 151, 181 (National Population Commission, 2006) it shares borders with Kaduna and Bauchi state. Agriculture, trading and mining are the main occupations. (Wikipedia, 2020).

## Ethical approval

Ethical approval was obtained from the Kano state operational research sub-committee at the hospitals services management board Kano.

## Data Analysis

The Statistical Package for Social Sciences (SPSS) version 23 was used to analyze the data of patients' demographic characteristics – months, types of poisoning agents, the age range of patients and gender. The descriptive statistics of frequency counts and percentages were used in answering the research questions.

## Results

A total of 52 cases were found in 2 years (January 2010 to December 2011), among the 52 cases one death of a male patient of age group <10 was recorded in March from accidental poisoning agent pesticide otapiapia. The prevalence rate of accidental poisoning was 0.035 %.

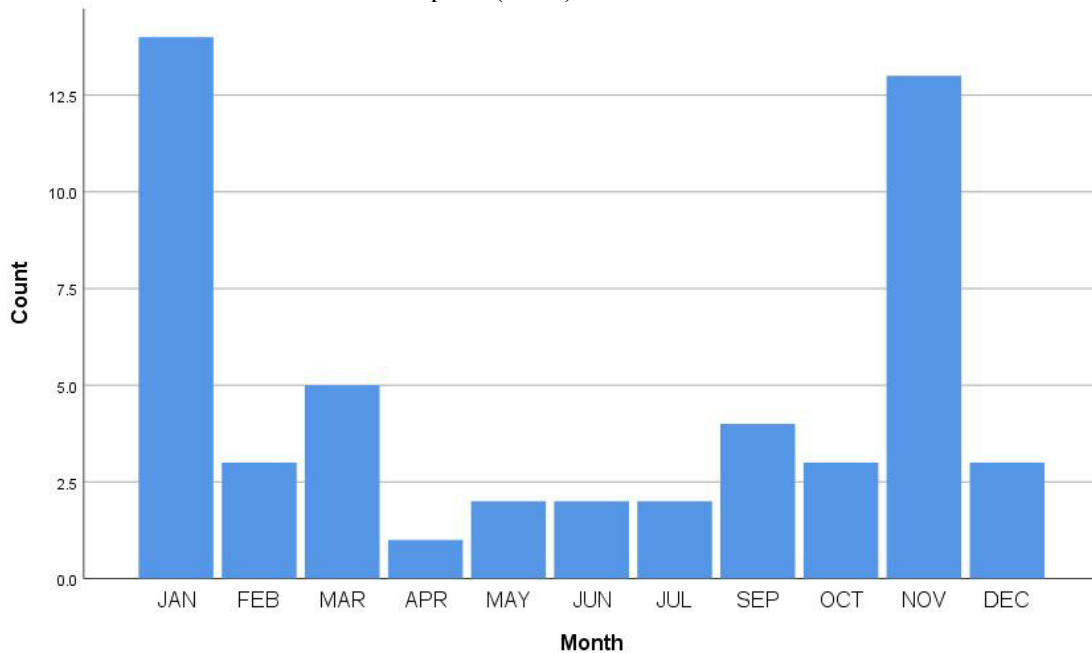
**Research Question 1:** Which month is accidental poisoning common in Doguwa Local Government Area, Kano state?

**Table 1.** Monthly Distribution of Accidental Poisoning

	Frequency	Percent
JAN	14	26.9
FEB	3	5.8
MAR	5	9.6
APR	1	1.9
MAY	2	3.8
JUN	2	3.8
JUL	2	3.8
SEP	4	7.7
OCT	3	5.8
NOV	13	25.0
DEC	3	5.8
Total	52	100.0

**Source:** Doguwa General Hospital Accident and Emergency Unit Register

Table 1 shows the month with highest cases January 14(26.9%) than November 13(25.0%) and the month with the lowest case was April 1(1.9%).



**Figure 1:** Number of cases admitted for Accidental Poisoning based on Month

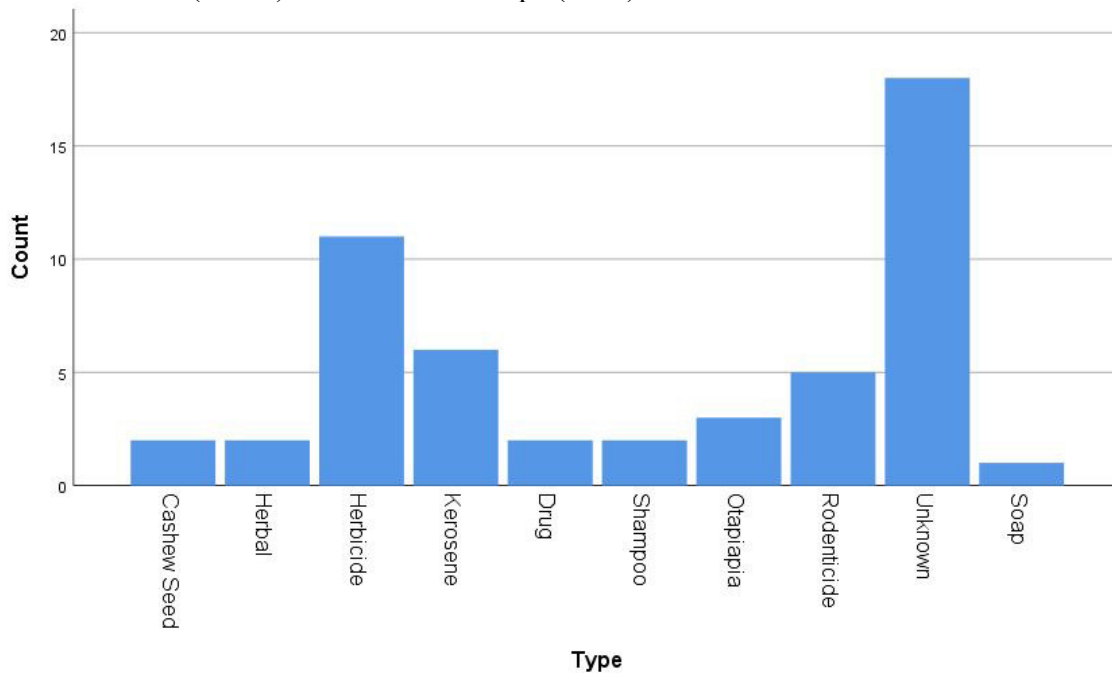
**Research Question 2:** What are the common types of poisoning agents in Doguwa Local Government Area, Kano State?

**Table 2.** *Types of Poisoning Agents*

Poison agent	Frequency	Percent
Cashew Seed	2	3.8
Herbal	2	3.8
Herbicide	11	21.2
Kerosene	6	11.5
Drug	2	3.8
Shampoo	2	3.8
Otapiapia (pesticide)	3	5.8
Rodenticide	5	9.6
Unknown	18	34.6
Soap	1	1.9
Total	52	100.0

**Source:** *Doguwa General Hospital Accident and Emergency Unit Register*

Table 2 shows the type of poisoning agent with highest number was an unknown agent 18(34.6%), then herbicide 11(21.2%) and lowest was soap 1(1.9%).



**Figure 2:** *Types of Accidental Poisoning Agents*

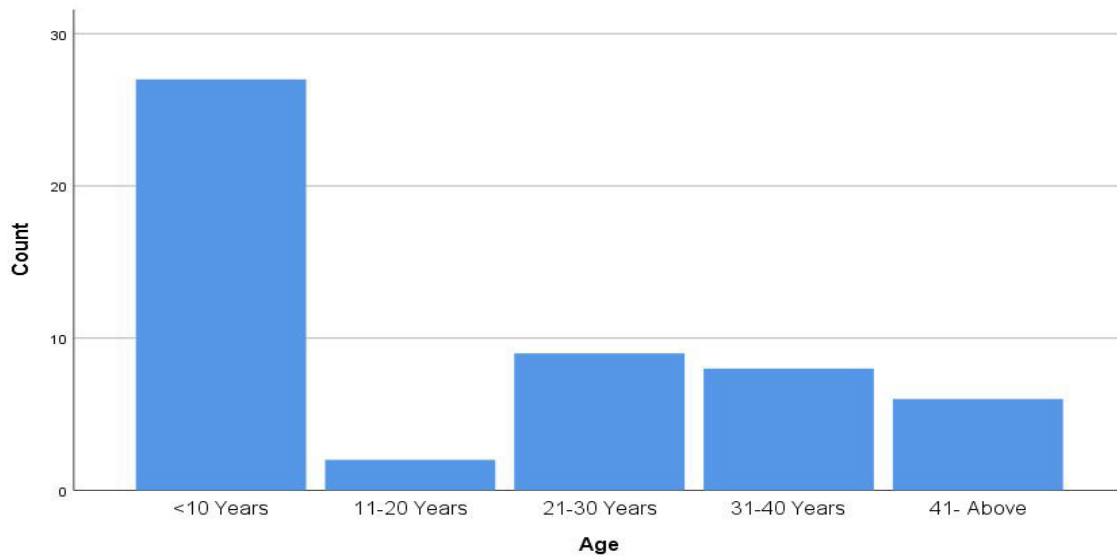
**Research Question 3:** What is the age range of patients commonly affected by accidental poisoning in Doguwa Local Government Area, Kano State?

**Table 3.** Age Ranges of Patients Admitted for Accidental Poisoning

Age in Years	Frequency	Percent
<10 Years	27	51.9
11-20 Years	2	3.8
21-30 Years	9	17.3
31-40 Years	8	15.4
41- Above	6	11.5
Total	52	100.0

**Source:** Doguwa General Hospital Accident and Emergency Unit Register

Table 3 shows more than half of patient 27(51.9%) were within the age group of <10 years and the lowest age group were 2(3.8%).



**Figure 3:** Age Range of Patient admitted for Accidental Poisoning

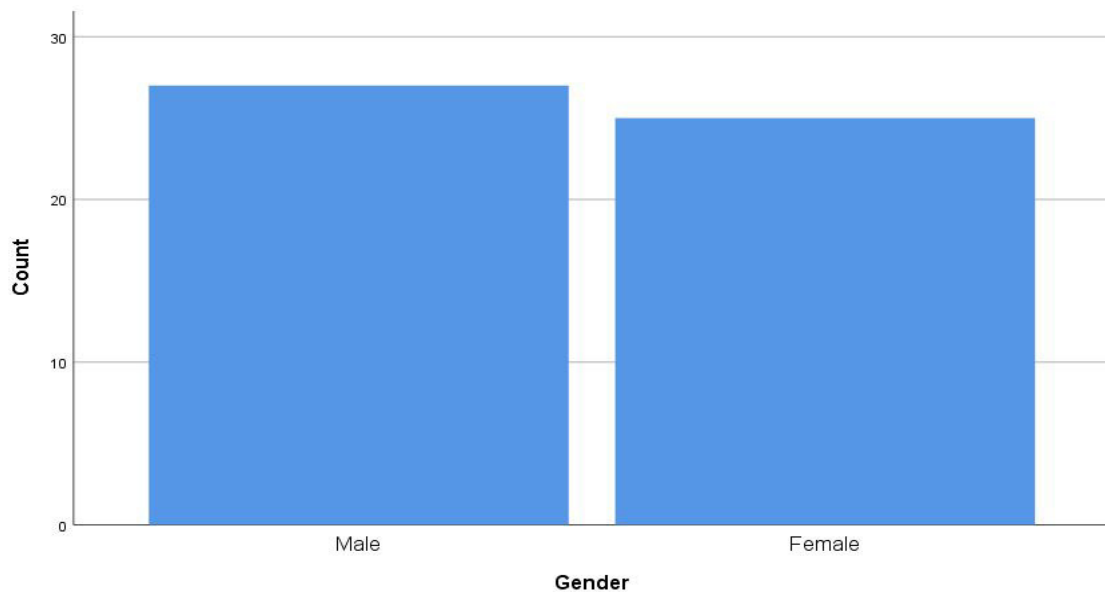
**Research Question 4:** What is the gender commonly affected by accidental poisoning in Doguwa Local Government Area, Kano state?

**Table 4.** Gender Distribution of Patient with Accidental Poisoning

Gender	Frequency	Percent
Male	27	51.9
Female	25	48.1
Total	52	100.0

**Source:** Doguwa General Hospital Accident and Emergency Unit Register

Table 4 shows male gender 27(51.9%) with the highest proportion of patient with accidental poisoning while female were 25(48.1%).



**Figure 4:** Gender Distribution of Patients with Accidental Poisoning

### Discussion

The finding of this study revealed 52 cases of accidental poisoning in the Doguwa Local Government Area and a prevalence rate of 0.035 percent. We also found one patient death from accidental poisoning. This agrees with the work of Nistor et al (2018) which revealed two deaths from poisoning, so also is studied by Asawari et al (2017) unlike our finding the number of death were 13 from poisoning. Similarly, Zhang et al (2018) documented 64 deaths from poisoning.

This study found the month with the highest cases to be January 14(26.9%) then followed by November 13(25.0%) and the month of April 1(1.9%) recorded lowest. This study concurs with the finding of Asawari et al (2017) in west India, Nistor et. al (2019) in Romania and Sanusi et al (2018) in Kano which indicated the incidence of accidental poisoning.

This study revealed the types of poisoning agent with the highest number of cases to be an unknown agent 18(34.6%), then followed by herbicide 11(21.2%) and lowest was soap 1(1.9%). This finding agrees with the report of Donald et al (2015), Tagwireyi (2016), Tadasse (2016) in their separate studies.

Unlike our findings Zhang et al (2018) found drugs and pesticide as the main poisoning agent, we also noted that its perhaps because the majority of the population are farmers who use herbicide agent in their farms, which may likely account for the predominance of pesticides and herbicides agents in the majority these studies.

This study found the highest age range of more than half 27(51.9%) to be those within the age range of <10 years and below, while we found 11 – 20 to be the lowest 2(3.8%). This study is inconsonant with the finding of Ahmed (2015) in Qatar, Volfe et al (2019) in Brazil, Nistor (2018) in Romania. The age range mainly affected were children, we noted the death of a 6-month-old baby boy due to ingestion of otapiapia (herbicide). It also showed that majority of the victims range of <10 - 30 years. This agrees with the work of Donald et al (2015); Edelu et. al (2016); Imoudu et. al (2018).

This study also revealed that majority of the patients were male 27(51.9 %) while female 25(48.1%) this study affirmed the findings of Khatoun et al (2017) in India, Al Balas et al (2020) in Jordan, Olatunya et al (2015) in Ekiti (2015) and Abhulimhen-Iyoha and

Israel-Aina (2018) in Benin, Shakya, Ahikari and Bajracharya (2016) which affirmed the predominance of male gender in accidental poisoning. contrastingly, the work of Zhang et al (2018) in China revealed a high female preponderance of poisoning than male.

This study has some limitations including conducted in a small geographic area, lack or inability to compare these data to other General hospitals and most of the reports were based on data from patients records.

### Implication of this study

Health care professional should conduct regular health education in conjunction with individual, family and community to sensitize them on the dangers of poisonous substances. The education should be done at the hospital setting, schools, workplaces, market and places of worship on the dangers of the poisonous agent to human health and wellbeing.

### Conclusion/Recommendation

This study concluded that poisoning is one of the major health problems in Doguwa local government area, and it is considered the leading cause of accidental poisoning on individual, family and community. Also when poisoning occurs it should be immediately reported and refer to the nearest hospital for prompt emergency treatment.

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