

**ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE  
SCHOOL OF MEDICINE  
DEPARTMENT OF EMERGENCY AND CRITICAL CARE MEDICINE**



**OUTCOME AND ASSOCIATED FACTORS OF ACUTE ADULT  
POISONING IN EMERGENCY DEPARTMENT, ZEWDITU MEMORIAL  
HOSPITAL ADDIS ABABA**

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**A RESEARCH THESIS SUBMITTED TO THE DEPARTMENT OF  
EMERGENCY MEDICINE AND CRITICAL CARE, AAU PRESENTED IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
SPECIALIZATION PROGRAM IN EMERGENCY AND CRITICAL CARE  
MEDICINE.**

**January, 2024  
Addis Ababa, Ethiopia**

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# Declaration

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# Abbreviation

AAU - Addis Ababa University

AOR - adjusted Odds Ratio

CHS - Collage of Health Science

COR - crude odds ratio

ED - Emergency Department

EMCC - Emergency and Critical Care

HMIS - Health Management Information System

JUSH - Jimma university Specialized Hospital

MD - Medical Doctor

MICU - Medical Intensive Care Unit

OTC – Over the counter medications

PGY - Postgraduate year

PI - Primary Investigator

PPI - proton pump inhibitor

SPSS - statistical package for Social Science

TASH - Tikur Anbesa Specialized Hospital

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# Abstract

**Background:** Acute poisoning is a prevalent medical emergency around the world because a huge variety of substances and medications are widely accessible. Poisoning-related morbidity and mortality is becoming a major public health concern in many nations. Although it is well known that this public health issue is a pressing one in Ethiopia, the scope and magnitude of poisoning have yet to be thoroughly investigated.

**Objective:** The aim of this study was to investigate the outcomes, the sociodemographic characters and associated factors of adult poisoning in ZMH Addis Ababa, Ethiopia.

**Methods:** This was an institution based quantitative study on a total of **114** patients. Data was collected from a retrospective chart review. A simple random sampling method was used, and Google forms was used to collect data which was cleaned and analyzed using SPSS version 27. Pretest was done on 10 charts and necessary changes were made to the questioner. Data quality was insured daily by the PI. Descriptive statistics, multivariate and univariate analysis was used to analyze outcomes and associations. Odds ratios was also calculated for independent variables. A P value of  $< 0.05$  was taken as significant.

**Results:** The overall case fatality rate was 3.5% and the rest were discharged after being treated in ED, MICU or Medical ward. The most common poison identified was bleaching agent (24.6%) followed by Organophosphate (18%) and most of poisoning were intention self-harm (92%) secondary to social conflicts (47.4%) that is common among the youngsters mean age of 24.4 years.

**Conclusion:** Despite the fact that there is no statistically significantly association between independent variables and Outcome, we can see that poisoning is still a major public health concern primarily affecting the younger age group. In addition, it showed that emergency care of poisoning cases was sub optimal with over all case fatality rate of 3.5%. Based on the findings in this research paper it is recommended that timely and focused care should be given to acutely poisoned patients. The other recommendation is that it is advised health care workers and stake holders advocate the safe and proper utilization poisonous substances.

# 1. Introduction

## 1.1 Background of the Study

Poisoning causes significant morbidity and mortality in patients worldwide and is a common cause of morbidity and mortality worldwide [1]. In most countries with modern medical facilities, acute poisoning is a common reason for emergency department visits and hospitalizations, accounting for 3 to 5% of these visits [2]. Acute poisoning requires immediate and effective treatment to prevent patient mortality or sequelae [1]. There is a lack of data describing the epidemiology of various poisonings, features of clinical presentation and predictors of outcome [3].

When a chemical that is toxic to the body has been consumed in excess, poisoning is the negative consequence that results. Any chemical that is damaging to the body might be considered a poison. Poisons can be ingested, inhaled, administered intravenously, or absorbed through the skin. Indoor or outdoor plants, lead and mercury metals, household items, medications that aren't taken as prescribed, and insecticides are only a few examples of poisonous compounds. Poisoning can result in a short illness, brain damage, coma and death. Poisoning symptoms vary depending on the chemical, quantity, and form of interaction.[1,2].

Acute poisoning is defined as acute exposure (less than 24 hours) to a toxic substance[3]. Acute poisoning is a common reason for emergency department visits and hospitalizations worldwide, and a common cause of morbidity and mortality[4,5]. In the United Kingdom, the most common causes of acute poisoning are paracetamol, benzodiazepines, and tricyclic antidepressants. Rates of self-poisoning in the UK are among the highest in Europe[4]. In developing countries such as Iran, the most common causes of acute poisoning are opioids, sedatives, benzodiazepines, and organophosphate insecticides[6]. In Ethiopia, the most common causes of acute poisoning are organophosphate insecticides, aluminum phosphide, and kerosene[5].

## **1.2 Statement of the Problem**

On a worldwide scale, poisoning is well understood and well documented, but in the majority of underdeveloped nations, little is known about its occurrence, treatment options, and outcomes. Additionally, while rich nations have effective databases for poisoning monitoring systems, the majority of low-income nations lack institutional, well-established poison control facilities to gather these data. As a result, there is still a lack of information about this public health issue[1].

Studies on the frequency of acute poisonings in Ethiopia are scarce. The few hospital-based studies that have been conducted so far have shown that the case fatality rate ranges from 1.5% to 8.6. Despite the ever-increasing use of chemicals in the country, the possibility of adverse public health effects from acute poisoning may increase due to a lack of poison control centers and toxicology expertise among health professionals [7,8].

## **1.3 Significance of the Study**

The purpose of the acute poisoning cases study was to determine the pattern of acute poisoning cases and their treatment in the emergency department, as well as to identify factors associated with poor treatment outcomes in acute poisonings. Acute poisoning is a significant cause of morbidity and mortality worldwide and a common reason for emergency room visits and hospitalizations. The aim of the study is to gain insights into the epidemiology of poisonings and their changes, which are important for emergency physicians and public health physicians. The study also aims to compare results with previous studies and monitor trends in acute incidents involving toxic substances. The ultimate goal of the study is to improve the treatment of acute cases of poisoning and prevent patient mortality or sequelae.

## 2. Literature review

### 2.1 International

A study done in emergency department of University in Turkey on 839 poisoning cases showed that there is relatively equal distribution of cases among male and female 47.9% and 52.1% respectively. The commonest age group was between 18 and 30 years (30.4%). The 18–30 age group experienced more drug and narcotic poisonings, while the 31–45 age group experienced more carbon monoxide poisonings (P 0.001). It was determined that 86.1% of patient arrived within 6 hours of poisoning. The most common cause of poisoning was suicidal attempt followed by accidental poisoning 54.4% and 41.7% respectively. Primary route of intake of the poisons were gastrointestinal (70.4%) followed by respiratory tract (29.2) and intravenous (0.2%). Out of the 839 patients 47% were admitted to Intensive Care Unit, 26.9 left the emergency against medical advice and there was no death during the study period.[9]

A retrospective descriptive study done in Shanghai, China one of the biggest cities in north east China on 5009 cases of acute poisoning with age ranging from 11yr old to 92yr old and females account nearly 10% higher than the males (54.2 vs 45.8). The patients most vulnerable to poisoning were those aged 20–29 years (30.9% of cases), the most used poison in this age group was therapeutic drugs (sedatives and analgesic) followed by alcohol and pesticide. Suicide attempt takes the highest percent of type of exposure (56.7%) with abusive exposure and accidental exposure coming second and third. The most common route of exposure was ingestion and the most common substance was therapeutic drugs (Sedatives, analgesic and cough and cold medications). Regarding treatment and outcome, gastric lavage and charcoal were administered in 72.5 % and 64.8% of cases respectively and 7.7% of the cases received hemodialysis. Out of the 5009 cases 4945 of them were discharged safely while 64 of them died with a case fatality rate of 1.3%. [10]

## **2.2 Sub- Saharan Africa**

Poisoning is major public health concern in sub-Saharan Africa. A prospective study done in Tanzania, one of the sub-Saharan countries found in east Africa from March 2013 to June 2013 on 106 patients in the ED of Muhimbili National Hospital. The majority of cases were male (79.2 %). Out of the 106 cases only 13 of them arrived within 2 hours of exposure. The most common clinical finding was altered mental status and tachypnea. The top two toxic agents used were alcohol and alcohol with other medications. More than half of the total cases were intentional exposure. Only one (0.9) of the cases died in the ED while the other (98[92.5%]) were admitted to the wards and (7[6.6%]) making the case fatality rate less than 1 percent[11].

Retrospective analysis was done on the medical records of 424 patients who were hospitalized to eight hospitals in South Africa between January 2005 and June 2005. 17.6 years old on average, and 57.8% of the population was female. In descending order, the toxic agents that were responsible for the poisonings were: household chemicals (45.7%), modern medicines (17.5%), animal/insect bites (15.8%), agrochemical chemicals (9.7%), food poisoning (5.4%), drugs of abuse (3.3%), traditional medicines (2.4%), and plants (0.2%). Fifty-nine percent of the poisonings were accidental. Males were more likely than females to become poisoned by illicit drugs, but females were more likely to become poisoned by all other toxic substances. Females (48.4%) were more likely than males (31.3%) to intentionally poison themselves. 2.4% of cases were fatal overall[12].

## **2.3 Ethiopia**

A one-year record-based retrospective analysis on 103 patients' acute poisoning at JUSH revealed that 52.4% of the patients were female and 47.6% were male. The group with the highest prevalence was those between the ages of 12 and 20 (67.96%). The majority (50.5%) of the instances included purposeful poisoning, whereas 27.2% involved accidental poisoning. The most frequent exposure method (94.25%) is ingestion, while 5.75 percent of patients have inhalational exposure. The most frequent causes were household cleaning products, organophosphates, and pharmaceuticals (41.7%, 27.2%, and 12.6%, respectively). The most frequent presenting symptoms were, in order, nausea and vomiting, altered consciousness, and epigastric pain (49.5%,

16.5%, and 13.6%). The most frequent explanations for 54 patients' poisonings were family or marital conflict (74.9%), a psychiatric issue (14.8%), and substance abuse (9.3%). In terms of arrival time, only 8.7% of patients arrived to the hospital within 30 minutes, while 52.4% arrived between 30 and 1 hour after exposure. The remaining 38% arrived in between an hour and 24 hours. In 78.6% of cases, GI decontamination was carried out, and in 12.6% of cases, particular antidotes were administered. The remaining victims (8.7%) found other managements. The majority of cases (61.2%) improved and were discharged. The death rate per case was 5.8%. Upon discharge, psychiatric referral and targeted education were provided in 8.7% and 40.8% of the cases, respectively. With regards to intentional poisoning, the victims' ages ( $P=0.0002$ ) and marital statuses ( $P0.0001$ ) were both significantly ( $P0.05$ ) correlated[13].

According to a study conducted in the Ambo town area on patients treated with acute poisoning between January 1, 2018, and March 17, 2019, the prevalence was 1.7%. There were 1:1.06 male to female ratio. For both sexes, the age group of 18 to 29 years was the most affected (50.7%). Organophosphates were the most often reported cause of toxicity (53.7%). Additionally, intentional poisoning was the most frequent cause of poisoning (76.9%), followed by family strife (35.9%). In less than 5 hours, all cases reached the hospitals. The death rate per case was 1.5%. Age 35 years ( $p\text{-value}=0.049$ ), female gender ( $p\text{-value}=0.027$ ), and hospital stay of  $>48$  hours ( $p\text{-value}=0.035$ ) were the independent predictors of poor treatment outcome[8].

One hundred and sixteen adult patients who visited Tikur Anbessa Specialized University Hospital (TASH) between January 2007 and December 2008 had their medical records retrospectively reviewed. Males were outnumbered by females (64.6%). The average age was 21. Most (89.6%), when considering place of residence, were from Addis Ababa. The three main causes of poisoning were organophosphates (21.6%), household cleaning products (43.1%), and phenobarbital (10.3%). The most often reported circumstance, accounting for 112 (96.6%) of 116 cases, was intentional self-harm poisoning. Loss of consciousness (46.2%), vomiting (23.8%), and epigastric pain (22.5%) were the most frequent presenting complaints. Temporary conflict (57%) and emotional disturbance (26%) were the most often cited causes of poisoning among patients who disclosed their cause. The median amount of time between exposure to poison and hospital admission was three hours. Within 12 hours of exposure, the majority of patients (94.3%) arrived at the hospital. ( $OR =1.428$ ,  $95\%CI=0.343-5.959$ ) There was no statistically significant positive

correlation between home treatment and the result. Out of 116 patients, (75%) had emergency room treatment, (13.8%) had MICU admission, and (11.2%) had medical ward admission. The death rate per case was 8.6%. Organophosphate and phenobarbitone poisoning were the most frequent causes of death[7].

# 3. Objectives

## 3.1 General objective

The objective of this research is to determine the outcome and associated factors of adult poisoning in ZMH from Jan 2020 to Dec 2021

## 3.2 Specific objective

- To Determine the outcome of adult poisoning in ZMH from Jan 2020 to Dec 2021
- To Describe the Sociodemographic characters of adult poisoning in ZMH from Jan 2020 to Dec 2021
- To Describe factors that affect the outcome of adult poisoning in ZMH from Jan 2020 to Dec 2021

## **4. Methodology**

### **4.1 Study area**

This research was conducted at ZMH, one of the affiliated hospitals of the College of Health Sciences, Addis Ababa University. The hospital is located in Addis Ababa, the capital of Ethiopia, and is operated by the Addis Ababa City Health Bureau. The hospital is a 180-bed referral center and employs 460 medical professionals. The emergency department has 37 beds, 38 nurses and 10 doctors, of which 3 are EMCC consultants and 7 are general practitioners. The numbers come from the monthly audit report from the ZMH emergency room.

### **4.2 Study Design**

A quantitative cross-sectional study was used, and data was taken from a retrospective chart review of adult acute poisoning cases that were presented to ZMH emergency department from Jan 2020 to Dec 2021. Data collection and analysis was conducted between July 2023 to December 2023.

### **4.3 Population**

#### **4.3.1 Source population**

All patients seen in the adult emergency department during the study period

#### **4.3.2 Study population**

All patients treated with a case of poisoning in the adult emergency department during the study period.

## 4.4 Eligibility Criteria

### 4.4.1 Inclusion Criteria

All adult patients who suffered acute poisoning and were brought to the emergency department and admitted to the medical ward or intensive care unit and/or discharged from the emergency department during the study period were included.

### 4.4.2 Exclusion Criteria

Adult patients whose medical records were incomplete, completely lost, or misplaced were excluded.

## 4.5 Sample Size Determination and Sampling technique

### 4.5.1 Sample size determination

The sample size was determined using the cross-sectional survey single population proportion formula while taking into account the following assumptions. The case fatality rate of a study done in a one-year period at Tikur Anbessa Specialized University was 8.6 % among 116 patients. Confidence interval was taken as 95% and 5% marginal error was also considered.

$$n = \frac{Z^2 P(1-P)}{d^2}$$

**n** is sample size

**Z** is standard deviations corresponding to the 95% confidence interval = **1.96**

**P** is proportion among the study population = **0.086**

**d** is degree of accuracy required or desired precision (maximum allowable error of the estimate) = **0.05**

Inserting the numbers into the formula will give us a sample size of **181**.

Since the sampling frame is less than 10,000 adjustment formula was used

$$n_{adj.} = \frac{n}{[1+(n/N)]}$$

**n<sub>adj.</sub>** is adjusted sample size

**n** is calculated sample size = **181**

**N** is Study population = **240**

Inserting the numbers into the formula gave us  $n_{adj.} = 103$  with 10% anticipated non response rate final sample size became **114**.

#### **4.5.2 Sampling technique**

Simple random sampling technique was used to select the 114 cases among patients with acute poisoning who visited ZMH emergency department in the study period.

### **4.6 Study variables**

#### **4.6.1 Independent variables**

- Sociodemographic characters
- Triage category
- Circumstance of poisoning
- Comorbid conditions / underlying illness
- Route of exposure
- Average time of poisoning to hospital arrival
- Primary presenting symptom
- Cause of poisoning
- Treatment given

#### **4.6.1 Dependent variables**

- Outcome of acute poisoning of patients

## **4.7 Data Collection**

The cards were collected by clerical staff in the card office after a structured English questionnaire was prepared using previous research with some modifications based on the objectives of the study. The card numbers from the registration book were used for this card selection. After selecting the cards, trained data collectors completed the provided formats, which the principal investigator (PI) reviewed. The data collection tool went through a pre-test and was tested on 10 charts. Depending on the results, changes were made as necessary.

## **4.8 Data Quality control**

During data collection, the PI verified the data daily for consistency and accuracy.

## **4.9 Operational Definition**

**Comorbid/underlying condition** – this term refers to any condition that the patient has that could lead to poisoning and also the conditions that lead to poisoning

**Over the counter medication (OTC)** -Includes NSAIDS and Acetaminophen

**Pesticides** – this category includes all non-organophosphate based pesticides, herbicides and Rodenticides

**Incomplete Medical record** – this means a chart that doesn't contain all the necessary information to answer all the questions listed in the questioners used to gather data for this research.

**Government Hospitals** – in this thesis it includes Health centers, Primary Hospitals and general Hospitals

**Outcome of adult poisoning** – in this research refers to death.

#### **4.10 Data analysis**

Data extracted from patients' medical records and registry were entered into SPSS software, cleaned, and analyzed. Descriptive statistics as well as multivariate and univariate analyzes were used to analyze the results and relationships. A p value of  $<0.05$  was considered statistically significant.

#### **4.11 Ethical Consideration**

The study will be conducted after ethical clearance is obtained from AAU, CHS, EMCC research committee. Patient confidentiality was upholding during the whole investigation and coding was used to hide the Identity of participants.

# 5. Results

## 5.1 Sociodemographic Characteristics

Out of the 114 cases included in this study 46 (40.4%) were male and 68 (59.6%) females. There were 240 cases seen at ZMH Emergency Department during the study period, this number was retrieved from the Emergency HMIS log book. The median age was 24yr (SD ± 8.6) while the minimum age was 15yrs and maximum age 76yrs [Figure 1]. Place of residency of most of the patients was from Addis Ababa 84(73%) and the rest were from Oromia region. Source of referral for more than 40% of the patients was self-referral followed by Police (32%) and Governmental Hospitals (21%). [Table 1]

**Table 1: Comparison of Sex, source of referral and place of residence against outcome**

		Outcome			
		Death		Discharge	
		Count	Column N %	Count	Column N %
SEX	Male	2	50.0%	44	40.0%
	Female	2	50.0%	66	60.0%
Place of residence	Addis Ababa	2	50.0%	82	74.5%
	Oromia	2	50.0%	28	25.5%
Source of referral	Self	0	0.0%	50	45.5%
	Police	3	75.0%	34	30.9%
	Governmental Hospital	1	25.0%	24	21.8%
	Private Hospital	0	0.0%	2	1.8%

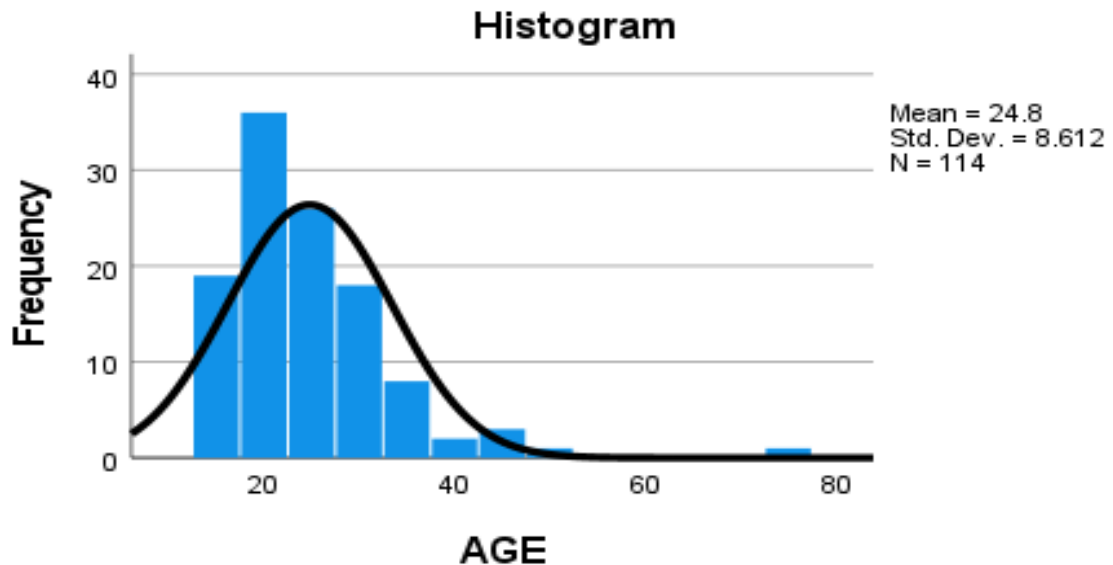
## 5.2 Poisoning Characteristics

### Triage category

According to triage Category most patients are triaged to yellow (43%) the rest were triaged to Red Orange and Green with 20.2% 17.5% and 19.3% respectively. There is one death from each group.

### Circumstance of Poisoning

Intentional poisoning accounts for more than 90% of cases the rest are Accidental and unspecified. Three of the deaths were intentional and one was from accidental poisoning.

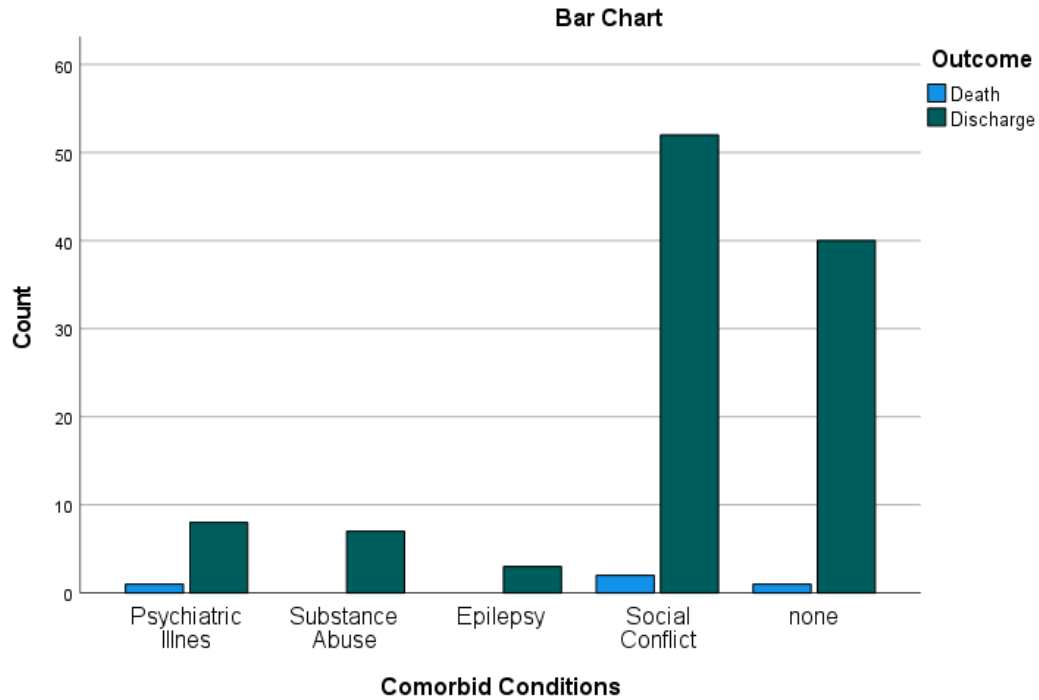


**Figure 1 : A histogram showing the total age distribution of acute adult poisoning cases**

### Co morbid situations / underlying conditions for poisoning

Social conflict accounts for 47.4 % of the cases and 36 % of the cases had no comorbid conditions or underlying cause for poisoning. Psychiatric illness, Substance abuse and Epilepsy

account for 7.9%,6.1% and 2.6% of the cases. One of the deaths had no identified underlying condition while two of the death occurred in those whose underlying condition was social conflict and one death from the Psychiatric patients. [Figure 2]



**Figure 2 : A bar Graph showing the underlying/comorbid condition of study subjects**

### **Route of exposure**

In almost all cases, exposure occurred via the oral route, with the exception of two cases which involved inhalation. 100% of deaths occurred from the oral exposure group.

### **Time of Arrival to hospital after poisoning**

Hundred seven of the cases (93.9%) arrived between 1 hour and 24 hours. Six cases arrived within 1 hour and one case arrived after 24 hours. Three cases died from those who arrived between 1 hour and 24 hours period and one case from those who arrived after 24 hours.

### Primary presenting Symptom

The most common presenting symptoms were Vomiting, epigastric pain and Altered mental Status. Secretions and headache were the least common presenting Symptoms. There was no death from those who presented with Vomiting, Secretions and Headache. [Table 2]

**Table 2 : Presenting symptoms of study subjects with regard to their Outcome in Percent**

		Outcome				Total	
		Death		Discharge			
		N	%	N	%	N	%
Primary presenting Symptoms	Vomiting	0	0.0%	45	40.9%	45	39.5%
	Epigastric Pain	2	50.0%	31	28.2%	33	28.9%
	Altered mental Status	2	50.0%	27	24.5%	29	25.4%
	Secretions (Saliva, Tear)	0	0.0%	4	3.6%	4	3.5%
	Headache	0	0.0%	3	2.7%	3	2.6%
Total		4	100.0%	110	100.0%	114	100.0%

### Cause of Poisoning

The most common cause of poisoning was bleaching Agent (24.6%) followed by organophosphate (18.4%), pesticides (13.2%) and alcohol (13.2%). The others, carbon monoxide, OTC, Antiseizure, Hydrocarbon, antipsychotics and Antibiotics account for less than 7% of the causes each. There were two deaths from organophosphate and one death from bleaching agent and pesticides each.

### Treatment Given

Ninety-Seven of the patients received IV fluids and Omeprazole or either of the two treatments, five of them received antidotes and another five received gastric lavage. Two cases were mechanical ventilator. three of them required vasopressors. Three of the patients who died received Fluids and Omeprazole and one received antidote.

**Table 3 : Comparison of Type of Poison and Place of residence**

		Place of residence		Total
		Addis Ababa	Oromia	
Cause of Poisoning	Alcohol	14	1	15
	Bleaching Agent	24	4	28
	Carbon monoxide	2	1	3
	OTC	7	1	8
	Antiseizure	5	1	6
	Pesticides	10	5	15
	Hydrocarbons	3	1	4
	organophosphate	5	16	21
	Antipsychotics	5	0	5
	Antibiotics	5	0	5
	Other	4	0	4
Total		84	30	114

**Outcome**

Out of the 114 patients included in this study there were only 4 deaths making accounting for **3.5 %** of the study population. The other 110 were discharged home after either being admitted to medical ward or ICU. more than 70% of the discharged were linked to Psychiatric clinic upon discharge. The overall discharge rate was 96.5%. [Table 4]

**Table 4 : Treatment given and the outcome of study subjects**

		Outcome				Total	
		Death		Discharge		N	%
		N	%	N	%		
Type of treatment Given	IV fluids and Omeprazole	3	75.0%	94	85.5%	97	85.1%
	Activated Charcoal	0	0.0%	1	0.9%	1	0.9%
	Antidote	1	25.0%	4	3.6%	5	4.4%
	Gastric Lavage	0	0.0%	5	4.5%	5	4.4%
	Vasopressors	0	0.0%	3	2.7%	3	2.6%
	Mechanical Ventilator	0	0.0%	2	1.8%	2	1.8%
	Oxygen Therapy	0	0.0%	1	0.9%	1	0.9%
Total		4	100.0%	110	100.0%	114	100.0%

### Factors associated with Outcome

Bivariate Logistic regression was run using 95% Confidence interval and Hosmer Lemeshow goodness fit test was used for each variable and as shown on the table depicted below there is no statistically significant associated variable to further run multivariable regression.  
[Table 5]

**Table 5 : Association and Crude Odds ratio of sociodemographic characters and Poisoning Characters**

Variable	P value	COR	Confidence Interval	
			Upper	Lower
Age	.262	.957	.887	1.033
Sex	.691	.667	.091	4.91
Place of residence	.294	.341	.046	2.539
Source of referral	.301	.548	.175	1.175
Triage category	.819	1.12	.424	2.957
Circumstance	.398	.455	.073	2.822
Comorbid	.415	1.347	.658	2.456
Route	.999	.000	.000	-
Treatment	.999	.000	.000	-
Symptoms	.462	.767	.378	1.556
Poisoning	.503	.895	.647	1.238

## 6. Discussion

The results indicate that three out of every five poisoning cases are females and higher number of the cases are youngsters residing mostly in Addis Ababa who either are self-referrals or brought by the police. Intentional poisoning is far common than accidental poisoning in this study and most common route is oral intake of poisonous substances like bleaching agents, organophosphate, pesticides and alcohol. The main reason behind the intentional poisoning was social conflicts. This results are the same as those seen in other studies done in different setups [7,8,13]The case fatality is 3.5% which is closer to most studies done in JUSH (5.8%) [13]and Adama hospital medical college (1.3%)[14] Ambo (1.5 %)[8] this shows that even though this research was done in different setup and different time period the case fatality rate of poisoning remains relatively the same across the country.

Among those who are discharged to home more than 70% have been linked to either psychiatric clinic or neurology clinic prior to their discharge which is higher number than those seen in TASH (17.2%) and JUSH(8.7%) [7,13].This is due in part to the availability of both the hospital's psychiatry and neurology clinics as well as the growing awareness of the necessity for psychiatric care in such a group.

In this study, bleaching agents are the most often utilized poisons, followed by organophosphate; these findings are consistent with research conducted in TASH, JUSH, and South Africa[7,12,13].However, other research indicates that the most commonly utilized toxic chemical is organophosphate[8,14] the other finding in this study is that even though alcohol intoxication ranked fourth it has higher percentage as compared to the results seen in TASH,JUSH.

This study shows that individuals from Addis Ababa took bleaching agents more frequently than those from the Oromia region, and that individuals from Oromia also took organophosphate more frequently than those from Addis Ababa, when we combine the variables of place of residence and type of poisoning. [Table 3]

The most common presentation was vomiting followed by epigastric pain and altered mental status which is similar to the one done in JUSH [13]

Only one patient received activated charcoal and five more received gastric lavage; the majority of patients were given PPI and IV fluids for resuscitation. This result differs with studies conducted in Turkey and JUSH, where the majority of patients also got additional symptom-based treatments in addition to gastric lavage and activated charcoal. This is partially because of the kind of poisoning the patients took, but mostly because the majority of them arrived at the emergency room after hours[9,13].

The study shows that there is no statistically significant association between the variables and the outcome. This might be due to the sample size and the fact that there are few numbers of deaths seen in the research despite this limitation we can understand from this research that the sociodemographic and poison characteristics of adult patients presenting with acute poisoning to the emergency department of ZMH have some similarity with previously done researches in this area.[7,9]

Limitations of this study were, that it was done in retrospect and the data was collected from charts meaning that there is ample chance that it might not answer all the questioner prepared for collecting the data and the other limitation was that this study was unable to show association between variables and outcome.

## **7. Conclusion**

In conclusion we can safely say that the commonest cause of poisoning was bleaching agent and that most patients only received fluid resuscitation and PPI only which shows a gap in the management of acutely poisoned patients. The main reason for the poisoning was intentional self-harm secondary to social conflicts and the affected population was mainly the younger population. The overall case mortality was 3.5% which is closer to other researches.

As the main reason for the poisoning was social conflicts it is better to have to educate youngsters on conflict resolution methods. Health care workers and major stake holders in health system should also advocate on safe handling of poisonous substances. It is also recommended that health care workers engage in better care of poisoning cases thru timely and focused care.

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## 9. Annexes

### 9.1 Annex i:

#### Questioner

1. Sociodemographic data
  - a) MRN
  - b) Age
  - c) Sex
  - d) Place of residence
  - e) Source of referral
    - a) Government
    - b) Private
    - c) Police
    - d) Self
2. Poisoning characters
  - i. Triage category
    - a) Red
    - b) Orange
    - c) Yellow
    - d) Green

- ii. Circumstance of Poisoning
  - a) Intentional
  - b) Accidental
  - c) Unspecified
- iii. Co morbid Condition / Underlying reason for poisoning
  - a) Psychiatric illness
  - b) Substance abuse
  - c) Epilepsy
  - d) Social conflict
  - e) Other (specify)
  - f) None
- iv. Route of exposure
  - a) Oral ingestion
  - b) Inhalation
  - c) Cutaneous (thru Skin contact)
  - d) Other (specify)
- v. Average time from time of poisoning to hospital
  - a) Within 1 hour
  - b) <24 hour
  - c) > 24 hours
- vi. Primary presenting symptom
  - a) Vomiting
  - b) Epigastric pain
  - c) Altered mental status
  - d) Difficulty of breathing
  - e) Fever
  - f) Excessive Secretions (sweating/urine/saliva)
  - g) Headache
  - h) Other (specify)
- vii. Cause of poisoning
  - a) Alcohol

- b) Bleaching Agents
- c) Carbon monoxide
- d) OTC
- e) Antiseizures
- f) Pesticides
- g) Hydrocarbons
- h) Organophosphate
- i) Antipsychotics
- j) Antibiotics
- k) Other (specify)

viii. Type of treatment given

- a) Fluid resuscitation and PPI
- b) Activated charcoal
- c) Antidote Management
- d) Gastric Lavage
- e) Vasopressors
- f) Mechanical Ventilation
- g) Others (specify)

ix. Outcome

- a) Discharged home
- b) Death