COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF EMERGENCY &CRITICAL CARE NURSING

TREATMENT OUTCOME AND ASSOCIATED FACTORS OF ACUTE POISONING AT EMERGENCY DEPARTMENT OF WORABE COMPREHENSIVE SPECIALIZED HOSPITAL ETHIOPIA, 2025

A THESIS TO BE SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF EMERGENCY AND CRITICAL CARE NURSING IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR A MASTER'S DEGREE IN EMERGENCY AND CRITICAL CARE NURSING

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DEPARTMENT OF EMERGENCY AND CRITICAL CARE NURSING

Treatment Outcome &Associated Factors of Acute Poisoning at Emergency Department of Worabe Comprehensive Specialized Hospital, Ethiopia, 2025

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ABSTRACT

Background: Acute poisoning, an adverse health effect that emerges within 24 hours of exposure to a toxic substance, is a significant public health problem worldwide. Its impact is particularly severe in low- and middle-income countries, including Ethiopia. However, the full extent and severity of this problem in Ethiopia remains largely unexplored, highlighting the crucial need for further research and understanding in this area.

Objective: To assess treatment outcome and associated factors of acute poisoning cases at the Emergency Department of Worabe Comprehensive Specialized Hospital, 2025

Methods: A hospital-based retrospective cross-sectional study was conducted for acute poisoning patients treated from February 1, 2022 to January 31, 2025 and data was collected from 20 March to 24 April 2025. All acutely poisoned patients meeting inclusion criteria during the three-year window were selected by census. Medical record numbers were retrieved from ED logbook and a total of 206 completed charts were reviewed using a pre-tested checklist. Collected data were entered in Epi-Data 4.6 and analyzed with SPSS 26. Binary logistic and multivariate model were used to asses factors associated with treatment outcome. Variables associated at $p< 0.05$ were taken as significantly associated.

Result: Total of 206 patient's record was reviewed, and the mean age was 25. Majority 113(54.9 %) were females and 131(63.6%) resided in rural areas. Intentional ingestion of pesticides accounted for 117(56.8%) of cases. Fewer than half 94(45.6%) reached the hospital within one hour. Overall survival rate was 182(88.3%), and mortality rate 24(11.7%). Delayed presentation (>1 h) (AOR=4.693(1.349–18.558), p = 0.020), and male (AOR =3.77 (1.34–10.57), p = 0.012), were significantly associated with outcomes of acute poisoning.

Conclusion: Acute poisoning at WCSH predominantly affects young females from rural. Intentional ingestion of pesticides was commonly involved. While most patients recover, mortality remains concerning in male patients and those patients who were arrived after 1hour of exposure. These findings highlight the need for targeted public health strategies to enhance early access to emergency care is key in reducing incidence and severity of poisoning

Key words: Poison, Treatment, Outcome.

THESIS APPROVAL SHEET

TREATMENT OUTCOME AND ASSOCIATED FACTORS OF ACUTE POISONING AT EMERGENCY DEPARTMENT OF WORABE COMPREHENSIVE SPECIALIZED HOSPITAL ETHIOPIA, 2025

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LIST OF ABBREVIATIONS AND ACRONYMS

AOR---------- Adjusted Odds Ratio

AP---------- Acute Poisoning

CDR---------- Crude Death Rate

COR---------- Crude Odds Ratio

ED---------- Emergency Department

EMCCN ----------Emergency Medicine and Critical Care Nursing

GI---------- Gastro Intestinal

ICU----------Intensive Care Unit

JUSH---------- Jimma University Specialized Hospital

OP----------Organophosphate Poisoning

PI----------Principal Investigator

SPSH----------St Peter Specialized Hospital

TASH ---------- Tikur Anbessa Specialized Hospital

UAPP---------- Unintentional Acute Pesticide Poisoning

WCSH---------- Worabe Comprehensive Specialized Hospital

WHO----------World Health Organization

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1. INTRODUCTION

1.1. Background

A poison is a substance that can cause injury, illness, or death if it enters the body (1). It can be swallowed, inhaled, absorbed through the skin or eyes, or injected (by a sting or bite). Anything can be poisonous if it is not intended to be absorbed by the body. Even some substances that are intended to be absorbed by the body, such as medications, can be toxic if taken by the wrong person or if the person takes too much (2). Acute poisoning (AP) is defined as adverse health effects resulting from acute poisoning almost immediately or within 24 hours of exposure (3,4).

Poisoning can be intentional (suicidal) or unintentional (accidental) manner (5). The substances used in poisonings vary depending on the area and the culture. Typical agents used in poisoning include pesticides, rodenticides, herbicides, pharmaceutical products, household chemicals, foods, alcohol, plants, traditional medicines, and illegal street drugs (6). The mechanism by which it affects the human body varies depending on the type of poison. It can involve interference with cellular functions, disruption of organ systems, or damage to specific tissues, leading to a range of symptoms and health effects which include nausea, vomiting, diarrhea, abdominal pain, dizziness, difficulty breathing, confusion, seizures, loss of consciousness and even death (7–9). Certain populations are at a higher risk of acute poisoning due to various factors such as occupation, age, and underlying health conditions. The high-risk groups for acute poisoning include: farmers, children, elderly individuals, industrial workers substance abusers (10,11)

Advances in technology and social development have resulted in the availability of most drugs and chemical substances in the community. Around 40,000–60,000 synthetic chemicals are currently in use worldwide, and between one and two thousand new chemicals appear on the market each year (12,13). Additionally, over 1000 pesticides are used around the world. In industrialized countries, there are at least one million commercial products that are mixtures of chemicals, and the formulation of one-third of them can change every year. It is projected that chemical production is set to triple by 2050 (11,12). The number and volume of

chemicals hazardous to human health will also increase accordingly (12). A similar situation exists in rapidly industrializing developing countries. In less developed regions, there is increasing use of agrochemicals such has pesticides and fertilizers, basic industrial chemicals, especially in small-scale rural industries, and household and other commercial products, as well as pharmaceutical products which can lead to intentional and suicidal poisoning (14). The poisoning resulting from such a substance can lead to significant mortality and morbidity (15).

Treatment outcomes in cases of acute poisoning depend on several critical factors. Early knowledge about the prevalence of poisoning, its characteristics or nature, and treatment outcome is important to the public, policymakers, emergency physicians, and health practitioners, to take prompt and appropriate measures to save lives and reduce morbidity and mortality. The nature, mortality, and morbidity of acute poisoning vary owing to differences in socioeconomic, cultural, and healthcare facility levels of the country (19,20). Therefore, local data are paramount for planning and efficient use of resources for the prevention and management of acute poisoning. recognition of symptoms, accurate diagnosis, and timely medical intervention are essential to improving survival rates and minimizing complications (8). Common treatments include gastric decontamination, administration of specific antidotes, supportive care, and monitoring for delayed effects (16). The prognosis varies depending on the type and dose of the toxic substance, the duration of exposure, and the patient's underlying health condition. Delays in steeking medical care or mismanagement of cases can lead to adverse outcomes, including prolonged hospitalization, organ damage, or death (17,18). Furthermore, mortality and morbidity from acute poisoning can be minimized by reducing the availability and access to highly toxic pesticides as well as by having a well-organized healthcare system (14). Thus,

1.2. Statement of the Problem

Acute poisoning is a critical global health challenge, significantly contributing to morbidity and mortality worldwide. Annually, over 1 billion workers are exposed to hazardous substances, including pollutants, dust, vapors, and fumes, leading to approximately 651,279 deaths worldwide (21). In 2016, acute chemical poisoning alone caused 106,683 deaths, while unintentional poisoning resulted in an estimated 59,000 deaths in 2021, with more than half of

these fatalities occurring in the African region (13,22). Additionally, unintentional acute pesticide poisoning (UAPP) accounted for an estimated 385 million cases globally, leading to approximately 11,000 deaths. Based on a global agricultural population of roughly 860 million, this means that approximately 44% of farmers are poisoned by pesticides each year (13,23). Pesticide poisoning, particularly intentional ingestion, remains a leading cause of death, resulting in approximately 370,000 fatalities annually (1,19). This burden is disproportionately borne by low- and middle-income countries which consume only 15% of global pesticides but account for over 50% of pesticide poisoning cases due to limited regulations and unsafe practices (13,24). The World Health Organization (WHO) highlights a twofold increase in pesticide poisoning over the last decade, with sub-Saharan Africa being a high-burden region (13,23).

In Ethiopia, where agriculture dominates the economy, the prevalence of acute poisoning is especially concerning. Pesticides are widely used in farming and domestic pest control, but inadequate storage, improper handling, and excessive use heighten the risk of both unintentional and intentional poisoning (8,10,25). Few hospital-based studies in Ethiopia indicate that acute poisoning is a frequent cause of emergency visits, accounting for 6.2% of emergency admissions in a study conducted by Millennium Medical College of St. Pauls and Addis Ababa Emergency and Trauma Hospital and 8% of total emergency admission Jimma university specialized hospital (26,27). With mortality rates ranging from 1.5% to 62.5% (8,16,20,28).

Treatment outcomes are often compromised by delays in seeking medical attention, limited availability of antidotes, and inadequate healthcare infrastructure. Rural communities face compounded challenges, including reliance on traditional farming practices that increase pesticide exposure and a lack of robust healthcare systems (24,28,29). If left unaddressed, the consequences of acute poisoning will be devastating, including increased mortality, long-term disability, and economic strain on families and the healthcare system. Additionally, the productive agricultural workforce, essential for Ethiopia's economy, will suffer, threatening food security and economic growth (21,25). Although efforts have been made to mitigate acute poisoning through public awareness campaigns, regulatory measures, and training programs for healthcare workers, these interventions have often fallen short due to weak

enforcement, resource limitations, the absence of localized data to guide targeted strategies, and absence of adequate poisoning center (21,25,29). The prevalence, nature, mortality, and morbidity of acute poisoning vary from region to region even in the same country owing to differences in socioeconomic, cultural, and healthcare facility levels of the country (20). Therefore, local data are paramount for planning and efficient use of resources for the prevention and management of acute poisoning. However, epidemiological data on these important health issues are scarce in Ethiopia. Few existing studies focus on urban populations, failing to address the unique risks faced by rural and agricultural communities.

Worabe Comprehensive Specialized Hospital, serving the predominantly agricultural community of the South and central part of Ethiopia, is uniquely positioned to provide insights into the patterns and outcomes of acute poisoning in this high-risk population. However, there is a critical gap in research on the treatment outcomes of acute poisoning and its associated factors in this context. The current study aims to fill this gap by investigating treatment outcomes, and associated factors of acute poisoning among patients attending the Emergency Department of Worabe Comprehensive Specialized Hospital.

1.3. Significance of Study

The Southern part of Ethiopia especially the Silte zone is the one where khat and other cereals are highly cultivated. Most of the farmers in this region use various pesticides, like malathion, to enhance productivity (30). Consequently, there would be a high possibility for the interaction of pesticides with farmers.

Since there are few studies done on poisoning in this country, and no study done on acute poisoning at WCSH, it is believed that valuable information will be gained from the study. The findings of the study will help in identifying gaps and potential intervention areas concerning the management practice of acute poisoning at ED. The findings will also show the outcome and other predictors of acute poisoning cases for the hospital managers as well as concerned stakeholders to work on quality of care. The findings will also help policymakers to develop strategies and guidelines to improve quality of care and decrease mortality. Furthermore, the result of this study serves as a reference for future research in this area by taking this study as a preliminary finding.

2. LITERATURE REVIEW

2.1. Introduction

Acute poisoning is a common situation in emergency departments (EDs) all over the world and involves high medical attention and significant costs (9). Several studies have examined the prevalence of acute poisoning in various populations, such as specific age groups, regions, or types of substances. Predictors of treatment outcome of acute poisoning can include demographic factors, mental health conditions, types of substance used, average time of presentation from exposure to hospital, and route of exposure (31). Unless a short period of medical observation is performed, the management of acute poisoning often requires hospitalization, whose outcomes are the length of stay and the associated costs. If the treatment is successful, the patient would have survived and be discharged from the hospital. When the treatment is not successful, acute poisoning may lead to death. This outcome is measured as the case fatality rate (32). Early diagnosis and proper treatment may be lifesaving; thus, understanding the general pattern of poisoning in different regions is important (33).

2.2. Distribution of acute poisoning

The distribution and types of acute poisoning vary considerably across the world and depend on socio-demographic characters, socioeconomic status, and cultural practices, as well as on local industrial and agricultural activities (10)

2.2.1 socio-demographic distribution

2.2.1.1 Distribution by Age

More than 60% of poisoning cases occur among adolescents and adults aged 15–59 years, with the majority falling in the 21–30 age group. A retrospective descriptive study conducted in Shenyang, China (2012–2016) reported an average patient age of 36.0±15.1 years, with over half (52.7%) in the 20–39 age group(34). In contrast, a study from Zambia found the highest incidence in the 0–12 age group (36%), followed by the 20–30 age group (31 %)(35). Similarly, in Congo, acutely poisoned patients were aged between 1 and 45 years (36). In Ethiopia, the TASH mean age of victims was 21 years (26). In Jimma, 78.9% of patients were in the 12–30 age range (27), while in Dessie, 44.2% were in the 21–30 age group (37). ,.

Moreover, a study in Gondar found that 55% of cases occurred in individuals aged 15–24 years (38).

2.2.1.2 Distribution by sex

Concerning sex distribution, males in low- and middle-income countries in Europe account for the highest proportion of poisoning cases globally. Supporting this, several retrospective hospital-based studies from India (81.2%), Iran –Teheran (51%)(33), and Zambia (52%)(35) report a higher incidence of acute poisoning among males. However, other retrospective studies conducted in Qatar (56%)(9), Congo (54%)(36), and Harar, Ethiopia (57.3%)(39), showed a higher incidence of acute poisonings in females.

2.2.1.3 Distribution by Place of Residence

Differences have also been seen in studies from different parts of the world regarding place of residence. A retrospective study conducted in China showed that acute poisoning is more common in rural areas (51.3 %) as compared to urban areas (44.7%)(34). But a study done in Iran-Teheran 67.9% (33), Debretabor 70.6 %(39), and Dessie 65%(39) reported a higher incidence in urban populations.

2.2.2 Distribution by Type of Poisoning

Poisoning can result from exposure to a variety of substances. The substances used in poisonings vary based on socioeconomic, demography, and culture. Major poison agents used in poisonings include pesticides, rodenticides, herbicides, pharmaceutical products, household chemicals, animal bites, carbon monoxide, alcohol, plants, traditional medicines, and illegal street drugs(40). In a retrospective study conducted in China therapeutic drugs (32.6%) predominated, followed by pesticides (26.9%)(34). Opioids, tramadol, and pesticides (organophosphate and aluminum phosphide) have remained a common hazard in Iran(41). In Addis Ababa household cleansing agent(bleach) predominate(43.1%)(26), Debretabor, which shows rodenticide distribution was predominate (56.9%) followed by organophosphate poisoning (24.5%) (39).

2.2.3. Distribution by Mode of Poisoning

Variation is also observed in the patterns of the circumstances of poisoning which were intentional, accidental, and unknown. Literature shows that intentional poisoning is the major cause of death in many developing and developed countries(40,42). It has been shown that the

consequences of intentional self-poisoning outweigh those of accidental poisoning by far Accidental poisoning commonly occurs among children(43). Different studies also reported that intentional poisoning is the major mode of poisoning in many countries. In Iran-Teheran (90.2%)(33), Addis Ababa-Ethopia (96.5%) (40), and Jimma-Ethiopia (50.5%) (5).

2.2.3 Distribution by season

Seasonal variation of acute poisoning was also seen in studies from different part of the world. In a study conducted in Iran-Tehran, seasonal distribution of poisoning of spring predominate (28%)(41), in Dessie autumn predominate (37.1%), (37). Moreover, a study conducted in Addis Ababa revealed the highest proportion 111 (36.2%) of acute poisoning cases occurred from March-May (Tseday), followed by from June-Aug (Kiremt) 105 (34.3%) and from Dec-Feb (Bega) 90 (29.4%)(44).

2.3. Clinical Presentation

The clinical presentation of acute poisoning varies depending on the substance or type of toxin, dose, duration, and concentration of exposure. Understanding the clinical features of acute poisoning is crucial for timely and appropriate management in the ED.

One study in Qatar found that the most reported symptoms were gastrointestinal (nausea, vomiting, pain, diarrhea.), respiratory (tachypnea) neurological (confusion, dizziness,) and cardiac symptoms (bradycardia, dysrhythmias) (9). A systematic review of observational studies in Ethiopia showed that diarrhea, vomiting, altered consciousness, and epigastric pain are the most common chief complaints of patients (40). Another study in Addis Ababa found that the commonest presentations were altered consciousness 67 (36.6%), epigastric pain, diarrhea & vomiting 30 (16.4%), diarrhea & vomiting 26 (14.2%), and epigastric pain 20 (10.9%) (44). Vomiting, accounted for (75.6%) of the patients, followed by loss of consciousness and epigastric pain, which accounted for 59 (18.7%) and 18(5.7%) of the patients, respectively.

The majority of patients (227/72.1%) arrived at the hospital between 1 and 24 hours after poisoning, and 24 (7.6%) arrived within 30 min of poisoning in a study conducted in northern Ethiopia(17). Furthermore, gastrointestinal presentation (vomiting, epigastric pain) accounts for (83.5%) followed by CNS manifestation (comma, altered mentation) 82(30.6%),

respiratory presentation (shortness of breath, cough) 10(3.8%), and others (excess secretion salivation, diarrhea, hypotension, and seizure) accounts 39(14.5%) among acutely poisoned patient at adult emergency department in FHCSH (45).

2.4. Treatment Outcome of Acute Poisoning

A study conducted in the emergency department of Menoufia University Hospitals reported a mortality rate of 40.5%, with 25% of cases requiring ICU admission, 21.4% referred to outpatient consultations, 6% needing intermediate care, and another 6% admitted to a common ward(46). Similarly, a retrospective study analyzing medical records and forensic autopsy reports from January to December 2019 found that 14.6% of deaths were due to confirmed poisoning. (47). Similarly mortality reported from Iran was high as 19.5% and 80.5% were survived and discharged(48).

In a prospective observational study conducted over 24 months at Dhaka University Hospital, acute poisoning led to severe complications (49). Comparatively, a study at Lumbini Medical College Teaching Hospital in Nepal found that 89.9% of acute poisoning cases fully recovered and were discharged, while 5.1% died, and another 5.1% left against medical advice. (50). Likewise, a retrospective cross-sectional study in Congo reported an 85% cure rate, a 5% mortality rate, and a 10% rate of long-term complications such as renal failure, epilepsy, and depression (36).

A systematic review and meta-analysis on acute poisoning mortality in Ethiopia estimated a pooled mortality rate of 4.69% (8). Meanwhile, a retrospective cross-sectional study at the SPSH toxicology center found that 89.3% of patients improved with treatment, 4.7% were transferred or referred, 3.7% died, and 1.7% left against medical advice. (51). Similarly, a study at TASH reported a case fatality rate of 13.7%, with an 86.3% discharge rate (26)

A study conducted in the city of Ambo on patients hospitalized for acute poisoning revealed that the mortality rate was (1.5%)(20). Similarly, a cross-sectional study in eastern Ethiopia found that 16.7% of poisoning cases resulted in death, while 83.3% survived and were discharged(52). Likewise, research in northwestern Ethiopia indicated that 82.5% of cases survived, whereas 17.5% succumbed to poisoning (53).

A retrospective cross-sectional analysis at Jimma University Specialized Hospital (JUSH) revealed that 93.6% of patients improved and were discharged, whereas 6.4% did not survive. (27). Meanwhile, a study at Millennium Medical College of St. Paul and Burns, Emergency and Trauma Hospital in Addis Ababa found that 68.9% of severely poisoned patients recovered without complications, with a mortality rate of 8.4%. (44). In contrast, research at Felege Hiwot Comprehensive Specialized Hospital (FHCSH) reported a significantly higher fatality rate, with 62% of poisoning cases resulting in death, accounting for 21.6% of all ICU fatalities. Aluminium phosphide was the most common toxicant, responsible for 76% of cases. (54).

2.5. Factors Associated with Treatment Outcomes of Acute Poisoning

Acute poisoning is a critical global health issue, with treatment outcomes influenced by various factors. These factors may be categorized as socio-demographic, clinical, management-related, and poisoning-related factors.

2.5.1. Socio-demographic Factors (Patient-Related Factors)

According to a study conducted in Iran significant proportion of men died from acute poisoning 325 men compared to 70 women. Moreover, the study showed that Death was common among men aged 70 and older (55). Another study done at the St. Peter Toxicology Center found no statistically significant difference in poisoning outcomes between men and women or across different age groups. However, married individuals had a higher mortality rate (55.5%). Furthermore study conducted in Ambo showed that independent predictors of poor treatment outcomes as age ≥ 35 years and female gender (20).Being a rural dweller is significantly associated with a mortality of poisoning(17,56). However urban residence is significantly associated with discharge (27,40)

2.5.2. Clinical Factors

According to a multicentre study conducted in northwestern Ethiopia, referral hospitals revealed being unconscious, not treated in the triage area, transport by Bajaj, spo2 <95%, and staying>48 hours in the hospital were significantly associated with a mortality of poisoning (17). Moreover, another study conducted in Amhara region found that time to hospital arrival ≥ 1 hour, insufficient oxygen intake, and lack of epinephrine/dopamine medication were strongly associated with death in poisoning cases (53). A study conducted in Jimma found

that patients requiring intubation had poorer outcomes. Furthermore different study revealed that delayed arrival time is significantly associated with mortality of poisoning(27,40,53)

2.5.3. Poisoning-Related Factors

A study in Menoufia University Hospitals found a highly significant association between the type of poison and patient outcome. Aluminum phosphide was the most common poison in 97.1% of fatal cases. Another study in Addis Ababa (Millennium Medical College of St. Paul and Burns, Emergency and Trauma Hospital) found that the most common cause of poisoning-related deaths was organophosphate poisoning, followed by herbicides and rodenticides(44). A cross-sectional study in eastern Ethiopia found that participants who were intentionally poisoned were 2.4 times more likely to have poor treatment outcomes. Those poisoned by medication had 2.13 times higher odds of poor outcomes (39).

Conceptual Framework

The conceptual framework for understanding treatment outcomes and associated factors in acute poisoning is grounded in a multidimensional approach that integrates patient-specific, poisoning-related, and healthcare system factors. This framework helps identify the critical determinants of patient prognosis, guides clinical decision-making, and informs public health strategies to mitigate the burden of acute poisoning.

In general, this conceptual framework highlights the complex interplay of patient, poison, and Treatment-Related factors in determining treatment outcomes for acute poisoning.

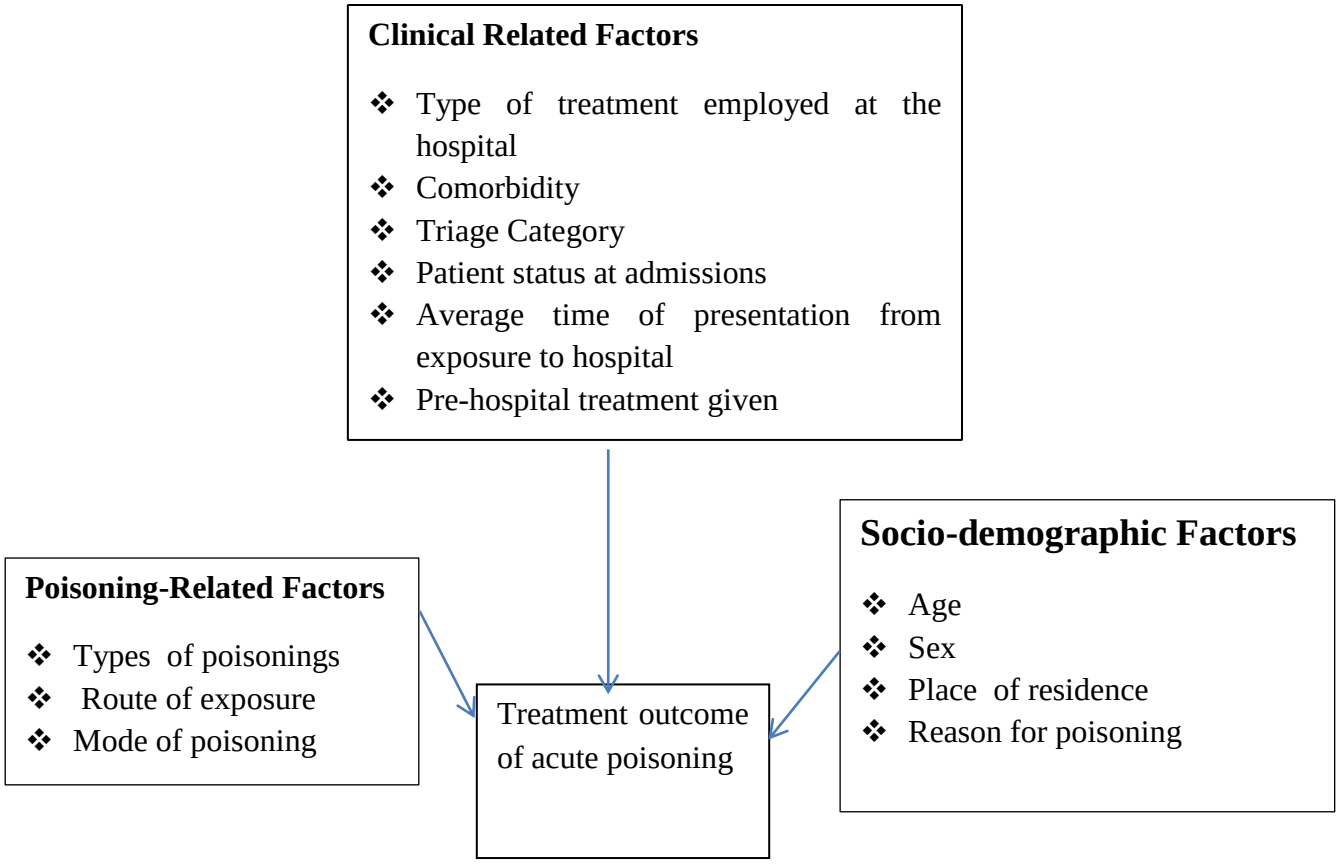

Figure 1: Conceptual framework adapted from treatment outcome and associated factors of acute poisoning cases at an emergency department(20).

3. OBJECTIVE OF THE STUDY

3.1. General Objective

- To assess treatment outcomes and associated factors of acute poisoning cases at the Emergency Department of WCSH 2025

3.2. Specific Objective

- To assess the outcome of poisoning cases at the emergency department of WCSH 2025
- To identify factors associated with treatment outcomes of acute poisoning cases at the emergency department of WCSH 2025

4. METHODS AND MATERIALS

4.1 Study Area and Period

The study was conducted at the Emergency Department of WCSH, Worabe Comprehensive Specialized Hospital is among the tertiary hospitals in the central Ethiopia region. It is located in the capital of Silte Zone workable town. The hospital is located 176km far from Addis Ababa, Capital City of Ethiopia. It has the capacity to accommodate above 600 inpatient beds and serve 5 million catchment populations. The hospital was inaugurated on Hidar 20/2007 EC and started service provision officially. Currently, Worabe Comprehensive Specialized Hospital has more than 658 clinical, 516 administrative, and support staff that provide medical specialty services to patients who are referred from all over the country. While the inpatient capacity is more than 427 beds, the hospital sees an average of 957 emergency and outpatient clients daily(57) (57). The study was conducted from March, 20, to April 24, 2025. Three years of data were included (February 1, 2022-January 31, 2025)

4.2. Study Design

A hospital-based retrospective cross-sectional study was conducted.

4.3. Source Population

The source population was all patients with acute poisoning who were admitted to the emergency department of WCSH during the study period.

4.4. Study Population

The study population included selected patient cards of acutely poisoned patients who fulfilled the inclusion criteria at both pediatric and adult emergency departments of WCSH.

4.5 Inclusion Criteria

All pediatric and adult patients who were acutely poisoned and admitted with complete charts to both pediatric and adult emergency departments of WCSH during the study period were included in the study.

4.6 Exclusion Criteria

Acutely poisoned patients whose medical records were found to be incomplete or lost patients who were referred and those who were left against medical advice were excluded from the study due to their unknown outcome.

4.7. Sample Size Determination

The sample size was calculated by using the formula for single population proportion for a cross-sectional survey considering the following assumptions: the proportion of fatality rate was 18% taken from a one-year study done on the outcome of Poisoning and Associated Factors Among Patients Admitted at Referral Hospitals in Northwest Ethiopia, 5% marginal errors (17)and 95% CI (1.96) was used. Using a single population proportion formula, the sample size is

$$\frac{\left[Z_{\frac{\alpha}{2}}\right]^2 \times P(1-P)}{d^2}$$

Where:

n=sample size from an infinite population

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

P= proportion among the study population =0.18

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

n $= \frac{(1.96)^2 * 0.18*0.82}{(0.05)^2}$ =226.8. It was 250. (With 10 % non-response rate).

However, since the number of cases was below the calculated sample size, all records, during the study period, were included.

4.8, Sampling Technique and Procedure

First, the WCSH Hospital has been selected purposefully. Then, the medical record numbers (MRNs) of acute poisoning patients who had been admitted to ED from February 1, 2022-January 31, 2025 were identified from the registration logbooks. A census sampling method was used and all patients with a case of acute poisoning who fulfilled the inclusion criteria and were admitted between the study periods were included.

4.9. Data Collection Tools and Procedure

The data collection checklist containing three parts; namely socio-demographic, poison related factors and clinical factors was developed from the previous publication with slight modification(20). The data was collected from the patient card using a pretested and pre-prepared data collection checklist after recording the card number of acute poisoning cases from the ED patient's registration logs. Then using this card number, the data collectors filtered the patient's chart from the medical record room. All the data collection process was conducted by recruited data collectors and monitored by the PI.

4.10 Data Quality Assurance

To ensure the quality of the data, the checklist was pre-tested among 5% (12 charts) of the study sample size at Butajira General Hospital, found in Gurage zone, Central Ethiopia Regional State, two weeks prior to the actual data collection date. The necessary modifications were made to the data collection tool based on the findings.

The data collectors and supervisors were senior, experienced BSc nurses who were working in another hospital's ED (one supervisor and two data collectors were recruited). A one-day training (orientation) was given for data collectors and supervisors before actual data collection on the purpose of the study, the data collection tool, data collection methods, and ethical concerns during data collection. During the data collection period, close and ongoing supervision and monitoring were done by supervisors to ensure the quality of the data. On each day of data collection, all collected data was examined for completeness and consistency by supervisors and the principal investigator. Consistency was examined through a random selection of the study sample’s charts by the principal investigator and cross-checked for similarity. After data collection, the principal investigator was carefully double-checked the

data entry using Epi-Data 4.6.0 software and cleanse the data before starting the analysis using SPSS version 26 statistical software.

4.11. Data Processing and Analysis

The collected data was coded, entered into Epi-data version 4.6.0, and then exported into SPSS version 26 statistical software for cleaning, categorizing, and analysis. Descriptive statistics was presented with a central tendency (mean or median) and dispersion (standard deviation) for continuous data and a frequency distribution for categorical data. The Binary logistic regression model was used to analyze the relationship between independent and outcome variables. Regression model, multi-collinearity was checked using the variance inflation factor (VIF). Bivariate Binary logistic regression model analysis was fitted for each explanatory variable to identify candidate variables for the multivariable logistic regression model. Variables with a p-value ≤ 0.25 in the bivariate analysis were entered into the multivariable logistic regression model to determine factors associated with treatment outcomes of acute poisoning. Also, the Binary logistic model goodness-of-fit to the data was checked. The association between the independent variables and the treatment outcome was assessed using the multivariable logistic regression model with a 95% CI, and a P-value < 0.05 was considered statistically significant. The adjusted odds ratio (AOR) with 95% CI and p-values was used to measure the strength of the association, identify statistically significant results, and interpret the results. Lastly, the results were organized and presented in texts, tables, charts, and graphs.

4.12. Study Variable

4.12.1. Dependent Variables

- Outcome of Acute Poisoning

4.12.2. Independent Variables

- Socio-demographic characteristics
  - Age
  - Sex
  - Place of residence
  - Mode of poisoning

- Types of poisonings identified
- Route of exposure
- Average time of presentation from exposure to hospital
- Pre hospital intervention
- Type of treatment employed
- Reason for poisoning
- Past medical illness/Comorbidity
- Clinical presentation at the time of the visit

4.14 Operational Definition

Treatment outcome: If the patient survives at the time of discharge, it could be considered a good treatment outcome, whereas a poor treatment outcome would be considered if the patient has died before discharge.

Pre-hospital intervention: Any intervention given for acute poisoning before hospital arrival.

Acute poisoning case: Refers to those patients diagnosed by the attending physician as acute poisoning cases through history, physical examination, assessment of toxidromes, and or laboratory investigations.

4.15 Ethical Consideration

Ethical clearance was obtained from the Institutional Review Board (IRB) of Addis Ababa University. A letter of permission was obtained from the Medical Directors of the study setting before the actual data collection period. The objective of the study was briefed to the staff of the documentation unit. Since the study was done through the review of medical records, individual patients may not be harmed as long as confidentiality is maintained. Confidentiality was maintained by omitting their name and personal identification from the data collection format. Finally, all collected data was coded and locked in an isolated room before entering the computer, and once entered; the computer was locked by password. The collected data was disclosed to any person other than the principal investigator.

5. RESULTS

5.1 Socio-demographic characteristics

During the specified study period, there were a total of 227 acute poisoning cases retrieved from the log book of the emergency department. Of 227 patients' chart 206 were retriheved with complete information on their charts and were included in this study making the retrieval rate of 90.7%. According to this study, out of 206 patients, 113(54.9%) of them were females. Considering age-related variables, the mean age of study participants was 25.6 years. Most of them were in the range of 18 to 37 years which accounts for 103 (51.9%). Rural residency accounts, 131 (63.6%). The majority of the patients were presented by self-referral 161(78.2%)(Table 1).

Table 1: Socio-demographic characteristics of acute poisoning cases at WCSH from February 1, 2022-January 31, 2025

Variable	Category	Frequency	Percent
Age	<18	63	30.6
	18–37	107	51.9
	>37	36	17.5
Sex	Female	113	54.9
	Male	93	45.1
Place of Residence	Rural	131	63.6
	Urban	75	36.4
Source of Referral	Self-Referral	161	78.2
	Referred from other institution	45	21.8

5.2 Patterns of Exposure to toxic agent, Seasonal variation & Route of exposure

Organophosphates were the most common toxic agents (29.1%), followed by bleaching agents (18.4%), rodenticides (15.1%), and herbicides (9.2%). In terms of exposure, the majority of cases (95.6%) occurred through oral ingestion. Seasonally, poisonings peaked between June and August (30.1%). Moreover, intentional poisoning accounted for 56.8% of cases (Table 2).

Table 2: Patterns of Exposure to toxic agent, Seasonal variation & Route of exposure WCSH from February 1, 2022-January 31, 2025

Variable	Category	Frequency	Percentage
Mode of poisoning	Intentional	117	56.8
	Accidental	89	43.2
Season of poisoning	Sep–Nov	30	14.6
	Dec–Feb	55	26.7
	Mar–May	59	28.6
	Jun–Aug	62	30.1
Route of exposure	Oral	197	95.6
	Inhalational	9	4.4
Poison Substance identified	Organophosphate	60	29.1
	Bleaching	38	18.4
:	Agents		
	Rodenticide	31	15.0
	Pharmaceutical drugs	16	7.8
	Herbicide	19	9.2
	Herbal Medicine	12	5.8
	Carbon Monoxide	8	3.9
	Food poisoning	9	4.4
	Benzene	1	0.5
	Alcohol Intoxication	8	3.9
	Unspecified poison	4	1.9

5.4. Clinical Characteristics

Most patients were previously healthy (85.4%) and arrived fully conscious (89.3%). Common clinical features included nausea and vomiting (72%), epigastric pain (30.5%), and hypotension (16.9%). While 45.6% reached the hospital within one hour, the majority (54.4%) arrived later, and only 15.5% received pre-hospital care (Table3).

Table 3: frequency distributions and percentages for key clinical variables acute poisoning cases at WCSH from February 1, 2022-January 31, 2025

Variable	Category	Frequency	Percentage (%)
Any Comorbidity	No	176	85.4
	Yes	30	14.6
Level of Consciousness at Admission	Unconscious	22	10.7
	Conscious	184	89.3
Hypotension on Admission	No	171	83.0
	Yes	35	17.0
Hypoxia	Yes	48	23.3
	No	158	76.7
Pulse Rate	Bradycardia	10	4.9
	Normal pulse rate	137	66.5
	Tachycardia	59	28.6
	Red	106	51.5
Triage Category	Orange	52	25.2
	Yellow	32	15.5
	Green	16	7.8
Time to Hospital	≤1hr	94	45.6
	>1hr	112	54.4
Pre-Hospital Care Given	No	174	84.5
	Yes	32	15.5
Length of Hospital Stay	≤48hr	138	67.0
	>48hr	68	33.0
Main presenting Complaints	Nausea &vomiting	148	71.8
	Epigastric pain	63	30.5
	Diarrhea	28	13.6
	Hypotension,	3	16.9
	Excessive salivation & urination	9	4.4
	Breathing difficulty	7	3.4
	Weakness	4	1.9
	Headache	3	1.5

5.4.1. Types of management employed

Fluid resuscitation was the most common intervention, used in 91.7% of cases. Moreover specific antidotes primarily atropine was given in 28.2%, covering 96.7% of organophosphate poisoning cases. Gastric lavage was provided in 10.2% of patients (Table 4).

Table 4: Management employed for a patient with acute poisoning at WCSH from February 1, 2022-January 31, 2025

Types of management employed	Frequency (%)
Fluid resuscitation	189(91.7)
Specific Antidotes(atropine)	58(28.2)
Oxygen Support	35(17)
Gastric Lavage	21(10.2)
Tracheal intubation	22(10.6)
Antidotes (vitamin K1)	1(0.5)
Histamine 2 Receptor Blocker and antiemetic	60(29.1)
Other supportive medication	26(12.6)

Other supportive medications include vasopressor (adrenaline, dopamine) antibiotics, dextrose, potassium chloride, and analgesics.

5.5. Treatment Outcomes of Acute Poisoning Cases

Regarding the outcome of poisoning, the majority 182(88.3%) of the patients improved and discharged. On the other hand, 24 patients died making poisoning mortality rate of 11.7%. Among cases with the suicidal mode of poisoning who were discharged 79(87.7%) were linked to the psychiatry department. Majority of the patients 138 (67.0%) were discharged within 48 hours, whereas 68 (33.0%) required longer stays over 48 hours. Most deaths occurred in those male patients poisoned with rodenticide and arrived after 1hour.

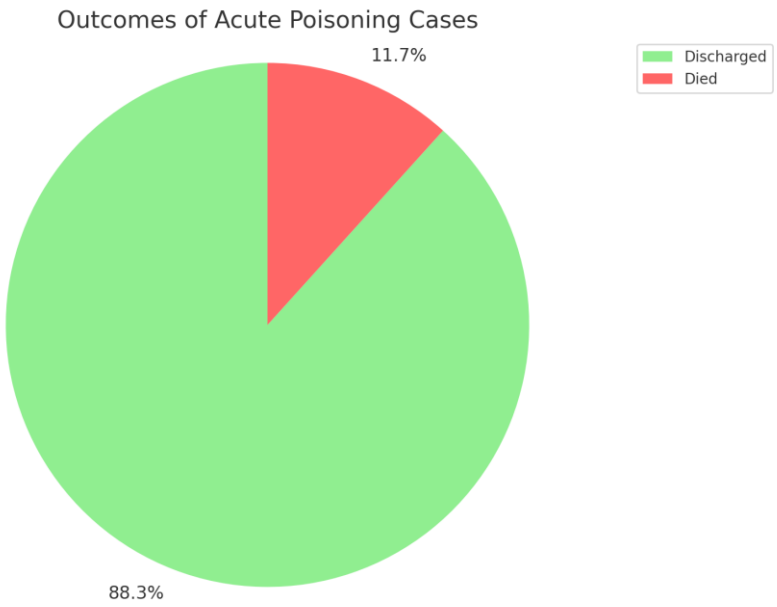

Figure 2: Distribution of treatment outcomes of acute poisoning cases at WCSH from February 1, 2022-January 31, 2025.

5.6. Factors associated with Treatment outcomes of acute poisoning

Initially, different variables such as age, sex, place of residence, level of consciousness at admission, Vital signs, triage category, poisoning agent, Mode of poisoning, Comorbidity, route of exposure, the average time of presentation, length of hospital stay, pre-hospital treatment, and management employed were considered for bivariate analysis. In the bivariate analysis, variables such as sex, mode of poisoning, level of Consciousness at admission, time to arrival, and length of hospital stay had a p-value of less than 0.25. These variables were taken and analyzed together using a multivariate logistic regression model. After controlling for the effects of potentially confounding factors using a multivariate logistic regression model, sex and time to arrival, were found to be statistically significant predictors of outcome.

Males were about 4 times more likely to have higher mortality than females (AOR =3.77 (1.34–10.57), p = 0.012). Delayed arrival time to the hospital (> 1 hour) was significantly associated with poor treatment outcomes (AOR = 4.693 (1.349–18.558), p = 0.020). Patients who arrived after 1 hour were nearly 5 times more likely to have poor outcomes than those who arrived before 1hour. Regarding the level of Consciousness at Admission, unconscious patients at admission tended to have poorer outcomes, than conscious patients (AOR = 2.693 (0.88–8.21), p = 0.82). Similarly, suicidal poisonings had poorer outcomes than accidental poisoning, (AOR =2.31 (0.75–7.13), p = 0.14). Moreover longer hospital stays (>48hrs) were linked to increased odds of poor outcome (AOR=1.70; (0.65–4.39), although this was not statistically significant (p=0.277) (Table 5).

Table 5: Multivariable analyses of factors associated with treatment outcome of acute poisoning at WCSH from February 1, 2022-January 31, 2025.

Variable	Category	Outcome		COR (95% CI)	AOR (95% CI)	p-value
		Good%	Poor%			
Sex	Female	107(94.7)	6(5.3)		1	
	Male	75(80.6)	18(19.4)	4.28(1.623 -11.29)	3.77 (1.34 – 10.57)	**0.012**
Mode of Poisoning	Intentional	98(83.8)	19(16.2)	3.257(1.16 -9.1)	2.31 (0.75 – 7.13)	0.146
	Accidental	84(94.4)	5(5.6)		1	
Consciousness at Admission	Conscious	167(90.8)	17(9.2		1	
	Unconscious	15(68.2)	7(31.8)	4.584(1.64 2-12.797)	2.69 (0.88 – 8.21)	0.082
Time to Hospital	≤1hr	91(96.8)	3(3.2)		1	
	>1hr	91(81.3)	21(18.7)	7(2.017-24.289)	4.693 (1.349–18.558)	**0.020**
Length of Hospital Stay	≤48hrs	127(92)	11(8)		1	
	>48hrs	55(80.9)	13(19.1)	2.729(1.15 1-6.468)	1.70 (0.65 – 4.39)	0.277

6. DISCUSSION

This study was aimed to assess treatment outcome of acute poisoning and its associated factors. The study revealed acute that poisoning primarily affected young adults, with female predominance and a majority of cases originating from rural areas. Organophosphates were the most common toxic agents, followed by bleaching agents, rodenticides, and herbicides, which might be due to easily availability in agricultural community. Intentional ingestion was prevalent, pointing to significant mental health concerns. Cases peaked during the agricultural season (June–August), likely due to increased exposure to chemicals. Treatment was mainly supportive, with fluid resuscitation widely used and atropine effectively administered for organophosphate poisoning. Despite a relatively high case fatality rate of 11.7%, most patients (88.3%) recovered. Notably, rodenticides contributed to the majority of deaths, reflecting their high toxicity and absence of specific anti dot. Poor outcomes were associated with male gender and delayed presentation, while early hospital arrival and female gender were linked to better outcomes. The findings underscore the need for improved mental health services, better regulation of toxic sub stances particularly rodenticides and strengthened emergency care, especially in rural settings

In the present study females accounted for the majority of acute poisoning cases (54.9%), which contrasts with several studies in low- and middle-income countries where males were the predominant victims. For instance, studies in India (81.2%) and Iran (51%) found males to be more commonly affected(55). However, the current finding aligns with research from Qatar (56%) and Jimma (65.4%), Harar (57.3%) Mettu (57.9%) where females were more frequently affected (9,27,52)(19). This may reflect regional socio-cultural differences and varying patterns of exposure or intent (e.g., higher suicidal tendencies among women in some communities).

Regarding age, the majority (51.9%) of poisoning cases occurred among individuals aged 18–37 years, with a mean age of 25.6 years. This is consistent with studies from Shenyang, China, where more than half of cases were in the 20–39 age group and the mean age was 36 years (34) Similarly, research in Harar, Ethiopia, reported that (59.3% of cases fell within the 18–37 year range(52). These findings may reflect the vulnerability of young adults due to psychological, social, and occupational stressors.

In this study, the majority of poisoning cases (63.6%) were from rural areas. This aligns with a study from China reporting higher poisoning incidence in rural areas (51.3%)(34). In contrast, studies from Tehran, Debre Tabor, and Dessie reported higher rates in urban settings(33,58,59). These discrepancies could be attributed to differences in healthcare access, use of agricultural chemicals in rural areas, and reporting systems.

Organophosphates (29.1%) were the most frequently identified poisoning agents in this study, consistent with findings from Iran, Ambo, Dessie, and Harar where pesticide poisoning is common(20,58). However, household bleach was the most frequent agent in Addis Ababa and Jimma (27,60), while in Debre Tabor, rodenticides predominated (56.9%)(59). These differences may be due to varying chemical accessibility and usage patterns across regions.

Considering the mode of poisoning, most (56.8%) were intentional poisoning like a study done in Tanzania(59.4%)(61), and Ambo (76.9%)(20). In contrast, studies from western Amhara referral hospitals report most common mode of poisoning was accidental (89.8)(62). These differences may be due to varying underlying reasons for poisoning that are affected by the study area and sociocultural practices

Only 69.8% of patients specified their reason for poisoning, of this conflict with family was the commonest reason for poisoning (41.4%) which was higher than a study done at Ambo (35.9%)(20), but lower than a study done in JUSH (75.9%)(63).

Ingestion was the commonest route of exposure (95.6%) which is almost comparable with a study done at JUSH (94.25%)(63) and slightly higher than a study done in Harar (74)(39) and in China (86.2%)(34). Inhalational poisoning occurred in 4.4% of the cases which is almost similar to a study done in JUSH (5.75%)(63). These differences might be due to the difference in the type of substances used for poisoning.

Most cases (54.4%) arrived after 1 hour which is almost comparable with a study done at Western Amhara referral hospital that reports the majority of arrived after 1hour(62). Conversely there is a delay in arrival as compared to a study done in JUSH (54.2% arrived within 30minutes-1 hour) (63). This difference might be due to an increase in number of patients from distant rural area.

In this study, 14.6% of acutely poisoned patients had pre-existing comorbidities, which is notably lower than the 31.7% reported from Saint Peter Specialized Hospital in Addis Ababa(64), likely reflecting demographic or healthcare access differences; moreover, 10.7% were unconscious on arrival compared to 18.7% a Northwest Ethiopia(53) possibly due to variations in toxin types or presentation delays. Similarly, hypotension was observed in 17.0% of our patients, closely matching the 16.4% in acute organophosphate poisoning cases from China (65), yet lower than the 23.7% reported from Saint Peter Specialized Hospital(64), suggesting differences in toxin profiles and severity. In terms of timing, 45.6% arrived within one hour higher than the 27.9% reported from Northwest Ethiopia(53) highlighting better early access, since delays increase mortality. Notably, only 15.5% received pre-hospital care, similar to other Ethiopian(52,62,64). 67.0% were discharged within 48 hours, comparable to a study conducted at Saint Peter Specialized Hospital(64) findings, suggesting effective management and self-limiting toxicity in many cases. Regarding types of management employed intravenous crystalloid infusion was administered to 97.5 % of patients, mirroring utilization rates from Kumasi Ghana (96 %)(66) and Jimma98 %)(63). Atropine was given for (28.2 %) which is Comparable to Sri Lanka's 30 %(67) and North-West India's 25 %(68); an order of magnitude higher than Australian data (<2 %), consistent with pesticide exposure patterns.

In this study,11.7% of the patients had poor outcomes, which is comparable to the studies conducted in Gondor, Ethiopia 11.16%(38), India 13.6%(69) and lower than, Debretabor 18.6(59), Harar 16.7 (39), Mettu 27.6 (19), Iran 19.5%(48), and Sri Lanka 21.5% (67). On the opposite of this, a systematic review and meta-analysis study conducted in Ethiopia(8) was 8.6%, and a study conducted in China (34) was found to be 1.3% %. This might be due to the type of poisoning, dose difference, early and easy access to health facilities, and a relatively good setup in the health facilities.

The higher mortality rate in this study may be due to the fact that most cases (54.2%) involved rodenticides (aluminum phosphide and zinc phosphide), which are highly fatal even in small doses. The lack of an antidote for this types of poisoning may also contribute to this, as 68% of the patients who ingested rodenticides had unfavorable outcomes a finding consistent with another study conducted in India.(68)

Our findings showed that male sex and delayed (>1 h) presentation are the primary predictors of poor treatment. This is similar to a meta-analysis of Ethiopian poisoning studies that showed a pooled odds ratio of 1.9 for mortality in men versus women(8). Hospital-based cohorts in Amhara (62) and Addis Ababa(64) documented AORs of 3.1 and 3.9 respectively, mirroring the 3.77 seen in our study. Risk-taking behaviors, occupational, exposure, and a higher likelihood of ingesting highly toxic agrochemicals have been advanced as explanations

Delay to hospital: The strong effect of delayed arrival (AOR $\approx$ 4.7) aligns with studies from Western Ethiopia, which found arrival after 1 hours increased the odds of poor treatment outcomes seven-fold(20), and with a pooled Ethiopian estimate showing delay doubled mortality risk. Rural residence, transport barriers, and initial recourse to traditional remedies contribute to late presentation.

7. LIMITATION AND STRENGTH OF THE STUDY

The objective of this study was to assess treatment outcomes and factors associated with poisoning outcomes. As this is the first study conducted in this particular study area, it provides novel and valuable information. The findings will serve as a baseline for future research. Moreover, the findings of this study also identified gaps and potential intervention areas for the management of poisoning cases. Furthermore identified gap will serve, hospital manager, Regional Health Bureau and FMOH, to design strategies in order to reduce poisoning related morbidity and mortality

This study was cross-sectional study employing a retrospective chart review. The medical records of some studied patients lack completeness which resulted in missing or incomplete data for some study variables. Moreover, factors associated with treatment outcome of acute poisoning were assessed using a cross-sectional design which might not show causal relationships with potential risk factors.

8. CONCLUSIONS AND RECOMMENDATION

In this study, the overall case fatality rate was 11.7% which is relatively high when compared to the findings of other studies. Younger rural females were mostly affected. The commonest cause of poisoning in this study was organophosphate. Furthermore the commonest causes of death were ingestion of Rodenticides, Organophosphates, and Pharmaceutical drugs in descending order. GI decontamination was given to only a few patients. Most deaths occurred in male patients who were arrived after 1hour. Male patients and delayed arrival time were significantly associated with poor treatment outcomes and female patients and early presentation to hospital were significantly associated with good outcomes.

These findings highlight the need for targeted public health strategies to improve awareness and early access to emergency care, particularly in rural areas, and to address the specific vulnerabilities of younger populations in acute poisoning situations should be designed and implemented by WCSH managers, Regional Health Bureau and FMOH. Further research is warranted to explore preventive measures. It is equally important to stress the need for continuous improvement in treatment protocols to reduce the incidence and severity of poisoning cases. Prospective study has to be done to predict the factors contributing to treatment outcomes with the incorporation of laboratory finding, related factors. Further large-scale studies are required to investigate national trends of poisoning and factors associated with treatment outcomes.

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ANNEXES

Annex I; Information sheet and informed consent form

Information sheet and informed consent form for Worabe Comprehensive Specialized Hospital medical director/CEO

My name is Kamil Ababor. I am studying for a Masters' degree in emergency medicine and critical care nursing at Addis Ababa University, College of Health Science. I kindly request that you give me your attention to explain the study and your health institution being selected as the study setting.

Name of the Organization: Addis Ababa University's College of Health Science, Department of Emergency Medicine and Critical Care Nursing

Title of the study

Prevalence and treatment outcome of acute poisoning among patients admitted to adult emergency department of worabe comprehensive specialized hospital. 2025.

Purpose/aim of the study

The study will be conducted through a collection of secondary data already collected on the patient's chart (card) and ED logbook register, and the aim of this study will be to write a thesis as a partial requirement for the fulfillment of a Masters' degree program in emergency medicine and critical care nursing for the principal investigator. The study's findings will help the hospital in identifying prevalence of acute poisoning, gaps and potential intervention areas with respect to management practice of acute poisoning and its common predictors at ED.

Data collection procedure and duration

I will review records of adult acute poisoning using a data retrieval form to obtain pertinent data that will be deemed helpful for the study. There will be 20 questions, and I will fill out

the data retrieval form by reviewing records. The review of each record may take 15–25 minutes to collect data for a single chart.

Risks and benefit of the study

The risk of reviewing in this study will be minimal; the only assumed risk will be time loss by data collectors during data collection, which will only take a few minutes from the patient's card or database and follow-up charts being used by hospitals. There will not be any direct payment for reviewing this study. The findings from this study might contribute to the body of knowledge that informs hospital, program planners and decision-makers.

Confidentiality

The information collected as explained above will be kept confidential. To assure privacy, the information on the charts will be collected by excluding the names of the clients, and the information collected from this study development will be kept private and stored in a file cabinet. In addition, it will not be shown to anyone except the investigator, and it has been kept in a locked system with a computer password. The study's findings will be general for the study community and will not reflect anything particular about individuals.

Rights

Participation in this study is voluntary. Your hospital has the full right to declare whether or not it is reviewing the records. If you have allowed me to review the records, you also have the full right to withdraw from the study at any time if any problem is perceived.

Contact address

This study's development will be revised and approved by Addis Ababa University's College of Health Science, Department of Emergency Medicine and Critical Care Nursing. If there is any question or inquiry about the study or procedures at any time, please contact any of the following individuals (investigator and advisors) using the following addresses:

Principal investigator: Kamil Ababor Abagaro

Cell phone: +251-961836603

E-mail: kamilababor179@gmail.com

Main Advisor: Mrs. Heyria Hussein (PhD Candidate). Addis Ababa University, college of health Science, department of emergency medicine and critical care nursing.

Cell phone: +251-911714659

Co-advisors

Mr. Andualem Wubetie. (MSc, assistant professor)

Mobile: +251-920531585

Dr. Lemlem Beza (PhD), Addis Ababa University, College of Health Science, Department of Emergency Medicine and Critical Care Nursing.

Mobile: +251-923092533

E-mail: E-mail:lemnene33@yahoo.com

Declaration of informed voluntary consent

I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, the confidentiality issues, the rights to participate, and the contact address for any queries. I have been given the opportunity to ask questions about things that may have been unclear. I will be informed that the hospital has the right to withdraw from the study at any time. I will also be informed that the hospital has the right to stop this study from being conducted if any unethical procedures are observed during the data collection process on the hospital's premises. Therefore, I declare my voluntary consent on behalf of **worabe comprehensive specialized hospital** management to allow this study to be conducted in the hospital with my signature.

Name of medical director/CEO: _____Signature _____ Date_____

Name of data Principal investigator: _____Signature _____ Date_____

Annex II: Checklist

This is a checklist set to collect information on Treatment Outcome and associated factors of Acute Poisoning among patient attending emergency department of worabe Comprehensive Specialized Hospital. 2025.

Instructions: First, introduce yourself and talk about the objectives of the study, then request that you review the selected records of acute poisoning. Finally, fill in all individual

information from the patient record on the checklist correctly. Please write the required information clearly and completely.

Data collection date ----------month----------Year----------

Name of the Hospital ----------

Name of data collector ---------- signature----------

Name of supervisor ----------signature----------

Data abstraction format from patient medical charts

Part I: Socio-demographic Characteristics

1. Age: ---------

2. Sex: Male ---- Female -----

3. Place of Residence: Rural ----- Urban -----

4. Reason of Poisoning: Unemployment -------Mental Illness------- Income Problems ------- Failure in Exam ------- Quarrel with Family -------Unspecified…….Others (Specify) ----------

PART II: poisoning Related Factors

1. Mode of Poisoning: Intentional …… Accidental -------Unspecified ------

2. Season of Poisoning: Dec-Feb (Winter) ----- March-May (Spring) ----- June-Aug (Summer) - --- Sep-Nov (Autumn)

3. Route of exposure a) Oral b) Inhalation c) Eye drop/topical d. Others (specify)

4. Dose of poison. _____

5. Any comorbidity……

6. Poisoning Substances Identified: a. Organophosphate, ----- b. Bleaching Agents, ----------

c. Pharmaceuticals:

1. Benzodiazepines

2. Antipsychotics

3. Barbiturates

4. Analgesics

Others (Specify) ----------

d. Herbicides, ----------

e. Rat Poisoning Chemicals, --------

f. Alcohol Intoxication, ----------

g. Carbon Monoxide, ----------

h. Snake Bite, ----------

i. Traditional Medicines, ----------

j. Others (Specify) ----------

Part III: Clinical Related factors

1. Source of referral, a). Self-referral b). Referred from another health institution
2. Referred With Treatment a). Yes b). No
3. Pre hospital treatment given a) Yes b) No
4. Average time of presentation to hospital after poisoning -------
5. Clinical presentation

a. Epigastric pain b. Diarrhea c. vomiting. d. Excess sweating/urine/saliva e. Fever

f. Breathing difficulty g. Headache h. Hypotension i. Altered conscious j. Others (specify)

6. Vital sign at presentation, a. HR---- b. BP--. c. RR---- d. SPO2-- e. Temperature.-- f. GCS--------

7. Triage category a) Red b) Orange c) Yellow d) Green

8. Type of Treatment Given/Management Practices:

a. Fluid Resuscitation

b. Chelation with Activated Charcoal

c. Antidote Management

d. Whole Bowel irrigation

e. Gastric Lavage

f. Hemodialysis g. Emesis

h. Medications other than Antidote

i. Others (Specify) ----------

9. Any linkage to Psychiatric unit----------

10. Length of hospital stay (days) , ----------

11. Treatment Outcome

a. survived and discharged from hospital

b. Died in hospital before discharge

DECLARATION

Declaration

I hereby declare that the research thesis entitled **"Treatment Outcomes and Associated Factors of Acute Poisoning at the Emergency Department of Worabe Comprehensive Specialized Hospital, Ethiopia, 2025"** is my original work. To the best of my knowledge, this study has not been previously conducted in the study area and has not been presented for a degree or any other purpose in any other university or institution. All sources of materials used for this thesis have been duly acknowledged and cited.

Name: Kamil Ababor Abagaro

Signature: _____

Date: _____