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AN ASSESSMENT OF PESTICIDE POISONING INCIDENCES PRESENTED AT HEALTH CARE FACILITIES IN MASHONALAND CENTRAL PROVINCE, ZIMBABWE

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HCF

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ABSTRACT

Acute Pesticide Poisoning (APP) is a significant problem in developing countries, causing loss of productivity and fatalities in the agricultural sector. However, limited information on the connection between pesticide use, APP, and deaths in Zimbabwe is available. This study aimed to evaluate incidents that resulted in APP and identify the specific pesticides that caused them at Health Care Facilities (HCFs) in Mashonaland Central Province. Researchers conducted a survey asking standardized questions to gather information on APP cases from 93 HCFs. Descriptive statistics and chi-square association tests for APP cases in the targeted HCFs were calculated using IBM SPSS version 22. The study found that 43% of APP cases were due to pesticides belonging to the World Health Organization (WHO) class II acute toxicity category, while 26.1% were caused by Highly Hazardous Pesticides (HHPs). Most of the cases were due to intentional poisoning (87.1%), with the majority (55.9%) of APP incidents being males. The highest APP cases were recorded in the 21-30 age group (38.8%), followed by the 31-40 age group (32.8%). These results emphasize the significant impact of intentional poisoning by WHO class II type pesticides, particularly HHPs, on the incidence of APP in Zimbabwe. To mitigate the impact of HHPs on human health, it is recommended that the government of Zimbabwe consider pesticide risk reduction measures, such as stricter pesticide registration criteria, import

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restrictions, and the promotion of less toxic alternatives. These findings highlight the urgent need for policymakers, researchers, and other stakeholders in the agricultural sector to work collaboratively towards creating a safer and more sustainable farming environment in Zimbabwe.

1 Introduction

Using pesticides in modern agriculture has greatly increased food production and security (Zimba and Zimudzi 2016; Tudi et al. 2021). However, the inappropriate handling and misuse of these chemicals have harmed human health and the environment (Ntzani et al. 2013; Pathak et al. 2022). The number of pesticide poisonings in farms worldwide has increased significantly from around 25 million cases in 1990 to 385 million in 2018 (Boedeker et al. 2020). Alarmingly, approximately 44% of the global population working in agriculture, including 860 million farmers and agricultural workers, are exposed to pesticide poisoning each year (Boedeker et al. 2020). Highly Hazardous Pesticides (HHPs), a small group of pesticides classified as acutely or chronically hazardous to human health or the environment, are responsible for most of these poisonings. HHPs are identified based on the Food and Agriculture Organisation of the United Nations (FAO)/World Health Organisation (WHO) Joint Meeting on Pesticide Management's (JMPM) 8-point criteria for HHPs identification (FAO/WHO 2016). These statistics emphasize workers' significant risks in the agricultural industry and the urgent need to prioritize implementing adequate safety measures to protect them. The increasing evidence about the harmful effects of pesticides underscores the importance of adopting alternative methods of agriculture that reduce the reliance on these chemicals.

It's important to understand that pesticide poisoning cases can arise from accidental mishaps and intentional acts. While accidental poisoning accounts for a smaller percentage of deaths related to pesticide exposure (Jørs et al. 2018; Eizadi-Mood et al. 2023), intentional self-poisoning unfortunately accounts for most of the cases. In fact, it makes up at least one in seven suicides worldwide (Mew et al. 2017; Eizadi-Mood et al. 2023). Despite this, the true extent of the problem and the global distribution of deaths are not accurately reported. It's worth noting that low- and middle-income countries in sub-Saharan Africa account for 3.5% of global pesticide-related self-poisoning fatalities (Mew et al. 2017).

It is difficult to obtain accurate data on pesticide poisoning cases in Africa due to inadequate notification records maintained by health authorities (Rao et al. 2005; Brassell et al. 2022). Underreporting incidents in health facilities is also a significant issue, as many country-specific reporting systems lack a central reporting point or legal mechanism requiring incident reporting (Boedeker et al. 2020). Studies indicate that the epidemiology of poisoning in Kenya, Malawi, South Africa, and Zimbabwe, as well as in other African countries, is not well established (Tagwireyi et al. 2016; Brassell et al. 2022). According to the WHO, unintentional poisoning caused eight deaths per 100,000 people in Zimbabwe in 2004 (Tagwireyi et al. 2016).

Toxic vigilance is crucial in hospitals as it provides critical epidemiological information to design targeted interventions (Razwiedani and Rautenbach 2017). Unfortunately, most healthcare workers (HCWs) in sub-Saharan African countries lack adequate training in occupational health and toxicology, which limits their ability to diagnose signs and symptoms of acute pesticide poisoning (APP) or identify the appropriate chemical groups and WHO pesticide hazard class (Lekei et al. 2017; Ssemugabo et al. 2020). As a result, diagnosing and managing pesticide poisoning cases is challenging and often leads to poor patient outcomes (Sibani et al. 2017; Ssemugabo et al. 2020). Inadequate diagnosis and management also impede epidemiological data collection, which is essential for identifying problematic pesticides that need regulation.

Zimbabwe's agricultural sector significantly contributes to the country's economy, accounting for 14% of the Gross Domestic Product (GDP) and employing 70% of its population, directly or indirectly. Smallholder farmers, who own 50% of the country's land, play a vital role in agricultural production (Kuhudzayi and Mattos 2018). However, farmers in low and middle-income countries, such as Zimbabwe, face a high risk of adverse health effects due to pesticide exposure (Jørs et al. 2018). Despite the risks associated with pesticide use, there is an increase in farmers' dependence on pesticides in Zimbabwe (Maumbe and Swinton 2003; Foti and Chikuvire 2005; Mutami 2015). Unfortunately, Zimbabwe lacks national data on the incidence of APP or the pesticides that cause deaths, which is crucial for developing effective regulations for problematic pesticides. Therefore, this study aims to characterize the incidents and severity of pesticide poisoning cases presented to healthcare facilities (HCFs) in Mashonaland Central, Zimbabwe. It also aims to identify the pesticide formulations commonly associated with pesticide poisoning and determine the events that lead to pesticide poisoning incidences.

2 Materials and Methods

2.1 Study setting and design

This research aims to investigate the occurrence and treatment of Acute Pesticide Poisoning (APP) by Healthcare Workers (HCWs) in seven districts, namely Bindura, Muzarabani, Guruve, Mazowe, Rushinga, Shamva, and Mount Darwin of Mashonaland Central Province in Zimbabwe. The study used a cross-sectional design to collect qualitative and quantitative data by distributing questionnaires to HCWs handling APP cases. The province was selected based on its high agricultural production statistics, which suggest high pesticide usage. A total of 93 healthcare facilities were visited out of 140 identified using the District Health Information Software (DHIS) due to limited accessibility, time, and resources. 99 HCWs were interviewed, with six of the health care facilities having two respondents per facility instead of one. Their responses provided valuable insights into the management of APP among healthcare workers in the region.

2.2 Data collection

In this study, a semi-structured questionnaire was used to collect data on Acute Pesticide Poisoning (APP) incidences. To ensure the questionnaire's effectiveness and accuracy, we pilot-tested it in July 2021 with a small sample of 10 healthcare workers (HCWs) from selected facilities in Mashonaland Central. Based on the pilot test results, some necessary refinements were made to the questionnaire to align it with the study's objectives. The questionnaire was administered at the Outpatient Department (OPD) of health facilities, where most APP incidences are received and recorded. In some cases, it was administered in the records section of the health facility. We primarily interviewed Doctors, Nurses, and Environmental Health Technicians who directly provide care to patients suffering from APP. Eight (8) enumerators were trained for two days on administering the questionnaire and the study's objectives. The data collection process took place in September 2021.

The questionnaire gathered data on respondents' demographics, such as their age, gender, profession, and experience, as well as data on the number of pesticide poisoning incidents recorded, events leading to pesticide poisoning, the outcome of the poisoning, the pesticides responsible for acute poisoning, the pesticide poisoning record-keeping system, and healthcare workers' training on APP management. While the data collected using semi-structured questionnaires were primarily quantitative, we also collected qualitative data through further probing HCWs with open-ended and follow-up questions.

2.3 Statistical analysis

Quantitative data were collected and organized in Microsoft Excel. The collected data were coded and verified to eliminate errors, and IBM SPSS version 22 was used to calculate frequency, relative frequency, and chi-square (v2) tests for association at a 5% significance level. Qualitative data were organized thematically and then triangulated with quantitative data to validate it. This approach ensured the reliability and accuracy of our study findings. The pesticides responsible for APP were classified according to the WHO Hazard Classifications and functional groups. Descriptive statistics were used to analyze the data (WHO 2020).

2.4 Ethical considerations

The study protocol was approved by both the Medical Research Council of Zimbabwe (MRCZ) and the Ministry of Health and Child Care. The study adhered to the Covid-19 prevention and containment measures recommended by the Government of Zimbabwe and the World Health Organization (WHO). Healthcare workers (HCWs) were informed about the study's aim and were given the option to participate or decline without any negative consequences. Oral and written consent was obtained from the participants after that. The confidentiality of the HCWs was maintained, and their information was kept anonymous.

3 Results

3.1 Demographic characteristics of Healthcare Facilities visited

As part of this study, 93 healthcare facilities (HCFs), including rural health centres, clinics, private hospitals, provincial referral hospitals, district hospitals, rural hospitals, and private surgeries were interviewed. The results related to these participants are mentioned in Table 1. During the study, a total of 93 healthcare facilities were visited, on six of the facilities two respondents per facility were interviewed, resulting in 99 healthcare workers being interviewed (Table 2). Out of all the participants who responded, 85.9% were nurses, 7.1% were Environmental Health Technicians, and 5% were doctors. The largest group of respondents (38.4%) had 11-15 years of work experience, followed by those with 1-5 years of experience (28.3%) (Table 2). However, none of the participants had received on-the-job refresher training on APP management.

3.2 Socio-demographic characteristics of APP cases

Out of the 99 respondents interviewed, 22 APP cases were excluded from the data analysis as they lacked information on the circumstances that led to the APP incident. Among the remaining 77 APP cases, most individuals affected (55.9%: n=77) were males, while only 44.1% were females. The association between gender and poisoning was significant ($p<0.05$). In cases of intentional poisoning, males (48.1%) were affected more than females (39%). In terms of age, the highest number of intentional poisoning cases (38.8%: n=67) were recorded in the 21-30 age range, followed by the 31-40 age range (32.8%). The association between age and poisoning was also significant ($p<0.05$) (Table 3).

3.3 Pesticides responsible for acute poisoning cases- incidences presented at HCFs

The studied Healthcare Facilities (HCFs) reported poisoning cases caused by 16 pesticides. The most frequent causes of poisoning were Dimethoate (14.3%), Lambda Cyhalothrin (14.3%), Aldicarb (13%), Aluminium Phosphide (13%), and unknown substances (15.3%).

Table 1 Health Care Facilities visited during the study (N=93)

Category	Owner	HCFs Interviewed
Clinic	Municipality	2
Clinic	Government	10
Clinic	Rural District Council	10
District Hospital	Government	5
Mission Hospital	Private/Church related	4
Private Hospital	Private	1
Private Surgery	Private	11
Provincial Hospital	Government	1
Rural Health Center	Rural District Council	26
Rural Health Center	Government	21
Rural Hospital	Government	2
Total Respondents		93

Table 2 Health Care Workers interviewed and years of experience (N=99)

Health Care Workers interviewed	Frequency (N)	Percentage (%)
Doctor	5	5.0
Nurse	85	85.9
Environmental Health Technician	7	7.1
Information Officer	1	1.0
Clinic Officer	1	1.0
Respondents' working experience in years		
1-5	28	28.3
6-10	16	16.1
11-15	38	38.4
16-20	9	9.1
20+	8	8.1

Table 3 Pesticide poisoning cases categorized by age and gender (n=77)

Age	Intentional poisoning		Unintentional poisoning	
	Frequency (n=67)	Percentage	Frequency (n=10)	Percentage
Less than 20	8	11.9	5	50
21- 30	26	38.8	0	0
31 – 40	22	32.8	4	40
41 – 50	4	6.0	1	10
51 – 60	2	3.0	0	0
61 – 70	1	1.5	0	0
Over 70	4	6.0	0	0
Gender				
Male	37	55.2	6	60
Female	30	44.8	4	40

Table 4 Pesticides reported to be responsible for acute poisoning in the case studies (n=77)

Pesticide Name	Pesticide functional group	WHO Hazard Chemicals Classification	Respondents (%)
Lambda Cyhalothrin	Pyrethroid	II	14.3
Fenvalerate	Pyrethroid	II	1.3
Aldicarb[a]	Carbamate	1a	13
Carbaryl	Carbamate	II	2.6
Aluminium Phosphide	Inorganic compound	FM	13
Imidacloprid+ Beta-cyfluthrin	Neonicotinoid+ Pyrethroid	1b[b]	1.3
Lambda Cyhalothrin + Acetamiprid	Neonicotinoid+ Pyrethroid	II	2.6
Paraquat[a]	Bipyridyl	II	4
Copper Oxychloride	Inorganic compound	II	1.3
Dimethoate	Organophosphate	II	14.3
Methamidophos[a]	Organophosphate	1b	6.5
Chlorpyrifos	Organophosphate	II	1.3
Dichlovos[a]	Organophosphate	1b	1.3
Glyphosate	N-Glycine	III	4
Triadimenol[a]	Triazole	II	1.3
N-Decanol	Fatty Alcohol	U	2.6
Not known	Not known	Not known	15.3

[a]Highly Hazardous Pesticide; [b]Based upon the more toxic active ingredient; FM-Fumigant, Fatal if inhaled

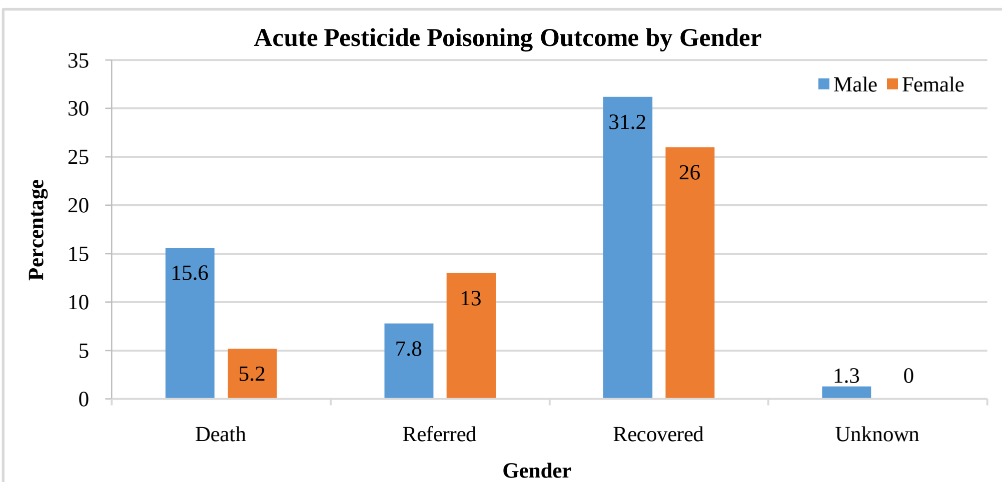

Figure 1 Acute Pesticide Poisoning Outcome by Gender

Other pesticides like Methamidophos (6.5%), Glyphosate (3.9%), and Paraquat (3.9%) had frequencies of less than 10%. Among all the cases, 26.1% (n=77) were caused by highly hazardous pesticides (HHPs), as mentioned in Table 4. The pesticides responsible for poisoning belonged to different functional groups, including organophosphates (25%), carbamates (12.5%), pyrethroids (12.5%), neonicotinoids (12.5%), and inorganic compounds (12.5%). Despite the banning of Aldicarb, Paraquat, and Methamidophos in Zimbabwe, these pesticides were still found to be responsible for some of the poisoning cases.

3.4 Outcomes of APP incidences presented at HCFs

Out of all the recorded cases of APP, 56.1% of them recovered from their illness, while 21.8% of them unfortunately passed away. About 20.8% of the patients were referred to another healthcare provider, and the status of the remaining 1.3% is unknown (Table 5).

A significant proportion (15.6%: n=77) of deaths were recorded in males, while 5.2% were females (Figure 1). According to the recorded data, the highest mortality rate of 10.8% was caused by

Table 5 Poisoning outcome by pesticide recorded in Mashonaland Central Province (n=77)

Pesticide name	% Mortality	% Recovered	% Transferred	% Missing data
Aldicarb	2.7	7.8	2.5	0
Aluminium Phosphide	10.8	0	2.2	0
Lambda Cyhalothrin+ Acetamiprid	0	2.6	0	0
Carbaryl	1.4	1.3	0	0
Chlorpyrifos	0	0	0	1.3
Copper oxychloride	0	1.3	0	0
Dichlorvos	0	1.3	0	0
Dimethoate	0	7.8	6.5	0
Fenvalerate	0	1.3	0	0
Glyphosate	0	2.6	1.4	0
Lambda Cyhalothrin	2.7	10.3	1.2	0
N-Decanol	0	2.6	0	0
Paraquat	1.4	0	2.6	0
Methamidophos	1.4	3.9	1.2	0
Imidacloprid+ beta-cyfluthrin	0	1.3	0	0
Triadimenol	0	1.3	0	0
Not Known	1.4	10.4	3.5	0
Total	21.8	55.8	21.1	1.3

Aluminium phosphide poisoning, followed by Lambda Cyhalothrin (2.7%) and Aldicarb (2.7%). On the other hand, Paraquat, Methamidophos, and Carbaryl had a mortality rate of 1.4% each. Lambda Cyhalothrin recorded the highest percentage of recovered cases (10.3%), followed by Aldicarb and Dimethoate, which recorded (7.8%) each. In addition, 10.4% of APP cases recovered from unknown pesticides, and 1.3% of the poisoning cases recorded had unknown outcomes because of missing information. Dimethoate had the highest number of referred cases (6.5%) recorded during the survey.

4 Discussion

According to the demographic information, most healthcare workers (HCWs) have more than ten years of experience, but none have received any on-the-job training on managing Acute Pesticide Poisoning (APP). Although the HCWs have vast working experience and have handled many APP cases, the lack of refresher training has resulted in gaps in their knowledge of APP management. A study conducted on HCWs with working experience ranging from 1 to 24 years in Tanzania revealed that they had poor knowledge of pesticide poisoning management and were unfamiliar with the adverse health effects of pesticides (Lekei et al. 2017). Knowing the general pattern of APP is crucial, which can lead to early diagnosis and control of poisoning, resulting in reduced morbidity and mortality rates (Koulapur et al. 2015).

According to recent data, most cases (87%) of APP (Acute Pesticide Poisoning) reported in Zimbabwean Health Care Facilities (HCFs) are caused by intentional poisoning. In contrast, a previous study conducted in Zimbabwe over two years suggested a lower figure of 32% due to intentional poisoning (Tagwireyi et al. 2002). The difference between these two studies can be attributed to the increased use of pesticides in Zimbabwe during the last two decades (Zinyemba et al. 2021). Several studies in Low to LMIC countries like Iran, Sri Lanka and India have reported that the intentional use of pesticides for poisoning is a significant challenge associated with pesticide use (Jesslin et al. 2010; Razwiedani and Rautenbach 2017; Noghrehchi et al. 2022; Chan et al. 2023). It has been observed that intentional pesticide poisoning is the cause of one in five suicides worldwide (FAO/WHO 2019). This has led to a global call to reduce and eliminate highly hazardous pesticides and replace them with lower-risk alternatives (Soko 2018; Chan et al. 2023; Ter Horst et al. 2023). It is noted that while a study conducted in Uganda found that 54.7% of all APP cases were caused by non-intentional poisoning, this study discovered that only 13% of cases were due to unintentional poisoning (Sekabojja et al. 2020). However, it is important to consider that the official records of APP may not be entirely accurate as many cases in small communities, farms, and homes go unreported. Farmers who experience mild to moderate pesticide poisoning symptoms often do not seek medical attention unless the condition is severe or life-threatening (Ssemugabo et al. 2017; Tessema et al. 2022). This means the actual number of APP cases is likely higher than officially reported.

The 21-30 age group had the majority (38.8%) of intentional poisoning cases, followed by the 31-40 age group (32.8%). The findings of this study confirmed the WHO, which suggested that pesticides are the most common method of suicide worldwide, and the age group of 15-29 is the most vulnerable (WHO 2022). In another study in Zimbabwe, 42% of intentional pesticide poisoning cases were found to occur in the 21-30 age range (Kasilo et al. 1991). The findings where most APP poisoning incidences were in the 19-29 age range were reported several times in the literature (Jesslin et al. 2010; Pedersen et al. 2017; Samaria et al. 2024; Teym et al. 2024). Domestic disputes, especially among married couples, have also been reported to cause the occurrence of intentional poisoning cases for this age group (Tagwireyi et al. 2002; Chan et al. 2023). Other reasons have also been reported as a result of problems in family, studies, life settlement and employment, which result in stress and may make them attempt suicide (Jesslin et al. 2010; Samaria et al. 2024).

The results of the current study, in which 72.7% of those poisoned were under the age of 40 years, corroborated with a study in South Africa by Razwiedani and Rautenbach (2017), where 79.8% of those poisoned by organophosphates were under the age of 40. Most of the APP incidences were males, and most of them were intentionally poisoned. The incidences of APP by males being much more than by females have been reported in many studies (Tagwireyi et al. 2002; Razwiedani and Rautenbach 2017; Sekabojja et al. 2020; Chan et al. 2023; Samaria et al. 2024). The high number of male cases of poisoning by pesticides has been attributed to the majority of them being engaged in rigorous agricultural works such as spraying and other non-farm related risks of exposure such as stress, family overload and domestic violence (Noghrehchi et al. 2022; Eizadi-Mood et al. 2023). Males also select more lethal methods for deliberate self-harm; they are less likely to seek help for depression and also express their depression differently to women. This results in men more likely to behave impulsively (including suicide) and less likely to be diagnosed and effectively treated (Mergl et al. 2015; Freeman et al. 2017; Eizadi-Mood et al., 2023).

According to a report by Slabbert and Smith (2011), some cases of Acute Pesticide Poisoning (APP) were transferred to referral hospitals, even though these hospitals have a better capacity to handle APP. Referrals to secondary hospitals are made when patients require special care, surgery, high or intensive care management, and remarkable investigations unavailable at the referring facility (Slabbert and Smith 2011; Pedersen et al. 2017).

According to a study, most poisoning cases were caused by WHO class II pesticides, namely Lambda Cyhalothrin and Dimethoate, followed by WHO class 1a Aldicarb and an unclassified highly toxic Fumigant Aluminium Phosphide. These products are categorized as extremely hazardous (1a), highly hazardous (1b) or moderately hazardous (II), and their association with poisoning at the HCF is consistent with their acutely toxic characteristics (World Health Organization 2020; Waktola et al. 2023; Samaria et al. 2024). A similar outcome was reported by HCWs in northern Tanzania, where 71% of the pesticides causing poisoning were WHO class II (Lekei et al. 2017).

It has been reported that in Kenya, the majority of the cases of acute poisoning among healthcare workers were caused by Dimethoate and Lambda Cyhalothrin (Marete et al. 2021). Studies conducted in India have suggested that organophosphates are the primary cause of most Acute Pesticide Poisoning (APP) cases, followed by Pyrethroids (Samaria et al. 2024; Hurtado et al. 2024). Lambda Cyhalothrin is responsible for most poisoning cases in Asia, Africa, and Latin America. Dimethoate has been listed among the top five pesticides responsible for acute poisoning in Zimbabwe between 1970 and 1990 (Nhari 1996). The Rotterdam Convention, Multilateral Environmental Agreement has categorized Lambda Cyhalothrin 5EC and Dimethoate 40EC formulations as Severely Hazardous Formulations due to APP incidents (Rotterdam Convention 2024). As they are cheap and readily available, Lambda Cyhalothrin and Dimethoate are used extensively in the cultivation of various crops in the region and, thus, are the most likely cause of APP.

Aluminium phosphorus poisoning was responsible for most APP cases presented at the HCFs. It has also been reported to be responsible for the majority (over 80%) of deliberate acute poisoning and deaths in Iran and Ethiopia (Navabi et al. 2018; Dorooshi et al. 2021; Waktola et al. 2023). In India, acute APP with Aluminium Phosphide is ubiquitous (68%) and has up to 60% mortality rates (Sarkar et al. 2022). It emerged as a poison of suicidal deaths as it has no effective antidote, is cheap, freely available, and is a ‘sure agent of death (Yatendra et al. 2014).

According to a study, Aldicarb was associated with low mortality rates despite being classified as WHO class 1a due to its high acute toxicity. Lambda-cyhalothrin had the highest recovery rate but moderate mortality rates, possibly because mammals quickly metabolize pyrethroids to non-toxic metabolites (Bradberry et al. 2005). Paraquat and Dimethoate were reported to be the most acutely toxic pesticides responsible for deaths from 2002 to 2019 in Sri Lanka (Manuweera et al. 2008; Buckley et al. 2021). Paraquat poisoning has been found to cause many cases of acute pesticide poisoning, with most outcomes being fatal. After the product ban, the use of Paraquat for acute pesticide poisoning also significantly decreased, with an overall reduction in case fatality (Kim et al. 2017; Chan et al. 2023). Deliberate self-poisoning through the ingestion of Paraquat is a significant cause of illness and mortality in the Asia-Pacific region (Tajai and Kornjirakasemsan 2023).

Mashonaland Central is a region known for intensive farming. As a result, pesticides are easily accessible to farmers. The choice of pesticides farmers use is based on availability, capital, and the range of crops grown in the area (Oesterlund et al. 2014; Bar et al. 2022). Some of the banned pesticides in Zimbabwe, such as Aldicarb, Paraquat and Methamidophos, have still been detected in the area, suggesting that they may have been smuggled into the country. However, the issue of banned pesticides is not unique to Zimbabwe, as it has also been reported in other countries such as Malawi, Kenya, Morocco, Brazil, Taiwan, Costa Rica, Nicaragua, India and Kazakhstan. Illegal pesticides often enter these countries through porous borders, making it difficult to control their circulation (Loha et al. 2018; Kosamu et al. 2020; Benaboud et al. 2021; Bayoumi 2022). Developed countries are also not spared from the illegal pesticide trade. In the first four months of 2020, illegal pesticides worth 94 million were seized in the EU, USA, and Colombia (Bar et al. 2022).

Conclusions and Recommendations

In this study, we analyzed the demographic characteristics of the healthcare facilities visited to identify gaps in knowledge regarding Acute Pesticide Poisoning (APP) management. The results showed that most respondents were nurses (85.9%) with over ten years of experience. However, none of them had received any on-the-job refresher training on APP management, indicating a need for training programs to bridge the knowledge gap. Intentional poisoning was identified as the leading cause of APP cases, with males representing the majority of cases (48.1%). The 21-30 age range had the highest percentage (38.8%) of intentional poisoning cases. The study identified the pesticides responsible for most poisoning cases, including Lambda Cyhalothrin, Dimethoate, Aldicarb, Aluminium Phosphide, and unknown. The highest number of deaths were reported to be as a result of Aluminium Phosphide poisoning. The outcomes resulting from APP were noted as death (21.8%), recovery (56.1%), patient transferred to a referral hospital (20.8%), and unknown (1.3%). The study recommends that healthcare professionals undergo on-the-job refresher training on APP management. Moreover, the government should regulate the use of highly toxic pesticides, including banning highly hazardous ones and replacing them with less toxic alternatives. Finally, there is a need for more research to evaluate the effectiveness of current APP management strategies to improve outcomes for APP cases.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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