

# Understanding Challenges and Barriers in Hospitalization Following Pesticide Poisoning in Rural India: A Qualitative Perspective of Key Stakeholders

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## ABSTRACT

**Introduction:** The broad objective of this study is to understand the challenges and barriers in treatment seeking for victims of pesticide poison in rural India from key stakeholders' perspectives.

**Methods:** A Cross-sectional multi-centric prospective study was designed using a mixed method approach in seven states of India from April 2019 to July 2021. Fifty key stakeholders' interviews were conducted with village heads/leaders, pesticide shopkeepers, doctors/health care professionals, and police officials, and 17 case studies collected information on the treatment-seeking behaviour of pesticide poison survivors.

**Findings:** Unregulated buying, selling, and usage of pesticides have led to increased cases of pesticide poisoning in rural India. Some farmers cross the Indo-Nepal border to purchase banned pesticides. Self-poisoning is often hidden due to fear of police involvement, lengthy legal procedures, and negative family reputation. Lack of awareness about legal procedures and illiteracy are the main reasons for hiding self-poisoning incidences. Victims often do not receive necessary treatment due to a lack of hospital infrastructure, staff shortages, the high cost of medicines, and the distance of referral units from the villages.

**Conclusions:** Awareness generation activities about the impact of pesticide poisoning, medico-legal procedures, and safe use of pesticides are urgently needed to be implemented in rural India to reduce deaths due to poisoning. Additionally, the frontline functionaries of health and police departments needed to be motivated to address these cases with empathy. To reduce fear of police and legal procedures, police departments need to leverage convergence activities between the Ministry of Health and NCRB.

**Keywords:** poisoning, rural, availability, stigma, community, perception

## INTRODUCTION

Globally, 14-20 per cent of suicides are attributed to pesticide self-poisoning [1-2]. Pesticide poisoning is a major issue in low and middle-income countries (LMICs) due to the easy accessibility of pesticides resulting from high farming activities in or

near homes [3-4]. In India, pesticide ingestion is the second-largest mode of suicide, like in other South-Asian countries [5-7]. In 2019, The World Health Organization (WHO) Global Health estimated India accounts for 24.7 per cent of global suicide deaths [8]. Despite a 21.6% decline in suicide

incidences due to poisoning between 2011 and 2021, as reported by the National Crime Records Bureau (NCRB), poisoning remains the second most common method of suicide in India, accounting for 25% of cases [9].

In India, suicide deaths are estimated based on data from the National Crime Records Bureau (NCRB), which compiles registered cases from police records [9]. However, police reporting of suicide incidents is often influenced by the stigma attached to it in society [10]. Consequently, police records may not always provide a complete and accurate picture of the situation and could be underestimated or underreported [11-14]. For instance, during the years 2006 to 2008, Manoranjitham et al. [15] estimated that there were 95 suicides per 100,000 people in Kaniyambadi Block, Vellore District of South India, according to data obtained from the Demographic Surveillance System. This is in contrast to the NCRB estimates for Tamil Nadu state in 2008, which reported 21.7 suicides per 100,000 people [16]. In Lucknow, the estimated prevalence of suicide during 2012 was 24.2 per 100,000 hospital admissions, which is also significantly higher than the NCRB state average of 2.2 per 100,000 [17-18]. According to Patel, et.al. 2012 [11], the NCRB data only accounted for 75% of the actual suicide deaths for men and 64% for women. This indicates that the actual number of suicide deaths in India may be significantly higher than what is officially reported. A study in the informal settlements of Bengaluru city observed discrepancies between police records and socio-cultural autopsy, especially for female suicides [19]. The National Suicide Prevention Strategy (2017) has also confirmed this claim and stated, "India's current data on suicide is not only limited but also incomplete with regard to information on means or most common mode of suicide" [20].

Although previous studies have highlighted the under-reporting of suicide cases by the NCRB data, the reasons behind it remain unknown. To fill this knowledge gap, a

qualitative study has been conducted to investigate the viewpoints of key stakeholders and suicide victims in seven major states of India. The study aims to shed light on self-poisoning, treatment-seeking behaviour, and stigma towards police reporting.

## **MATERIALS & METHODS**

### ***Study setting and design***

The EHA network of hospitals has been operating in eight states for the past 50 years. They are currently running 19 EHA hospitals (Figure 1). These hospitals have a causality unit that treats patients suffering from poisoning and other health issues before referring them to the appropriate facilities. A cross-sectional prospective study was conducted from April 2019 to July 2021, using a mixed method approach, to comprehend the burden of patients hospitalized due to poisoning in the Emmanuel Hospital Association (EHA) network hospitals. The study was commissioned in eight EHA network hospitals across seven major states. These hospitals had recorded a high rate of hospitalization due to poisoning every month. These EHA networks hospitals are: Herbertpur Christian Hospital, Dehradun, Uttarakhand; Christian Hospital Chhattarpur, Chhattarpur, Madhya Pradesh; Champa Christian Hospital, Champa Chhattisgarh; Sewa Bhawan Hospital Jadeshpur, Mahasamund, Chhatisgarh; Chinchpada Christian Hospital, Nandurbar, Maharashtra; Nav Jivan Hospital, Palamu, Jharkhand; Duncan Hospital Raxaul, East Champaran, Bihar; and Jiwan Jyoti Christian Hospital, Sonbhadra, Uttar Pradesh (Fig. 1). The EHA-network hospitals are situated at hard-to-reach areas where most vulnerable population inhabits. The quantitative data was collected from all the patients hospitalised due to poisoning at the EHA network hospitals. Qualitative data was collected from pesticide shopkeepers, village heads/leaders, police officials, health care professionals, and pesticide poisoning victims using Key Informant Interview

(KII) and case study techniques. This study is using only the qualitative data from this study.

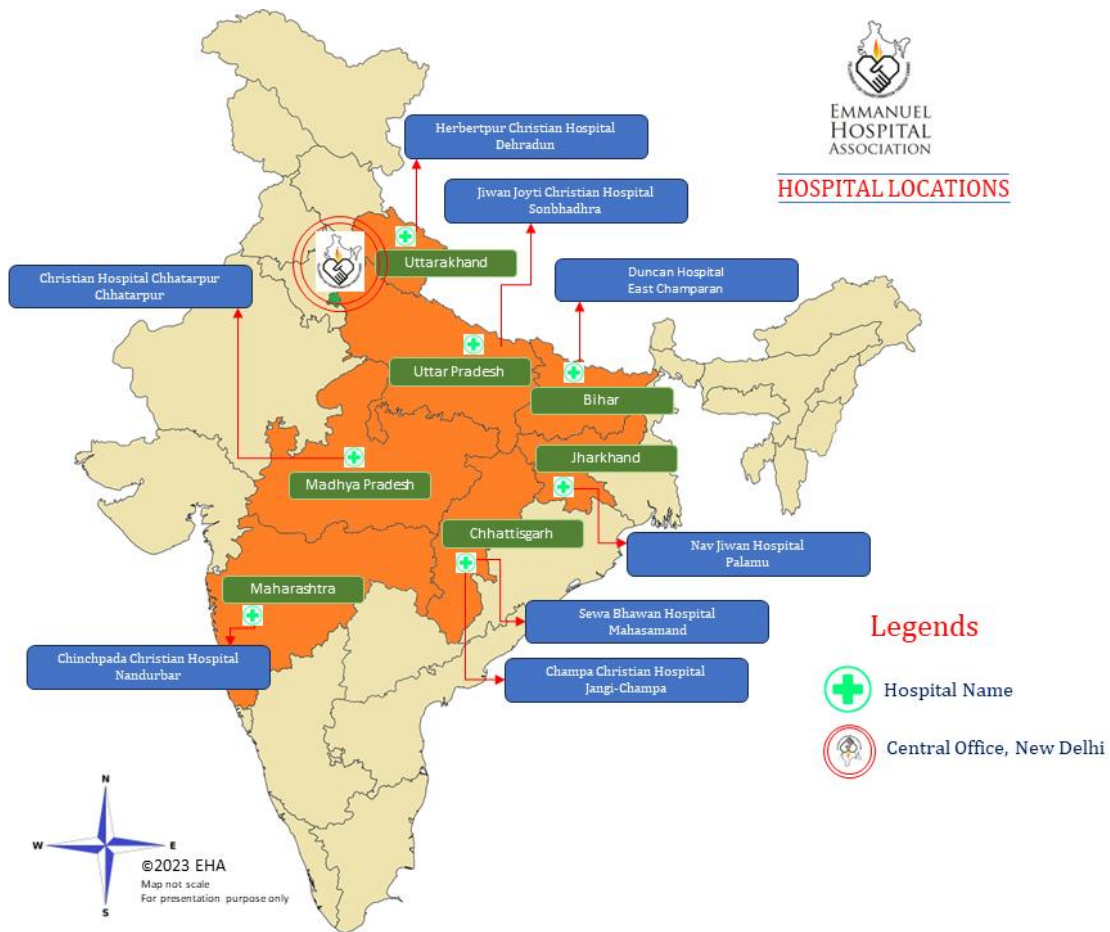


Figure 1. EHA Network Hospitals

### Study participants and sample size

The study required input from individuals with a wealth of information, such as village heads/leaders, pesticide shopkeepers, police officers, and healthcare professionals like doctors and paramedical staff. These key stakeholders were interviewed because they possess in-depth knowledge of community concerns, given their roles and experience. Village heads/leaders, pesticide shopkeepers, and community health workers were deemed exceptionally knowledgeable about community issues. While doctors at hospitals and police officials know the chain of actions that lead to access to treatment, the community outreach activities of EHA are stand-alone programs that run independently of hospitals for more efficient community-level activities. As a result,

EHA staff have a strong rapport with the community as well as various stakeholders. The EHA community workers initially identified all the participants of the qualitative study. The total number of participants was determined by data saturation, resulting in 50 stakeholders being interviewed. These participants included village heads and leaders (8), pesticide shopkeepers (12), police officers (11), and healthcare professionals at both public (12) and non-public facilities (7). Additionally, 18 individuals who attempted suicide by consuming pesticides were interviewed to understand the reasons behind their actions, their behavior in seeking treatment, and their reporting to authorities. To participate in this study, individuals had to meet specific criteria,

such as being 18 years or older and having direct experience in treating, selling, reporting, or addressing suicidal issues.

<b>Thematic areas</b>	<b>Codes</b>	
Pesticide awareness and management	Trend of poisoning incidences over the years	
	Commonly used pesticides in the community	
	Reasons of self-harm by poisoning	
	Knowledge about safe use of pesticides	
Treatment-seeking behaviour for victims of poisoning	Accessing emergency treatments	
	Distance of health facility	
Challenges & Barriers in treatment seeking for victims of poisoning?	Individual barrier	Lack of knowledge about the safe use of pesticide
		Safe storing of pesticide
		Lack of motivation
	Community barrier	Social stigma
		Economic constraints
		Poor road condition
		Availability of Transit
	Institutional barrier	Lack of access to the health facility
		Fear of police
		Lack of health infrastructure and medicine
	Policy influence	Ineffective pesticide policy implementation and monitoring
		Low knowledge about legal procedure of suicide

### **Tools for data collection**

Separate KII guidelines were developed for health care professionals, police officers, the village head and pesticide shopkeepers however, all the questions were designed around themes: 1) Accessing emergency treatment in cases of attempted suicide; 2) Mental-related services; 3) Suicide reporting in rural India; 4) Autopsy; 5) Police reporting; and 6) Indian Penal Code, criminalisation of reporting suicides, 7) current pesticide regulations and management, and 8) illegal access of pesticide. Additionally, a case study guideline was developed to understand individual viewpoints of poison victims. The informal communications, body language and hesitancy of various stakeholders were also recorded in a field diary.

### **Data collection and analysis**

All the interviews were conducted by the lead author in Hindi, following the collection of verbal informed consent. The duration of each interview ranged from 50 to 70 minutes, depending on openness and knowledge of the issue. All the interviews were audio recorded. Then, all the KII audio records were transcribed verbatim in Hindi. After validation of all the responses, the

transcripts were translated into English to preserve the original meaning, context and archiving purposes. The coding and management of all transcripts has been done using ATLAS.ti 22.2.5 and MS Office 2010. The authors included several interactive steps during content analysis. First, all the transcripts were shorted into meaning units and a set of descriptive codes were developed using thematic context analysis (Table 1). Both manifest and deductive approaches have been adopted during the coding of data. Thus, the themes of the study are structured to manifest the research objective. To improve consistency, rigorous criteria in qualitative research were developed by Lincoln and Guba (1986) [21], and the four criteria are credibility, dependability, conformability, and transferability. Several interactive steps are included during this process to fulfil rigour criteria demand. Key findings, which include direct quotations from key stakeholders, are presented in italics.

## **FINDINGS**

### **Profile of the participants**

The study consisted of 50 KII participants with a mean age of 47.2 ( $\pm 10.8$ ) years. The number of participants varied from 6 to 8 across different states. Six stakeholders

from Uttarakhand and eight from Bihar, Chhattisgarh, and Maharashtra participated in the KII. The age range of participants was as follows: police (43 – 57 years), healthcare professionals (40 – 60 years), village heads/leaders (22 – 59 years),

pesticide shopkeepers (28 – 59 years), and frontline health workers (26 – 52 years), as shown in Fig. 2. The mean age of the 17 pesticide poison survivors ranges from 16 to 50 years, and the gender ratio (male/female) is 0.8 (Table 2).

Figure 2. Study participants (Key stakeholders)



Table 2. Pesticide poison survivors' profile

SL	Hospital Name	District	M	F	Age	Total
1	Herbertpur Christian Hospital	Dehradun	1	0	36	1
2	Christian hospital Chhatarpur	Chhatarpur	1	1	32, 24	2
3	Champa Christian hospital	Jangi-Champa	2	2	19,30, 47, 49	4
4	Sewa Bhawan Hospital	Mahasamand	0	1	29	1
5	Chinchpada Christian hospital	Nandurbar	0	1	27	1
6	Nav Jiwan hospital	Palamu	1	0	26	1
7	Duncan hospital	East Champaran	3	3	16,21,45,2,50,1	6
8	Jiwan Jyoti Christian Hospital	Sonbhadra	0	1	23	1
Total			8	9		17

**The magnitude of self-poisoning incidences in the community:**

During discussions with village heads/leaders, police officials, and healthcare professionals, it was highlighted that pesticide poisoning has been on the rise in their respective areas. The village head/leader of Chhattisgarh recounted that in the last year, eight people in his village attempted suicide by consuming pesticides.

Similarly, the village head/leader of Jharkhand stated that poisoning is the primary mode of suicide for 80% of the suicide cases in his village. Police officials from Chhattisgarh, Uttarakhand, Uttar Pradesh, and Bihar confirmed that pesticide poisoning is a significant contributor to suicide in these states. In contrast, the village head/leader and police officials of Maharashtra reported a decline in pesticide

poisoning cases due to the reduced and restricted use of chemical pesticides.

*I noticed for the last 5 to 8 years, the incidences of suicide overall increased in the state, and in most of the cases, the mode is either hanging or pesticide poisoning. I think this situation is due to a lack of opportunities, along with mental health issues.*

– **53-year-old police official from Chhattisgarh**

#### ***Knowledge about commonly used pesticides in the community***

The study found that most participants knew about the commonly used pesticides in their area. *Endosulfan* was widely used in all states except Maharashtra, and other pesticides such as 505, Galmar, De Roger, Demokarant, and Melayathan were in demand in Chhattisgarh. Farmers in Maharashtra have turned to Thymate after the ban on *Endosulfan*. Pesticide shopkeepers listed various pesticides in demand in their areas, with apparent state-wise variations. In Bihar and Uttarakhand, shopkeepers reported not selling banned pesticides but informed that these illegal pesticides were readily available in the black market and in Nepal. As a result, farmers from the Indo-Nepal border area travel to Nepal to buy *Endosulfan*. The study further found that nine out of twelve doctors found traces of *Endosulfan* in patients hospitalised due to poisoning. *Endosulfan and Rat killer are highly toxic and readily available in Nepal. Though these pesticides are banned for use in India, they are still manufactured in India for export, including in Nepal. Since Nepal and India share open borders, the farmers from adjoining areas of the border can easily cross the border and buy these pesticides to use in their farms in India.*

– **34 years old pesticide shopkeeper from Bihar**

#### ***Reasons for pesticide poisoning***

1) **Indirect reasons:** The village leaders and pesticide shopkeepers have pointed out several indirect reasons for pesticide poisoning. They said that most of the population in these areas is involved in agricultural activities, which is why they stock many pesticides in bulk. They attributed the availability of various pesticides in enormous amounts within the vicinity to the ‘*increased government subsidies on agricultural products, including pesticides*’, ‘*unrestricted selling and buying of pesticides*’, and ‘*huge concessions on bulk buying of pesticides*’. Some village leaders and shopkeepers also mentioned that people from far-off villages buy pesticides in bulk and set up pesticide stalls on the roadside, especially during monsoon season. Additionally, big farmers lend pesticides to poor farmers and expect payback after harvesting crops. As a result, both the accessibility of pesticides and pesticide poisoning are increasing. The village leaders also emphasised that farmers often exceed recommended pesticide limits, leading to higher risks of accidental poisoning.

*A few years back, a regulation passed on selling pesticides, which stated that only a life science or agriculture graduate could sell pesticides. However, that regulation had neither been implemented universally nor monitored. Thus, anyone can open a shop and sell it. For a long time, I have been selling pesticides, but I still do not know about HHP regulations in my district and the code of conduct on pesticides. The authorised dealers of pesticides also never ask for or monitor the license or other papers of small shopkeepers.*

– **42 years old village head/leader from Chhattisgarh**

2) **Direct reasons:** During the interview, the experts highlighted that ‘*lack of education and knowledge about pesticides*’, ‘*gambling*’, ‘*fight with spouse*’,

'alcohol consumption', 'domestic violence' and 'adultery' are the critical direct reasons of increasing pesticides poisoning. They further emphasised that due to socio-economic changing scenarios, poverty and alcohol consumption make husband and wife relationship strenuous. Sometimes, husbands were engaged in physical violence towards wives, specifically among scheduled tribes and scheduled casts.

*Two months back, a young man aged 26 years consumed pesticide followed by fighting with his wife. Then, he was admitted to the hospital and saved by the doctors there. The next day, after returning from the hospital, he hanged himself till death.*

#### – 28 years old village head/leader from Jharkhand

The poisoning survivors also informed similar reasons behind impulsive action. The informed 'physical and verbal abuse by close relative', 'stress due to household economic condition', 'verbal abuse by in-laws', 'marital conflict', 'sibling conflict', 'lack of freedom in movement, communication, use of mobile phone, and life partner selection' were the reasons they tried to commit suicide using pesticides.

#### *The legal procedure for an attempt to suicide*

The study aimed to assess the level of awareness among community members, shopkeepers, and healthcare professionals regarding the legal formalities associated with poisoning incidents. All the village heads and leaders mentioned that they knew the procedures to follow for unnatural death. They stated that they must report the incident to the police since they were the only ones authorised to issue a death certificate. The steps to follow after an unnatural death, according to the village heads and leaders, are: firstly, inform the police and the block level Panchayat Secretary; then call the emergency number 100, hospitalise the victim, and conduct a post-mortem autopsy.

#### **Barriers to legal procedure**

The participants from the police department felt that 'lengthy legal procedure', 'lack of law knowledge', 'improper reporting of poisoning incidences', and 'stigma towards the police' are the main barriers to recording suicide incidences, specifically poisoning.

#### 1) **Lengthy legal procedure:**

According to police officials, the main reason for the lengthy legal procedure is the delay in forensic investigations. Forensic laboratories are often located in big cities or the state capital, making it difficult to forward samples and receive results promptly. As a result, family members of the victims may feel that police are intentionally delaying legal procedures. Some police officials have acknowledged that legal procedures can sometimes continue for three to six months, causing family members to feel harassed.

#### 2) **Lack of knowledge about the law:**

One of the police officials stated that suicide has not been a punishable offence in IPC 307 since 2014; however, many residents in these areas are unaware.

#### 3) **Improper reporting of poisoning incidences:**

Another police official said that improper reporting of poisoning incidences is one of the primary reasons for the under-reporting of suicide incidences. He informed that suicide cases are recorded under the circumstances of 'unnatural deaths' instead of 'suicide attempts'. Often, family members of victims either hide or try to avoid the context and process of poisoning to evade lengthy legal procedures. Sometimes, the village heads/leaders, along with family members, also request not to perform post-mortem autopsy. Consequently, suicide deaths are underreported.

#### 4) **Stigma towards the police:**

In the villages, a stigma is attached to involving the police in legal procedures. Village heads, leaders, and shopkeepers have reported that in most cases, families of the

victims are hesitant to take their loved ones to the hospital for treatment because the hospital would file a Medical-Legal Case (MLC), which would involve the police. They fear that the police might harass family members, imprison innocent people and tarnish the family's dignity. To expedite the legal procedure, the police ask for bribes ranging from 1,000 – 25,000 INR, depending on the family's financial capacity. Those who are unable to bribe face prolonged investigations. This present bribery culture has primarily influenced the length of the legal procedure.

*In most of the cases, police reporting was compromised due to social stigma and negotiation for bribes with the police. Some families do not admit the poisoned patients to the hospital due to fear of police involvement. They knew that if they took the patient to the hospital, then the hospital would call the police.*

– **42 years old Village head of Chhattisgarh**

To avoid involving the police, low-income families tend to perform funerals quietly without proper treatment or informing the authorities in case of death. If a victim is hospitalised, hospital staff are often requested not to report the case or inform the police. Healthcare professionals in Uttarakhand have mentioned that some families provide false names and addresses of victims and refuse to disclose information about the poison used to avoid legal procedures. In the district of Chhatarpur, Madhya Pradesh, village leaders and police have reported that 30-40% of suicide cases are not officially reported. A healthcare provider in Raxual, Bihar, has reported that half of all patients hospitalised in their facility last year were Nepalese.

*Six months back, my son committed suicide with rat poison. First, we took him to a nearby hospital and then to a private hospital in Nepal. At the hospital, he was declared dead on the way. We brought back home the body*

*immediately and performed the last rituals. We feared that the police would find out and create a problem.*

– **67 years old village head from Bihar**

The study also tried to know if the participants who were survivors of poisoning reported to the police. Surprisingly, none of the poison survivors reported police involvement in their case.

### ***Barriers and challenges in treatment-seeking***

The stakeholders have identified several barriers that prevent poison victims from accessing prompt treatment. Apart from the fear of dealing with the police and legal procedures, the stakeholders also pointed out the lack of infrastructure and distance to referral units as the foremost obstacles. Often, family members of victims are not aware of the chemical's name or do not bring the container of the chemical, making it challenging for medical professionals to diagnose and treat the patient. Healthcare facilities in remote areas also face challenges in handling critical cases, as they have limited resources such as staff, equipment, and antidotes for poisoning. Additionally, the hospitals have to cater to many patients in the casualty unit, leading to long waiting times for basic first aid. Rapid tests to determine the chemical compound are unavailable, and doctors must rely on the signs and symptoms for treatment.

*During rush hour, our facility's emergency unit receives around 15 – 20 patients. Workforce in our facility is also limited. Hence, patients must wait about 30 – 40 minutes after hospitalisation for attention, stomach cleaning, and other first-aid treatments.*

– **52-year-old Government Facility Doctor from Uttar Pradesh**

It was found that most doctors refer critical cases to district hospitals. However, upon further investigation, it was discovered that



the district hospitals are far from the villages, and transportation is difficult due to the remote location, poor road conditions, and lack of funds. Private facilities in the area are also hesitant to admit patients with poisoning because they fear harassment from the victim's family in case of death. As a result, patients either die on their way to the district hospital or their families abandon treatment seeking.

*If a case is very critical, the doctor directly refers it to the district hospital at Varanasi. Since this facility is bigger and well-equipped with an ICU facility. However, from Robartsganj, the distance to this facility is around 85 km.*

#### – 60-year-old Pharmacists from Uttar Pradesh

Out of the 18 survivors of pesticide poisoning who participated in this study, 12 reported being hospitalised as a result of the poisoning. One adolescent girl shared her experience, stating that her mother immediately took her to a nearby hospital after learning about her poisoning. However, the hospital declined to treat her, citing concerns about alarming the neighbours. She was then referred to another hospital, where her mother admitted her for treatment. The mother requested that the hospital not involve the police, as she did not want the incident to become widely known in their village. Survivors who have not facilitated treatment also stated similar reasons.

## DISCUSSION

Several studies criticize India's official statistics of suicide as an incomplete document due to it being a compilation of police records [20]. However, the actual reasons for underreporting of suicide incidences, specifically pesticide poisoning cases in the police record, are still under veil. This study aimed to understand the barriers and challenges in treatment-seeking and police reporting of pesticide poisoning cases from key stakeholders' perspectives of

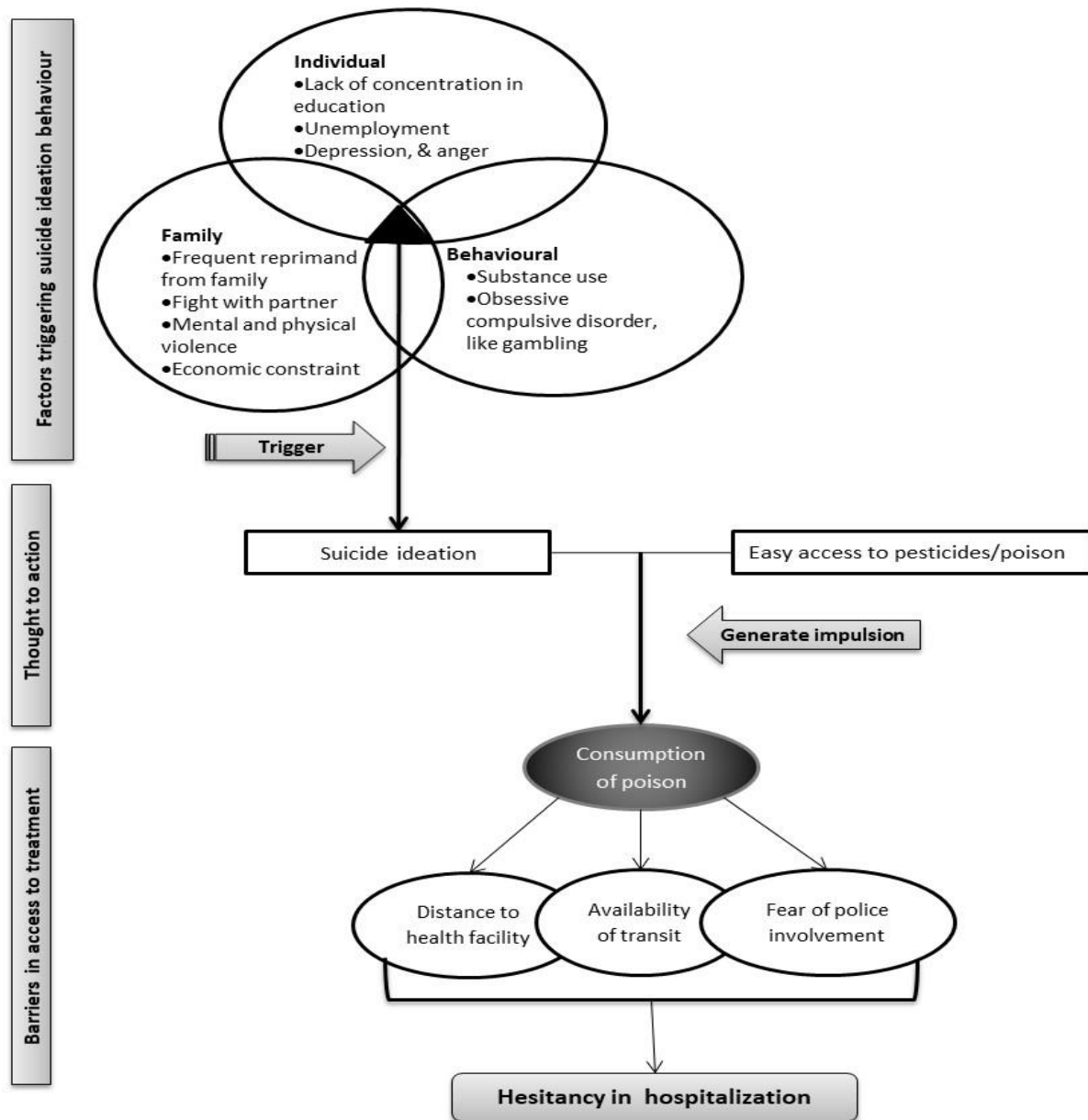
rural India. A total of 50 KII was conducted with village heads/leaders, frontline health workers, doctors, police, and pesticide shopkeepers, along with 18 pesticide poison survivors. The findings of this study can be grouped into three major sections: 1) reasons for pesticide poisoning, 2) thoughts of action, and 3) barriers in treatment-seeking (Figure 3).

**Factors triggering suicide ideation using pesticide:** The findings of this study highlight that the study participants perceive pesticide poisoning is increasing over the years across the states, which is similar to the earlier claim that 'Suicide rates in India are climbing faster than in the rest of the world' [22]. The participants emphasised the 'increasing cost of living', 'indebtedness', 'unemployment', 'substance abuse', 'gambling', 'domestic violence', 'inter-spousal conflict', and 'adultery' are few of the individual, family level, and behavioural factors influencing suicide ideation in the community. In India, personal/social reasons are the leading drive for suicide ideation, has been documented by several studies [15, 23-26].

On the contrary, according to the participants from Maharashtra, the number of pesticide poisoning incidents decreased in their area after the ban on Endosulfan and restrictions on the use of chemical pesticides. They informed that the strict regulations and restrictions on the use of chemical pesticides and farmers' increasing interest in organic farming have contributed to decreased poisoning incidents in the state over the years. Similar findings were recorded earlier in an evaluation study [27] conducted in four villages of Andhra Pradesh, where farmers stopped using chemical pesticides to promote non-pesticide management (NPM). This study found that the means restriction on chemical pesticides reduced suicide by pesticide poisoning [27]. Several other studies conducted in India [27-30], Sri Lanka [31-33], China [34-35], Thailand [36], and Uganda [37] observed that 'means restriction' of

chemical pesticides reduces the prevalence of pesticide poisoning.

Figure 3. Summary of the findings



**Thought to action:** The case studies of poison survivors in this study indicate that in the majority of the cases, suicide ideation is an act of impulse, and the process is lengthy. All the poison survivors informed that access to pesticides was the easiest option for them to opt for suicide. Thus, they impulsively consumed pesticides. The key stakeholders also perceived easy access to pesticides in or near the vicinity caused

the victims to act on suicide ideation. All the village heads/leaders and pesticide shopkeepers emphasised that enormous subsidies on agricultural products and huge discounts for bulk buying pesticides are the foremost reasons behind unregulated pesticide selling, buying, storing and using. This increased easy access to pesticides and the unregulated use of pesticides.

This situation is evident from the reported use and availability of *Endosulfan*, which is banned from being used by the general population of India. The cross-border journey of farmers to buy *Endosulfan* has also been reported by pesticide shopkeepers in Bihar and Uttarakhand.

**Barriers to treatment seeking:** Previous studies highlighted the under-reporting of pesticide poisoning cases in India [11-14, 38]. The findings of this study also observed underreporting. According to the participants, fear and apprehension towards police and legal procedures are the main barriers to treatment seeking. Since hospitalisation would lead to MLC and police involvement. The multifaceted reasons for avoiding police and legal procedures are: victim's family members are unwilling to bribe, avoid imprisonment, lengthy investigation process, and/or delay in the legal procedure. On the other hand, the police officials who participated in this study believe that the general public in India is unaware of the fact that suicide attempts have been decriminalised under the Mental Health Care Act (MHCA) of 2017. Although the attempt to die by suicide is discussed in Section 115 of MHCA 2017, Part 1 of the section states that "Notwithstanding anything contained in section 309 of the Indian Penal Code (45 of 1860), any person who attempts to commit suicide shall be presumed, unless proved otherwise, to have severe stress and shall not be tried and punished under the said Code" [39]. Thus, attempting suicide is still considered a punishable offence.

The findings identified other challenges are 'distance of well-equipped health facilities', 'lack of infrastructures to treat poison patients at the health facility in the vicinity', 'lack of staffs', 'equipment', 'intensive care units', 'anti-dots', 'long waiting time', 'bad condition of the road', 'availability of transit', and 'out-of-pocket expenditure for medicines'. Previous research conducted among cotton farmers in Telangana [40] reported similar findings. Other studies [38,

41] have also documented the challenges faced by rural health facilities in India in treating poison patients due to staff shortages, lack of antidotes for poisons, and other life-saving drugs. However, the India National Suicide Prevention Strategy (NSPS) formulated in 2017 in line with WHO's South-East Asia Regional strategy on suicide prevention and delineates the reinforce, enhance, develop, and strengthen (REDS) path [20], is silent about easy access of treatment for victims of poisoning. However, NSPS has recommended convergence between MoHFW and NCRB to improve the collection and collaboration of NCRB data [20]. However, none of the community-level actions were designed to reduce the stigma of police or IPC 309, which is the main reason for the under-reporting of suicide deaths. The police officials and doctors who participated in this study also mentioned that due to fear and apprehension of police and legal procedure, the family members of victims become non-cooperative; often, family members use the pseudo name and address during hospitalisation. Kaur 2018 also observed the use of dual citizenship among people inhabiting the Indo-Nepal border, where dual citizenship is common for locals. Resulting in poisoning incidents being underreported in the police record [42]. Nevertheless, this study withstands some limitations. First, the study is based on the perception of key stakeholders: village heads/leaders, doctors/health care professionals, police, and pesticide shopkeepers. Second, the study solely focuses on the challenges and barriers to seeking treatment. Thus, community engagement activities of the Government and other organisations to reduce pesticide poisoning haven't been captured to understand its effect on treatment-seeking behaviour. Still, this study is unique since it highlights an important issue: treatment-seeking behaviour associated with pesticide poisoning. Additionally, this study detailed the reasons for the underreporting of pesticide poisoning cases and the reasons

for avoiding hospitalisation of victims by their family members. On the other hand, there is timely and effective access to health care for victims of suicide since the risk of death among poison victims increases among those who have comorbidities [43-44].

## CONCLUSION

In conclusion, the findings of this study emphasise that the complex health systems, low resource settings, low health literacy, and social stigma further compound the difficulty in treatment-seeking and increase the risk of suicide death. Further, emergency care in an institutional setting for patients who attempted suicide is often denied by the victim's family members as well as many hospital authorities and practitioners. They hesitate to provide the needed treatment for fear of legal hassles. Therefore, accurately determining the extent of pesticide poisoning is an enormous issue in mapping high-priority locations. Use, buying, selling, and storing highly hazardous pesticides in the hard-to-reach areas of rural India is unregulated. Even people often use pesticides, which are 'banned of use by general population'. The main reason for increasing death due to poisoning is a lack of motivation towards hospitalisation for several socioeconomic factors, along with the stigma of police and lengthy legal procedures. Lack of infrastructure, distance of health facilities, and easily accessible low-cost medicines are a few other reasons for the lack of treatment-seeking motivation. Consequently, poisoning incidents are under-reported in the police record.

## Declaration by Authors

**Ethical Approval:** Approved. Ethical approval was obtained from the Emmanuel Hospital Association institutional ethics committee for human research (IRB Number 169, Versioin:4).

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**Conflict of Interest:** The authors declare no conflict of interest.

## REFERENCES

1. Mew EJ, Padmanathan P, Konradsen F, et.al. The global burden of fatal self-poisoning with pesticides 2006-15: systematic review. *Journal of Affective Disorders*. 2017 Sep 1;219:93-104.
2. Lee YY, Chisholm D, Eddleston M, et.al. The cost-effectiveness of banning highly hazardous pesticides to prevent suicides due to pesticide self-ingestion across 14 countries: an economic modelling study. *The Lancet Global Health*. 2021 Mar 1;9(3):e291-300.
3. Eddleston M, Karunaratne A, Weerakoon M, et.al. Choice of poison for intentional self-poisoning in rural Sri Lanka. *Clinical Toxicology*. 2006 Jan 1;44(3):283-6.
4. Karunaratne A, Gunnell D, Konradsen F, et.al. How many premature deaths from pesticide suicide have occurred since the agricultural Green Revolution?. *Clinical toxicology*. 2020 Apr 2;58(4):227-32.
5. Chowdhury AN, Banerjee S, Brahma A, et.al. Pesticide practices and suicide among farmers of the Sundarban region in India. *Food and nutrition bulletin*. 2007 Jun;28(2\_suppl2):S381-91.
6. Ajdacic-Gross V, Weiss MG, Ring M, Hepp U, et.al. Methods of suicide: international suicide patterns derived from the WHO mortality database. *Bulletin of the World Health Organization*. 2008; 86:726-32.
7. Bose A, Sandal Sejbaek C, Suganthi P, et.al. Self-harm and self-poisoning in southern India: choice of poisoning agents and treatment. *Tropical Medicine & International Health*. 2009 Jul;14(7):761-5.
8. World Health Organization. Suicide worldwide in 2019: global health estimates. 2021. Licence: CC BY-NC-SA 3.0 IGO.
9. National Crime Records Bureau. Accidental Deaths & Suicides in India 2021. National

- Crime Records Bureau (Ministry of Home Affairs), Government of India. New Delhi. 2022.
10. Joseph A, Abraham S, Muliyl JP, George K, Prasad J, Minz S, Abraham VJ, Jacob KS. Evaluation of suicide rates in rural India using verbal autopsies, 1994-9. *Bmj*. 2003 May 22;326(7399):1121-2.
  11. Patel V, Ramasundarahettige C, Vijayakumar L, *et.al.* Suicide mortality in India: a nationally representative survey. *The Lancet*. 2012 Jun 23;379(9834):2343-51.
  12. Arya V, Page A, River J, *et.al.* Trends and socio-economic determinants of suicide in India: 2001–2013. *Social psychiatry and psychiatric epidemiology*. 2018 Mar; 53:269-78.
  13. Arafat SY, Menon V, Kar SK. Media and suicide prevention in Southeast Asia: challenges and directions. *Journal of Public Health*. 2021 Mar;43(1):e123-4. <https://doi.org/10.1093/pubmed/fdaa084>
  14. Arya V, Page A, Armstrong G, *et.al.* Estimating patterns in the under-reporting of suicide deaths in India: comparison of administrative data and Global Burden of Disease Study estimates, 2005–2015. *J Epidemiol Community Health*. 2021 Jun 1;75(6):550-5.
  15. Manoranjitham SD, Rajkumar AP, Thangadurai P, *et.al.* Risk factors for suicide in rural south India. *The British Journal of Psychiatry*. 2010 Jan;196(1):26-30.
  16. National Crime Records Bureau. Accidental Deaths & Suicides in India 2008. National Crime Records Bureau (Ministry of Home Affairs), Government of India. New Delhi. 2009.
  17. Kumar S, Verma AK, Bhattacharya S, *et.al.* Trends in rates and methods of suicide in India. *Egyptian Journal of Forensic Sciences*. 2013 Sep 1;3(3):75-80.
  18. National Crime Records Bureau. Accidental Deaths & Suicides in India 2012. National Crime Records Bureau (Ministry of Home Affairs), Government of India. New Delhi. 2013.
  19. Sahu B, Tamysetty S, Babu GR, *et.al.* Suicide During the Pandemic in an Informal Settlement of Bengaluru. DOI: <https://doi.org/10.52403/ijhsr.20230124>
  20. Ministry of Health and Family Welfare. National Suicide Prevention Strategy. Government of India, New Delhi, India. 2021.
  21. Lincoln YS, Guba EG. But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New directions for program evaluation*. 1986 Jun;1986(30):73-84.
  22. Swanhuysen E. Suicide deaths in India increasing at alarming rate. *Glocal Health* 2016. <https://www.humanosphere.org/global-health/2016/08/suicide-deaths-india-increasing-alarming-rate/>
  23. Manoranjitham S, Charles H, Saravanan B, *et.al.* Perceptions about suicide: a qualitative study from southern India. *National Medical Journal of India*. 2007 Jul 1;20(4):176.
  24. Mohanraj R, Kumar S, Manikandan S, *et.al.* A public health initiative for reducing access to pesticides as a means to committing suicide: findings from a qualitative study. *International review of psychiatry*. 2014 Aug 1;26(4):445-52. doi:10.3109/09540261.2014.924094
  25. Arya V, Page A, River J, *et.al.* Trends and socio-economic determinants of suicide in India: 2001–2013. *Social psychiatry and psychiatric epidemiology*. 2018 Mar; 53:269-78. <https://doi.org/10.1007/s00127-017-1466-x>
  26. Dandona R, Bertozzi-Villa A, Kumar GA, *et.al.* Lessons from a decade of suicide surveillance in India: who, why and how? *International journal of epidemiology*. 2017 Jun 1;46(3):983-93.
  27. Vijayakumar L, Satheesh-Babu R. Does ‘no pesticide’ reduce suicides? *International journal of social psychiatry*. 2009 Sep;55(5):401-6. doi:10.1177/0020764008095340
  28. Kanchan T, Menon A, Menezes RG. Methods of choice in completed suicides: gender differences and review of literature. *Journal of forensic sciences*. 2009 Jul;54(4):938-42.
  29. Arya V, Page A, Gunnell D, *et.al.* Armstrong G. Suicide by hanging is a priority for suicide prevention: method specific suicide in India (2001–2014). *Journal of affective disorders*. 2019 Oct 1; 257:1-9.
  30. Bonvoisin T, Utyasheva L, Knipe D, *et.al.* Suicide by pesticide poisoning in India: a review of pesticide regulations and their

- impact on suicide trends. BMC public health. 2020 Dec;20:1-6.
31. Gunnell D, Fernando R, Hewagama M, *et.al.* The impact of pesticide regulations on suicide in Sri Lanka. International journal of epidemiology. 2007 Dec 1;36(6):1235-42.
  32. Knipe DW, Chang SS, Dawson A, Eddleston M, *et.al.* Suicide prevention through means restriction: Impact of the 2008-2011 pesticide restrictions on suicide in Sri Lanka. PloS one. 2017 Mar 6;12(3):e0172893.
  33. Konradsen F, Pieris R, Weerasinghe M, *et.al.* Community uptake of safe storage boxes to reduce self-poisoning from pesticides in rural Sri Lanka. BMC Public Health. 2007 Dec;7:1-7.
  34. Page A, Liu S, Gunnell D, *et.al.* Suicide by pesticide poisoning remains a priority for suicide prevention in China: analysis of national mortality trends 2006–2013. Journal of affective disorders. 2017 Jan 15;208:418-23.
  35. Yip PS, Caine E, Yousuf S, *et.al.* Means restriction for suicide prevention. The Lancet. 2012 Jun 23;379(9834):2393-9.
  36. Laohaudomchok W, Nankongnab N, Siriruttanapruk S, *et.al.* Pesticide use in Thailand: Current situation, health risks, and gaps in research and policy. Human and Ecological Risk Assessment: An International Journal. 2020 Aug 26; 27(5):1147-69.
  37. Ssemugabo C, Halage AA, Neebye RM, *et.al.* Prevalence, circumstances, and management of acute pesticide poisoning in hospitals in Kampala City, Uganda. Environmental health insights. 2017 Sep 1; 11:1178630217728924.
  38. Mahadik K, Raut A, Chowdhury M, *et.al.* Medical officer's perspectives and professional challenges in handling poisoning cases in rural India. Indian Journal of Community and Family Medicine. 2022 Jan 1;8(1):39.
  39. Ministry of Health and Family Welfare. Mental Health Care Act (MHCA). (2017). <https://main.mohfw.gov.in/sites/default/files/Final%20Draft%20Rules%20MHC%20Act%2C%202017%20%281%29.pdf>
  40. Kannuri NK, Jadhav S. Generating toxic landscapes: impact on well-being of cotton farmers in Telangana, India. Anthropology & Medicine. 2018 May 4;25(2):121-40.
  41. World Health Organization. Clinical management of acute pesticide intoxication: prevention of suicidal behaviours. World Health Organization; 2008. Geneva, Switzerland. [https://apps.who.int/iris/bitstream/handle/10665/44020/9789241597456\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/44020/9789241597456_eng.pdf)
  42. Kaur, H. Major area disputes of indo-nepal relations: an analysis. *International Education & Research Journal [IERJ]*. 2018. Volume 4(9); pp 10-15.
  43. Cho J, Lee WJ, Moon KT, *et.al.* Medical care utilization during 1 year prior to death in suicides motivated by physical illnesses. *J Prev Med Public Health*. 2013; 46(3):147–54.
  44. World Health Organization. Preventing suicide: A global imperative. World Health Organization; 2014.

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