

Socio-Demiological and Psychological Profile of Poisoning Patients in a Tertiary Care Hospital in Eastern Odisha

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ABSTRACT

Background: Poisoning, involving harmful substance exposure leading to illness or death, causes approximately 300,000 annual deaths globally. Agricultural pesticides, especially in developing countries like India, are commonly used for self-harm, contributing to 20% of global poisoning fatalities, with pesticide consumption being a major cause in India. The aim is to evaluate the socio-demographic and psychological profile of poisoning in tertiary care.

Methods: This cross-sectional observational research at a hospital assessed sociodemographic characteristics of adult poisoning patients admitted to PGIMER and CH. Factors included age, sex, religion, residence, marital status, employment, socioeconomic status, literacy, and poisoning causes. Age was measured in years, and sex was classified as male, female, and other. Religions included Buddhism, Christianity, Islam, Hinduism, and others.

Results: The distribution of poisoning types among patients shows organophosphorus poisoning at 18.8%, celphos and phenyl each at 16.9%, vermilion at 7.5%, oleander at 9.4%, and other types at 30.2%. Primary causes are family disturbances (39.6%) and love affairs (32.1%), with financial and educational issues each at 11.3%. Organophosphorus and oleander poisonings are rural, while urban areas see more vermilion and phenyl poisoning. Suicide is the predominant intent (96.2%), with 42.4% having prior suicidal attempts. Outcomes show 73.5% discharged, 16.9% referred, and 9.4% deaths.

Conclusion: An increase in public awareness about the seriousness of the problem through health education and efforts to destress and develop a healthy outlook towards life should be undertaken. It is needed to establish a poison information centre for the better management and prevention of poisoning cases.

Key-words: Agricultural pesticides, Psychological profile, Poisoning patients, Eastern Odisha, Organophosphates

INTRODUCTION

Poison is any substance which can cause ill health or death when inhaled or ingested or by local action. Exposure to substances in toxic doses leading to clinical signs and symptoms is poisoning ^[1].

The World Health Organisation (WHO) estimates that different acute poisonings cause over 3 lakh deaths annually. The most often utilised compounds for drug abuse in industrialised nations and poisoning in poor ones are agricultural pesticides (organophosphates). The most frequent cause is intending to hurt oneself. 20% of fatalities worldwide are caused by pesticides ^[2]. Poisoning oneself is a prevalent method of suicide in low- and middle-income nations such as India ^[3]. Most poisoning cases in India are caused by pesticide ingestion.^[4] While the kind of poison and the resulting morbidity and death vary depending on the region, poisoning is generally seen as a serious health issue in

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developing nations like India.^[5] Carbamates, organophosphorus. The culprits employed in suicide poisoning in India include home poisons and members of the pyrethroid pesticide family.^[6] The second most frequent way that people intentionally kill themselves is via drug overdose, and pesticide poisoning is frequently linked to a high case fatality rate (CFR) in underdeveloped nations—which is 15 times greater than in industrialized nations.^[7]

Regarding the situation of pesticide poisoning in Odisha and eastern India, very little information is accessible. Furthermore, there is a dearth of material on the psychological effects of poisoning in Odisha. We will be able to better understand the social and psychological problems that poisoning victims face, especially about the intention and cause of the poisoning. To stop such incidents, it will also assist us in promptly determining and controlling the true source of the behaviour.

MATERIALS AND METHODS

Research Design- This study targeted all adult patients admitted to the Department of General Medicine at PGIMER & CH with a confirmed history of poisoning. It utilized a hospital-based observational cross-sectional study design, conducted over a period from January 2023 to December 2023.

The study population consisted of adult patients admitted to the Medicine Ward of PGIMER & CH BBSR due to poisoning. Various socio-demographic characteristics were considered, including age, sex, religion, place of residence, marital status, employment, socioeconomic position, literacy, and causes of poisoning. Age was recorded in years, and sex was categorized as male, female, or other. Religion was categorized into Buddhism, Christianity, Islam, Hinduism, or Islam. The residence was classified as urban if under municipal corporations and rural if under Gram Panchayat areas. Marital status included categories of married, single, separated, and divorced. Employment status was classified into farmers, students, housewives, unemployed (excluding students not engaged in economic activities), and employed (in government, private, or public sectors). Education levels ranged from illiterate, elementary school, high school, and graduate, to higher levels. A predesigned questionnaire was

employed to assess the psychological factors influencing poisoning patients.

Inclusion Criteria- The inclusion criteria for the study were all adult patients with a confirmed history of poisoning and those who or whose attendants consented to participate in the study.

Exclusion Criteria- The study excluded patients with a doubtful history of poisoning, those unwilling to participate, and cases of food poisoning.

Statistical Analysis- The data collected were analyzed using SPSS version 26, employing appropriate statistical parameters for comprehensive analysis. The discrete data was considered by their frequencies and percentage while the continuous data was considered in its average form and standard deviation.

Ethical Approval- The study was approved by the Ethical Committee of PGIMER and Capital Hospital, Bhubaneswar, Odisha.

RESULTS

Table 1 shows that the majority are aged between 16-29 years (52.8%), with smaller proportions in the 30-44 years (35.8%), 45-59 years (5.6%), and ≥60 years (5.6%) age groups. More patients are female (60.3%) than male (39.6%). Address and type of admission data show that most patients from rural areas were referred (48 out of 56), while urban admissions were predominantly direct (32 out of 50). Regarding occupation, the largest groups are unemployed (33.9%) and shop owners/farmers and unskilled workers (20.7% each). Educational distribution indicates a higher number of illiterate patients (24), followed by those with up to 12th-grade education (22), and fewer with higher education (12). Lastly, a notable proportion of patients (30.2%) are addicted to alcohol and smoking.

Table 1: Demographic details of the patients

Age	Frequency	Percentage (%)
16-29 years	56	52.8
30-44 years	38	35.8
45-59 years	6	5.6
>=60 years	6	5.6

Gender Distribution			
Male	Percentage (%)	Female	Percentage (%)
42	39.6	64	60.3
Distribution of address and type of admission			
	Direct	Referred	Total
Rural	8	48	56
Urban	32	18	50
Total	40	66	106
Distribution of occupation			
Occupation	Frequency	Percentage (%)	
Professional	8	7.5	
Semi-professional	6	5.6	
Shop owner/farmer	22	20.7	
Skilled worker	12	11.3	
Unskilled worker	22	20.7	
Unemployed	36	33.9	
Distribution of education			
Education	Frequency	Percentage (%)	
PG & GRADUATE	12	11.3	
12 th Std.	22	20.7	
10 th Std.	13	12.2	
8 th Std.	19	17.9	
Primary school	16	15	
Illiterate	24	22.6	
Distribution of addiction to alcohol and smoking			
	Frequency	Percentage (%)	
Yes	32	30.2	
No	74	69.8	

Table 2 shows the distribution of poisoning types among patients shows that organophosphorus poisoning accounts for 18.8% of cases, followed closely by celphos and phenyl poisoning, each at 16.9%. Vermillion poisoning represents 7.5%, and oleander poisoning makes up 9.4% of the cases. A significant portion, 30.2%,

falls under other types of poisoning, indicating a diverse range of substances involved.

Table 2: Distribution of type of poisoning

Poisons	Frequency	Percentage (%)
Organophosphorus	20	18.8
Celphos	18	16.9
Vermillion	8	7.5
Phenyl	18	16.9
Oleander	10	9.4
Other	32	30.2

Table 3 shows that the primary causes of poisoning are family disturbances (39.6%) and love affairs (32.1%), followed by financial and educational issues, each accounting for 11.3%, with other causes making up 5.6%. The association between residence and type of poison shows that organophosphorus and oleander poisonings are exclusive to rural areas, while urban areas are more affected by vermillion and phenyl poisoning. Suicide is the predominant intent behind poisoning cases (96.2%), with a small percentage being accidental or homicidal (1.8% each). A notable 42.4% of patients had a history of prior suicidal attempts. Regarding outcomes, 73.5% of patients were discharged, 16.9% were referred, and 9.4% resulted in death.

Table 3: Other factors of poisoning and its outcome

Distribution of cause of poisoning			
Cause	Frequency	Percentage (%)	
Financial	12	11.3	
Educational	12	11.3	
Family disturbance	42	39.6	
Love affairs	34	32.1	
Others	6	5.6	
Distribution of association between residence and type of poison			
	Rural	Urban	Total
Organophosphorus	20	0	20
Celphos	16	2	18

Vermillion	0	8	8
Phenyl	0	18	18
Oleander	10	0	10
Other	9	23	32
Distribution of intent of poisoning			
	Frequency	Percentage (%)	
Suicide	102	96.2	
Accidental	02	1.8	
Homicide	02	1.8	
Distribution of history of prior suicidal attempt			
History of prior suicidal attempt	Frequency	Percentage (%)	
Yes	45	42.4	
No	61	57.5	
Distribution of outcome			
	Frequency	Percentage (%)	
Discharged	78	73.5	
Referred	18	16.9	
Death	10	9.4	

DISCUSSION

The following findings were observed: (iv) history of mental illness had no bearing on the degree of intoxication, although patients with mood and schizophrenia disorders were more likely to report moderate to severe courses, while patients with stress and personality disorders were more likely to report asymptomatic and mild courses; (v) patients with a history of mental illness significantly more frequently displayed prior SRB, with recurrence especially common in patients with combined mental illness (45.7%) and personality disorder (44.8%); (vi) patients with a prior mental illness were significantly more likely to have a history of mental illness overall; The majority of our SRB cases were reported in females, which is consistent with other findings. Interestingly, there was no identifiable trigger around.^[8]

One-third of all instances, especially in people with a diagnosed mental illness, which may make it more challenging to identify those who are at risk of developing SRB.^[9] In the remaining patients, spouse

disagreements, family disputes, and health challenges were more commonly identified as triggers for SRB. The only group of patients with a prominently recognised trigger—partnership conflicts—was those with stress disorder. The majority of the patients in this category were first-time suicidal attempters who had not previously received medication or mental health treatment. Notably, individuals suffering from stress-related behaviours avoided SRB more frequently than those who did not.

A known psychiatric condition was present in two-thirds of the cases, which is consistent with earlier findings that individuals receiving psychiatric care had a high incidence of self-poisoning attempts at suicide ^[10]. Compared to individuals with an unidentified mental illness, these patients were more likely to have at least one past SRB, exhibit suicidal behaviour as opposed to parasuicidal behaviour, and have suicidal thoughts. Yousuf *et al.* ^[10] discovered that young individuals who had severe outcomes had a higher incidence of mental illness at the time of SRB.

In keeping with earlier findings from Swiss research looking into suicide attempts, the great majority of patients chose to take their prescription rather than any other kind of drug. Compared to the group without a history of mental illness, patients with a history of mental illness used drugs at a much higher rate ^[11]. Antidepressants, benzodiazepines, and antipsychotics are the most often selected long-term and on-demand drugs by patients with a documented psychiatric condition, which is consistent with the substance source results in this and previous research. Instead, OTC medications—possibly "leftovers" from the medical cabinet—were more frequently used by people without a history of mental illness to self-intoxicate. Of these drugs, antidepressants are a known risk factor for SRB, which is more prevalent in young people and the early stages of the condition. of counselling. Overall, our results corroborate previous meta-analyses showing that the primary risk variables for poisoning suicide are female sex, age 15–40, mental condition, and psychiatric therapy with antidepressants.

Although Crosby *et al.* ^[12] showed that suicide announcements were frequent among patients with psychiatric problems, we did not discover a difference in the prevalence of suicide announcements between those with and without a known mental illness. In addition, we

found that 14.3% of patients left a suicide note—nearly half as many as the number of suicide victims who were evaluated in Japan [13]. That study also discovered that patients who committed suicide due to mental illness tended to write a suicide note less frequently, which is consistent with earlier studies showing that suicide victims without a psychiatric background left a suicide note more frequently.

Mood disorders were the most common cause of illness among the patients in our study, followed by personality disorders, stress disorders, addiction, and schizophrenia. In prior research conducted in Turkey, which focused mostly on cases of intentional self-poisoning, 28.5% of the patient's experienced depression. Among Swiss patients who had self-harmed, the three most common diagnoses were depression, stress disorder, and personality disorder. A prior study found that mood disorders are associated with an increased likelihood of purposeful self-poisoning. Suicide rates among bipolar affective disorder patients are believed to be 17–20 times higher than those in the general population [14]. Moreover, several research reports on mental autopsy revealed that suicide survivors have a higher likelihood of having multiple psychiatric diagnoses [15].

On the other hand, in our investigation, the combined psychiatric condition group experienced just 5.9% of severe poisonings and no fatalities. In our study, we discovered that individuals with mood disorders and those with mixed mental disorders were more likely to have modest to moderate PSS and to take long-term/on-demand medication. Before their current suicide attempt, over 25% of people with mood disorders and mixed mental disorders had suicidal thoughts [16]. There were variations between the two groups: patients with mood disorders showed suicidal intent more frequently, whereas those with mixed mental disorders had a larger percentage of patients with two or more SRB, past psychiatric care, and medication. These results are consistent with prior research conducted on male inmates. In our study, we discovered that individuals with mood disorders and mixed psychiatric illnesses were more likely to take long-term/on-demand medication. This suggests that serious suicide attempts are linked to substantial depression, which is followed by psychosis, anxiety, and addiction disorders [17,18].

Schizophrenia patients recovered from poisoning more severely, took their long-term/on-demand medications,

and had previously received mental treatment and medication [19]. With a lifetime frequency estimated at 5.6%, the risk of suicide is recognised to be elevated among individuals with schizophrenia or schizoaffective disorder. Furthermore, after their initial suicidal thoughts were withdrawn, people with schizophrenia continued to harbour suicidal thoughts and had the greatest likelihood of inpatient mental hospital admissions. It has been demonstrated in the past that following purposeful self-poisoning, people with schizophrenia or other psychotic disorders were more likely to be sent to a mental health facility for discharge [20].

CONCLUSIONS

The study has concluded that the predominance of suicide as the primary intent behind poisoning cases, along with a significant history of prior suicidal attempts among patients. The distribution of poisoning types and associated factors have the multifaceted nature of poisoning incidents, with organophosphorus, celphos, and phenyl being prominent agents. The study highlights family disturbances and love affairs as leading causes, predominantly affecting rural areas. Suicide emerges as the primary intent, with a concerning history of prior suicidal attempts among patients. Despite the severity of cases, a substantial proportion is discharged, indicating effective medical management.

These findings emphasize the need for comprehensive preventive strategies addressing socioeconomic stressors and mental health issues, especially in rural settings, to mitigate poisoning incidences and improve patient outcomes. Additionally, targeted interventions focusing on suicide prevention and mental health support are imperative for reducing the burden of poisoning-related morbidity and mortality in the community.

CONTRIBUTION OF AUTHORS

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