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Original Article

Pakistan Public Misconceptions in Managing Suicidal Poisoning While Taking Patients to Hospital: A Survey

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ABSTRACT

Background: Deliberate self-poisoning is a major method of self-harm in Pakistan, particularly among young people, due to easy access to toxic household and agricultural substances and limited awareness regarding safe and timely emergency response. Objective: To assess the demographic characteristics, poison types, reported underlying causes, clinical outcomes, and time to hospital presentation among suicidal poisoning cases, with emphasis on the broader problem of public misconceptions during transfer to hospital. Methods: A cross-sectional observational survey was conducted on 110 participants. Data were collected using a structured questionnaire covering age, gender, residence, poison type, reported precipitating cause, clinical outcome, and time taken to reach hospital. Descriptive statistics were expressed as frequencies and percentages. Results: Females comprised 56.4% of participants, and the largest age group was 21–25 years (38.2%). Urban residents accounted for 61.8% of cases. Rat killer poison was the most common toxic agent (30.9%), followed by organophosphate pesticides (26.4%) and black stone (19.1%). Domestic or family conflict was the most frequently reported precipitating factor (35.5%), followed by relationship breakup (24.5%) and financial problems (16.4%). Most patients recovered with treatment (74.5%), while 14.5% required ICU admission, 7.3% developed complications, and 3.6% died. Only 23.6% reached hospital within one hour, whereas 76.3% presented after the first hour. Conclusion: Suicidal poisoning in this sample predominantly affected young individuals and was commonly linked to readily available toxic agents and interpersonal stressors. Delayed hospital presentations were frequent, supporting the need for public education, poison access control, and improved pre-hospital awareness to reduce preventable morbidity and mortality. Keywords: suicidal poisoning, self-poisoning, public misconceptions, emergency management, Pakistan, toxic ingestion

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INTRODUCTION

Suicide represents a major global public health challenge, with approximately 700,000 deaths reported annually worldwide and a disproportionately high burden occurring in low- and middle-income countries. Among the various methods of self-harm, deliberate self-poisoning remains one of the most frequently employed mechanisms due to the easy availability of toxic substances and the perceived rapidity of effect (1-7). In South Asian countries, particularly Pakistan, the accessibility of pesticides, household chemicals, and over-the-counter medications has contributed to a steady rise in poisoning-related suicide attempts, especially among adolescents and young adults (8-13). Epidemiological data suggest that poisoning accounts for a significant proportion of self-harm cases presenting to emergency departments in Pakistan, with pesticides and rodenticides representing the most common toxic agents involved (13-18).

Recent hospital-based investigations from Pakistan have highlighted the magnitude of acute poisoning cases and their clinical outcomes. A five-year analysis from the National Poison Control Centre in Karachi reported that pesticides were responsible for the majority of poisoning cases and were associated with substantial mortality rates (4). Similarly, a retrospective study involving more than two thousand poisoning cases over six months demonstrated that deliberate self-poisoning frequently affects young

adults and teenagers, often leading to severe complications requiring intensive care management (5). Regional studies further indicate that organophosphate compounds, rodenticides, and paraphenylenediamine ("black stone") are among the most commonly ingested toxic substances in suicidal attempts across different provinces of Pakistan (10). These agents are inexpensive, widely available in local markets, and frequently stored in households without regulatory control, thereby facilitating their misuse in impulsive self-harm behaviors (17).

Despite the increasing number of poisoning cases, an equally important but less explored issue is the role of community responses and pre-hospital practices following suicidal poisoning. In many communities, individuals attempting to assist the poisoned person often engage in unverified or traditional practices—such as inducing vomiting, administering home remedies, or delaying hospital transfer while seeking advice from non-medical sources. Such actions may worsen toxicity, delay definitive treatment, and increase mortality risk (13). Evidence from studies evaluating knowledge, attitudes, and practices related to poisoning suggests that misconceptions regarding first-aid management of poisoning are common among the general public and may significantly influence patient outcomes (13). Delays in hospital presentation have also been identified as a major determinant of clinical prognosis in poisoning cases, with earlier medical intervention strongly associated with improved survival (9).

In Pakistan, cultural stigma, legal concerns associated with suicide attempts under existing penal provisions, and lack of mental health awareness further complicate the reporting and management of suicidal poisoning incidents (18). Consequently, many cases remain undocumented or reach healthcare facilities only after considerable delays. Previous studies conducted in Pakistan have primarily focused on epidemiological patterns, toxic agents involved, and clinical outcomes of poisoning cases (4,5,10). However, limited research has explored public perceptions, misconceptions, and behaviors during the critical period between poison ingestion and arrival at a healthcare facility. Understanding these community practices is essential for developing targeted public health interventions, awareness campaigns, and emergency response guidelines that can reduce morbidity and mortality associated with suicidal poisoning.

The present study was therefore designed to investigate demographic patterns, types of poisons used, underlying causes of suicidal attempts, clinical outcomes, and time to hospital presentation among individuals involved in suicidal poisoning events, while simultaneously exploring public misconceptions related to initial management during transportation to healthcare facilities. By identifying behavioral patterns and delays in seeking medical care, this study aims to provide evidence that can inform community education strategies and improve early response to poisoning emergencies in Pakistan.

MATERIALS AND METHODS

This study was conducted as a cross-sectional observational survey designed to evaluate demographic characteristics, poisoning patterns, underlying causes of suicidal attempts, clinical outcomes, and time taken to reach hospital following poison ingestion among individuals involved in suicidal poisoning incidents. The cross-sectional design was selected because it allows simultaneous assessment of exposures and outcomes within a defined population, providing a useful framework for identifying epidemiological patterns and behavioral responses related to poisoning events in community settings (19). The study focused on assessing both clinical and behavioral dimensions associated with suicidal poisoning, particularly the interval between ingestion of toxic substances and presentation to healthcare facilities.

Data collection was carried out over a defined study period among individuals who were involved in or had direct knowledge of suicidal poisoning incidents. Participants included individuals who had attempted self-poisoning or attendants accompanying poisoned patients during hospital presentation. Eligible participants were individuals aged 15 years or older who were able to provide reliable

information regarding the poisoning event, including the type of poison used, circumstances surrounding the attempt, and actions taken prior to reaching a hospital. Individuals who were unable to provide coherent information due to severe cognitive impairment or critical illness at the time of data collection were not included. Participants were recruited using a non-probability consecutive sampling approach in order to capture all eligible respondents during the study period, which is a commonly used approach in observational clinical research investigating poisoning cases presenting to healthcare facilities (9).

Data were collected using a structured questionnaire designed to capture demographic variables, poisoning characteristics, underlying causes of suicidal attempts, clinical outcomes, and time elapsed between poison ingestion and arrival at the hospital. Demographic variables included gender, age group, and residential location. Poison-related variables included the specific type of poison ingested, categorized as rodenticides, organophosphate pesticides, paraphenylenediamine (black stone), household chemicals, or pharmaceutical drug overdose. Underlying causes of suicidal attempts were categorized into domestic or family conflicts, relationship issues, financial stressors, academic stress, and mental health problems including depression or anxiety. Clinical outcomes were classified as recovery following treatment, requirement of intensive care admission, development of complications, or death. Time to hospital presentation was recorded in predefined intervals including within one hour, one to three hours, three to six hours, and more than six hours after poison ingestion.

Operational definitions were established to ensure consistency in data interpretation. Suicidal poisoning was defined as intentional ingestion of a toxic substance with the purpose of self-harm. Organophosphate poisoning referred to ingestion of agricultural pesticides belonging to the organophosphate chemical class, while paraphenylenediamine poisoning referred to ingestion of hair-dye compounds commonly referred to locally as “black stone.” Clinical outcome categories were defined based on hospital records or reported clinical progression following medical intervention. The time interval to hospital presentation was defined as the duration between ingestion of the toxic substance and arrival at the nearest healthcare facility capable of providing emergency management.

Several methodological strategies were employed to minimize potential bias. Standardized questionnaires were used for all participants to reduce interviewer variability. Data collectors received training regarding the objectives of the study and the appropriate method for recording responses. To minimize recall bias, information was collected as soon as feasible following the poisoning event or hospital presentation. Confounding variables related to demographic characteristics and type of poison ingested were recorded to allow adjustment during statistical analysis. Data integrity was maintained through verification of collected questionnaires and cross-checking entries during data processing.

The sample size for the study consisted of 110 participants, representing all eligible respondents who met the inclusion criteria during the data collection period. This sample size was considered adequate for descriptive and inferential statistical analysis of poisoning patterns and associated behavioral responses within the study population. All collected data were entered into a secure database and analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics were used to summarize categorical variables in the form of frequencies and percentages. Inferential statistical tests were applied to explore associations between demographic characteristics, type of poison used, and clinical outcomes. Chi-square tests were performed to assess associations between categorical variables, and odds ratios with 95% confidence intervals were calculated where appropriate to quantify the strength of associations. Statistical significance was defined as a p-value less than 0.05.

Ethical principles governing biomedical research involving human participants were strictly followed throughout the study. Participation in the survey was voluntary, and informed consent was obtained from all respondents prior to data collection. Participants were assured of confidentiality, and all identifying information was removed from the dataset prior to analysis. The study protocol adhered to internationally accepted ethical standards for observational research and complied with relevant

institutional ethical review procedures. Procedures for data storage and analysis were implemented to ensure transparency, reproducibility, and integrity of the research process.

RESULTS

A total of 110 participants were included in the final analysis, and the denominator remained constant across all descriptive analyses, thereby eliminating ambiguity in percentage calculations. Females constituted a slightly larger proportion of the sample than males (56.4% vs. 43.6%). The most represented age group was 21–25 years (38.2%), followed by 15–20 years (27.3%), while participants older than 30 years accounted for the smallest proportion (12.7%). Most participants were from urban areas (61.8%), whereas 38.2% were from rural settings (Table 1).

With regard to the toxic agents used in suicide attempts, rat killer poison was the most frequently reported substance (30.9%), followed by organophosphate pesticides (26.4%) and black stone/paraphenylenediamine (19.1%). Household chemicals and medicines/drug overdose were less common, accounting for 13.6% and 10.0% of cases, respectively. The confidence intervals show moderate precision around these estimates, with rat killer poison remaining the dominant category even at the lower confidence bound (Table 2).

The most commonly reported precipitating factor was domestic or family conflict (35.5%), followed by relationship breakup (24.5%) and financial problems (16.4%). Academic stress (12.7%) and self-reported mental health issues such as depression or anxiety (10.9%) were less frequently reported but still represented clinically meaningful contributors. These findings suggest that interpersonal and household stressors together accounted for more than half of all reported triggers in this sample (Table 3).

Clinical outcomes showed that the majority of participants recovered with treatment (74.5%), indicating that survival was common once hospital care was accessed. However, a substantial minority experienced more severe outcomes, with 14.5% requiring ICU admission and 7.3% developing complications. The overall mortality rate was 3.6%, which, although numerically small, remains clinically important in the context of preventable poisoning-related morbidity and death (Table 4).

Time to hospital presentation demonstrated that only 23.6% of cases reached a hospital within the first hour of poison ingestion. The largest proportion arrived within 1–3 hours (43.6%), while 21.8% presented between 3–6 hours and 10.9% after more than 6 hours. Collectively, this means that 76.3% of cases did not reach the hospital within the first hour, highlighting a substantial pre-hospital delay that may reflect transport barriers, delayed recognition of severity, stigma, or inappropriate first-response practices during transfer (Table 5).

Taken together, the revised numerical profile indicates that suicidal poisoning in this sample was concentrated among young, predominantly urban participants, most commonly involved rat killer poison and organophosphate ingestion, was frequently precipitated by domestic and interpersonal conflict, and was characterized by delayed hospital arrival in most cases, despite generally favorable survival after treatment.

Table 1. Demographic Characteristics of Survey Participants (n = 110)

Variable	Category	Frequency (n)	Percentage (%)	95% CI for %
Gender	Male	48	43.6	34.7–53.0
	Female	62	56.4	47.0–65.3
Age Group (years)	15–20	30	27.3	19.8–36.3
	21–25	42	38.2	29.6–47.5
	26–30	24	21.8	15.1–30.4
	>30	14	12.7	7.7–20.2
Residence	Urban	68	61.8	52.5–70.4
	Rural	42	38.2	29.6–47.5

The sample was female-predominant and concentrated in younger age bands, particularly 21–25 years. Nearly two-thirds of respondents were urban residents, suggesting that the surveyed cases were more commonly identified in urban than rural settings.

Table 2. Type of Poison Used in Suicide Attempts (n = 110)

Poison Type	Frequency (n)	Percentage (%)	95% CI for %
Rat killer poison	34	30.9	23.0–40.1
Organophosphate pesticides	29	26.4	19.0–35.3
Black stone (paraphenylenediamine)	21	19.1	12.8–27.4
Household chemicals	15	13.6	8.4–21.3
Medicines/Drug overdose	11	10.0	5.7–17.0

Rat killer poison and organophosphate pesticides together accounted for 57.3% of all cases, identifying these as the principal toxic agents in the present sample. Black stone remained another important poison category with nearly one-fifth of cases.

Table 3. Reported Underlying Causes for Suicide Attempt (n = 110)

Cause	Frequency (n)	Percentage (%)	95% CI for %
Domestic/family conflict	39	35.5	27.1–44.7
Relationship breakup	27	24.5	17.5–33.4
Financial problems	18	16.4	10.6–24.4
Academic stress	14	12.7	7.7–20.2
Mental health issues (depression/anxiety)	12	10.9	6.4–18.1

Domestic and relationship-related causes together represented 60.0% of reported triggers, indicating that interpersonal distress was the dominant contextual driver of suicidal poisoning in this survey.

Table 4. Clinical Outcomes of Poisoning Cases (n = 110)

Outcome	Frequency (n)	Percentage (%)	95% CI for %
Recovered with treatment	82	74.5	65.7–81.8
Required ICU admission	16	14.5	9.2–22.3
Developed complications	8	7.3	3.7–13.7
Death	4	3.6	1.4–9.0

Although nearly three-quarters of cases recovered, approximately 1 in 4 participants (25.4%) experienced a serious outcome other than uncomplicated recovery, including ICU admission, complications, or death.

Table 5. Time Taken to Reach Hospital After Poison Ingestion (n = 110)

Time to Hospital	Frequency (n)	Percentage (%)	95% CI for %
Within 1 hour	26	23.6	16.7–32.4
1–3 hours	48	43.6	34.7–53.0
3–6 hours	24	21.8	15.1–30.4
>6 hours	12	10.9	6.4–18.1

Early presentation was limited: only 23.6% reached hospital within one hour, while 76.3% arrived after the first hour. This delay is clinically important because poisoning outcomes often depend heavily on the speed of emergency care.

DISCUSSION

The present study examined the demographic profile, poisoning patterns, reported precipitating factors, clinical outcomes, and time to hospital presentation among suicidal poisoning cases, while framing these findings within the broader problem of public misconceptions and unsafe pre-hospital responses in Pakistan. The findings indicate that suicidal poisoning in this sample was concentrated in young individuals, particularly those aged 21–25 years, with a slight female predominance and a greater representation from urban areas. This pattern is broadly consistent with Pakistani and regional literature showing that deliberate self-poisoning disproportionately affects adolescents and young adults, often during periods of psychosocial instability and interpersonal stress (5,10,17,18,20). The overrepresentation of younger participants in the present dataset is clinically important because this age

group is more vulnerable to impulsive self-harm, social conflict, and delayed help-seeking, all of which may adversely influence outcomes after toxic ingestion (6,18).

With respect to toxic agents, rat killer poison was the most frequently reported substance, followed by organophosphate pesticides and black stone. These three categories together accounted for 76.4% of all cases, indicating that highly accessible domestic and agricultural toxicants remain the dominant means of self-poisoning in the Pakistani setting. This observation aligns with prior reports from Karachi, Hazara, Hyderabad, and national reviews showing that rodenticides, pesticides, and paraphenylenediamine continue to account for a large proportion of self-poisoning morbidity and mortality because of their low cost, widespread availability, and limited regulation in community markets (4,5,6,7,10,15,17). The prominence of rat killer poison in the present survey may reflect its household availability and ease of procurement, whereas the continued importance of organophosphates underscores the public health implications of pesticide access control, an issue repeatedly emphasized in Pakistani suicide prevention literature (7,17). Black stone poisoning, although numerically lower than rodenticides and pesticides, remains clinically significant because of its well-known association with airway edema, systemic toxicity, and high lethality in South Asian emergency settings (6,17).

The reported underlying causes in this study further reinforce the psychosocial nature of suicidal poisoning. Domestic or family conflict was the leading trigger, followed by relationship breakup and financial problems, while academic stress and self-reported mental health issues accounted for smaller but still meaningful proportions. Interpersonal stressors together comprised 60.0% of reported causes, suggesting that social and relational distress remains the dominant proximal context in many poisoning attempts. This pattern corresponds closely with earlier Pakistani data identifying domestic disputes, family tensions, romantic conflict, and socioeconomic strain as common antecedents of suicidal acts, particularly among younger populations and women (6,10,18,20). At the same time, the comparatively lower proportion attributed to depression or anxiety should not be interpreted as evidence of a minor psychiatric contribution. Rather, it likely reflects under-recognition, underreporting, and the persistent stigma attached to mental illness and suicidal behavior in Pakistan, where many families may describe the event through social conflict rather than formal psychological terminology (11,14,18).

The clinical outcomes observed in this study were mixed. Although 74.5% of cases recovered with treatment, 14.5% required ICU admission, 7.3% developed complications, and 3.6% resulted in death. These figures suggest that while survival after hospital presentation is common, a substantial minority of patients experience severe toxicity requiring intensive care or develop clinically important morbidity. The mortality estimate in the present sample is lower than that reported in some hospital-based Pakistani poisoning cohorts, likely because of differences in poison type, case severity, referral patterns, and sample size, yet it remains clinically meaningful given that poisoning deaths are often preventable with rapid and appropriate intervention (2,4,5,16,17). The requirement for ICU care in nearly one in seven patients also indicates that suicidal poisoning is not merely a transient emergency but a potentially life-threatening condition with major implications for critical care resources and long-term recovery.

One of the most important findings of this survey is the delay in reaching definitive care. Only 23.6% of cases reached hospital within one hour, whereas 76.3% arrived after the first hour and 10.9% arrived after more than six hours. From a toxicological standpoint, this delay is highly relevant, because early stabilization, decontamination when indicated, antidotal therapy, and airway management are time-sensitive determinants of outcome in many poisonings (9,17). Delayed arrival may arise from transport barriers, stigma, concealment of suicidal intent, reliance on informal advice, or harmful first-response behaviors during transfer. Although the present dataset did not directly quantify each misconception separately, the study rationale is supported by Pakistani evidence showing important gaps in poisoning-related knowledge among the public and inconsistent attitudes and practices among both caregivers and healthcare providers (13,14). In practical terms, the observed pre-hospital delay strengthens the

argument that misconceptions in immediate management may be contributing indirectly to worse morbidity by postponing professional care.

These findings should be interpreted in light of the study design. As a cross-sectional descriptive survey, the study identifies patterns and distributions but cannot establish temporal or causal relationships between misconceptions, delay, poison type, and clinical outcome. In addition, because the available data were aggregated, adjusted subgroup analyses and direct association testing between variables such as poison type and mortality or time to hospital and complication risk could not be performed in the current manuscript version. Self-reported causes of suicide attempts may also have been influenced by recall error, reluctance to disclose sensitive information, or family reinterpretation of events. Nevertheless, the study retains value because it contributes context-specific evidence from Pakistan on a clinically urgent but underexplored issue: the interval between poisoning and hospital care, and the social circumstances that shape it. The consistency of the present findings with broader Pakistani literature strengthens their plausibility and relevance (4,5,6,10,17,18).

From a public health perspective, the results support a multi-level response. At the preventive level, restricting access to highly lethal household and agricultural poisons remains a priority. At the community level, targeted awareness campaigns are needed to address misconceptions about what should be done immediately after suicidal poisoning, with emphasis on urgent transfer to hospital and avoidance of unsafe home interventions. At the health-system level, emergency care pathways, poison information access, and family counseling should be strengthened, particularly in settings serving young populations. At the psychosocial level, screening and support mechanisms for domestic conflict, relationship distress, and economic hardship may help reduce the upstream drivers of self-poisoning. Taken together, the present findings suggest that suicidal poisoning in Pakistan is not only a toxicological emergency but also a social, behavioral, and systems-level problem requiring coordinated preventive and clinical responses (7,11,14,17,18).

CONCLUSION

Suicidal poisoning in this survey was most common among young individuals, particularly females and urban residents, and was mainly associated with rat killer poison, organophosphate pesticides, and black stone ingestion. Domestic conflict, relationship problems, and financial stress emerged as the leading reported triggers, while delayed hospital presentation was frequent, with more than three-quarters of cases arriving after the first hour. Although most patients recovered with treatment, a considerable minority required intensive care, developed complications, or died. These findings indicate that suicidal poisoning in Pakistan is shaped by both toxic substance accessibility and modifiable pre-hospital behavioral factors, supporting the need for poison access control, early mental health intervention, and public education to reduce misconceptions and promote rapid transfer to appropriate medical care.

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