Trends in intentional and unintentional events among pediatric patients at a tertiary care center in Gandaki Province, Nepal

Namrata KC[1]*, Aman Panjiyar[1], Bandana Shrestha[1], Nirmala Shrestha[2], Neelu Hirachan[3], Ravi Timasina[4]

[1]Department of Pediatrics, Gandaki Medical College Teaching Hospital and Research Center, Pokhara, Nepal, [2]Department of Community Medicine, Pokhara Academy Health Sciences, Pokhara, Nepal, [3]Department of Forensic Medicine, Gandaki Medical Teaching Hospital and Research Center, Pokhara, Nepal, [4]Department of Psychiatry, Gandaki Medical Teaching Hospital and Research Center, Pokhara, Nepal

ABSTRACT

Introduction: The poisoning and pediatric medicolegal cases among children have been a major cause of hospital admission and a significant global health problem, including Nepal. Unintentional event like poisoning is common among infants and younger children, whereas in older children, poisoning is usually intentional. The aim of this study was to find out the trends in the intentional and unintentional events among pediatric cases admitted to a tertiary care center. **Methods:** The hospital records of children admitted in Pediatric Intensive Care Unit of tertiary care center, Gandaki Province, Nepal from April 2020 to March 2024 were analysed. After ethical approval from Institutional Review Committee, hospital files of 105 patients were conveniently chosen for analysis. The data were analysed using SPSS version 25.0. **Results:** Among 105 admitted cases, 53(50.48%) were males and 52(49.52%) were females. The median (interquartile range) age was 4.5 years (2-12 years). Seventy-four percent of cases had unintentional events. Pesticides were the common ingestion source for both unintentional and intentional events. Interpersonal issues being the common reason (70.83%) of intentional event. The likelihood of intentional event was 11.2 times more among females than male participants (Crude odd ratio: 11.29; 95% CI: 3.10-41.01; p< 0.001). The median (interquartile range) of age for intentional event: 14(13-15) was significantly higher than unintentional event: 3(2-6), p<0.001. **Conclusions:** The unintentional events were common in younger children and intentional events among older children and pesticides being the most common poisoning, highlighting the need of control of availability of toxic pesticides, education regarding safety storage and mental health education for adolescence.

Keywords: Intentional events, pediatrics, pesticides, poisoning, unintentional events.

***Correspondence:**
Dr. Namrata KC
Department of Pediatrics
Gandaki Medical College Teaching Hospital and Research Center, Pokhara, Nepal
Email: namukcpkr@gmail.com
ORCID iD: 0000-0002-7216-785X

Submitted: September 24, 2025
Accepted: December 15, 2025

To cite: KC N, Panjiyar A, Shrestha B, Shrestha N, Hirachan N, Timasina R. Trends in intentional and unintentional events among pediatric patients at a tertiary care center in Gandaki Province, Nepal. JGMC-Nepal. 2025;18(2):153-8.

DOI: 10.3126/jgmc-n.v18i2.84791

INTRODUCTION

Acute poisonings are adverse health effects due to acute exposure (less than 24 hours) to a toxic substance, medications, drug overdose, acute drug abuse problems, chemical exposure, occupational and environmental toxins, biological agents, and envenomation.[1,2] According to the WHO, among all the mortality due to acute poisoning, 13% occurred in age groups less than 20 years.[3]

Intentional events in poisoning are purposely self-inflicted or inflicted by another person with intent to harm and unintentional events are accidental exposure or error. Unintentional event is common in children under five years, whereas intentional events like poisoning is more common in adolescents.[4-6] Among unintentional event mortality, poisonings ranked fourth after road traffic crashes, fires and drowning.[7,8] The demographics and etiology can change over time, even within the same area so to identify trends in particular agents and other variables linked to childhood poisoning, regular

surveillance is crucial.[9]

The aim of the study was to find out the trend of unintentional and intentional event among children specifically the demographics, the common events, the underlying cause for the events and outcomes to focus on the vulnerable age group for better emergency management and highlight the need of control of availability of toxic pesticides, education regarding safety storage and mental health education for adolescence.

METHODS

This is an observational cross-sectional study carried out in 105 children admitted to (PICU) Paediatric Intensive Care Unit of a tertiary care center in Nepal from April 2020 to March 2024 after obtaining ethical approval from Institutional Review Committee. (Ref. No. 90/081/082-F). The intentional events (deliberate ingestion of poison or act of self harm like hanging, drowning) and unintentional medical events(medication error and dosage, ingestion of cleaning agents and pesticides, environmental exposure, bites, stings) confirmed from caregiver history and medical judgement among children aged 5 months to 15 years, admitted to the hospital in PICU with altered vital signs for medical management during the study period with complete data was considered as the inclusion criteria.The sampling technique is convenience sampling including all the children meeting the of inclusion criteria and children with incomplete medical records were excluded from the study as done in Yadav et al.[8]

Variables regarding age, gender, ethnicity, type of poisoning agent, intentional and unintentional events, duration of PICU stay, season of the year and outcome were collected from the hospital records. A proforma for data collection, comprising the variables selected for measurement was used for gathering the required data. Data were entered in MS Excel 2016 and analysis was done in Statistical Package for the Social Sciences (SPSS) version 25.0. The descriptive analysis was expressed in number, percentage, mean, standard deviation, median, interquartile range (IQR), bar diagram. In inferential statistics, Pearson chi-square test was applied to analyze the relationship between two categorical variables. A non-parametric test Mann Whitney U test was applied to analyze the difference between two groups when the numerical data was not normally distributed. The significance level of p-value was set at 5%.

RESULTS

Out of 105 total paediatric participants, 53(50.48%) were males. The minimum and maximum age of the participants were 5 months and 15 years respectively with median age 4.5 years (IQR 2-12 years). Intentional events were most common in autumn season which is optimal season for weed control. The distribution of age group, ethnicity and residential area of children involved in our study is shown below in table 1.

Table 1: Demographic characteristics (n=105)

Variables	Numbers(n)	Percentage(%)
Age-group		
5 month to 5 years	59	56.20%
>5years to 10years	18	17.10%
>10years	28	26.70%
Ethnicity		
Brahmin/Chhetri	46	43.80%
Janajati	35	33.30%
Dalit	24	22.90%
Resident		
Pokhara	64	61.0%
Tanahun	14	13.30%
Baglung	10	9.50%
Syangja	15	14.30%
Lamjung	2	1.90%

The result showed significant relationship between event type and gender (p<0.001). The likelihood of occurrence of intentional event was 11.29 times more among female than male participants (Crude odd ratio: 11.29; 95% CI: 3.10-41.01; p<0.001). Similarly, season was significantly associated with types of events (p=0.011). Intentional events were 7.69 times less likely to occur in summer when compared to winter (Crude odd ratio: 0.13; 95% CI: 0.02-0.89; (p=0.038). However, types of events was not significantly associated with ethnicity (p=0.32) of the participants. (Table 2)

Table 2: Relationship between types of events and various predicting variables (n=105)

Variables	Intentional n(%)	Unintentional n(%)	Chi-square (P value)	Odd ratio (95% CI)	p-value
Gender					
Female	21(40.4%)	31(59.6%)	17.949 (<0.001)*	11.290 (3.10-41.01)	<0.001*
Male	3(5.7%)	50(94.3%)		Reference	
Ethnicity					
Brahmin/ Chhetri	8(17.4%)	38(82.6%)	2.27 (0.321)	0.477 (0.14-1.63)	0.231
Janajati	8(22.9%)	27(77.1%)		0.823 (0.23-2.85)	0.759
Dalit	8(33.3%)	16(66.7%)		Reference	
Season					
Autumn	12(40.0%)	18(60.0%)	11.166 (0.011)*	1.33 (0.32-5.58)	0.689
Spring	6(20.0%)	24(80.0%)		0.451 (0.09-2.11)	0.313
Summer	2(6.1%)	31(93.9%)		0.13 (0.02-0.89)	0.038*
Winter	4(33.3%)	8(66.7%)		Reference	

*p<0.05 denotes statistical significance

Differing patterns of event source were observed between unintentional and intentional groups. Overall most of the

admissions were due to unintentional events 81(77.14%) while 22.86% admissions were due to intentional events. Pesticide ingestion 43(40.9%) was the most common event followed by medication 19(18.1%) and wasp bite 13(12.4%). Hanging 1(0.9%) was the least common event that occurred in our study participants. With regards to the 81 children in whom unintentional events occurred, wasp bite 13(16%) was the most common cause followed by paracetamol ingestion 10(12.3%) and mosquito repellent ingestion 9(11.1%).(Table 3) Similarly, among the 24 children who showed intentional events, organophosphorus poisoining 7(29.2%) was the predominant agent for self-harm followed by rodenticide ingestion 3(12.5%) and psychiatric drug ingestion 3(12.5%). Across all the modes of event, wasp bite, dhatura ingestion, mushroom poisoning, rat bite and foreign body ingestion were 100% unintentional while hanging was 100% intentional. (Table 3)

Regarding outcome of our study participants, majority 81(77.1%) of the children were discharged from the hospital, 10(9.5%) of the children left against medical advise, 7(6.7%) were discharged on request and 7(6.7%) were referred to higher center and no mortality was observed in our center. The majority of the referred patients were unintentional, among them all the four mushroom poisoning were referred. (Table 3)

Table 3: Distribution of unintentional and Intentional events and outcomes (n=105)

Events	Unintentional	Intentional	Total
Pesticides Ingestion	29(35.8%)	14(58.3%)	
Herbicide Ingestion	1(1.2%)	1(4.2%)	
Insecticide Ingestion	5(6.2%)	3(12.5%)	43(40.9%)
Mosquito repellent Ingestion	9(11.1%)	0	
Organophosphorus Ingestion	8(9.9%)	7(29.2%)	
Rodenticide Ingestion	6(7.4%)	3(12.5%)	
Medications Ingestion	13(16%)	6(25%)	
Paracetamol	10(12.3%)	0	
Psychiatric drugs	2(2.5%)	3(12.5%)	19(18.1%)
Antibiotic	1(1.2%)	1(4.2%)	
Unknown medicine	0	2(8.3%)	
Wasp bite	13(16%)	0	13(12.4%)
Cleaner	8(8.8%)	2(8.3%)	10(9.5%)
Dhatura ingestion	7(8.6%)	0	7(6.7%)
Mushroom poisoning	4(4.9%)	0	4(3.8%)
Drowning	3(3.7%)	1(4.2%)	4(3.8%)
Rat bite	2(2.5%)	0	2(1.9%)
Foreign body ingestion	2(2.5%)	0	2(1.9%)
Hanging	0	1(4.2%)	1(0.9%)
Total	81(77.1%)	24(22.9%)	105
Outcome			
Discharged	60 (74.1%)	21(87.5%)	81(77.1%)
Discharged on request	5 (6.2%)	2 (8.3%)	7(6.7%)
Left against medical advice	10 (12.3%)	0	10(9.5%)
Referral	6(7.4%)	1(4.2%)	7(6.7%)

The distribution of unintentional and intentional events that occurred in different age group is shown in Figure 1. Majority of unintentional events (79%) occurred in the younger children from the age group of 5 months to 6 years i.e pre-school age group and 44.4% was among children between six months to two years of age. But, intentional events were seen most commonly in elder children with 87.5% of the events occurring in children greater than 12 years. (Figure 1)

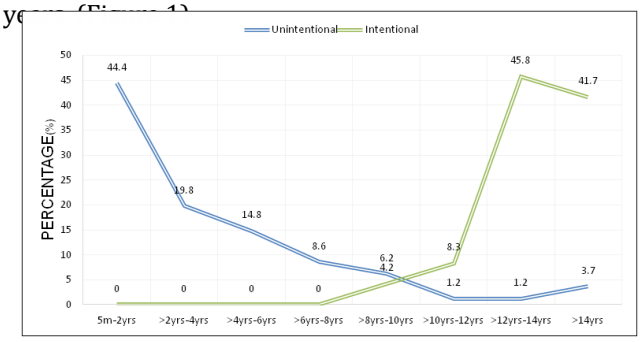

Figure 1: Types of events in different age-groups (n=105)

A non-parametric Mann-Whitney U test was applied to analyze the difference of age between intentional and unintentional group. The result showed statistically significant difference between age in intentional and unintentional events (p-value<0.001). (Table 4)

Table 4: Age difference of participants in intentional and unintentional events (n=105)

Age	Intentional	Unintentional	Mann-Whitney U test	p-value
Mean Rank	90.71	41.83	67.00	<0.001*
Median (IQR)	14(IQR13-15)	3 (IQR2-6)		

*p<0.05 denotes statistical significance

The most common reasons for intentional self-harm was found to be interpersonal issues (70.83%) like conflicts with friends and family members followed by academic issues (16.66%) like exam failure.

The length of PICU stay (median, IQR) in children with intentional events was 2 days (IQR2-3) days with minimum and maximum of 1 day and 17 days respectively, while in children with unintentional events was 2days(IQR2-3) days with minimum and maximum of 1 day and 5 days respectively.

DISCUSSION

In our study, among 105 admitted cases, males to female ratio accounts to 1.01:1 which is almost equal. However, there are few studies showing male predominance of 1.28:1 in Yadav et al. done in eastern Nepal and higher female predominance of 1.29:1 in Kespali et al. done in Antalya, Turkey.[8,10] The median (Interquartile range) age was 4.5 years (2years to 12 years) and the children under 5 years age group (5months to 5years) represented the majority at 59(56.20%). Most studies have reported that poisoining

is commonest in children under five years which is similar to this study, with the highest number of poisonings seen in the age group under 5 years.[6,11,12] The real incidence of childhood poisoning outnumbers the available data in Nepal, as most cases are under-reported. Children of all age groups are at risk of poisoning, with two peaks of age in children under five years because of curiosity and constantly exploring nature and lack of awareness of potential risk and again during adolescence, possibly because of intentional self-harm behavior. Intentional event like poisoning was more common in older girls, the median age was 14 years and unintentional event was more common in younger boys, median age at three years which is similar with the study done by Lin et al. and Bacha et al.[13,14] This finding is consistent with those of several studies undertaken in developing and developed countries.[15-18] Gender distribution followed a similar pattern to global findings, with more females involved in self intentional poisoining.[16-18] According to previous research, women were more likely than men to choose a non-violent method of self-harm.[19-21] In other words, men are likely to commit suicide or involve in self-harm using more lethal methods like firearms, burning, and jumping from high places. Women use poisoning since the probability of getting killed as a result is less than that if more violent methods are used because they do not really want to kill themselves. Some researches suggest that lethality and intent are significantly corelated and some scholars argued that women who attempt suicide are crying for help and are not really motivated to die.[15,22]

This finding may be explained by the increasing rate of intentional poisoning among adolescents in Nepal. However, the difference was less in the age group less than five years which is similar to a study by Prasadi et al. in rural Sri Lanka,[23] where females significantly predominated in older children. This could suggest a potential regional influence on gender distribution in childhood poisoning. The most common reasons for intentional self-harm was found to be interpersonal issues (70.83%) like conflicts with friends and family members in our study which was similar to Harsha et al.[24] The type of poisoning agents depends on geographic location, as reported in different studies, with pesticides common in rural areas and pharmaceutical agents in urban areas. Moreover, the common poisoning agent has also changed over time, with a decrease in kerosene poisoning cases owing to the use of alternative fuel sources in recent days.[25] Most children in this study were poisoned by pesticides followed by medication. Nepal is an agricultural country, and organophosphorus compounds are easily available and accessible at home. Medications were the most common agent for poisoning event in studies done by Lee et al. in Taiwan,[11] Dhakal et al. in Nepal,[12] and Shirkosh et al. in Iran.[26] This data highlights the importance of storing medications in child-resistant containers and places not easily accessible to children. Paracetamol, the anti-pyretic that is easily available over the counter, was the most common medication consumed unintentionally in childhood poisoning, as observed in this study. Studies in Nepal have reported prescription medication and OP poisoning as the most common agents.[12,27]

The duration of hospital stay depends on the type and quantity of poison ingested and the severity of symptoms. The mean hospital stay time in various studies ranges from 0.66 to 17 days.[14,28] The median (IQR) PICU stay time in this study was 2 days (IQR2-3) days in both intentional and unintentional events groups. There was no case fatality rate in our study and various studies have mentioned no death to 3.4% mortality in childhood poisoning.[5,11,29] The better outcome in our study may be due to prompt resuscitation, initiation of antidotes and referral of critically ill children to higher center for further management or could be the quantity of poison ingested being below the lethal range. Additionally, there is an overall decrease in childhood poisoning-related deaths worldwide due to improved emergency and intensive care.[30]

The variations observed in the results might stem from contextual factors such as regional differences in poison availability, socio-cultural norms influencing healthcare-seeking behaviour, and diverse healthcare infrastructure. Similarly, differences in study designs, definitions, and data collection methods across studies may contribute to discrepancies in reported prevalence rates. Clinically, our findings emphasize the importance of healthcare professionals being vigilant about the types of event and poisoning agents prevalent in the region. This knowledge can guide prompt and effective interventions, particularly in cases of pharmaceutical medication poisoning, where timely administration of antidotes is critical.

Several limitations must be acknowledged. Being a retrospective, single-center study, the generalizability of our findings to the broader population is limited. The reliance on hospital admissions may underestimate the true incidence of childhood poisoning, as milder cases may be managed outside the hospital setting. Additionally, the accuracy and completeness of recorded data in medical records introduce potential sources of bias and imprecision.

CONCLUSIONS

The unintentional events were common in younger children and intentional events among older children highlighting the need of control of availability of toxic pesticides, education regarding safety storage and mental health education for adolescence.

ACKNOWLEDGMENTS

The authors express sincere gratitude to Gandaki Medical College Teaching Hospital and Research Center, the Research Committee, and the Institutional Review Committee of Gandaki Medical College. We also thank the nurses and interns for their valuable support. Finally, we extend our heartfelt appreciation to all the respondents who participated in this study.

CONFLICTS OF INTEREST: None declared

SOURCE OF FUNDING: None

AUTHORS' CONTRIBUTIONS

NKC conducted the concept design, literature search, manuscript preparation, manuscript editing and review. AP conducted literature review, data acquisition and manuscript editing. NS carried data analysis and statistical analysis. BS, NH and RT performed manuscript editing. All authors take full responsibility for the integrity and accuracy of the work.

REFERENCES

1. Resiere D, Kallel H, Oxybel O, Chabartier C, Florentin J, Brouste Y, et al. Clinical and Epidemiological Characteristics of Severe Acute Adult Poisoning Cases in Martinique: Implicated Toxic Exposures and Their Outcomes. Toxics. 2020;8(2):28. DOI: 10.3390/toxics8020028 PMID: 32283693.

2. Zhang Y, Yu B, Wang N, Li T. Acute poisoning in Shenyang, China: a retrospective and descriptive study from 2012 to 2016. BMJ Open. 2018;8(8):e021881. DOI: 10.1136/bmjopen-2018-021881 PMID: 30158226.

3. Holder Y, Matzopoulos R, Smith N. World report on child injury prevention: Poisoning. Geneva: World Health Organization; 2008. 123 p. Available from: https://www.who.int/publications/i/item/9789241563574

4. Gaw CE, Curry AE, Osterhoudt KC, Wood JN, Corwin DJ. Characteristics of Fatal Poisonings Among Infants and Young Children in the United States. Pediatrics. 2023;151(4):e2022059016. DOI: 10.1542/peds.2022-059016 PMID: 36897244.

5. Rodrigues Mendonça D, Menezes MS, Matos MA, Rebouças DS, Filho JN, de Assis RS, et al. Acute Poisoning in Children in Bahia, Brazil. Glob Pediatr Health. 2016;3:2333794X15623243. DOI: 10.1177/2333794X15623243 PMID: 27335994.

6. Ramawat P, Jain N. A study about clinic-epidemiological pattern of acute poisoning in pediatric age group. Asian J Med Sci. 2021;12(4):48-53. DOI: 10.3126/ajms.v12i4.30701

7. Taft C, Paul H, Cionsunji R, Miller TR. Childhood unintentional injury worldwide: meeting the challenge. Washington, DC, Safekids Worldwide, 2002. Available from: www.usa.safekids.org/ContentPages/15804783.pdf. [Accessed 18 April 2016]

8. Yadav S, Yadav SP, Agrawal J, Shah G. Pattern of acute poisoning in children in a tertiary care hospital in Eastern Nepal. Inter J Contempor Pediatr. 2016;3(3):1001-5. DOI: 10.18203/2349-3291.ijcp20162380

9. Ram P, Kanchan T, Unnikrishnan B. Pattern of acute poisonings in children below 15 years--a study from Mangalore, South India. J Forensic Leg Med. 2014;25:26-9. DOI: 10.1016/j.jflm.2014.04.001 PMID: 24931857.

10. Kesapli M, Celik A, Isik I. Characteristic Features of Childhood and Adolescent Poisonings, in the Mediterranean Region over 6 Years. Iran J Public Health. 2018;47(11):1667-1674. PMID: 30581782.

11. Lee J, Fan NC, Yao TC, Hsia SH, Lee EP, Huang JL, et al. Clinical spectrum of acute poisoning in children admitted to the pediatric emergency department. Pediatr Neonatol. 2019;60(1):59-67. DOI: 10.1016/j.pedneo.2018.04.001 PMID: 29748113.

12. Dhakal AK, Shrestha D, Shakya A, Shah SC, Shakya H. Clinical profile of acute poisoning in children at a teaching hospital in Lalitpur. J Nepal Paediatr Soc. 2014;34(2):100-3.

13. Lin YR, Wu TK, Liu TA, Chou CC, Wu HP. Poison exposure and outcome of children admitted to a pediatric emergency department. World J Pediatr. 2011;7(2):143-9. DOI: 10.1007/s12519-011-0267-7 PMID: 21574031.

14. Bacha T, Tilahun B. A cross-sectional study of children with acute poisoning: A three-year retrospective analysis. World J Emerg Med. 2015;6(4):265-9. DOI:

10.5847/wjem.j.1920-8642.2015.04.003 PMID: 26693260.

15. Nur Afni Amir, Balamurugan Tangiisuran, Sulastri Samsudin, Noor Afiza Abd Rani, Ahmed Ibrahim Fathelrahman, Fahim Mohamed, et al. Trends in the Intentional and Non-intentional Poisoning-related Calls among Adolescents Reported to the Malaysia National Poison Centre (2010-2020). Univers J Public Health. 2025;11(5): 573-583. DOI: 10.13189/ujph.2023.110505

16. Fathelrahman AI, Ab Rahman AF, Zain ZM. Self-poisoning by drugs and chemicals: variations indemographics, associated factors and final outcomes. General Hospital Psychiatry, 2008;30(5):467–470. DOI: 10.1016/j.genhosppsych.2008.04.004

17. Soler AM, Sanchez LM, Monseny AM, de la Maza VTS, González MDP, Cabeza FV, et al. Epidemiological characteristics in suicidal adolescents seen in the emergency department. An Pediatr Barc. 2016; 85 (1):13-17. DOI: 10.1016/j.anpedi.2015.04.022

18. Zakharov S, Navratil T, Pelclova D. Suicide attempts by deliberate self-poisoning in children and adolescents. Psychiatry Research. 2013;210(1):302–307.

19. Sheridan DC, Hendrickson RG, Lin AL, Fu R, Horowitz BZ. Adolescent Suicidal Ingestion: National Trends over a Decade. J. Adolesc. Health. 2016;60(2):191-195. DOI: 10.1016/j.jadohealth.2016.09.012

20. Pringle K, Caupp S, Shi J, Wheeler KK, Spiller HA, Casavant MJ, et al. Analysis of Intentional Drug Poisonings Using Ohio Poison Control Center Data, 2002–2014. Clinical Toxicology. 2017;55(7):652–658. DOI: 10.1080/15563650.2017.1309050

21. Tyrrell EG, Orton E, Tata LJ. Changes in poisonings among adolescents in the UK between 1992 and 2012: a population-based cohort study. Injury Prevention. 2016;22 (6):400–406. DOI: 10.1136/injuryprev-2015-041901

22. Callanan VJ, Davis MS. Gender differences in suicide methods. Social psychiatry and psychiatric epidemiology. 2012;47:857-869. DOI: 10.1007/s00127-011-0393-5

23. Prasadi GA, Mohamed F, Senarathna L, Cairns R, Pushpakumara PH, Dawson AH. Paediatric poisoning in rural Sri Lanka: an epidemiological study. BMC Public Health. 2018;18(1):1349. DOI: 10.1186/s12889-018-6259-y

24. Harsha KS, Channawar KS, Divya B. Psychosocial factors in children presenting with poisoning in a tertiary care centre. Inter J Contempor Pediatr. 2025;12(2):228-33. DOI: 0.18203/2349-3291.ijcp20250089

25. Jayakrishnan MP, Krishnakumar P, Geeta MG, George B. Changing Trends of Accidental Poisoning in Children over the Last Two Decades. Indian J Community Med. 2021;46(2):350-351. DOI: 10.4103/ijcm.IJCM_723_20 PMID: 34321766.

26. Shirkosh S, Esmaeilidooki M, Nakhjavani N, Hadipour A, Osia S, Hajiahmadi M. Epidemiological and clinical pattern of acute poisoning in children: A hospital based study in northern Iran. Casp J Pediatr. 2019;5(1):334-341. DOI: 10.22088/CJP.BUMS.5.1.334

27. Rwimal HS, Tiwari U, Ghimire K, Thapa M. Hospital Based Study of Poisoning Among Children, 1 to 18 Years of Age in Eastern Nepal. Birat J Health Sci. 2017;2(1):138-41. DOI: 10.3126/bjhs.v2i1.17293

28. Oguche S, Bukbuk DN, Watila IM. Pattern of hospital admissions of children with poisoning in the Sudano-Sahelian North eastern Nigeria. Niger J Clin Pract. 2007;10(2):111-5. PMID: 17902501.

29. Abdel Baseer KA, Gad EF, Abdel Raheem YF. Clinical profile and outcome of acute organophosphate poisoning in children of Upper Egypt: a cross-sectional study. BMC Pediatr. 2021;21(1):98. DOI: 10.1186/s12887-021-02563-w PMID: 33637060.

30. Suting E, Bhaskar V, Batra P. Changing epidemiology of poisoning in children: A retrospective study from a tertiary care center in New Delhi, India. Indian J Public Health. 2021;65(4):400-402. DOI: 10.4103/ijph.IJPH_234_21 PMID: 34975087.