

A Cross-Sectional Study on Assessment of Knowledge, Attitude and Practices Towards Household Poisoning Among South Indian Population

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DOI: <https://doi.org/10.52403/ijhsr.20221202>

ABSTRACT

Background: Hazardous materials have become a popular home item in many developing countries over the last few decades. It has become a huge global health problem due to their simple availability, marketing, accessibility, and lack of knowledge. According to current statistics, unintentional and domestic poisoning is the 13th biggest cause of mortality in India. This was the first KAP study done among South Indian populations regarding household poisoning.

Objective: The study was carried out to assess knowledge, attitude, practices towards household poisoning in South Indian Population.

Materials and methods: A Cross Sectional Observational Survey (online) was done through self-administered questionnaire consist of 27 questions. Data analysis was done using Descriptive analysis.

Result: On an overall comparison among South Indian population regarding knowledge, attitude and practice, Andhra Pradesh has the highest percentage of knowledge (74%) and Kerala has the least percentage regarding knowledge (62.8%). Kerala has the highest level of good attitude (100%) and practice (80.5%) whereas Telangana has the lowest percentage in attitude (29.1%) and Andhra Pradesh was found to have the least percentage on practice (44.8%) regarding the household poisoning.

Discussion: As evidenced by this study, there has been a rise in knowledge and created a positive attitude towards household poisoning. The findings may also help to identify that many were aware of the probable poisonous situations but were hesitant to practice safety precautions.

Conclusion: In conclusion, people in South India needs more awareness on the household poisons, the poisonous circumstances and the management for such emergency situations.

Keywords: Household poisons, Knowledge, Attitude, Practices, South Indian Population, poisons

INTRODUCTION

Hazardous materials have become a popular household item in many developing countries over the last few decades. It has become a huge global health problem due to their wide availability, marketing,

accessibility, and lack of knowledge. [1] On a daily basis, we utilize a wide range of household products in our lives. Many of us are aware that they are harmful and could endanger our lives. When we are not attentive, everything we use at home, from

cleaning goods to cosmetics, cooking fuel, sanitizers, the paint we use, the water we drink, and so on, is poisonous.^[2] The majority of poisonings (79%) occur in low- and middle-income nations like India, with ingestion of hazardous substances being the most common mode of poisoning.^[3]

Poison is defined as any substance that, when put into the live organism or when it comes into contact with any part of it, causes harm or death by local or systemic action, or both.^[4]

Household poisoning is defined as the toxic effect caused due to the exposure of household

products and chemicals such as cosmetics, insecticides, detergents, sanitizers, cleaners etc. Because many household poisons cannot be felt, seen, smelled, or tasted when they come into contact with us, it is critical to be aware of the most frequent household poisons and to take proactive actions to minimize or reduce our exposure to them.^[5]

A study done by Sharda Shah Peshin and Y K Gupta (2018) on epidemiology of household poisoning based on a ten-year retrospective analysis which was performed by the National Poisons Information Centre, New Delhi indicates that unintentional and domestic poisoning is the 13th biggest cause of mortality in India^[4] (45.5%) among adults (>18 years) and children (1 to 18years). Males outnumbered females by a margin of 62.4% to 37.5%. Unintentional poisoning was the most common mode of poisoning (66.8%), followed by intentional poisoning (33.2%). Oral exposure was the most common method of poisoning (95.6%).^[6,7]

The amount of chemicals that could be implicated in a home mishap is enormous. As a result,

no attempt was made to exhaust the subject.^[7] The remarks were limited to some of the

circumstances' more general elements, as well as examples of some of the more common and

noteworthy occurrences. While there is a wealth of information about poisons in the

numerous texts on general toxicology, industrial toxicology, pharmacology, and special articles in the medical literature, these often fall short of providing answers to the specific problems that a physician faces in the event of a household accident.^[8]

Though there are numerous regional evidences, a meta-analysis of worldwide data on household poisoning is still lacking.^[3]

In an urban setting in India, Patil et al. (2014) discovered home items to be the most common poisoning agents.^[9] Poisoning has become a growing source of concern in recent years, not only in India but around the world. Preventive, therapeutic, and rehabilitation strategies are inadequately implemented in India due to a lack of comprehensive scientific data on home poisoning and its variation with age and geography. As a result, this cross-sectional study was conducted to assess the impact of public knowledge, attitude and practice on the prevention of accidental or home poisoning.^[10,11]

The majority of houses utilise solid fuels such as wood, charcoal, and biogas, which produce health-damaging pollutant compounds as a result of incomplete combustion, resulting in substantial health problems as well as serious environmental pollution, which in turn creates health dangers. Xenobiotic organic chemicals in wastewater are primarily found in cleaning and personal care products.^[12] Ethylene glycol and methanol are two of the most harmful compounds still found in household items.

Daniel S et al. (2021) reviewed that in this current pandemic situation, the use of alcohol-based sanitizers has been increased significantly. Hand sanitizers are 60-70% ethyl-alcohol, which can be harmful to children even in small quantity. The prevalence of harm caused by alcohol and non-alcohol-based hand sanitizers was high in the initial five months of the year 2020 when compared to the year 2011-2014. It was highly noticed in children ≤ 12 years of age.^[13]

Poisoning occurs in different ways in different parts of the country. Understanding a country's geographical pattern of poisoning aids in identifying risk factors.^[14]

GRADING SYSTEM

WHO categorized poisoning severity as grading system, based on clinical

presentation upon exposure towards household poisoning (Table 1). A standardized and universally applicable classification scheme for the severity of poisoning allows a qualitative assessment of incidence and facilitates comparability of data.^[15]

Table 1: Poison severity scale

POISONING SEVERITY SCORE (GRADES)	CLINICAL PRESENTATION
NONE (0)	No symptoms or signs related to poisoning
MINOR (1)	Mild, transient and spontaneously resolving symptoms
MODERATE (2)	Pronounced or prolonged symptoms
SEVERE (3)	Severe or life-threatening symptoms
FATAL (4)	Death

A single exposure to a certain dose of toxicant may be sufficient to produce a toxic concentration in the target tissue, leading to the development of toxicity. The persistent presence of toxic amounts of venom can affect the ability of damaged cells to repair, thus preventing any chance of recovery. Therefore, if a single dose that produces symptoms and signs of toxicity is repeated over time, it can lead to death. Repeated exposure to certain chemicals can also produce toxic effects other than acute exposure.^[16] The pathology depends on the exposure path or the poison absorption path. Most of the home poisoning occur by oral ingestion of corrosive effects in the alimentary system with toxicity. If poison get's contact to the skin or eye of a person, the contact area can be damaged. Poisoning will be faster through hot and wet skin than cold and dry skin.^[17]

Moderately strong acid causes the formation of the clotting necrosis of the gut mucosa and the Eschar formation which limits the damage to the surface layer. Moderately strong alkaline causes liquefactive necrosis of the mucosa with a saponification and continues to undergo a deep penetration into connected organs/tissues causing further destruction. These tissue destruction leads to corrosion, disintegration and perforation, and results into slimy mass.^[18] General management of poisoning is common focusing on Airway, Breathing and

Circulation and Decontamination.^[19]

Antidote is regarded as an agent that "changes the kinetics of toxic substances or affects their effects" on the receptor site.^[20]

Antidotes have been identified in a small fraction (<2%) of toxins. In severe poisoning, the antidote is only an auxiliary means to support treatment^[21]

Pharmacy professionals are key participants in the prevention of poisoning because they are the most accessible health care professionals for the public^[22]. Awareness of the possibility of poisoning and education about drug and family safety are essential to limit the effects of poisoning. The intervention of clinical pharmacists reduced the number of unknown poisons, and their participation improved poison identification and poisoning treatment programs.^[23]

Pharmacists can raise public awareness by explaining to parents and other caregivers that most poisoning cases can be safely managed at home by consulting experts at PCC, many of whom employ healthcare professionals, including licensed pharmacists, who are certified and specialize in poison information.^[23]

Because many household poisons cannot be felt, seen, smelled, or tasted when they come into contact with us, it is critical to be aware of the most frequent household poisons and to take proactive actions to minimize or reduce our exposure to them.^[5]

This study was conducted among the people

of South India to assess their knowledge, attitudes and practices concerning household poisoning.

Objectives

- To assess Knowledge, Attitude, Practices towards household poisoning among South Indian Population.
- To obtain socio-demographic variables regarding household poisoning among South
- Indian Population.

LITERATURE REVIEW

Adepu R et al., (2017) concluded that intentional poisoning was more in male adults and in female adolescent group. The mortality and morbidity due to poisoning can be reduced by conducting educational programs in rural areas and providing counselling services and poison information services to the needy people.^[2]

Ashuthosh Baliram Potdar et al., (2018) concluded that there are innumerable things we use in our household on day-to-day basis. Many things that we use at home from cleaning products to cosmetics are toxic when we are not careful about them. In the present study, 84% medical students and 83% nonmedical students said that awareness about household poisons should be added in the academic curriculum. This will provide a pathway for health education to broaden a change of attitude toward household poisons.^[6]

MATERIALS & METHODS

This was a cross sectional observational study (online survey) that was carried out in the South Indian States of Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and Telangana for a period of 6 months in the year 2020-2021 which included an overall sample size 394. The study subjects were selected based on specific inclusion criteria. Included both male and female populations and age > 18 years (for filling the Google forms). Participants with proper internet access, who knows English and those who were willing to give the informed consent

was included. Participants below < 18 years of age, those who were not willing to give informed consent, People without internet access, Participants who didn't know English and participants from North Indian States were excluded from the study

Data collection and design:

Data was collected using self-administered questionnaire through Google forms (KAP-HQ) which was prepared and validated.

The form included the following domains:

Informed consent: It was provided to ensure voluntary participation, protection of rights and safety of the participants.

Demographic Details: Age, gender, educational qualification, occupation, state, family type, special population. Questionnaire was framed in order to assess the **knowledge, attitude and practice** on household poisoning in south Indian population. Each section consists of 9 questions.

Declaration: "the responses provided to the questionnaire are true." was obtained from the participants. The form was circulated through various social media plat forms.

Data Analysis:

The study variables in the data are age, gender, family type, special population etc. The data was tabulated using Microsoft Excel; Data analysis was done using Descriptive analysis.

Validation of questionnaire:

Knowledge, Attitude, Practice for Household poisoning Questionnaire (KAP-HQ) was developed and validated. (KAP-HQ) was circulated through Google forms to collect the required information. The generation of the item in the questionnaire was done. Pre-test, pilot-test were performed with samples of 14 and 30 respectively. Cronbach's alpha was used to establish reliability of the questionnaire (Table 3). Readability of the questionnaire item was measured by the following online test tools.

- Flesch-Kincaid readability tests designed to indicate how difficult a reading passage in English is to understand.
 - The Gunning fog index measures the readability of English writing.
 - The Coleman-Liau index designed to gauge the understandability of a text.
 - The Simple Measure of Gobbledygook (SMOG) is a measure that estimate the years of education needed to understand.
 - The automated readability index designed to gauge the understandability of a text.
- Finally, the average grade level of these tests was taken into account. These tests were done using free online readability calculator (Table 2).

Table 2:

Criteria	Description
Name	KAP-HQ
Purpose	Assessment of Knowledge Attitude Practice on Household poisoning in South Indian population
Research Question	Research questions were identified and finazed by pretest and pilot test
Scale	Likert, yes or no and multiple option
Generation of item	Items generated from experts,underlying theoretical structure and literature review
Pilot of items	Pilot work:30 respondents
Readability	Flesch–Kincaid Gunning fog index Coleman–Liau index SMOG Grade ARI
Reliability	Cronbach’s alpha for each domain > 0.714

Table 3:

CRONBACH’S ALPHA		INTERNAL CONSISTENCY	
$\alpha \geq 0.9$		Excellent	
$0.9 > \alpha \geq 0.8$		Good	
$0.8 > \alpha \geq 0.7$		Acceptable	
$0.7 > \alpha \geq 0.6$		Questionable	
$0.6 > \alpha \geq 0.5$		Poor	
$0.5 > \alpha$		Unacceptable	

Average inter item covariance	Number of items in the scale	Scale reliability coefficient	Internal consistency
0.121	27	0.714	Acceptable

The scale reliability coefficient is 0.71 means 71% of the variance in the scores is reliable variance, 29% of the variance in the scores is error variance.

RESULT

1. Demographic Distribution Among South Indian States (Table: 4).

Table: 4

DEMOGRAPHICS		Demographic Distribution Among South Indian States in Percentage (%)				
		ANDHRA PRADESH	KARNATAKA	KERALA	TAMIL NADU	TELANGANA
AGE	18-25	14.5	10.7	14	18.5	11.4
	26-45	3.3	6.1	5.3	5.3	4.6
	>45	1.3	0.3	2	1	0.8
GENDER	Male	12.4	7.4	12.7	2.3	12.7
	Female	7.1	10.2	8.6	22.1	4.1
EDUCATION	Primary	0.3	0	0	0	0
	Secondary	0	1	0.5	0	0
	HSC	2.3	1.3	2.5	0.8	1
	UG	11.2	9.4	12.7	16	11.2
	PG	5.8	5.8	5.6	8.1	4.6
OCCUPATION	Student	11.4	7.6	10.2	14.5	8.6
	Private	5.3	7.6	6.1	5.6	5.1
	Government	0.8	0.8	1	0.8	1
	Unemployed	2	1.5	4.1	4.1	2
FAMILY TYPE	Small	13.7	11.7	16.5	20.8	12.4
	Large	5.8	5.8	4.8	4.1	4.3

SPECIAL POPULATION	Children	6.9	8.1	8.6	8.6	6.6
	Pregnant	2	2	2.3	0.5	1.3
	Elderly	6.9	9.1	10.7	9.6	6.9

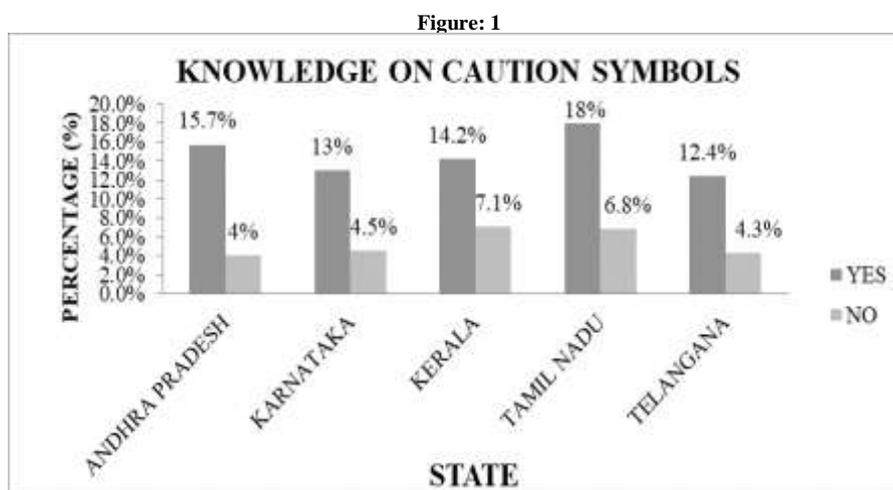
2. Product availability among South Indian states (Table: 5).

Common household product available among South Indian Population in percentage (%)

Table: 5

HOUSEHOLD PRODUCTS	ANDHRA PRADESH	KARNATAKA	KERALA	TAMIL NADU	TELANGANA
CLEANERS	19%	14.7%	21.3%	24.1%	16.8%
COSMETICS	18.8%	14.2%	21.1%	23.9%	16%
PESTICIDES	18%	12.7%	16.5%	19.3%	14.7%
ELECTRONICS	19%	13.5%	21.1%	24.4%	16.5%
STATIONARIES	18.8%	14.2%	20.8%	24.4%	15.7%
MEDICINES	9.6%	6.9%	13.2%	11.9%	9.4%
MISCELLANEOUS	18%	13.7%	20.8%	23.1%	16%

3. Knowledge on caution symbols on the label of household products (Figure: 1).



4. Attitude on mixing of chemicals, usage of products after colour and consistency is changed, reuse of containers and once product is expired (Table: 6).

Table: 6

STATE	%	%	%
Andhra Pradesh	14.1 %	5.9%	0%
Karnataka	0%	15.3%	0%
Kerala	0%	21.3%	0%
Tamil Nadu	0%	23%	3.5%
Telangana	1.8%	6.1%	8.9%

5. Approaches in case of poison exposure (Table: 7).

Table: 7

APPROACHES	Andhra Pradesh	Karnataka	Kerala	Tamil Nadu	Telangana
Wait for the symptoms to appear	0%	0%	0%	0%	7.1%
Try to remove poison from the affected area	0%	0%	0%	14%	9.6%
Treat by self	0%	0%	0%	9.9%	0%
I go to hospital	8.1%	17.5%	14%	0%	0%
Call for medical emergency care(108)	11.4%	0%	0%	0%	0%
(Poison Information Center)	0%	0%	7.5%	1%	0%

6. OVERALL COMPARISON ON KNOWLEDGE, ATTITUDE, PRACTICES TOWARDS HOUSEHOLD POISONING AMONG SOUTH INDIAN STATES (Figure:2).

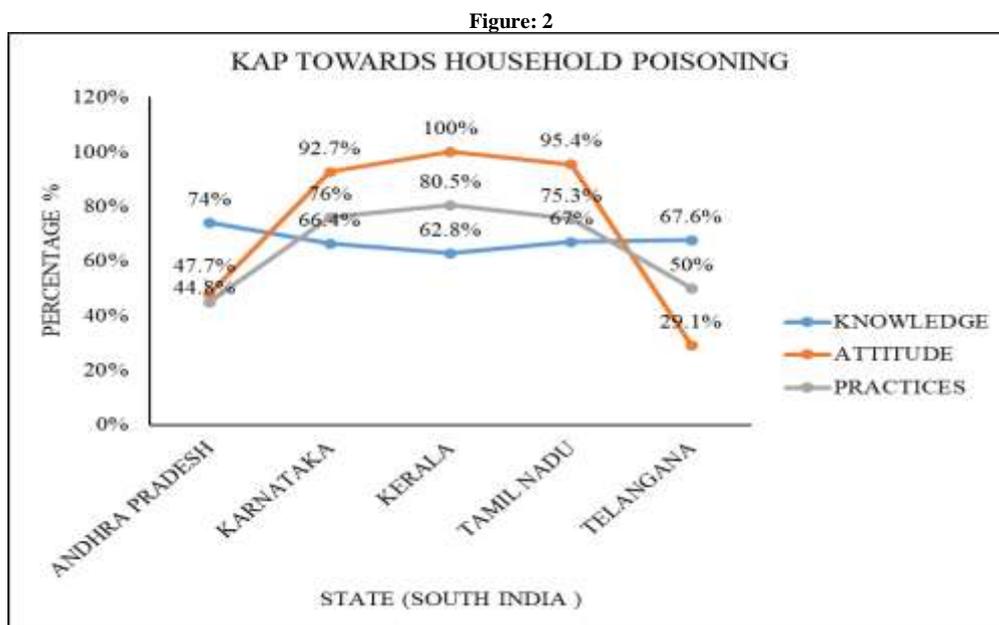


Figure: 2 illustrated that maximum Knowledge level was found in Andhra Pradesh (74%) followed by Telangana (67.6%) Tamil Nadu (67%) followed by Karnataka (66.4%) followed by Kerala (62.8%) and maximum positive attitude was found in Kerala (100%) followed by Tamil Nadu (95.4%) followed by Karnataka (92.7%) followed by Andhra Pradesh (47.7%) followed by Telangana (29.1%) and maximum good practice was found in Kerala (80.5%) followed by Karnataka (76%) followed by Tamil Nadu (75.3%) followed by Telangana (50%) and Andhra Pradesh (44.8%).

DISCUSSION

A variety of household products are used and retained at house for our day-to day needs and are stored in areas of easiest access and visibility. Improper storage and utilization of these products might lead to different type of toxicity. So, this cross-sectional study was conducted among South Indian population to assess the respondent's knowledge, attitude and practice on household

poisoning where a total of 402 responses were obtained, from Andhra Pradesh (77), Karnataka (69), Kerala (84), Tamil Nadu (98), Telangana (66) and also 8 responses from other states of India, which was excluded for our study.

From the study, we observed that major responses were from age between 18-25 years (71%) and the least responses were obtained from the people of age above 45 years. The responses from females outnumbered the males. Most of our respondents were from large family (76.4%). Many of respondents have special population in their family, either pregnant women, children <18 years or people above 60 years. Ashutosh Baliram et.al., (2018), conducted a similar study among medical and non-medical students regarding the household poisoning. In their study they found out that medical students have more awareness on household poisons than non-medical students despite that, while assessing commonly used household products such as sanitizers, cosmetics, cooking fuel, asbestos many were aware about the harmful effect of them. But least

were aware about the harmful effects of asbestos like respiratory problems, the same conclusion reflected in our study.

Our current study, which is the first study conducted among South Indian population on knowledge, attitude and practices towards household poisoning and revealed that Andhra Pradesh has the highest level of knowledge whereas level of attitude and practice regarding the household poisoning was high in Kerala and the least was found in Telangana.

From this study, we found that some factors contribute to the poison exposure, like age, literacy rate, also lack of awareness and carelessness, improper storage, pessimistic attitude towards handling of household products, misconception, and lack of knowledge on first aid procedures, availability of look-alike substance at home. As evidenced by this study, we have provided an approach to gather the knowledge, attitude, practices of household poisoning among South Indian respondents and tried to create a positive attitude towards it. Furthermore, the study has offered an insight into potential reasons for the toxic exposure in houses and the approaches to be taken in case of a poisonous exposure.

Our study revealed that, most people are aware about the household poisoning, but still refuse to practice, which may be due to various practicability. So, the future study can focus on justification for refusal of practice regarding household poisoning among South Indian states also preventive, therapeutic, and rehabilitation strategies are inadequately implemented in India due to a lack of comprehensive scientific data on home poisoning and its variation with age and geography. More study is needed in this field to determine the precise incidence of unintentional poisoning in the country, as accidental poisoning is still a neglected aspect of research in the country.

LIMITATIONS OF THE STUDY

As the current study was done through an online self-administered questionnaire, it

has certain limitations.

The responses were not equally recorded among the targeted states, therefore the precision of our results was fluctuating.

A considerable amount of the 'not sure' response to household poisonings views may be attributed to misconceptions about the incidence of poisoning among the community. They were hence not included in comparison on KAP study.

Our survey couldn't reach out the common population of the South India majorly the illiterate people and so the responses we collected from them were so sparse.

Several factors, such as internet accessibility and social media platform access, may have a direct influence on the survey population. This may hence lead to reporting bias.

Few were refused to give the informed consent and so it was a major barrier in collecting data.

Language barriers were also a major limitation in conducting our study as our survey questionnaire was prepared in English language.

Less sample size and short duration is also a limitation factor.

CONCLUSION

In our study we found that majority of the people were aware that no poisonous exposures should be treated by self they hardly knew whom to contact in case of an emergency. The findings also help to identify that many were aware of the probable poisonous situations but were hesitant to practice safety precautions. In conclusion, people in South India need more awareness on the household poisons, the poisonous circumstances and the management for such emergency situation.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: The author would like to thank the C.L Baid Metha College of Pharmacy, Chennai for the support and help provided in the completion of the work.

Source of Funding: None

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

REFERENCES

1. Ramanan Karunakaran S, Muthunayanan L, Ramraj B. Prevalence of accidents and poisoning due to household hazardous materials in a rural area of Kancheepuram, Tamil Nadu. *Int J Community Med Public Health*. 2019 Apr 27;6(5):2047.
2. Potdar A, Priyanka D, Pawar G, Pawar J. Awareness and attitude toward household poisons among medical and nonmedical students: A comparative study. *Indian J Health Sci Biomed Res*. 2018;11(3):260.
3. Mittal C, Singh S, Kumar-M P, Varthya SB. Toxicoepidemiology of poisoning exhibited in Indian population from 2010 to 2020: a systematic review and meta-analysis. *BMJ Open*. 2021 May;11(5):e045182.
4. Peshin SS, Gupta YK. Poisoning due to household products: A ten years retrospective analysis of telephone calls to the National Poisons Information Centre, All India Institute of Medical Sciences, New Delhi, India. *J Forensic Leg Med [Internet]*. 2018;58:205–11. Available from: <http://dx.doi.org/10.1016/j.jflm.2018.07.005>
5. Reed DR, Knaapila A. Genetics of taste and smell: poisons and pleasures. *Prog Mol Biol Transl Sci [Internet]*. 2010;94:213–40. Available from: <http://dx.doi.org/10.1016/B978-0-12-375003-7.00008-X>
6. Jesslin J, Adepu R, Churi S. Assessment of prevalence and mortality incidences due to poisoning in a South Indian tertiary care teaching hospital. *Indian J Pharm Sci [Internet]*. 2010;72(5):587–91. Available from: <http://dx.doi.org/10.4103/0250-474X.78525>
7. Justin S, Shobha C. Impact of Educational Intervention on Knowledge, Attitude and Practice among General Public Regarding Accidental Poisoning. *Indian Journal of Pharmacy Practice*. 2014;7(1).
8. Hughes MF, Beck BD, Chen Y, Lewis AS, Thomas DJ. Arsenic exposure and toxicology: a historical perspective. *Toxicol Sci [Internet]*. 2011;123(2):305–32. Available from: <http://dx.doi.org/10.1093/toxsci/kfr184>
9. Patil A, Peddawad R, Verma VCH, Gandhi H. Profile of acute poisoning cases treated in a tertiary care hospital: a study in Navi Mumbai. *Asia Pac J Med Toxicol*. 2014;3:36–40.
10. Chelkeba L, Mulatu A, Feyissa D, Bekele F, Tesfaye BT. Patterns and epidemiology of acute poisoning in Ethiopia: systematic review of observational studies. *Arch Public Health [Internet]*. 2018;76(1). Available from: <http://dx.doi.org/10.1186/s13690-018-0275-3>
11. World Health Organization (WHO). World health statistics 2016: Monitoring health for the sustainable development goals (SDGs). Genève, Switzerland: World Health Organization; 2016.
12. Varthya SB, Mittal C, Singh S. Comprehensive analysis of incidence and prevalence of poisoning in India and its regions: a systematic review and meta-analysis. *Prospero CRD42020199427*. 2020;
13. Nyayakar S, Sundar Singh S, Christan M, Kurian Joseph M. A review on Alcohol Based Hand Sanitizers (ABHS) Poisoning during COVID-19 pandemic among young children. *PIJR*. 2021 Jun 15;(10):34-7.
14. Hovda KE, Bjornaas MA, Skog K, Opdahl A, Drottning P, Ekeberg O, et al. Acute poisonings treated in hospitals in Oslo: a one-year prospective study (I): pattern of poisoning. *Clin Toxicol (Phila) [Internet]*. 2008;46(1):35–41. Available from: <http://dx.doi.org/10.1080/15563650601185969>
15. Persson H, Sjöberg G, Haines J, Garbino J. Poisoning Severity Score: Grading of acute poisoning. *J Toxicology - Clinical Toxicology*. 1998;36:205–13
16. Klaassen CD, Halstead BW, Wong KL. poison. In: *Encyclopedia Britannica*. 2020.[cited 2022 Nov 10]. Available from: <https://www.britannica.com/science/poison-biochemistry>.
17. Advenier A-S, Dorandeu A, Charlier P, Lorin de la Grandmaison G. Microscopic acute lesions after caustic exposure. *Forensic Sci Int [Internet]*. 2014;234:57–63. Available from: <http://dx.doi.org/10.1016/j.forsciint.2013.10.039>
18. Ranzato R, Busato T, Tropea A, D'Amico C, Paratore S. Esophago-gastric lesions caused by caustics. *Ann Ital Chir*. 1992;63(5):605–9; discussion 610.
19. Chowdhury FR, Ruhan AM. Household Poisoning. In: *Clinical Pathways in Emergency Medicine*. New Delhi: Springer India; 2016. p. 503–12.
20. De Garbino JP, Haines JA, Jacobsen D, Meredith T. Evaluation of antidotes: Activities of the international programme on chemical safety. *J Toxicol Clin Toxicol [Internet]*.

1997;35(4):333–43. Available from:
<http://dx.doi.org/10.3109/15563659709043364>

21. Chacko B, Peter JV. Antidotes in poisoning. *Indian J Crit Care Med* [Internet]. 2019;23(Suppl 4):S241–9. Available from: <http://dx.doi.org/10.5005/jp-journals-10071-23310>

22. Researchgate.net. [cited 2022 Nov 11]. Available from: https://www.researchgate.net/publication/296337995_The_Role_of_the_Clinical_Pharmacist_in_Poison-Related_Admissions_in_a_Secondary_Care_Hospital

23. Uspharmacist.com. [cited 2022 Nov 11]. Available from:

<https://www.uspharmacist.com/article/the-pharmacists-role-in-pediatric-poison-control>

How to cite this article: S. Daniel Sundar Singh, Alka M Das, Harshini A et.al. A cross-sectional study on assessment of knowledge, attitude and practices towards household poisoning among South Indian population. *Int J Health Sci Res.* 2022; 12(12):7-16.

DOI: <https://doi.org/10.52403/ijhsr.20221202>
