Knowledge, Attitudes and Practices Regarding Rabies Among Patients and Bystanders at a Tertiary Care Centre in Kerala, India: A Cross-Sectional Study

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Abstract

Background:

Rabies, a fatal but preventable viral disease, remains a significant public health problem in India. Despite access to post-exposure prophylaxis (PEP), rabies-related deaths continue to occur, highlighting potential gaps in public knowledge and practice.

Objectives:

To assess the knowledge, attitudes, and practices (KAP) related to rabies among patients and bystanders attending a tertiary care hospital in Kerala and to identify key determinants influencing them.

Methods:

A cross-sectional study was conducted among 201 participants aged above 18 years at Government Medical College, Ernakulam, during August 2022. Data were collected using a pre-tested, semi-structured questionnaire in Malayalam, administered via interviews. The data were analyzed using SPSS; associations were tested using the chi-square test.

Results:

Most participants had average or above-average knowledge about rabies, yet misconceptions regarding fatality and PEP persisted. Educational status was significantly associated with better knowledge and preventive practices. Television and newspapers were the main sources of information. Gaps in awareness about animal welfare organizations and responsible pet ownership laws were identified. Vaccination following animal bites was not universal due to various factors, including cost and perceived risk.

Conclusion:

While general awareness about rabies exists, critical gaps remain in understanding disease prognosis and appropriate response after exposure. Educational outreach using mass media and school-based programs are essential. Improved PEP availability at peripheral centers is vital to bridge treatment gaps.

Keywords: Rabies, Knowledge Attitude Practice, Animal Bites, Post-Exposure Prophylaxis

INTRODUCTION

Rabies is one of the oldest known infectious diseases, caused by a rhabdovirus and primarily transmitted to humans through bites from infected dogs. Despite the availability of effective human and animal vaccines, canine rabies remains a major public health issue in many developing countries, with an estimated 55,000 deaths annually【1】. Human rabies is almost entirely preventable through timely post-exposure prophylaxis (PEP) and mass dog vaccination campaigns targeting at least 70% coverage【13,15】.

Successful control requires coordinated efforts—veterinary services must implement widespread dog vaccination, healthcare systems must ensure timely access to PEP, and the public must be aware of rabies risks and prevention strategies. Knowledge, Attitudes, and Practices (KAP) studies play a vital role in identifying behavioral and informational gaps that hinder effective rabies control【2,5,9】.

In Kerala, 11 rabies-related deaths were reported in 2021 despite the availability of PEP【6】. Several factors may explain this persistent burden, including increased human–animal contact, inadequate understanding of rabies transmission risks【11】, delays in seeking PEP after animal bites【8,12】, and prevailing misconceptions along with low community awareness【7,10,15】. This study therefore aims to provide baseline data that will help identify existing knowledge gaps and inform targeted education and improved service delivery for effective rabies prevention.

OBJECTIVES

1. To assess the knowledge, attitude and practice about rabies among patients and bystanders of Govt. Medical College, Idukki.
2. To identify any factors if any, that determine the knowledge levels of the study participants regarding rabies.

REVIEW OF LITERATURE

Rabies is a vaccine-preventable zoonotic disease that is almost universally fatal once symptoms appear, yet entirely preventable through timely post-exposure prophylaxis (PEP). Globally, an estimated 55,000 people die each year, with India alone contributing nearly 20,000 deaths and over 17 million animal bites annually【1】. Dogs remain the primary reservoir, responsible for up to 99% of human rabies transmission【2】. Despite effective vaccines, lack of awareness, poor health-seeking behavior, and persistence of traditional healing practices contribute to the continued high burden of rabies【3】.

The incubation period typically ranges from 2–3 months, but can vary from one week to several years, depending on viral load and site of entry【4】. Clinically, rabies manifests as either the furious form—characterized by hyperactivity, hydrophobia, and eventual cardio-respiratory arrest—or the paralytic form, which accounts for nearly 20% of cases and often goes unrecognized due to its less dramatic presentation【5】.

Timely PEP is crucial and consists of wound washing, vaccination, and, where indicated, administration of rabies immunoglobulin【6】. However, multiple studies from across India show gaps in public knowledge and practice. In Jaipur, only 22.5% of participants demonstrated good knowledge about rabies, and misconceptions such as believing that a single vaccine dose is sufficient were widespread【7】. A study in West Bengal found that while 59.6% of animal bite victims had good knowledge, nearly half still practiced harmful traditional wound applications such as turmeric, lime, and chilli powder【8】. Similarly, in Gujarat, although awareness of rabies was high, only one-third of respondents practiced appropriate wound care or sought timely medical help【9】.

Children are particularly vulnerable, with several studies showing that up to 40% of dog bite victims are below 15 years of age, often bitten on limbs by stray or unvaccinated dogs【10】. Cultural practices such as applying ash, herbal pastes, or chilli powder remain common before seeking medical care【11】. Urban studies from Kolkata【12】 and Ajmer【6】 similarly highlight good general awareness about rabies but persistent gaps in first-aid practices and delayed health-seeking.

Healthcare providers and students also demonstrate variable levels of knowledge. Studies among pharmacy students revealed poor understanding of pre-exposure prophylaxis【9】, while nursing trainees showed misconceptions about wound management【7】. Even among medical professionals, gaps exist in dosage calculation of immunoglobulins and the management of pregnant or lactating mothers with Category III exposures【16】. Encouragingly, interventional studies show that targeted health education significantly improves both knowledge and attitude scores, emphasizing the role of capacity-building among health workers【5】.

Delay in initiation of PEP remains a recurring challenge. Across multiple studies, between 20–40% of victims did not receive treatment within 24 hours of exposure, with reasons ranging from lack of awareness and distance from health facilities to unavailability of vaccines at peripheral centers【12,8】. Misconceptions and reliance on traditional healers were repeatedly associated with fatal outcomes, as illustrated in case reports where victims sought indigenous remedies before succumbing to the disease【17】.

Overall, the literature highlights that while awareness of rabies as a disease is relatively widespread in India, significant knowledge gaps, misconceptions, and poor practices persist across communities, students, and even healthcare professionals. These findings underscore the urgent need for targeted KAP studies and tailored educational interventions to bridge gaps in prevention, improve timely uptake of PEP, and ultimately reduce rabies mortality.

METHODOLOGY

A cross-sectional study was conducted among patients and bystanders aged above 18 years attending the tertiary care centre at Government Medical College, Idukki, during August 2022. A total of 201 participants were recruited using a convenient sampling method.

Data was collected using a pre-tested, semi-structured interview schedule consisting of 26 questions that assessed Knowledge, Attitude, and Practices (KAP) regarding rabies. The questionnaire was originally prepared in English, translated into Malayalam for better comprehension and cultural relevance, and pilot tested among 10 individuals. Based on their feedback, necessary refinements were made before the final data collection.

The topic of rabies was chosen by the research team following a detailed review of over 20 similar studies from across India to ensure local applicability and relevance【7–19】. The tool thus reflected both global recommendations and region-specific insights.

Data collection was done over three days across seven outpatient departments (OPDs) and five inpatient wards, through face-to-face interviews conducted by nine trained team members. Informed consent was obtained from each participant before the interview.

Ethical considerations were strictly adhered to. Participant anonymity and confidentiality were ensured. All data was anonymized before analysis.

Data entry was performed using Microsoft Excel, and analysis was done using SPSS software. Descriptive statistics such as frequencies and proportions were presented through tables and charts. Associations between knowledge levels and sociodemographic variables were assessed using the Chi-square test.

RESULTS

A total of 201 participants were enrolled, of whom 61.7% were females and 38.3% males. The mean age of participants was 39.6 years (±14.2). With respect to education, 42.3% had completed school, 34.8% were graduates or above, while 22.9% had not completed schooling. Nearly half (42.3%) of respondents were unemployed, 31.8% were salaried, and 25.9% were daily wage workers.

Most participants (59.7%) resided in rural panchayat areas, 23.9% in municipalities, and 16.4% in urban corporation areas. Pet ownership was reported by 34.3% of participants, of which 91.3% had their pets vaccinated.

Awareness of rabies was high, with 94.5% having heard of the disease. The most common sources of information were friends/neighbours (65.7%), newspapers (59.2%), and television (57.7%). However, knowledge regarding rabies transmission varied: while almost all (95%) recognized dogs as carriers, fewer identified cats (74.6%), monkeys (30.8%), or rodents (27.9%). Misconceptions persisted, with 9% believing in respiratory spread and 8% citing mosquitoes.

Regarding symptoms, 89.5% recognized excessive salivation and 40% reported knowledge of hydrophobia or muscle spasms in humans. In animals, aggressiveness (77.1%) and profuse salivation (83.1%) were the most recognized signs.

Knowledge scores showed that 33% of participants had good knowledge, 47% satisfactory knowledge, and 20% poor knowledge. Educational status was significantly associated with knowledge levels (p=0.028), with higher education correlating with better awareness. No significant associations were observed with gender, residence, or socioeconomic status.

[Table 1.]

TABLE 1. DETERMINAT FACTORS FOR KNOWLEDGE ABOUT RABIES

		Knowledge Category			Total	*Chi* square value	*P value*
		Poor Knowledge	Satisfactory Knowledge	Good Knowledge			
Education	College and above	17	24	29	70	10.48	*0.028*
		24.30%	34.30%	41.40%	100.00%		
	Completed school	18	42	25	85		
		21.20%	49.40%	29.40%	100.00%		
	Incomplete schooling	4	29	13	46		
		8.70%	63.00%	28.30%	100.00%		
Place of Residence	Corporation	7	13	13	33	7.568	0.109
		21.20%	39.40%	39.40%	100.00%		
	Municipality	15	21	12	48		
		31.30%	43.80%	25.00%	100.00%		
	Panchayat	17	61	42	120		

		14.20%	50.80%	35.00%	100.00%		
S.E Status	APL	23	45	35	103	0.92	0.631
		22.30%	43.70%	34.00%	100.00%		
	BPL	16	50	32	98		
		16.30%	51.00%	32.70%	100.00%		

In terms of practices, 59.7% reported correct first-aid of washing bite wounds with soap and water, whereas others resorted to salt, turmeric, or vigorous scrubbing. Only 35.3% of those ever bitten reported completing vaccination; financial constraints and misconceptions about the dog's health were the most cited reasons for not completing PEP.

Attitudes toward rabies prevention were encouraging: 82.1% stated they would take PEP if bitten, and 93% supported the need for a national law to ensure responsible pet ownership and stray dog control. About 50% recommended sterilization and sheltering as strategies for stray control, while 15% favored culling.

DISCUSSION

This study assessed the knowledge, attitudes, and practices regarding rabies among 201 participants attending a tertiary care centre in Kerala. The majority of respondents were female (61.7%), with over one-third having attained college-level education or higher. Nearly one-third were salaried, one-quarter were daily-waged, and 42% were unemployed. About one-third (34.3%) owned pets, and almost all respondents (94.5%) had heard of rabies, highlighting a high level of basic awareness.

Knowledge on Transmission and Symptoms

In our study, 95% correctly identified dogs as the main source of rabies, while a small proportion (6%) had misconceptions such as mosquito transmission. Similar misconceptions were reported in studies from Tamil Nadu, where 4.4% believed mosquitoes could transmit rabies, and from Odisha, where some participants attributed it to human or rat bites【10,11,14】. Awareness regarding transmission through bites was very high in our study (97.5%), consistent with findings from Gujarat (98.6%) and West Bengal (79.2%)【12,17】. However, awareness of scratches as a possible route was lower (77.6%), and 2.5% of respondents did not know that bites transmit rabies.

Regarding symptoms, 89.5% identified excessive salivation as a sign, while around 40% mentioned muscle spasms and hydrophobia. Misconceptions persisted, with some attributing diarrhoea (9%) and cough (1%) as rabies symptoms. Animal symptoms such as aggressiveness and excessive salivation were better recognized than paralysis. These findings are broadly comparable to studies from West Bengal and Puducherry, though awareness levels varied【9,12】.

Knowledge of Prognosis and Prevention

Only 37.3% correctly recognized rabies as universally fatal, and one-third wrongly believed it to be curable. In contrast, knowledge of rabies being preventable was better (73.6%). Similar gaps have been noted in other Indian studies, where prognosis awareness was as low as 25%, despite better recognition of preventability【9,12,13】.

Knowledge of immediate wound management was mixed: 59.7% mentioned washing the wound with soap and water, while others preferred covering, vigorous scrubbing, or applying salt and turmeric. Although more than 80% were aware of post-exposure prophylaxis (PEP), misconceptions around first aid persisted, as seen in studies from Gujarat, Odisha, and Haryana, where traditional practices were also common【11,12,18】.

Attitudes Towards Rabies Control

Most participants favored responsible pet ownership and stray animal control, with around half supporting birth control programmes and 15% suggesting culling. In comparison, a study from Bangladesh reported similar preferences, with 65% supporting birth control and nearly 20% favoring culling【19】. Notably, 93% of respondents in our study felt the need for a national law on pet ownership and stray animal control.

Practices and Vaccination Coverage

Among pet owners, 91.3% reported vaccinating their pets, a high figure compared to studies in rural Puducherry【9】. However, only about half of participants who had experienced bites received PEP, with affordability cited as a barrier. Comparable studies in North India reported

delays or non-utilization of PEP due to lack of awareness, distance from health facilities, and cost【13,15】.

Regarding management of biting animals, 40% observed the animal for 10 days, while another 40% released it, and 10% killed the animal. These findings highlight both awareness of observation practices and persistence of harmful actions like killing, as noted in Tamil Nadu studies【14】.

Determinants of Knowledge

Educational status was significantly associated with rabies knowledge ($p = 0.028$), with higher education linked to better awareness. No significant associations were found with gender, residence, socioeconomic status, or pet ownership. This suggests that education plays the most important role in improving rabies knowledge in the community.

CONCLUSION

Awareness of rabies engages communities and empowers people to save themselves by seeking the care they need. Majority of the population had average and above average knowledge. But the rest with poor knowledge gain importance in this aspect. This emphasizes the need for further awareness programmes in the society.

Most people had knowledge on the symptoms. But the fatal prognosis of the disease was not known to the majority of respondents. Thus, awareness programmes should also include the disease prognosis along with prevention and management. Considering the determinants of knowledge on rabies and its prevention, it was found that better the education level, better were the knowledge, attitude and health seeking practices. Most of the respondents were unaware of the Animal Welfare Organizations. The role of the media in creating awareness among public needs mention as they were the source of knowledge for the majority of respondents【4,5】.

The study also emphasizes the attitude of society towards stray dogs. Nearly half of the respondents were supporting the control of stray dogs. Some of the people suggested caring for these dogs. This difference in opinion can be justified by the difference in mentality to animals

and character among the individuals. The majority response towards the need of a law to ensure responsible pet ownership and stray animal control can be taken into consideration as a public opinion by the concerned law enforcement authorities.

Among pet owners, the majority had vaccinated their pets. The majority of respondents have taken vaccination when bitten by an animal. Among those who have not taken vaccination, many had taken the vaccine recently before the bite, others believed the dog to be not rabid, while the difficulty to afford the costs involved and the difficulty to access medical care also made others to not take it. Here, difficulties in accessing rabies vaccination gains importance. Our findings indicated the need for educational outreach to raise awareness of rabies from animals and proper prevention measures.

Steps must be taken by local self-governments to reduce animal bite cases by controlling the stray animal population. Sustainable strategies and methods acceptable to everyone including animal welfare associations and animal lovers should be planned and implemented. Stray animal shelters and animal birth control by the LSGD may prove to be a lasting option.

The health department should ensure that continuous uninterrupted post-exposure prophylaxis against rabies is available at the peripheral health care institutions, so that none of the animal exposure cases fail to take PEP due to non-availability, as reported by a small group of respondents【1,2,3,6】.

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