

Assessment of Knowledge Regarding Pre and Post-Exposure Prophylaxis of Rabies

Anupama Bhasi¹, Sreedevi P A², Abhirami S³, Aparna Vimal⁴,
Sona Sunny⁵

¹Tutor, Department of Community Health Nursing, Amrita College of Nursing, AMRITA Vishwa Vidyapeetham, Health Sciences Campus, Kochi-41, Kerala, India.

²Professor and Head, Department of Mental Health Nursing, Amrita College of Nursing, AMRITA Vishwa Vidyapeetham, Health Sciences Campus, Kochi-41, Kerala, India.

^{3,4,5}Fourth-year B.Sc. Nursing, Amrita College of Nursing, AMRITA Vishwa Vidyapeetham, Health Science Campus, Kochi-41, Kerala.

Abstract

Introduction: Rabies is a vaccine-preventable disease that affects both animals and humans. Rabies vaccines are safe and highly effective for the prevention of human rabies. Awareness regarding the disease and its preventive measures can play a vital role in decreasing rabies-related mortality and morbidity.

Objectives: To determine the knowledge of villagers regarding pre and post-exposure prophylaxis of rabies and to find the association between the knowledge and selected socio-demographic variables.

Methodology: A community-based descriptive survey was done among 500 adult residents of a rural area who were selected by convenience sampling. A semi-structured knowledge questionnaire which includes 20 multiple-choice questions was used to assess the knowledge regarding pre and post-exposure prophylaxis of rabies.

Results: The sample comprised 58% females and 42% males and 62% had up to higher secondary education. Among the study population, only 9.4% of respondents had good knowledge, 59.4% had average, and 31.2% had poor knowledge. The first step after an animal bite was known to 64% of participants. Near to half the proportion knows the number of doses of rabies vaccination. Surprisingly, the highly educated group had the least knowledge of rabies prophylaxis. **Conclusion:** Community awareness of rabies prophylaxis is limited; proper knowledge of vaccination regimens can save the lives of many. Therefore, it is important to evoke information on rabies prophylaxis among the general population.

Keywords: Community awareness, Knowledge, Pre-exposure prophylaxis, Post-exposure prophylaxis

Introduction

Rabies, also known as hydrophobia, is a zoonotic disease caused by Lyssavirus of the family Rhabdoviridae. It is one of the oldest recorded infections of mankind.¹ This previously neglected infection can spread to people and pets if they are bitten or scratched by a rabid animal. It is estimated that 59000 human deaths occur annually in over 150 countries because of rabies. Out of these, 95% of cases occur in Africa and Asia.² Ninety-nine per cent of rabies cases are dog-mediated, and poor rural populations disproportionately bear the burden of disease.³

WHO recommends two main immunization strategies: post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP). PEP includes timely, appropriate, extensive wound washing and management together with rabies immunoglobulins (RIG) and several doses of rabies vaccine administration, depending on the severity of exposure and previous vaccination status.⁴ PrEP includes the administration of several rabies vaccine doses before exposure to rabies virus. Rabies immunoglobulin and rabies vaccines are usually administered to humans. It is estimated that the number of deaths due to rabies may be 10 times higher than that reported. Deaths caused by rabies could be prevented by the timely application of appropriate prophylaxis.

India is endemic to rabies, accounting for 36% of the world's deaths. It causes 18000–20000 deaths every year. About 30–60% of reported rabies cases and deaths in India occur in children under the age of 15 years.⁵ These numbers reflect severe drawbacks regarding implementing pre-and post-exposure prophylaxis in endemic settings. Rabies deaths in humans are 100% preventable through prompt and appropriate medical care. There is an urgency to improve current strategies or develop approaches to control rabies disease in the future.

The incidence of rabies in India has been constant for the last few years, without any declining trend. The reported incidence is probably an underestimation of the true incidence because, in India, rabies is still not a notifiable disease.^{6,22}

In 2022, 21 people in Kerala died because of rabies. A noticeable effort to end rabies campaigns was initiated after this became sensational news in the mass media.⁷ Most of the family members of these individuals were unaware of the prophylactic management of dog bites. They were not vaccinated as per the schedule and neglected the follow-ups.^{5,18} In this scenario, it is important to educate the general public about the pre-and post-exposure prophylaxis of rabies. This, in turn, can reduce the incidence rate of rabies cases.⁸ People will be able to learn about the available vaccines and vaccination schedules.

Along with the knowledge of a complete course of four doses of intradermal and anti-rabies vaccine on bilateral deltoid, anti-rabies serum (in category 3 bite), and wound management including immediate washing of the wound with soap and plenty of water for a minimum of 15 minutes and tetanus toxoid injection, it can save many lives from fatal rabies.⁹ Community awareness about seeking medical care is the most important preventive strategy. The current study is aimed at determining the knowledge of villagers regarding pre and post-exposure prophylaxis of rabies and to find the association between the knowledge and selected socio-demographic variables.

Methodology

The current study used a quantitative approach with a descriptive survey design. The study was conducted among the residents of the 14th ward of Njarakkal Panchayat, Ernakulam district, Kerala. The sample size was calculated to be 354 by using the formula $4PQ/I^2$ ¹⁰. To have better coverage of the study population, the sample size was increased to 500. The tool used was a semi-structured questionnaire in Malayalam, with socio-demographic details as its first part and 20 multiple choice questions assessing knowledge related to pre-and post-exposure prophylaxis of rabies as the second part. The knowledge score was categorized into good (14-20), average (7-13) and poor (0-06). After receiving the ethical approval from the Institutional Review Board, the investigators selected 500 houses conveniently and one available adult member of that house was taken as a subject. After getting signed informed consent, the tools were administered by self-report method and it took 15-20 minutes to get data from one subject. Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 16. The socio-

demographic data and the knowledge regarding pre and post-exposure prophylaxis of rabies were expressed in frequencies and percentages. The chi-square test was used to associate socio-demographic variables and knowledge. The results obtained with a $p\text{-value} < 0.05$ were considered statistically significant.

Results

Sample characteristics

Of the 500 participants, 42% were males and 58% were females. The majority were from the age group of 31–43 years (33%), educated up to a higher secondary level (43.8%), self-employed (35.8%) and married (64.2%) (Table:1).

Table 1: Distribution of subjects based on demographic characteristics
n=500

Demographic variables		Frequency	Percentage
1. Age in years	a) 18-30	83	16.6
	b) 31-43	165	33.0
	c) 44-56	137	27.4
	d) Above 57	115	23.0
2. Sex	a) Male	210	42.0
	b) Female	290	58.0
3. Education	a) Primary education	89	17.8
	b) Secondary/Higher Secondary	219	43.8
	c) Graduation	147	29.4
	d) Post-graduation & above	45	9.0
4. Occupation	a) Government employee	70	14
	b) Private employee	153	30.6
	c) Self-employed	179	35.8
	d) Unemployed	98	19.6
5. Marital status	a) Married	321	64.2
	b) Unmarried	153	30.6
	c) Divorced	21	4.2
	d) Others	5	1

Knowledge of villagers on pre and post-exposure prophylaxis of rabies: - As per Figure: 1, among the study participants, 9.4% had good knowledge, 59.4% had average knowledge and 31.2% had poor knowledge regarding pre and post-exposure prophylaxis.

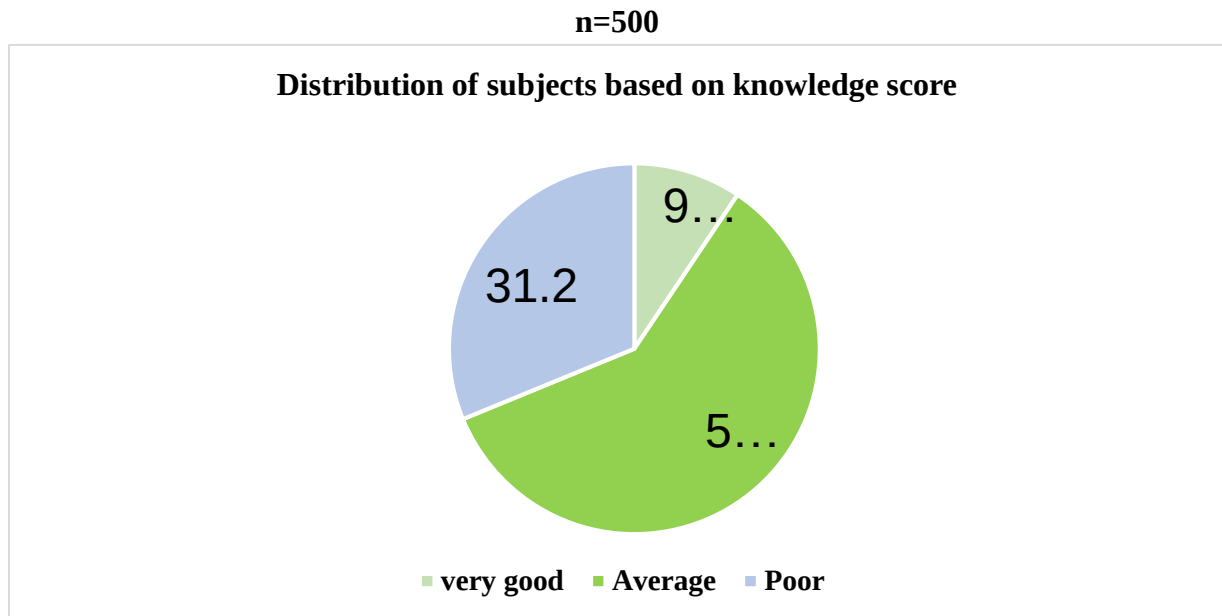


Figure I: Distribution of subjects based on knowledge score

Knowledge of villagers on selected items of the knowledge questionnaire

92.8% of the participants were aware that rabies is caused by the bite of rabid dogs and 64.6 knew that washing with soap and water is the initial step in the management of dog bite.

Table 2: Knowledge about pr and post-exposure prophylaxis on rabies

SI NO.	Question	Correct answer no.	Percentage (%)
1.	Rabies is caused by the bite of a rabid dog.	464	92.8
2.	The initial step is washing with soap and water.	323	64.6
3.	Vaccination among the pets.	233	46.6
4.	Site of vaccination	220	44
5.	Number of doses of post-exposure vaccination	241	48.2
6.	Number of doses of pre-exposure vaccination	69	13.8
7.	Need for further vaccination in a previously immunized person.	206	41.2

Association between socio-demographic variables and knowledge on pre and post-exposure prophylaxis of rabies

Poor knowledge was associated with female gender, participants with higher education and unemployed participants (Table: 2).

Table 2: Association between sociodemographic variables and knowledge on pre and post-exposure prophylaxis of rabies

Demographic variable	Knowledge			chi-square value	df	p-value
	Good	Average	Poor			
Age						
a) 18-30	7.2	63.9	28.9	6.854	6	0.335
b) 31-43	9.7	57	33.3			
c) 44-56	13.9	56.9	29.2			
d) above 57	5.2	62.6	32.2			
Sex						
a) Male	11	62.9	26.2	11.529	4	* 0.021
b) Female	8.9	56.8	34.8			
Education						
a) Primary education	18	64	18	21.398	6	* 0.002
b)Secondary/Higher Secondary	8.7	62.6	28.8			
c)Graduation	6.8	53.1	40.1			
d) Post-graduation & above	4.4	55.6	40			
Occupation						
a) Government employee	11.4	71.4	17.1	13.12	6	* 0.041
b) Private employee	10.5	60.1	29.4			
c) Self-employed	8.9	59.2	31.8			
d)Unemployed	7.1	50	42.9			

* Significant, $p < 0.05$

Discussion

The current study was conducted among the villagers, that is 500 adult residents selected from 500 houses of one ward of a Panchayat. The objectives were to determine their knowledge regarding pre and post-exposure prophylaxis of rabies and to find the association between the knowledge and selected socio-demographic variables.

In the current study, the participants from the age group of 31–43 years were the highest (33.0%), and 43.8% had secondary and higher secondary education. Regarding the knowledge about pre and post-exposure prophylaxis of rabies, 9.4 %, 59.4% and 31.2 % had good, average and poor knowledge respectively. The result shows that not only a small proportion of the subjects have good knowledge but also a considerable proportion has poor knowledge, which is quite surprising when it is known that nearly 20% of the community household participants of a study conducted in Mozambique, Africa have good knowledge about this disease condition.¹¹ Yet another study by Kapoor P, Baig VN, Kacker S, Sharma M

and Sharma M. A depicts a proportion of 22.5 participants had good knowledge. Fifty-six per cent had fair knowledge, and 21.5% of participants had poor knowledge, which was a cross-sectional study of knowledge regarding rabies conducted among attendees of the anti-rabies clinic of a teaching hospital, Jaipur.¹² In the above-mentioned study, it seems that approximately 56% of the attendees were aware of the initial step after a dog bite, whereas in our study, 64% knew the same. In the study of Chandan N, Kotrabasappa K. Awareness of animal bite and rabies among agricultural workers in rural Dharwad, Karnataka, India, the good knowledge percentage is 51 and 49 had poor knowledge.¹³

In contradiction with the study of Karmakar PR and Saharay S. in which good knowledge was found among highly educated groups, our study marked the knowledge rate as high in people with primary education.¹⁴

In our study, the major population among the group knew that rabies is mainly caused by dog bites (92.8%). About 64.6% know that washing with soap and water is the initial step after dog bites. 44% knew the site of rabies vaccination and 48.2% knew the number of doses of post-exposure vaccination. Few among the group (13.8%) were only aware of the pre-exposure vaccination. 46.8% were aware that vaccination among pets is also important in preventing rabies. 41.2% knew that further vaccination was needed for a previously immunized person. A study done by Krishnamoorthy Y, Vijayageetha M and Sarkar S in Puducherry revealed that 74.8% know that rabies is a fatal disease, and 40.9% feel that the wound should be washed with soap and water which complimenting our findings.¹⁵

A study on rabies control and prevention using knowledge, attitude, and practice in Jabalpur, central India, done by S. Dubey et al. suggested that the knowledge, attitude, and practice study of canine rabies showed that people had good information about rabies. Still, variations in information and its application were observed between different groups about rabies, vaccination, treatment, and control programmes.¹⁶ This was consistent with our study report.

Female dominance was noted among the study population in our study as that of a study conducted by Sivagurunathan C, Umadevi R, Balaji A, Rama R and Gopalakrishnan S. on knowledge, attitude, and practice of animal bite, rabies, and its prevention in an urban community among 350 samples¹⁷. However, the knowledgeable group was far above our study.

From studies, it is evident that community awareness of rabies prophylaxis is limited, and proper knowledge of vaccination regimens can save the lives of many. Therefore, it is important to evoke information on rabies prophylaxis among the general population.²³

Conclusion

Awareness regarding the disease and its preventive measures can play a vital role in decreasing rabies-related mortality and morbidity. It is estimated that the number of deaths due to rabies maybe 10 times higher than that reported. Deaths caused by rabies could be prevented by the timely application of appropriate prophylaxis.

REFERENCE

1. Park K. Park's Textbook of Preventive and Social Medicine. Jabalpur: M/s Banarsidas Bhanot; 2007. p.302-307
2. WHO epidemiology and burden of disease. WHO. 2020. <https://www.who.int/healthtopics/rabies#>
3. John D, Royal A, Bharti O. Epidemiological, humanistic and economic burden of dog mediated rabies in India: a systematic review protocol. F1000Research. 2021;10.

4. National guidelines on rabies prophylaxis. national centre for disease control 22-Sham Nath Marg, Delhi-110054.2015.
5. Nujum Z T, Indu P. S, Ramesh, J, Philip R. R, SS, A R S, N L R., Balaram NA. Rabies death in an adolescent tribal girl diagnosed postmortem, in Kerala precious life, preventable loss and equity concerns. *Int J Equity Health*.2024 May 23;23(1): 104.doi: 10.1186/s12939-024-02164-w.PMID:38783326; PMCID: PMC11112861.
6. Radhakrishnan S, Vanak AT, Nouvellet P, Donnelly CA. Rabies as a public health concern in India—A historical perspective. *Tropical medicine and infectious disease*. 2020 Oct 21;5(4):162
7. 21 rabies deaths, nearly 2 lakh dog bites this year in Kerala: report [internet]. Onmanorama. Thiruvananthapuram. Available from:<https://www.onmanorama.com/news/kerala/2022/09/25/twentyone-rabies-deaths-two-lakh-dog-bites-in-kerala-reveals-report.html>; 2022. Accessed September 25, 2022
8. Kessels JA, Recuenco S, Navarro-Vela AM, Deray R, Vigilato M, Ertl H, Durrheim D, Rees H, Nel LH, Abela-Ridder B, Briggs D. Pre-exposure rabies prophylaxis: a systematic review. *Bulletin of the World Health Organization*. 2017 Mar 1;95(3):210.
9. National action plan on dog-mediated rabies elimination from India by 2030.National centre for disease control. Ministry of Health and Family Welfare <https://www.nhp.gov.in/healthprogramme/national-action-plan-rabies-elimination>.
10. Herbert M, Riyaz Basha S, Thangaraj S. Community perception regarding rabies prevention and stray dog control in urban slums in India. *J Infect Public Health* 2012; 5:374-80.
11. Mapatse M, Sabeta C, Fafetine J, Abernethy D. Knowledge, attitudes, practices (KAP) and control of rabies among community households and health practitioners at the human-wildlife interface in Limpopo National Park, Massingir District, Mozambique. *PLoS neglected tropical diseases*. 2022 Mar 7;16(3): e0010202.e an
12. Kapoor P, Baig VN, Kacker S, Sharma M, Sharma M. A cross-sectional study of knowledge regarding rabies among attendees of anti-rabies clinic of a teaching hospital, Jaipur. *Journal of family medicine and primary care*. 2019 Jan;8(1):194.
13. Chandan N, Kotrabasappa K. Awareness of animal bite and rabies among agricultural workers in rural Dharwad, Karnataka, India. *Int J Community Med Public Health* 2016; 3:1851-5.
14. Karmakar PR, Saharary S. Rabies: Knowledge and practices towards its prevention & control among multi-purpose health workers of a rural area of West Bengal. *Int J Res Rev* 2020; 7:348-54.
15. Krishnamoorthy Y, Vijayageetha M, Sarkar S. Awareness about rabies among the general population and treatment-seeking behaviour following a dog-bite in rural Puducherry: A community-based cross-sectional study. *Int J Community Med Public Health* 2018; 5:2557-63.
16. Dubey S, Singh RV, Gupta B, Gupta DK, Nayak A, Rai A, Vandre R, Patel R, Sharma HK, Jadav KK. Study on rabies control and prevention using knowledge attitude and practice in Jabalpur central India.
17. Sivagurunathan C, Umadevi R, Balaji A, Rama R, Gopalakrishnan S. Knowledge, attitude, and practice study on animal bite, rabies, and its prevention in an urban community. *Journal of and primary care*. 2021;10(2):850-858.
18. Haradhanalli RS, Anwith HS, Pradeep BS, Isloor S, Bilagumba G. Health-seeking behaviour and compliance to post-exposure prophylaxis among animal bite victims in India. *Indian J Public Health*. 2019;63(Supplement): S20–S25.

19. Hampson K, Coudeville L, Lembo T, et al. Estimating the global burden of endemic canine rabies. PLoS Negl Trop Dis. 2015;9(4): e0003709.
20. Thomas J. Massive rise in rabies cases in Kerala; virus found in 168 out of 300 samples [internet]. Onmanoram. Thiruvananthapuram. Available from: <https://www.onmanorama.com/news/kerala/2022/09/05/massive-rise-in-rabies-cases-kerala.html>; 2022.
21. National Centre for Disease Control. National Guidelines for Rabies Prophylaxis, 2019 [internet]. National Rabies Control Program. Available from: <https://ncdc.gov.in/WriteReadData/linkimages/NationalGuidelinesforRabiesprophylaxis2019.pdf>; 2019.
22. Menezes R. Rabies in India. CMAJ. 2008; 178:564-6. Medline:18299543 doi:10.1503/cmaj.071488
23. Ichhpujani RL, Chhabra M, Mittal V, Bhattacharya D, Singh J, Lal S. Knowledge, attitude and practices about animal bites and rabies in general community multi-centric study. J Commun Dis. 2006;38:355-61. Medline:17913213