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Original Research Article

DEMOGRAPHIC PREDICTORS OF RABIES AWARENESS AND POST-BITE PRACTICES: A CROSS-SECTIONAL STUDY IN URBAN PATNA

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ABSTRACT

Background: Rabies is a highly fatal viral encephalitis, with domestic dogs accounting for 99% of human fatalities globally. Annually, rabies claims over 59,000 lives, with a significant burden in India. Despite the availability of vaccines, rabies remains uncontrolled due to inadequate awareness and insufficient post-exposure prophylaxis (PEP) measures. This study assesses rabies awareness, attitudes, and post-bite practices in an urban population in Patna.

Materials and Methods: A cross-sectional study was conducted at the Urban Health & Training Centre, AIIMS Patna, using a semi-structured questionnaire. Data were collected from 101 participants who had experienced animal bites. Descriptive statistics were used to summarize data, while Chi-square tests and binomial logistic regression identified predictors of knowledge levels.

Results: Of the participants, 67.3% were aware of rabies, with most information coming from family and friends (52.5%). Knowledge regarding post-bite wound care and PEP was low, with only 42.6% aware of appropriate first-aid measures. Logistic regression analysis revealed that age, income, and sources of information significantly influenced rabies knowledge. Health-seeking behaviors post-bite were suboptimal, with only 6% consulting faith healers, reflecting better attitudes in the urban population.

Conclusion: Despite moderate rabies awareness, there are significant gaps in post-bite practices and PEP knowledge. Targeted public health campaigns focusing on proper wound care and timely vaccination are crucial to improving rabies prevention in urban populations.

Keywords: Rabies, awareness, post-exposure prophylaxis, animal bites, Patna, health-seeking behavior.

INTRODUCTION

Rabies, an acute and relentless viral encephalitis, poses a grave threat to human health worldwide. While it can affect all mammals, the primary transmitter of rabies to humans remains domestic dogs, accounting for a staggering 99% of human fatalities attributed to the disease. With a case fatality ratio nearing 100%, rabies holds the highest lethality rate among conventional infectious diseases.[1] Annually, over 59,000 lives are claimed by rabies globally, the majority of which are a consequence of bites from rabid dogs.[2]

Intriguingly, some Asian nations such as Thailand, the Philippines, and Sri Lanka have made significant strides in curbing human rabies deaths. However, the

story is starkly different in countries like India, Pakistan, and Bangladesh, where thousands continue to lose their lives each year.[3] India, home to one of the world's largest populations of stray dogs, is particularly vulnerable due to the prevalence of unvaccinated strays, presenting a heightened risk of rabies transmission to its inhabitants.[3] Disturbingly, the Indian scenario is characterized by approximately 20,000 human rabies deaths and a staggering 17.4 million animal bites reported in 20044.[2] Nearly three-quarters (8,900) of all rabies deaths nationwide were discovered in the seven central and south-eastern states of Chhattisgarh, Uttar Pradesh, Odisha, Andhra Pradesh, Bihar, Assam, and Madhya Pradesh. Uttar Pradesh accounted for 4,300 of those deaths.[4] While certain pockets of India, such as the Andaman and Nicobar Islands and Lakshadweep, have historically remained rabies-free, the endemic nature of rabies in the country is a grim reality.[3] Despite the severity of the issue, surveillance efforts for both human and animal rabies have been far from adequate on a global scale. This inadequate surveillance has bred limited awareness, hindered public health prioritization, and constrained resource allocation for effective rabies prevention and control.[3] Encouragingly, certain nations have achieved remarkable success in eliminating human rabies deaths through strategic measures like awareness campaigns, mass dog vaccination initiatives, robust national rabies reporting mechanisms, and decentralized surveillance systems.[5] Acharya et al. emphasize that rabies should be recognized as a priority public health problem in India. The importance of primary prevention measures, such as Animal Birth Control (ABC) and dog vaccination, has been highlighted as essential for effective rabies control.[6]

In line with these global efforts, the Rabies Global Conference has set an ambitious goal to eliminate human deaths caused by dog-mediated rabies by the year 2030. Among the strategies aimed at achieving this target, the crux lies in continuous and consistent mass awareness campaigns, fostering a culture of health-seeking behavior following animal bites, ensuring proper management of animal bite wounds, and implementing effective vaccination strategies within the general populace.[7] Rahman and Isloor's review of rabies on the Indian subcontinent underscores that 45% of global rabies deaths occur in this region, with India contributing to nearly 33% of the total.[8] The majority of these deaths are preventable, highlighting the need for improved access to PEP, better vaccination coverage for dogs, and increased public awareness.[8]

Furthermore, the Asian Rabies Expert Bureau (AREB) has identified critical gaps in rabies knowledge and post-bite practices across multiple Asian countries. A multicenter survey conducted by Dodet et al. revealed that many at-risk populations lack sufficient awareness about the importance of proper wound care and timely consultation with rabies prevention centers.[9] These findings align with the situation in India, where awareness about rabies prevention remains limited, particularly in rural areas. Improving awareness through targeted educational campaigns could significantly reduce the burden of rabies-related deaths.

In line with global efforts to eliminate dog-mediated rabies deaths by 2030, the Rabies Global Conference has set ambitious goals, emphasizing continuous awareness campaigns, improved wound management, and mass dog vaccination as essential strategies(Manuscript Rabies-Revis…)(Manuscript Rabies-Revis…).[10]

In this context, the present manuscript undertakes a critical examination of the knowledge, attitudes, and practices pertaining to rabies within an urban community in Patna. By assessing these dimensions, this study aims to contribute to the broader understanding of rabies awareness and control strategies in an urban context. Through a thorough investigation of the animal bite victims of an urban community's perception and behavior concerning rabies, this research aspires to shed light on potential gaps, challenges, and avenues for improvement in the realm of rabies prevention and control.

MATERIALS AND METHODS

The research employed an observational cross-sectional study design to assess the knowledge and practices of individuals who had experienced animal bites. The study was conducted at the Immunization clinic of the Urban Health & Training Centre (UHTC) at AIIMS, Patna. This clinic serves as a primary healthcare facility for individuals seeking medical attention following animal bites in the nearby urban catchment area. The study spanned over a period of two months to ensure comprehensive representation of different cases. The study population comprised individuals attending the Immunization clinic of UHTC, AIIMS, Patna, who had suffered dog or animal bites. Participants were selected using purposive sampling, aiming to include those who met the inclusion criteria and were willing to participate in the study, during the data collection period.

Data was collected using a researcher-made, pre-tested, semi-structured questionnaire. The questionnaire was meticulously developed by the researchers to cover a range of topics related to rabies, animal bites, and dog-related behaviors. Its semi-structured format used closed-ended questions dealing with rabies knowledge and awareness, attitude towards animal and the disease and the practices following a bite.

Data Collection

The process of data collection was managed by a team of trained medical residents. Before initiating the interviews, each participant was comprehensively briefed on the aims and objectives of the study. Participants were asked to give their informed consent to take part in the study after receiving

assurance that their identity and responses would remain confidential. Once consent was granted, the medical residents conducted face-to-face interviews using a pre-validated, semi-structured questionnaire. The questionnaire was specifically designed for this study to examine a range of subjects related to rabies awareness, attitudes toward animals and disease, and the steps taken following an animal bite. It incorporated a mix of closed-ended questions to provide quantitative data on these topics. A cut off score for average to good knowledge and poor knowledge and good & poor attitude were decided by the researchers based on the 'correct' or 'good' answers. The data collection phase took place over a two-month period at the Immunization Clinic of the Urban Health & Training Centre (UHTC) at AIIMS, Patna.

Data Analysis

The data analysis aimed to investigate the knowledge, attitudes, and practices concerning rabies in an urban community in Patna, utilizing Jamovi software for statistical analysis. The dataset underwent cleaning for missing or inconsistent entries, and categorical variables were numerically coded. Descriptive statistics such as frequencies, percentages, mean, median, and standard deviation summarized the data. Inferential statistical tests like Chi-Square tests were used to explore associations between sociodemographic variables and knowledge levels about rabies. Binomial Logistic Regression identified predictors influencing 'poor' versus 'average to good' knowledge scores. For the logistic regression, several assumptions were taken into account: linearity of the logit for categorical predictor variables, independence of errors, absence of multicollinearity among predictors, and a sufficiently large sample size. The enter method was utilized for variable inclusion in the model, with all variables being entered simultaneously. Goodness-of-fit tests, such as the Hosmer-Lemeshow test, and measures like the AUC-ROC curve were employed to assess the model's adequacy T-tests or ANOVA were employed to compare mean knowledge scores across demographic groups. Confidence intervals were calculated at the 95% level, and a p-value less than 0.05 was considered statistically significant.

Ethical Considerations

The study received ethical clearance from the relevant institutional review board before initiation. Informed consent was obtained from all participants, emphasizing the preservation of their privacy and confidentiality throughout the study.

of animal bite incidents and the enhancement of community awareness about rabies, consequently fostering improved public health outcomes.

RESULTS

Table 1: Socio-demographic and other characteristics of the participants (N=101)

	Frequency	Percent	95% CI
Religion			
Hindu	95	94.1	0.8764 - 0.9725
Muslim	6	5.9	0.0275 - 0.1236
Caste			
General	31	30.7	0.2254 - 0.4026
OBC	50	49.5	0.3995 - 0.5909
SC/ST	20	19.8	0.1320 - 0.2862
Age			
>60 years	4	4.0	0.0155 - 0.0974
0-19 years	48	47.5	0.3806 - 0.5718
19-60 years	49	48.5	0.3900 - 0.5814
Gender			
Female	27	26.7	0.1907 - 0.3610
Male	74	73.3	0.6390 - 0.8093
Employment Status			
Employed	36	35.6	0.2699 - 0.4535
Not Applicable	50	49.5	0.3995 - 0.5909
Unemployed	15	14.9	0.0921 - 0.2307
Heard about Rabies			
No	33	32.7	0.2431 - 0.4231
Yes	68	67.3	0.5769 - 0.7569
Source of information			
Don't know	32	31.7	0.2342 - 0.4129
Friends/family members	53	52.5	0.4282 - 0.6194
Mass media (television/radio/newspaper)	16	15.8	0.0999 - 0.2419
Per Capita Income			
High	9	8.9	0.0476 - 0.1607
Middle	34	33.6	0.2520 - 0.4333
Low	58	57.5	0.4769 - 0.6662

Table 2: Knowledge and Attitude assessment (N=101)

Knowledge Questions	Correct response (frequency)	Percentage	CI
Which Animal transmits Rabies?	5	5.0	0.7 – 9.3
How the disease gets transmitted?	14	13.9	7.0 – 20.8
What are the symptoms of human Rabies?	12	11.9	5.4 – 18.4
Is Rabies fatal?	56	55.4	45.7 – 65.1
What is the correct First aid after animal bite?	43	42.6	32.9 – 52.3
When should one get the Rabies vaccine?	88	87.1	80.7 – 93.5
Do you know where to go for treatment when an animal bites?	82	81.2	73.6 – 88.8
Attitude Questions			
Which healthcare facility one should go to, if bitten by an animal?	94	93.1	88.4 – 97.8
Are stray dogs a problem?	29	28.7	19.7 – 37.7
What can be done to control Stray Dogs?	7	6.9	1.9 – 11.9

Table 3: Binomial Logistic Regression model for Knowledge Score

			95% Confidence Interval	
Predictor	**p**	**Odds ratio**	**Lower**	**Upper**
Age:				
0-19 years – 19-60 years	0.907	0.900	0.1540	5.26
>60 years – 19-60 years	0.742	0.669	0.0609	7.35
Gender:				
Female – Male	0.778	0.829	0.2243	3.06
Religion:				
Muslim – Hindu	0.605	1.720	0.2203	13.43
Cast:				
OBC – General	0.813	1.139	0.3877	3.35
SC/ST – General	0.642	1.383	0.3534	5.41
Employment:				
Not Applicable – Employed	0.134	4.058	0.6504	25.32
Unemployed – Employed	0.921	1.089	0.2027	5.85
Income Category:				
Low – High	0.385	2.105	0.3933	11.27
Middle – High	0.263	2.814	0.4600	17.21
Source of information:				
Don't know – Mass media (television/radio/newspaper)	0.011	8.361	1.6415	42.59
Friends/family members – Mass media (television/radio/newspaper)	0.887	1.094	0.3164	3.78
Note. Estimates represent the log odds of "Knowledgescorecat = poor score" vs. "Knowledgescorecat = Average to Good score"				

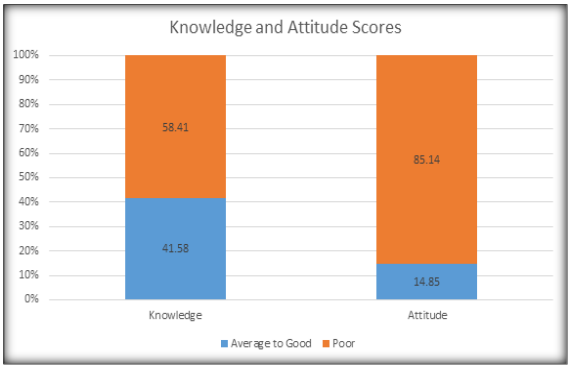

Figure 1: Knowledge and Attitude scores

Figure 2: Practices related to animal bite among the participants (Submitted separately)

The study revealed (Table-1) that the majority of respondents were Hindus (94.1%) while Muslims comprised a smaller percentage (5.9%). Among different castes, OBC respondents were predominant (49.5%), followed by General (30.7%) and SC/ST (19.8%). Participant ages were evenly distributed, with 0-19 years (47.5%) and 19-60 years (48.5%) representing the main cohorts. Males (73.3%) outnumbered females (26.7%), and employment status encompassed a mix of employed (35.6%), unemployed (14.9%), and not applicable (49.5%).

A significant proportion of participants were aware of rabies (67.3%), while others were not (32.7%). Information about rabies primarily stemmed from friends/family members (52.5%), followed by "don't know" responses (31.7%) and mass media (15.8%). Per capita income varied across income groups: high (8.9%), middle (33.6%), and low (57.5%). Overall, these findings provide insights into the demographic composition and awareness levels regarding rabies, underscoring the need for targeted awareness campaigns to enhance knowledge and prevention efforts among specific groups.

The binomial logistic regression analysis (Table-3) yielded insights into the predictors influencing the likelihood of having a "poor" knowledge score compared to an "Average to Good" knowledge score on rabies. Among age groups, individuals aged >60 years had a lower odds ratio (0.669) compared to those aged 19-60 years. Female participants exhibited slightly lower odds (0.829) of having "poor" knowledge compared to males. Among religious groups, Muslims had higher odds (1.720) of having "poor" knowledge compared to Hindus, although this result was not statistically significant. In terms of castes, OBC participants had slightly higher odds (1.139) of "poor" knowledge compared to the General category, while the odds for SC/ST

participants were 1.383. The "Not Applicable" employment status showed notably higher odds (4.058) of having "poor" knowledge compared to the "Employed" category. Income-wise, the odds of "poor" knowledge were 2.105 for Low and 2.814 for Middle income categories, in contrast to the High income category. Participants who reported "Don't know" as the source of information had substantially higher odds (8.361) of having "poor" knowledge compared to those relying on mass media, while the odds for friends/family members were 1.094. Overall, the results suggest that age, gender, employment status, income, and source of information significantly influenced the likelihood of having "poor" knowledge scores on rabies. However, it's important to note that some confidence intervals are wide, indicating potential variability in the effect estimates.

DISCUSSION

Our study's results indicate that a notable proportion of participants were aware of rabies (67.3%), sourced primarily from friends/family members (52.5%), followed by "don't know" responses (31.7%) and mass media (15.8%). In comparison, Sambo M et al.'s study highlighted lower levels of rabies knowledge, where 37% were classified as knowledgeable.[11] Factors such as education, long-term research interventions, bite experiences, gender, and dog ownership were linked to higher knowledge.[11]

Awareness

In comparison to Sivagurunathan C et al.'s study results, our study found a lower awareness level among participants, where a proportion (67.3%) had heard about rabies. In their study, 76% had heard about rabies. In another study by Tiwari et al, awareness was 96%.[12] This huge difference was because of the fact that they did the study among paramedical staff. Moreover, our study indicated that 63% of participants knew that rabies is fatal, whereas in the other study, 63.5% possessed this knowledge. Additionally, our study revealed that 52.5% of participants received information about rabies from friends/family members, while Sivagurunathan C et al.'s study did not specify the source of information.[13] Another study by Tschopp R et al reveal that although more than 90% of respondents claimed to be knowledgeable of rabies, up to 79.2% of them did not know how dogs contract the illness.[14] Study by N R Ramesh Masthi et al. demonstrated similar knowledge gaps, with 60.4% of participants aware of rabies but only 0.2% possessing extensive knowledge.[15] This finding aligns with our study, where we observed that despite a majority knowing about rabies, only 42.6% knew the correct first aid following an animal bite. Moreover, both studies revealed that awareness regarding pre-exposure prophylaxis (PEP) was alarmingly low, highlighting the need for targeted educational interventions on PEP.[15] Study Kamini Bharani et al which focused on a rural setting, also corroborates our findings regarding inadequate awareness of wound management.[16] In our study, 43% of participants knew the correct first aid procedure, a result mirrored in Bharani's study, where less than half of the participants were aware of proper wound care.[16] This consistency between urban and rural settings points to a wider systemic issue regarding rabies knowledge and post-exposure care.

The results from Aashima Auplish et al. highlight the effectiveness of educational interventions in increasing rabies knowledge, with post-intervention awareness improving by 19%.[17] While our study did not assess the impact of an educational intervention, the findings indicate a strong need for similar strategies to address the gaps in post-bite practices, such as immediate wound care and the importance of rabies vaccination.

However in our study the binomial logistic regression analysis revealed insights into the predictors influencing the likelihood of having a "poor" knowledge score compared to "Average to Good" scores on rabies. Age, gender, employment status, income, and source of information influenced knowledge scores. Interestingly, Sivagurunathan C et al.'s study identified gender-related differences, where females exhibited less knowledge in several areas. In contrast, our study did not elaborate on gender-based differences in knowledge.[13]

Health Seeking behavior

Taylor L H et al found that health-seeking behaviors post-bite were suboptimal, and community actions towards suspect rabid animals showed limited awareness of proper protocols.[11] It was similar in our study also where attitude was good in only 14.8% of people. These findings underscore the need for comprehensive awareness campaigns and education to improve rabies knowledge, health-seeking behaviors, and appropriate responses within communities.

Similarly, in a study done in West Bengal, most of the participants were found to be aware that rabies spreads through a dog bite also the majority knew that rabies was invariably fatal.[18]

Regarding knowledge about rabies transmission, our study noted that a considerable number of participants were aware of it (67.3%), which contrasts with the 31.6% in their study who knew that rabies could be transmitted through bites, scratches, and lick over broken skin.

In terms of practice, our study showed that good practices were around >60% following animal bites, whereas Sivagurunathan C et al.'s study found that 18.1% of participants had good practice following animal bites.

Tschopp R et al's observed that while around 40% of responders were unaware of the human rabies symptoms, 80% of them were unaware that the illness may kill a person if left untreated (41% in our study). If they are bitten, more than half of the respondents (58.7%) seek out traditional healers while in our study only 6% of the respondents go to anywhere

(faith healers etc) which reflects a better health seeking attitude in the urban population of the Indian city.[14]

Dodett et al. pointed out that many at-risk populations lack awareness of rabies prevention methods. Their multicountry survey revealed a significant gap in the knowledge of wound care and PEP.[9] Our findings resonate with these insights, as we observed that while awareness of rabies transmission was fairly high, understanding of proper post-bite practices remained inadequate. The critical gap in wound care knowledge found in both studies indicates that public health campaigns should focus on educating the population about immediate actions post-exposure.

CONCLUSION

The results of our survey provide insight into the extent of rabies awareness among Patna's urban population. The majority of respondents (67.3%) who were aware of rabies said they learned about it from friends, family, and the media. Variability in awareness levels was highlighted by comparisons with other studies and was ascribed to demographic variables and study population variances. Areas for improvement were seen in community responses to rabid animals and health-seeking behaviours. Despite certain knowledge and practise gaps, our research indicates that focused awareness programmes can be quite effective in raising awareness and encouraging responsible behaviour.

Recommendations

The study's suggestions place a strong emphasis on community health workers' involvement, customised educational programmes, and targeted awareness campaigns through friends, family, and the media. It is critical to promote responsible dog ownership and to sensibilize healthcare facilities. It is crucial to target the distribution of information depending on demographics and gender. Strategy evolution should be guided by ongoing study and evaluation. Together, these actions can raise rabies awareness, promote healthier habits, and lower transmission risks in the urban population of Patna.

REFERENCES

1. Hampson K, Coudeville L, Lembo T, Sambo M, Kieffer A, Attlan M. Estimating the global burden of endemic canine rabies. PLoS Negl Trop Dis. 2015;9:e0003709.
2. Sudarshan MK, Madhusudana SN, Mahendra BJ, Rao NS, Ashwath Narayana DH, Abdul Rahman S. Assessing the burden of human rabies in India: Results of a national multi center epidemiological survey. Int J Infect Dis. 2007;11(29):35.
3. World Health Organization. World Survey of Rabies. (35).
4. Suraweera W, Morris SK, Kumar R, Warrell DA, Warrell MJ, Jha P, et al. Deaths from Symptomatically Identifiable Furious Rabies in India: A Nationally Representative Mortality Survey. PLOS Neglected Tropical Diseases. 2012 Oct 4;6(10):e1847.
5. Taylor LH, Hampson K, Fahrion A, Abela Ridder B, Nel LH. Difficulties in estimating the human burden of canine rabies. Acta Trop. 2017;165(133):40.
6. Acharya AS, Kaur R, Lakra K. Rabies epidemiology and control in India: a review. J Commun Dis. 2012 Jun;44(2):59–69.
7. Zero by 30: the global strategic plan to end human deaths from dog-mediated rabies by. 2030.
8. Rahman SA, Isloor S. Rabies on the Indian subcontinent. Rev Sci Tech. 2018 Aug;37(2):529–42.
9. Dodet B, Goswami A, Gunasekera A, de Guzman F, Jamali S, Montalban C, et al. Rabies awareness in eight Asian countries. Vaccine. 2008 Nov 25;26(50):6344–8.
10. Global Alliance for Rabies Control [Internet]. [cited 2024 Oct 23]. Zero by 30: Our catalytic response. Available from: https://rabiesalliance.org/policy/united_against_rabies
11. Sambo M, Lembo T, Cleaveland S, Ferguson HM, Sikana L, Simon C, et al. Knowledge, Attitudes and Practices (KAP) about Rabies Prevention and Control: A Community Survey in Tanzania. PLoS Negl Trop Dis. 2014 Dec 4;8(12):e3310.
12. Tiwari HK, Vanak AT, O'Dea M, Robertson ID. Knowledge, attitudes and practices towards dog-bite related rabies in para-medical staff at rural primary health centres in Baramati, western India. PLoS One [Internet]. 2018 Nov 16 [cited 2020 Jun 8];13(11). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6239288/
13. 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. J Family Med Prim Care. 2021 Feb;10(2):850–8.
14. Tschopp R, Bekele S, Aseffa A. Dog Demography, Animal Bite Management and Rabies Knowledge-Attitude and Practices in the Awash Basin, Eastern Ethiopia. PLoS Negl Trop Dis [Internet]. 2016 Feb 22 [cited 2020 Jun 8];10(2). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4768771/
15. Ramesh Masthi NR, Sanjay TV, Pradeep SB, Anwith HS. Community awareness and risk of rabies associated with exposure to animals in India. Indian J Public Health. 2019 Sep;63(Supplement):S15–9.
16. Bharani K, Ramachandran K, Kommisetty V, Baalann KP. Knowledge of rabies among rural community in Chengalpet district, India. Bioinformation. 2022;18(3):155–9.
17. Auplish A, Clarke AS, Van Zanten T, Abel K, Tham C, Bhutia TN, et al. Estimating the intra-cluster correlation coefficient for evaluating an educational intervention program to improve rabies awareness and dog bite prevention among children in Sikkim, India: A pilot study. Acta Trop. 2017 May; 169:62–8.
18. Kumar S. A preliminary survey of knowledge, attitudes and practice regarding rabies in West Bengal, India. Sri Lankan Journal of Infectious Diseases. 2019 Apr 26; 9:79.