

Original Article

A STUDY ON KNOWLEDGE OF ANIMAL BITE VICTIMS REGARDING ANIMAL BITE AND RABIES ATTENDING ANIMAL BITE OPD ASSOCIATED WITH GOVERNMENT MEDICAL COLLEGE DATIA, MADHYA PRADESH

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ABSTRACT

Objective: The objective of the study is to assess the knowledge regarding animal bite, prevention and control and study the association of the socio-demographic factors with knowledge regarding animal bite, prevention and control.

Methods: An observational cross-sectional study was conducted in 280 animal bite victims attending animal bite OPD associated with Govt. Medical College Datia, Madhya Pradesh, India. Information collected with the semi-structured questionnaire after obtaining informed verbal consent for study duration of 3 mo. Data pertaining regarding knowledge of animal bite victims, prevention and control to the socio-demographic profile of victim, category of bite, age, sex, education, occupation, residence was collected. Data was analyzed using MS Excel and Epi Info software.

Results: Among 280 victims 178(63.57%) were males, 156(55.7%) belongs to 15-45 y, 170(60.71%) were living in urban area, and 98(35%) and 89(31.7%) of the victims were agriculture worker and laborers respectively. 263(93.92%) victims bitten by dog of them 249(88.9%) by street dog, 221(78.92%) had Category III bite, lower extremity was affected in 280(75.71%), and 156(55.71%) of the victims were affected during evening hours.

Conclusion: There is need for creating awareness in public and medical community about proper wound management and judicious use of anti-rabies vaccine.

Keywords: Animal bite, Dog bite, Human rabies, Rabies vaccine

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INTRODUCTION

Rabies, an invariably fatal viral disease that affects the central nervous system, poses a significant global public health threat due to its near 100% fatality rate once clinical symptoms manifest [1]. The primary mode of transmission is through bites, scratches, or direct contact with the infected animal's saliva, with domestic dogs being responsible for up to 99% of human rabies transmissions [1]. While the United States has made commendable progress in reducing human rabies cases through robust animal control, vaccination programs, and public health initiatives [2], the burden on a global scale remains critical, with over 95% of human deaths occurring in Asia and Africa [1].

Annually, more than 29 million individuals worldwide receive post-exposure prophylaxis (PEP), which prevents hundreds of thousands of rabies-related deaths [1]. In Southeast Asia, including countries like India, rabies remains endemic, necessitating a collaborative effort to eliminate dog-mediated rabies as a public health concern [3].

This study aims to assess the knowledge levels of individuals who seek treatment at the Animal Bite Outpatient Department (OPD) associated with Govt. Medical College Datia, Madhya Pradesh. Despite the availability of vaccines for over a century, gaps in public awareness and access to preventive treatments persist, particularly in resource-constrained settings [4]. Understanding the knowledge base of individuals seeking medical attention after an animal bite is crucial in developing effective awareness campaigns and improving public health interventions, ultimately reducing the burden of rabies in the region.

This study builds upon the imperative to address the persistent knowledge gaps among animal bite victims attending the Animal Bite OPD, Govt. Medical College Datia, Madhya Pradesh, as identified by global health organizations [1-3], previous research studies [4-8], and regional risk assessments [3].

The objectives of this study are twofold: to evaluate the knowledge of animal bite victims regarding animal bites, rabies, and preventive measures and to examine the association between socio-demographic factors and their knowledge levels. By identifying existing knowledge gaps and factors that influence awareness, this study aims to contribute to targeted interventions that can save lives and improve overall health outcomes in the community.

MATERIALS AND METHODS

Study type

This observational study was conducted at the Animal Bite Outpatient Department (OPD) of the Medical College-associated Hospital of Datia (M. P.) India.

Study area

The study focused on patients attending the Animal Bite OPD of the Medical College Datia.

Study population

The study population comprised patients attending the Animal Bite OPD of Medical College Datia during the three-month period from 1st July 2023 to 30th September 2023.

Study duration

The study was conducted over a period of three months, commencing from 1st July 2023 and concluding on 30th September 2023.

Sample size

A sample size of 280 was determined by including all new cases reported during the three-month period from 1st July 2023 to 30th September 2023.

Study tool

Data collection was facilitated through a semi-structured questionnaire administered via Google Forms.

Sampling technique

Purposive sampling was employed for participant selection.

Data collection

New cases reported to the Animal Bite OPD on a daily basis were documented. Interviews were conducted, and interns filled out the questionnaire daily. The recorded data were collated and segregated using MS Excel.

Inclusion criteria

Participants eligible for inclusion were animal bite victims seeking healthcare for prevention and control who consented to participate in the study.

Exclusion criteria

Individuals who did not provide consent or were critically injured were excluded from the study analysis.

Data collection

Prior to the study, participants were provided with detailed information about the research, and their consent was obtained

through an electronic consent form written in vernacular language.

Ethical clearance

Since the study is purely observational and does not involve any interventions, ethical clearance was not deemed necessary. Although not required, electronic consent (provided below) in vernacular language was taken from all participants as a precautionary measure.

Statistical analysis

Data analysis was performed utilizing MS Excel and SPSS version 20. Proportions of age and gender were visually presented in a pie chart. Chi-square test was employed as the significance test for qualitative data, with a p-value < 0.05 considered statistically significant.

RESULTS

The age distribution of animal bite victims, as shown in fig. 1, indicates a predominant occurrence in the 16-30 age group, accounting for 36.79% of the cases. The distribution is relatively balanced, with significant proportions in the 31-45 (20.36%) and >45 (20.71%) age groups. Moreover, children under 15 make up 22.14% of reported cases.

Fig. 2 demonstrates a significant gender disparity among animal bite victims, with 76.07% being male and 23.93% being female.

Table 1: Gender-wise distribution of study subjects for knowledge regarding rabies

Knowledge	Gender		Total, n=280 (%)	P Value
	Male, n=213 (%)	Female, n= 67 (%)		
Heard about rabies				
Yes	165 (77.46)	50 (74.63)	215 (76.79)	>0.05
No	48 (22.54)	17 (25.37)	65 (23.21)	
Transmission modes				
Bite	115 (53.99)	43 (64.18)	158 (56.43)	<0.05
Licking of wound	82(38.49)	18 (26.87)	100 (35.71)	<0.05
Skin scratch	7 (3.29)	0 (0)	8 (2.86)	<0.05
Other	9 (4.23)	4 (5.97)	13 (4.64)	>0.05
Animals responsible for transmission				
Dog only	100 (46.95)	35 (52.24)	135 (48.21)	<0.05
Other animals	87 (40.85)	22 (32.84)	109 (38.93)	<0.05
Do not know	26 (12.21)	10 (14.93)	36 (12.86)	<0.05
Wound care				
Application of household antiseptics	8 (3.76)	3 (4.48)	11 (3.93)	>0.05
Wash with water only	12 (5.63)	6 (8.96)	18 (6.43)	>0.05
Wash with soap and running water	167 (78.40)	50 (74.63)	217 (77.5)	<0.05
Do not know	26 (12.21)	8 (11.94)	34 (12.14)	<0.05
Wound status				
Open	156 (73.24)	53 (79.10)	209 (74.64)	>0.05
Close	57 (26.76)	14 (20.90)	71 (25.36)	
Understanding the preventive role of the vaccine				
Yes	170 (79.81)	40 (59.70)	210 (75)	<0.05
No	7 (3.29)	2 (2.99)	9 (3.21)	
Do not know	36 (16.90)	25 (37.31)	61 (21.79)	
Knowledge of anti-rabies vaccine doses				
5 doses	9 (4.23)	0 (0)	9 (3.21)	<0.05
4 doses	138 (64.79)	42 (62.69)	180 (64.29)	<0.05
Do not know	66 (30.99)	25 (37.31)	91 (32.5)	<0.05
Response to biting animal				
Observe the dog for symptoms of rabies	149 (69.95)	36 (53.73)	185 (66.07)	<0.05
Kill the animal	7 (3.29)	7 (10.45)	14 (5)	<0.05
Chase it away	3 (1.41)	6 (8.96)	9 (3.21)	>0.05
Do not do anything	8 (3.76)	3 (4.48)	11 (3.93)	>0.05
Do not know	46 (21.60)	15 (22.39)	61 (21.79)	<0.05
Duration of observation of biting animal				
<10 d	90 (42.25)	26 (38.81)	116 (41.43)	<0.05
≥ 10 d	55 (25.82)	10 (14.93)	65 (23.21)	<0.05
Do not know	68 (31.92)	31 (46.27)	99 (35.36)	<0.05
Awareness of rabies immunoglobulin				
Yes	139 (65.26)	37 (55.22)	176 (62.86)	>0.05
No	74 (34.74)	30 (44.78)	104 (37.14)	

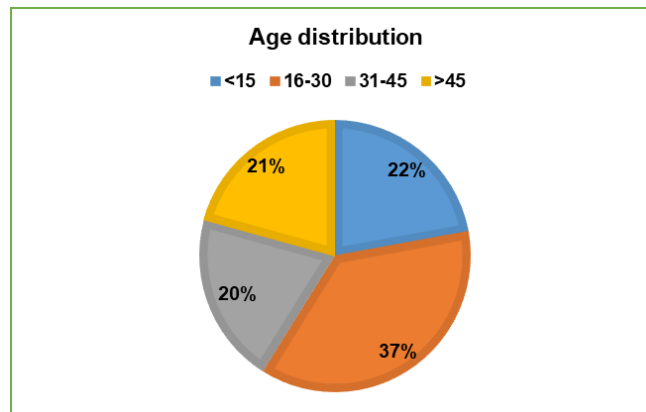


Fig. 1: Pie-chart showing age distribution of animal bite victims

Table 2 presents the distribution of 280 participants according to their educational status and knowledge of rabies. A significant proportion (57.69%) of individuals with below primary education were aware of the rabies disease, compared to 81.14% among those with primary and higher education ($p < 0.05$). Moreover, notable disparities were observed in the comprehension of rabies transmission. Participants with primary and higher education demonstrated a greater awareness

of bites as a mode of transmission, in contrast to individuals with below primary education ($p < 0.05$). Educational levels influenced knowledge about the animals responsible for transmission, first aid practices, wound care choices, and awareness of the preventive role of the anti-rabies vaccine ($p < 0.05$). Participants with primary and higher education displayed an overall higher level of awareness regarding various aspects related to rabies.

Table 2: Education status-wise distribution of study subjects for knowledge regarding rabies

Knowledge regarding rabies	Education		Total n=280 (%)	P Value
	Below primary n=52 (%)	Primary and above n=228 (%)		
Heard about rabies				
Yes	30 (57.69)	185 (81.14)	215 (76.79)	<0.05
No	22 (42.31)	43 (18.86)	65 (23.21)	
Transmission modes				
Bite	40 (76.92)	118 (51.75)	158 (56.42)	<0.05
Licking of wound	10 (19.23)	90 (39.47)	100 (35.71)	<0.05
Skin scratch	0 (0)	8 (3.51)	8 (2.86)	<0.05
Other	2 (3.85)	12 (5.26)	14 (5)	<0.05
Animals responsible for transmission				
Dog only	19 (36.54)	93 (40.79)	112 (40)	<0.05
Other animals	25 (48.08)	111 (48.68)	136 (48.57)	<0.05
Do not know	12 (23.08)	24 (10.53)	36 (12.86)	<0.05
Wound care				
Application of household antiseptics	2 (3.85)	9 (3.95)	11 (3.93)	<0.05
Wash with water only	4 (7.69)	14 (6.14)	18 (6.43)	<0.05
Wash with soap and running water	36 (69.23)	181 (79.39)	217 (77.5)	<0.05
Do not know	10 (19.23)	24 (10.53)	34 (12.14)	<0.05
Wound status				
Open	34 (65.38)	175 (76.75)	209 (74.64)	<0.05
Close	18 (34.62)	53 (23.25)	71 (25.36)	<0.05
Understanding the preventive role of the vaccine				
Yes	36 (69.23)	189 (82.89)	225 (80.36)	<0.05
No	0 (0)	6 (2.63)	6 (2.14)	<0.05
Do not know	16 (30.77)	33 (14.47)	49 (17.5)	<0.05
Knowledge of anti-rabies vaccine doses				
5 doses	4 (7.69)	11 (4.82)	15 (5.36)	>0.05
4 doses	26 (50)	154 (68.44)	180 (64.29)	<0.05
Do not know	22 (42.31)	61 (26.75)	83 (29.64)	<0.05
Response to biting animal				
Observe the dog for symptoms of rabies	28 (53.85)	163 (71.49)	191 (68.21)	<0.05
Kill the animal	3 (5.77)	6 (2.63)	9 (3.21)	>0.05
Chase it away	1 (1.92)	2 (0.88)	3 (1.07)	>0.05
Do not do anything	2 (3.85)	8 (3.51)	10 (3.57)	>0.05
Do not know	18 (34.62)	49 (21.49)	67 (23.93)	<0.05
Duration of observation of biting animal				
<10 d	16 (30.77)	101 (44.30)	117 (41.79)	<0.05
≥ 10 d	12 (23.08)	58 (25.44)	70 (25)	<0.05
Do not know	24 (46.15)	69 (30.26)	93 (33.21)	<0.05
Awareness of rabies immunoglobulin				
Yes	28 (53.85)	151 (66.23)	179 (63.93)	<0.05
No	24 (46.15)	77 (33.77)	101 (36.07)	

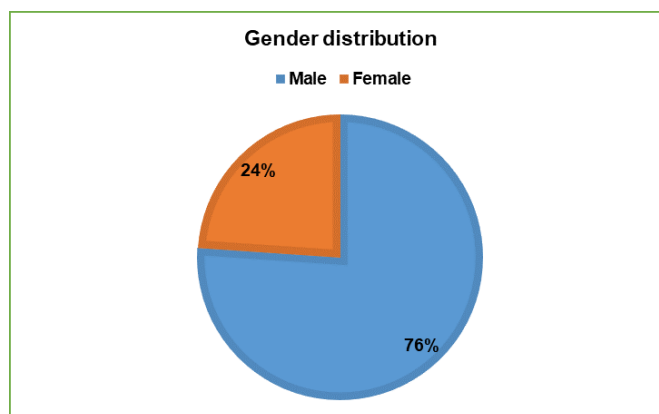


Fig. 2: Pie-chart showing gender distribution of animal bite victims

The findings from table 3 clarify the distribution of responses from 280 participants regarding various methods for preventing and controlling rabies. A significant majority, 52.86%, advocated for health education as a key strategy. Vaccination of dogs emerged as a significant method, with 16.43% of participants endorsing it. Additionally, 40% of the participants supported the prohibition of dogs in public places and streets as a preventive measure. Notably,

25% of respondents expressed a preference for isolating and killing rabies-infected animals as a method for controlling the spread of the disease. These results highlight the diverse perceptions among participants regarding the most effective strategies for rabies prevention and control, emphasizing the importance of comprehensive public health initiatives that incorporate multiple approaches to address this critical public health concern.

Table 3: Methods for prevention and control of rabies

Methods for prevention and control of rabies	Frequency distribution (%)
Vaccination of dogs	46(16.43)
Health education	148(52.86)
Isolation and killing	70(25)
Prohibition of dogs in public places and street	112(40)

Table 4: Distribution of education level and occupation by residence type (Urban vs. rural)

Responses	Residence		Total n=280 (%)	P Value
	Urban n=120 (%)	Rural n=160 (%)		
Education				
Below Primary	43 (35.83)	96 (60)	139 (49.64)	<0.05
Primary and above	77 (64.17)	64 (40)	141(50.36)	>0.05
Occupation				
Student	61(50.83)	44(27.5)	105 (37.5)	<0.05
Unemployed and housewife	8(6.67)	29 (18.13)	37 (13.21)	<0.05
Agriculture work	14(11.67)	53 (33.13)	67 (23.93)	<0.05
Laborer	7(5.83)	24 (15)	31(11.07)	<0.05
Service and business	30(25)	10 (6.25)	40 (14.29)	<0.05

Table 4 presents the distribution of participants' characteristics by residence, urban or rural, in a study involving a total of 280 individuals. Regarding education, a significant difference was observed between urban and rural areas, with a higher proportion of individuals with below primary education residing in rural areas (60%) compared to urban areas (35.83%), $p < 0.05$. However, for those with primary education and above, there was no significant difference between urban (64.17%) and rural (40%) areas. In terms of occupation, significant differences were found across all categories between urban and rural residents, with a larger proportion of students (50.83%), unemployed individuals or housewives (18.13%), agricultural workers (33.13%), laborers (15%), and those engaged in service or business (6.25%) in urban areas compared to rural areas, where the corresponding percentages were 27.5%, 13.21%, 23.93%, 11.07%, and 14.29%, respectively, all with $p < 0.05$.

DISCUSSION

The analysis conducted in our study revealed a predominant incidence of animal bites within the 16-30 age group, accounting for

36.79% of cases, with males representing 76.07% of the victims. A study conducted in Kolkata indicated that among 80 interns, the majority were male (68.75%) with an average age of 23.5 y [9]. Similarly, Kapoor *et al.* focused on 107 participants, predominantly males (72%) [10]. In a study involving 633 household heads, primarily females (56.6%) with an average age of 42.3 y were included [11].

In terms of rabies awareness, 76.79% of participants in our study were knowledgeable about the disease, with no significant gender disparity observed. Tenzin *et al.*'s study emphasized that male respondents, individuals with some level of education, and dog owners exhibited higher levels (89.6%) of knowledge and perception regarding rabies [12]. In contrast, a study in Rwanda reported varying levels of knowledge among respondents, with 67% being aware of rabies transmission between humans, dogs, cats, and jackals and only 53.3% possessing adequate overall knowledge [13].

Our study identified significant gender discrepancies in recognizing modes of transmission, preventive measures, and first aid practices following an animal bite. Education level also played a crucial role,

with 81.14% of individuals with primary and higher education being aware of rabies compared to 57.69% with education below the primary level. A study in Ethiopia found that 32.9% of participants received training or awareness about rabies, with informal sources contributing to 42.2% of this knowledge [11]. Despite this, 87.8% of individuals had heard of rabies, with 56.1% demonstrating good knowledge, 56.2% expressing a positive attitude, and 61.3% exhibiting good practices towards rabies prevention and control [11]. The study by Jain *et al.* indicated that 78.1% of dog owners had their pets vaccinated against rabies [14].

Our study also highlighted that methods for preventing and controlling rabies varied among participants, with health education being the most recommended strategy (52.86%), followed by dog vaccination (16.43%). A study done in Jaipur revealed a lack of knowledge about rabies, with only 22.5% of participants demonstrating good knowledge and 43.9% recognizing that a single injection is insufficient for immunization [10]. The study by Hagos *et al.* reported that 87.8% of participants were aware of rabies, with 56.1% demonstrating good knowledge, 56.2% expressing a positive attitude, and 61.3% exhibiting good practices towards rabies prevention and control [11]. In a study conducted in Gelephu, the community displayed a positive attitude towards rabies control, with a majority (84-92%) expressing willingness to report animal bites to hospitals and acknowledging the importance of managing the dog population and supporting rabies control initiatives [12].

One limitation of this study is its reliance on self-reported data, which may be subject to recall bias and social desirability bias. Participants may have provided answers they deemed socially acceptable or may have difficulty accurately recalling details about their knowledge or experiences with rabies. Additionally, the study's cross-sectional design limits the ability to establish causality or determine temporal relationships between variables. Furthermore, the study was conducted at a single center in Datia, Madhya Pradesh, which may limit the generalizability of the findings to other populations or regions with different socio-demographic characteristics or healthcare infrastructure. Future research incorporating longitudinal designs and multiple study sites could provide more robust insights into the factors influencing rabies knowledge and preventive behaviors.

CONCLUSION

Our study reveals satisfactory community-level knowledge about rabies, its prevention, and control, yet identifies significant gaps in understanding specific areas such as modes of transmission, preventive methods after suspected animal bites, initial actions taken at home following a bite, and awareness of the anti-rabies vaccine. Sex and educational status emerged as significant variables associated with rabies knowledge. The findings highlight the need for increasing awareness within the community, particularly prioritising proper wound management and the appropriate use of the anti-rabies vaccine. Efforts aimed at addressing these knowledge gaps are essential to enhance public health outcomes and mitigate the burden of rabies transmission effectively.

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AUTHORS CONTRIBUTIONS

Dr. Bikramjeet Mitra conceived the study and contributed to intellectual content, design, data acquisition, analysis, manuscript preparation, editing, review, and statistical analysis.

Dr. Kalpana Arya assisted in design, literature search, data acquisition, manuscript editing, and review.

Mr. Vikas Pandey contributed to intellectual content, data acquisition, data analysis, statistical analysis, manuscript preparation, editing, review, and the conceptualization of the study.

CONFLICT OF INTERESTS

There is no conflict of interest.

REFERENCES

- World Health Organization. Rabies. World Health Organization South-East Asia Region. Available from: <https://www.who.int/southeastasia/health-topics/rabies> [Last accessed on 08 May 2024]
- World Health Organization. Rabies. World Health Organization. Available from: <https://www.who.int/news-room/fact-sheets/detail/rabies> [Last accessed on 08 May 2024]
- Centers for Disease Control and Prevention (CDC). World map of areas with risk of rabies. Atlanta: CDC; Available from: <https://www.cdc.gov/rabies/location/world/index.html> [Last accessed on 02 Mar 2024]
- Marathe N, Kumar S. Epidemiological trends, knowledge and practices of animal bite in children attending outpatient department of Rewa City-a hospital-based survey. *J Evol Med Dent Sci.* 2019;8(10):667-70. doi: 10.14260/jemds/2019/148.
- 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;10(2):850-8. doi: 10.4103/jfmpc.jfmpc_1674_20, PMID 34041088.
- Singh T, Mahajan S, Dahiya N. A cross-sectional study of awareness and practices regarding animal bites in rural community, North India. *J Family Med Prim Care.* 2020 Jun 30;9(6):2751-7. doi: 10.4103/jfmpc.jfmpc_158_20, PMID 32984120.
- Trivedi R, Kumar S, Saxena M. Epidemiological trends and practices of animal bite victims presenting to the OPD, district and medical college hospital, India. *Int J Health Sci Res.* 2015;5(12):14-20.
- Jain P, Jain G. Study of general awareness, attitude, behavior, and practice study on dog bites and its management in the context of prevention of rabies among the victims of dog bite attending the opd services of chc muradnagar. *J Family Med Prim Care.* 2014;3(4):355-8. doi: 10.4103/2249-4863.148107, PMID 25657942.
- Chowdhury R, Mukherjee A, Naskar S, Lahiri S. A study on knowledge of animal bite management and rabies immunization among interns of a Government Medical College in Kolkata. *Int J Med Public Health.* 2013;3(1):17-20. doi: 10.4103/2230-8598.109313.
- 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. *J Family Med Prim Care.* 2019;8(1):194-8. doi: 10.4103/jfmpc.jfmpc_205_18, PMID 30911505.
- Hagos WG, Muchie KF, Gebru GG, Mezgebe GG, Reda KA, Dachew BA. Assessment of knowledge, attitude and practice towards rabies and associated factors among household heads in Mekelle city, Ethiopia. *BMC Public Health.* 2020;20(1):57. doi: 10.1186/s12889-020-8145-7, PMID 31937297.
- Tenzin NK, Dhand NK, Rai BD, Changlo K, Tenzin S, Tsheten K. Community-based study on knowledge, attitudes and perception of rabies in Gelephu, South-Central Bhutan. *Int Health.* 2012;4(3):210-9. doi: 10.1016/j.inhe.2012.03.005, PMID 24029402.
- Ntampaka P, Nyaga PN, Niragire F, Gathumbi JK, Tukei M. Knowledge, attitudes and practices regarding rabies and its control among dog owners in Kigali city, Rwanda. *PLOS ONE.* 2019;14(8):e0210044. doi: 10.1371/journal.pone.0210044, PMID 31430285.
- Jain P, Jain G. Study of general awareness, attitude, behavior, and practice study on dog bites and its management in the context of prevention of rabies among the victims of dog bite attending the opd services of chc muradnagar. *J Fam Med Primary Care.* 2014;3:355-8.