

Original Research Article

Attitudes and practices toward stray dog management for rabies prevention among adults in an urban field practice area: a community based cross-sectional study

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ABSTRACT

Background: Rabies is a fatal viral disease predominantly transmitted through dog bites. Although 100% vaccine preventable, India bears a heavy burden causing an estimated 18,000-20,000 deaths annually and accounting for around 36% of global rabies fatalities. Stray dogs remain the primary reservoir, underscoring the urgent need for effective stray-dog and bite-prevention strategies. This study was done to assess the attitudes and practices of adults in an urban field practice area towards stray-dog management for prevention and control of rabies in the community.

Methods: This cross-sectional survey in an urban field practice area of a medical college included 380 adults (≥ 18 years) using convenience sampling across five zones. Over 18 months, investigators used a validated, multi-language questionnaire. Data were analyzed in SPSS 23 with chi-square tests ($\alpha=0.05$).

Results: In this study, 87.1% of the 380 participants reported that stray dogs posed problems in their community, with common concerns including attacks/bites (57.4%), barking/nuisance (22.4%) and environmental spoilage (12.4%). While 71.8% opposed removing and killing stray dogs, 70.3% supported removing them from streets and sheltering them. Just over half (52.4%) endorsed sterilisation and release, and only 9.7% had ever filed a municipal complaint. Additionally, 73.2% believed the government alone is responsible for stray-dog population control.

Conclusions: The study found only 38.9% of participants had heard of rabies, with over half of them scoring “poor” on awareness. Despite prevalent stray-dog issues, 73.2% believed only government agencies are responsible. We recommend urgent IEC efforts, proactive dog-population control, community engagement, and a multidisciplinary “one health” approach.

Keywords: Awareness, One health, Rabies, Stray dogs

INTRODUCTION

Rabies is a fatal infectious viral disease that affects warm-blooded animals. Despite being a public health emergency in India, rabies remains underreported, and neglected. It has a 100% fatality rate in both humans and animals.¹ India remains severely affected, reporting between 18,000 and 20,000 cases per year.²

Nearly all human rabies cases in India stem from stray dogs, which serve as the main reservoir for the disease, according to the National Institute of Communicable Diseases (NICD). Although animal bite numbers remain high, efforts to address the issue have been hampered by legal pressure from animal-rights groups. According to the NICD, approximately 96% of rabies cases in India are caused by stray dogs, while the remainder are linked to pet dogs, cats, monkeys, mongooses and jackals. Each year,

around 2.2 million people in India are bitten by animals, yet only about 1.4 million seek treatment.³ This study was conducted in an urban field practice area that includes urban slums, as these areas often involve dumping large amounts of garbage in open spaces. This practice attracts a significant number of street dogs, which is a major risk factor for human rabies cases.⁴

Aim

To assess the attitudes and practices of adults in an urban field practice area towards stray-dog management for prevention and control of rabies in the community.

Objectives

To determine the proportion of adult participants who report problems caused by stray dogs in their community. To assess the attitudes of participants regarding stray-dog management strategies.

METHODS

The study adopted a cross-sectional design in the urban field practice area of Seth G. S. Medical College and KEM Hospital, Mumbai (Health Post-1, Malvani), which serves around 126,973 residents drawn from diverse socio-cultural and migrant backgrounds. Adults aged 18 years and above who were able to comprehend and respond to questions were eligible for inclusion. The required sample size of 380 was estimated based on an assumed awareness prevalence of 55%, a margin of error of 5%, and a confidence level of 95%. Given resource and time constraints, convenience sampling was applied with proportional allocation across the five regional zones. The study duration 18 months in total: four months for protocol development and ethics committee approval; twelve months (June 2023-February 2024) for home-based data collection; and two months for data entry, analysis and interpretation. A semi-structured questionnaire (validated by experts) and informed consent forms in English, Hindi and Marathi were utilised. Private face-to-face interviews were conducted in participants' homes by the co-investigator to collect socio-demographic information and data on rabies awareness. Data were entered into MS Excel 2023 and analysed using IBM SPSS Statistics 23. Numeric variables were summarised by means and standard deviations, whereas categorical variables were expressed as frequencies and percentages. Associations between awareness of rabies and awareness of the responsibility for stray dog population control were examined using chi-square tests at the 5% level of significance.

RESULTS

A total of 380 adults [133 males (35%), 244 females (64.2%), 3 transgenders (0.8%)] participated in the study. The largest age group was 31-40 years (28.2%), followed by 21-30 years (27.4%). The mean±SD age for males was 37.13±13.13 years, for females 36.59±13.08 years, and for

transgender participants 47.66±12.41 years (range 18-75 years).

Most participants were Muslim (65.0%), followed by Hindu (31.8%); among males, 56.4% were Muslim and among females 70.1% were Muslim. Two-thirds of transgender participants (66.7%) identified as Hindu.

Regarding marital status, 73.2% of participants were married (75.2% of males; 72.9% of females). Unmarried status applied to 18.4% (22.5% of males; 15.2% of females; and 100% of transgender participants). Widowed and divorced participants comprised 7.6% and 0.8% of the sample respectively.

In terms of education, nearly half (54.73%) of adults reported that they had completed middle-level and high-level education whereas 19.73% were illiterate. Among 75 illiterate participants, 56 (74.66%) were females. 171 (70.08%) females had completed their primary school, middle school, and high school, and 101 (75.93%) males had completed their primary school, middle school, and high school (Figure 1).

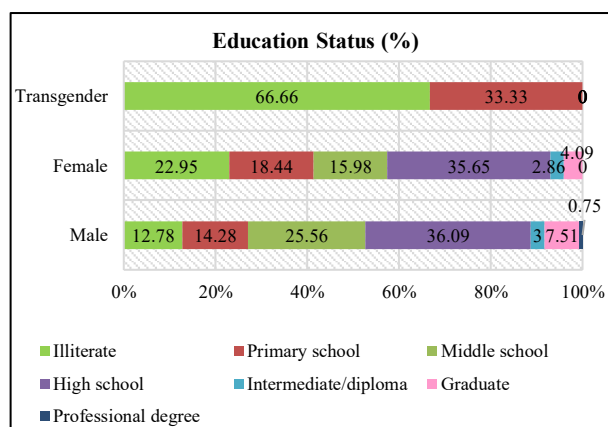


Figure 1: Distribution of study participants according to education (n=380).

Occupationally, 60.3% of participants were unemployed (including 21.1% of males; 82.4% of females). Unskilled workers accounted for 12.6% (24.1% males; 6.1% females; 33.3% transgender). Semi-skilled workers formed 6.3% (14.3% males; 2.0% females). Skilled workers comprised 15.8% (36.1% males; 4.1% females; 66.7% transgender). Clerical/shop/farm occupation was rare (0.3%). Professionals represented 4.7%.

Family structure data revealed that 58.4% of participants resided in nuclear families, 23.2% in joint families, and 18.4% in three-generation households. The overwhelming majority (96.6%) lived in pucca houses. The average family size was 5.34 members, with monthly incomes ranging from INR 5,000 to INR 100,000; 88.7% of families experienced overcrowding.

Only 37 participants (9.7%) reported having a pet at home; among these, 48.6% kept cats, 24.3% sheep, 16.2% dogs and 8.1% other animals (rabbits/tortoises).

Among 380 participants, 331 (87.10%) reported that stray dogs created problems for them. The reasons cited included that stray dogs attack and bite people (mentioned by 190 participants, 57.40%), bark and create a nuisance (74 participants, 22.35%), spoil the environment (41 participants, 12.38%), and spread diseases (10 participants, 3.02%). Additionally, 5 participants (1.51%) noted that the dogs were always roaming at night, while 3 participants (0.90%) each mentioned that the dogs were mad, not vaccinated, or dangerous. Furthermore, 2 participants (0.60%) claimed that the dogs were poisonous, and 1 participant (0.30%) each responded that the dogs were fearful or emitted an unpleasant smell.

Among the 380 participants surveyed, the majority, 273 (71.84%), believed that stray dogs should not be removed from the streets and killed, while 88 (23.15%) thought they should be removed and killed, and 19 (5%) were unsure.

A total of 267 participants (70.26%) stated that stray dogs should be removed from the streets and sheltered, whereas

99 (26.05%) opposed this idea, and 14 (3.68%) were uncertain.

Regarding the sterilization of stray dogs, 199 participants (52.36%) supported the idea of sterilizing and then releasing the dogs back onto the streets, 105 (27.63%) were unsure, and 76 (20%) were against sterilization.

When asked about the timing of stray dog sightings, the majority, 201 (52.89%), reported seeing more stray dogs at night, followed by 92 (24.21%) during the daytime, 69 (18.15%) in the evening, and 18 (4.73%) in the afternoon.

Regarding changes in the number of stray dogs on the streets over the past 10 years, 194 participants (51.05%) reported a decrease, 149 (39.21%) noticed an increase, 25 (6.57%) saw no change, and 12 (3.15%) were unsure.

Only 37 participants (9.73%) had complained to the municipal corporation about stray dogs, citing reasons such as the presence of too many stray dogs (20, 54.05%), continuous barking (10, 27.02%), the biting nature of particular dogs (5, 13.51%), and injured or sick dogs (2, 5.40%). Awareness about the street dog sterilization program was high, with 273 participants (71.84%) being aware of it.

Table 1: Association between awareness about rabies and awareness about responsibility for controlling the stray dog population (n=148).

Awareness about rabies	Awareness about responsibility for controlling the stray dog population									
	Government only		People in the community		Government and people in the community and NGO		Don't know		Total	
	N	%	N	%	N	%	N	%	N	%
Poor awareness	61	79.22	4	5.19	11	14.29	1.00	1.30	77	100
Average awareness	42	59.15	5	7.04	24	33.80	0.00	0.00	71	100
Total	103	69.59	9	6.08	35	23.65	1.00	0.68	148	100

Chi-square value- 9.216, df-3, p value- 0.027. The chi-square analysis shows a significant association between awareness about rabies and perceptions of responsibility for controlling the stray dog population ($\chi^2=9.216$, df=3, p=0.027). Participants with higher rabies awareness are more likely to recognize a shared responsibility among the government, community, and NGOs, compared to those with poor awareness.

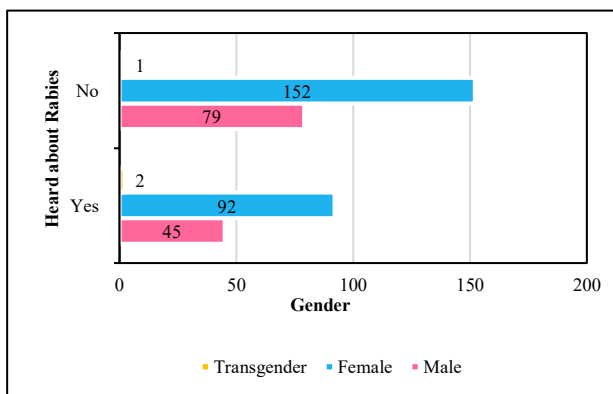


Figure 2: Distribution of study participants who heard about Rabies (n=380).

Regarding the responsibility for controlling the stray dog population, 278 participants (73.15%) believed that the government is solely responsible, 1 (0.26%) thought both the government and the people should share the responsibility, 7 (1.84%) considered it an NGO's responsibility, 17 (4.47%) believed the people are responsible, 64 (16.84%) said that the government, community, and NGOs are all responsible, and 13 (3.42%) were unsure.

Regarding awareness about rabies, participants were initially asked whether they had ever heard of rabies; only those answering "yes" proceeded to complete a detailed questionnaire. Each response carried a pre-assigned weight, yielding a maximum possible awareness score of 23. Participants were then classified into five categories

based on their total score: excellent (21-23), good (17-20), average (12-16), poor (6-11), and very poor (0-5).

Among 380, only 148 (38.94%) participants heard about rabies (Figure 2), the majority fell into the “poor” and “average” categories: 52.03 % scored in the poor range (6-11) and 47.97 % scored in the average range (12-16).

DISCUSSION

In our study, out of 380 participants, 133 (35%) were males, 244 (64.21%) were females, and 3 (0.78%) were transgender individuals. This gender distribution aligns with the findings of Sivagurunathan et al, who observed in an urban community in Tamil Nadu that out of 350 participants, 56.6% were females and 43.4% were males.⁵ 73.15% of participants were married, which is similar to the 59% marriage rate reported in the study by Cowshik and Shanmugapriya.⁶ The average family size was 5.34, which is similar to the findings of Singh et al in the rural field practice area of Fatehgarh Sahib district, Punjab, North India.⁷ Only 148 participants (38.94%) had heard about rabies (Table 1). This is slightly higher than the findings in the study by Roy et al where only 29.38% of participants were aware of rabies.⁸ This indicates a generally low level of awareness about rabies in both study populations.

Among 380 participants, 199 participants (52.36%) supported the idea of sterilizing stray dogs. This finding is consistent with the study by Cowshik and Shanmugapriya, where 55.2% of participants agreed that animal birth control programs could reduce rabies.⁶ This similarity underscores the recognition among communities of the importance of sterilization programs in controlling stray dog populations and mitigating rabies risk.

Our study found that a significant majority (87.1%) of participants reported that stray dogs created problems for them. This aligns closely with the findings of Hagos et al, who noted that 82.9% of respondents perceived stray dogs as dangerous, and 84.7% expressed annoyance with them.⁹ In contrast, Tiwari’s study indicated that younger respondents (≤ 34 years) did not view free-roaming dogs (FRD) as a significant threat to human health, which suggests a divergence in perception based on age.¹⁰

The high percentage of respondents in our study and Hagos et al indicating issues with stray dogs may reflect a broader concern about public safety and health risks, including potential diseases like rabies.⁹ This concern is further underscored by Hagos et al, where 88% of respondents acknowledged that health education could prevent rabies, highlighting the importance of awareness in mitigating risks associated with stray dogs. The discrepancy in perceptions between our study and Tiwari’s could be attributed to differences in study populations, geographic locations, or cultural contexts.¹⁰ Younger individuals might have different risk perceptions compared to older

adults, potentially influenced by varying levels of exposure or differing societal attitudes toward stray dogs.

Limitations of this study are:

The study was conducted within a specific urban field practice area, which may not fully represent the broader population. This could affect the generalizability of the findings to other urban areas or regions.

The study did not fully engage with certain subpopulations, such as homeless individuals, who might have different levels of awareness.

CONCLUSION

The study revealed a substantial deficiency in rabies awareness among adults in the urban slum-adjacent field practice area of Seth G. S. Medical College and KEM Hospital, Mumbai. Although exposure to stray-dog related risks is high, only 38.9% of participants reported having heard of rabies, and over half of those scored in the “poor” awareness category. Despite recognising stray dogs as a community issue (e.g., attacks, nuisance, disease), 73.2% still believe that only government agencies bear responsibility for stray-dog population control.

Recommendations

Strengthen IEC activities

Set up regular information, education, and communication (IEC) events at schools, urban health training centres, Anganwadi centres. Get healthcare workers, teachers, and community leaders to give health lessons and raise awareness about rabies especially in slum settings where stray-dog exposure is high.

Control the dog population

City officials should increase surveillance activities as regards to stray dogs in the city and pro-actively (not only when complaints received found from study findings). These activities should include sterilization and vaccination of stray dogs.

Encourage community to take responsibility and play an active role to control stray dog population in their neighbourhoods.

To promote “one health” approach by creating teams with doctors, veterinarian, environmental experts, and social scientists. These groups should team up to monitor, report, and manage rabies cases making sure all parts work together.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Godbole M, Joshi AR, Bant DD. A cross sectional study to assess the knowledge and response to dog bite among the urban and rural population of Hubballi taluk. *Int J Community Med Public Health.* 2019;6(2):539-44.
2. Rabies in India. Available from: <https://www.who.int/india/health-topics/rabies>. Accessed on 31 July 2024.
3. Kumar S. Stray dogs are a growing threat to public health. *BMJ.* 2002;325(7355):66.
4. Vijayalakshmi M, Chandran VM. Awareness of rabies and its prevention among adults in urban slums of Tiruvallur district. *Int J Community Med Public Health.* 2021;8(2):737-42.
5. 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 Fam Med Prim Care* 2021;10(2):850-8.
6. Cowshik E, Duraisamy S. A cross sectional study to assess the awareness of rabies among dog bite victims attending primary health center, Tiruppur. *Int J Acad Med Pharm.* 2023;5(6):184-90.
7. Singh T, Mahajan S, Dahiya N. A cross-sectional study of awareness and practices regarding animal bites in rural community, North India. *J Fam Med Prim Care.* 2020;9(6):2751.
8. Roy P, Nandimath VA, Bhadake KH. A cross-sectional study on knowledge, attitude and practice regarding rabies among patients attending a tertiary care centre, Solapur Maharashtra. *Int J Community Med Public Health.* 2023;10(9):3324-31.
9. 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.
10. Tiwari HK, O'Dea M, Robertson ID, Vanak AT. Knowledge, attitudes and practices (KAP) towards rabies and free-roaming dogs (FRD) in Shirsuphal village in western India: a community based cross-sectional study. *PLoS Negl Trop Dis.* 2019;13(1):e0007120.

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