Knowledge, attitude, and practice study on animal bite, rabies, and its prevention in an urban community

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ABSTRACT

Introduction: Rabies is a neglected zoonotic tropical disease that usually affects the poorest communities. Rabies is 100% fatal and at the same time 100% preventable. A huge proportion of death due to rabies occurs in Asia and Africa, and India is reported to have the highest incidence of rabies. Aims: To assess the knowledge, attitude, and practice related to animal bites, rabies, and its prevention and utilization of health services for this purpose in the study population. Methods: A community-based cross-sectional study done in an urban area among the age group 20 and above of both gender to assess and statistically highlight the knowledge, attitude, and practice related to animal bites, rabies, and its prevention and utilization of health services for this purpose in the study population. The sample size was estimated to be 350 and a simple random sampling technique was used for the selection of samples. Results: About 76% had heard about rabies. Among them only 63.5% knew it is a fatal disease, only 37.6% knew animals other than dogs can also cause rabies, only 37.3% of the study participants knew about appropriate first aid. Only 37.5% of the animal bite victims washed their wound with soap and running water and 35% had a full course of vaccination. Education had been an important factor that created a significant difference in the knowledge level of the participants. Conclusions: Improved community awareness, forestalling animal rabies, and better access to affordable and potent human rabies vaccines are essential for the elimination of human rabies.

Keywords: Animal bite, animal rabies, dog bite, human rabies, rabies vaccine, wound cleaning

Introduction

Rabies is a neglected zoonotic tropical disease that usually affects the poorest communities. It is the world’s deadliest disease which has 100% fatality and at the same time 100% preventable. Rabies is endemic in eight countries of the World Health Organization (WHO) South-East Asia Region (SEAR), except the Democratic People’s Republic of Korea, Maldives, and Timor-Leste. Almost 95% of the human cases are from Asia and Africa and 99% of all human rabies is transmitted through dog bites. Globally, it is estimated that rabies accounts for more than 59,000 deaths every year and the majority of human rabies deaths occur due to biting of the rabid dogs. India, rabies is a problem of considerable magnitude. India is endemic for rabies and except for the islands of Andaman and Nicobar and Lakshadweep, which are historically rabies-free. India is one of the countries that has the highest population of stray dogs in the world. With these stray...
dogs being unvaccinated, Indians are at high risk of getting rabies. In India, West Bengal reports the highest number of rabies cases every year.[10] Many countries achieved zero human rabies death by following strategies like awareness campaigns, mass dog vaccination campaigns, national rabies notification, and a decentralized surveillance system. The global conference of rabies constructed a framework for the elimination of human death from dog-mediated rabies by 2030. To achieve this target, the most important strategy should be focusing on continuous and consistent mass awareness campaigns on health-seeking behavior during the animal bites, proper animal bite wound management, and vaccination strategies among the general public. A study conducted by Kapoor et al. in India (2019), revealed that only 22.5% of respondents had good knowledge, 56% had fair, and 21.5% had poor knowledge.[10] Considering the situation, our study was conducted among the urban population on knowledge, attitude, practice, myths, and beliefs to explore the current status of knowledge, attitude, and practice (KAP) to foresee the implementation of mass awareness campaigns on rabies.

Objectives

1. To assess the KAP regarding animal bite, rabies, anti-rabies vaccine, and health services utilization.
2. To find out the misconceptions and incorrect practices in the community.
3. To study the association of the sociodemographic factors with KAP related to rabies.

Subjects and Methods

This is a community-based cross-sectional study conducted in an urban field practice area of a tertiary care institute, in the Kancheepuram district of Tamil Nadu. The study subjects were the residents of the urban field practice area (Anakaputtur) age 20 and above belonging to both genders. The sample size was estimated using the prevalence rate (74%) of the awareness of rabies among adults in urban slums near Bangalore, Karnataka as shown in the study done by Herbert et al.[9] The estimated sample size was 135 using the below-given formula, with 10% precision (7.4).

\[ N = \frac{Z^2 \times p \times q}{L^2} = 134.9 \]

To have better coverage of the study population, the estimated sample size had been increased to 2.5 folds and estimated to take 350 subjects into the study.

Sampling method

A simple random sampling technique was used for the selection of study participants. With the available streetwise population and family data of the urban field practice area, a list was prepared. Random numbers were generated using computer software and participants for the study selected accordingly.

Pilot study

The questionnaire was standardized by doing a pilot test with 40 participants. Based on the observations, necessary changes were made to the questionnaire. The results of the pilot test were not included in the final analysis.

Study tool and data collection

A structured questionnaire was prepared wherein the first part with the demographic details and the second part have questions assessing KAP related to the epidemiology of rabies, first aid, and vaccination following an animal bite. The data was collected by questionnaire and interview method by the house to house visit after getting the written informed consent in the native language.

Data analysis

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 16. Results were expressed in frequencies. A Chi-square test was used for analyzing the association between demographic variables and knowledge and practices related to rabies. Spearman’s correlation was carried out for the scores of knowledge with attitude and practice and the scores of attitude and practice, to measure the relationship between them. The results obtained with \( P \) value < 0.05 were considered as statistically significant.

Ethical committee approval

Ethical approval was obtained from the institutional ethics committee before the commencement of the study.

Results

Sociodemographic profile

About 53.2% of the participants were aged between 20 to 40 years and the mean age is 30 years. About 56.6% of the participants were females. The majority (77.5%) of the participants were educated up to Higher Secondary Certificate (HSC) or lower and about half of the participants were unemployed. About 64.9% of the study participants belonged to the social class upper lower.

Knowledge about the animal bite and rabies

[Table 1]

About 76% had heard about rabies among them, 63.5% knew that rabies is a fatal disease, 37.6% knew animal other than dogs can also cause rabies, about 47.4% mentioned that rabies is caused by a microorganism. Only 31.6% knew rabies could be transmitted through a bite, scratch, and lick over the broken skin. Only 36.2% knew washing the wound with soap and running water and 1.1% knew the application of iodine/alcohol solution could prevent rabies. About 95.7% said anti-rabies vaccination (ARV) following animal bites prevents the occurrence of rabies in humans.
Table 1: Knowledge, attitude, and practice related to animal bite and rabies in the study participants

| Determinants                                                                 | Frequency (n=350) | Percentage |
|------------------------------------------------------------------------------|------------------|------------|
| **Knowledge**                                                                |                  |            |
| Can an animal bite causes the disease to man                                 |                  |            |
| Yes                                                                          | 308              | 88         |
| No                                                                           | 35               | 10         |
| Do not know                                                                  | 7                | 2          |
| Have you heard of rabies                                                     |                  |            |
| Yes                                                                          | 266              | 76         |
| No                                                                           | 84               | 24         |
| **Fatality** (n=266)                                                         |                  |            |
| Yes                                                                          | 169              | 63.5       |
| No                                                                           | 36               | 13.6       |
| Do not know                                                                  | 61               | 22.9       |
| **Organism** (n=266)                                                         |                  |            |
| Germs                                                                        | 126              | 47.4       |
| Venom                                                                        | 117              | 44         |
| Do not know                                                                  | 23               | 8.6        |
| **Animals responsible for transmission** (n=266)                              |                  |            |
| Dog only                                                                     | 162              | 60.9       |
| Other animals can also cause rabies                                          | 100              | 37.6       |
| Do not know                                                                  | 4                | 1.5        |
| **Transmission** (n=266)                                                      |                  |            |
| Bite                                                                         | 122              | 45.9       |
| Scratch, lick, and bite over broken skin                                     | 84               | 31.6       |
| Lick and bite                                                                | 35               | 13.2       |
| Scratch and bite over broken skin                                            | 16               | 6          |
| Scratch only                                                                 | 5                | 1.8        |
| Lick only                                                                    | 1                | 0.4        |
| Do not know                                                                  | 3                | 1.1        |
| Can you identify a rabid animal (n=350)                                       |                  |            |
| Yes                                                                          | 275              | 78.6       |
| No                                                                           | 75               | 21.4       |
| **Symptoms of a rabid animal**                                               |                  |            |
| Animal becomes aggressive                                                    | 191              | 68.7       |
| Attack without provocation                                                   | 197              | 71.6       |
| Excessive salvation                                                          | 195              | 70.9       |
| Run amok                                                                     | 79               | 28.7       |
| Lethargy/drowsy                                                              | 12               | 4.3        |
| Bellowing                                                                    | 11               | 4          |
| Headbutting                                                                  | 9                | 3.2        |
| Skin lesions                                                                 | 103              | 37.4       |
| Other                                                                        | 1                | 0.3        |
| **First aid**                                                                |                  |            |
| Wash with water only                                                         | 16               | 4.5        |
| Wash with soap and running water                                            | 127              | 36.2       |
| Application of household antiseptics                                          | 82               | 23.4       |
| Application of alcohol/iodine solution                                       | 4                | 1.1        |
| Application of indigenous materials                                          | 13               | 3.7        |
| Do not do anything                                                           | 42               | 12         |
| Heat cauterization                                                           | 4                | 1.1        |
| Tourniquet above the wound                                                   | 15               | 4.3        |
| Application of crotalaria fluid                                              | 74               | 21.1       |
| Do not know                                                                  | 31               | 8.8        |

Contd...

Table 1: Contd...

| Determinants                                                                 | Frequency (n=350) | Percentage |
|------------------------------------------------------------------------------|------------------|------------|
| Effective medicine                                                          |                  |            |
| Modern medicine                                                             | 330              | 94.3       |
| Traditional medicine                                                        | 13               | 3.7        |
| Both modern and traditional medicine                                        | 3                | 0.9        |
| Do not know                                                                  | 4                | 1.1        |
| Can the anti-rabies vaccine prevent the occurrence of rabies                 |                  |            |
| Yes                                                                          | 335              | 95.7       |
| Do not know                                                                  | 15               | 4.3        |
| **Anti-rabies vaccine doses (n=335)**                                        |                  |            |
| 5 doses                                                                      | 41               | 12.2       |
| 3 doses                                                                      | 102              | 30.4       |
| Others                                                                       | 89               | 26.7       |
| Do not know                                                                  | 103              | 30.7       |
| Safety of anti-rabies vaccine in pregnancy                                   |                  |            |
| Yes                                                                          | 96               | 27.4       |
| No                                                                           | 105              | 30         |
| Do not know                                                                  | 149              | 42.6       |
| **Anti-rabies vaccine availability**                                         |                  |            |
| Government hospital                                                          | 64               | 18.3       |
| Private hospital                                                             | 7                | 2          |
| Both government and private hospital                                         | 273              | 78         |
| Do not know                                                                  | 6                | 1.7        |
| **Tetanus vaccination following animal bite (TT)**                            |                  |            |
| Yes                                                                          | 277              | 79.1       |
| No                                                                           | 27               | 7.7        |
| Do not know                                                                  | 46               | 13.2       |
| **What should be done to the biting animal**                                 |                  |            |
| Observe the dog for symptoms of rabies                                       | 259              | 74         |
| Kill the animal                                                              | 26               | 7.4        |
| inform the authorities                                                       | 9                | 2.6        |
| Chase it away                                                                | 14               | 4          |
| Do not do anything                                                           | 22               | 6.3        |
| Do not know                                                                  | 20               | 5.7        |
| **How many days to observe (n=259)**                                         |                  |            |
| 9 days or less                                                               | 32               | 12.4       |
| 10 days or more                                                              | 174              | 67.2       |
| Do not know                                                                  | 53               | 20.4       |
| **Rabies Immunoglobulin**                                                    |                  |            |
| Yes                                                                          | 11               | 3.1        |
| No                                                                           | 339              | 96.9       |
| **Attitude**                                                                 |                  |            |
| Rabies is curable                                                            | 40               | 11.4       |
| Do not know                                                                  | 124              | 35.5       |
| Disagree                                                                     | 186              | 53.1       |
| Application of indigenous materials can prevent rabies                       |                  |            |
| Agree                                                                        | 91               | 26         |
| Do not know                                                                  | 59               | 16.9       |
| Disagree                                                                     | 200              | 57.1       |
| **Completion of anti-rabies vaccine is necessary**                            |                  |            |
| Agree                                                                        | 332              | 94.9       |
| Do not know                                                                  | 15               | 4.2        |
| Disagree                                                                     | 3                | 0.9        |

Contd...
Table 1: Contd...

| Determinants                                      | Frequency (n=350) | Percentage |
|---------------------------------------------------|-------------------|------------|
| Kill the biting animal                            |                   |            |
| Agree                                             | 34                | 9.7        |
| Do not know                                       | 23                | 6.6        |
| Disagree                                          | 293               | 83.7       |
| Practice                                          |                   |            |
| History of animal bite in your family (n=350)      |                   |            |
| Yes                                               | 72                | 20.6       |
| No                                                | 278               | 79.4       |
| Type of animal (n=72)                             |                   |            |
| Stray animal                                      | 43                | 59.7       |
| Pet animal                                        | 29                | 40.3       |
| Specified animal* (n=72)                          |                   |            |
| Dog                                               | 68                | 94.4       |
| Rat                                               | 4                 | 5.6        |
| Cat                                               | 2                 | 2.8        |
| First aid done (n=72)                             |                   |            |
| Washed with water only                            | 6                 | 8.3        |
| Washed with soap and running water                | 25                | 34.7       |
| Applied household antiseptic                      | 8                 | 11.1       |
| Applied iodine/ alcohol solution                  | 2                 | 2.8        |
| Applied indigenous materials                      | 3                 | 4.2        |
| Did not do anything                               | 14                | 19.4       |
| Heat cauterization                               | 2                 | 2.8        |
| Applied crotalaria fluid                         | 10                | 13.9       |
| Washed with soap and running water and appliediodine/ alcohol solution | 2 | 2.8 |
| Doctor visit (n=72)                               |                   |            |
| Yes                                               | 63                | 87.5       |
| No                                                | 9                 | 12.5       |
| Type of hospital (n=63)                           |                   |            |
| Government hospital                               | 42                | 66.7       |
| Private hospital                                  | 21                | 33.3       |
| Anti-rabies vaccine received (n=72)                |                   |            |
| Yes                                               | 60                | 83.3       |
| No                                                | 3                 | 4.2        |
| Not applicable                                    | 9                 | 12.5       |
| Anti-rabies vaccine doses (n=60)                   |                   |            |
| 5                                                 | 21                | 35         |
| 3                                                 | 34                | 56.7       |
| 1 or 2                                            | 4                 | 6.7        |
| Did not know                                      | 1                 | 1.6        |
| Reason for No/Incomplete vaccination (n=41)       |                   |            |
| Self-decision                                     | 6                 | 14.6       |
| Doctor’s advice                                   | 33                | 80.5       |
| Dog immunized                                     | 2                 | 4.9        |
| Immunized against Tetanus (n=63)                  |                   |            |
| Yes                                               | 61                | 96.8       |
| No                                                | 2                 | 3.2        |
| Received Rabies Immunoglobulin (n=60)             |                   |            |
| No                                                | 59                | 98.3       |
| Do not know                                       | 1                 | 1.7        |
| Yes                                               | 0                 | 0          |
| Reason for not immunized against Tetanus (n=02)   |                   |            |
| Not necessary                                      | 2                 | 100        |
| Reason for not visiting the doctor (n=09)         |                   |            |

**Attitude related to animal bite and rabies [Table 1]**

Only 53.1% disagree with rabies as a curable disease and 57.1% disagree with the application of indigenous materials on wounds that can prevent rabies. About 94.9% agree that the completion of ARV is necessary.

**Practice following animal bite [Table 1]**

About 20.6% had a history of animal bites in their family. About 94.4% of bites were due to dogs, 59.7% of bites were due to stray animals. Only 37.5% washed their wound with soap and running water and 5.6% applied alcohol or iodine solution. About 87.5% of the victims visited the doctor and 83.3% received ARV of which only 35% had a full course of vaccination. About 96.8% were immunized with a single dose of tetanus.

**Knowledge, attitude, and practice score [Figure 1]**

About nine determinants (heard of rabies, fatality, organism, the animal responsible, mode of transmission, appropriate first aid, ARV, tetanus vaccination, and observing the animal) were taken to score the knowledge level. All four determinants were taken to assess the attitude and five determinants (first aid, doctor visit, ARV, tetanus vaccination, and observing the dog) were taken to measure the practice of the study participants. The mean KAP scores were 5, 2.9, and 3.4, respectively. About 27.7% of the study participants had good knowledge regarding animal bite and rabies, 34.6% of the study participants were in a good attitude related to animal bite and rabies, and 18.1% of the study participants have had good practice following animal bites.

**Knowledge and gender**

Females were more at risk of lack of knowledge regarding hearing of rabies, fatality, animals responsible for transmission, first aid, the safety of ARV during pregnancy, and the importance of tetanus vaccination following animal bite compared to males. [Table 2]

**Knowledge and education**

Illiterates and those who are educated up to high school were more at risk of lack of knowledge regarding hearing...
Table 2: Association between knowledge and gender

| Variables                              | Gender     | n   | Frequency/percentage | X²   | OR   | 95% CI    | P    |
|----------------------------------------|------------|-----|----------------------|------|------|-----------|------|
| Not heard of rabies                    | Female     | 198 | 56 (28.3%)           | 4.6  | 1.7  | 1.2-2.2   | 0.032|
|                                        | Male       | 152 | 28 (18.4%)           |      |      |           |      |
| Fatality                               | Female     | 198 | 113 (57.1%)          | 5.2  | 1.6  | 1.7-2.5   | 0.022|
|                                        | Male       | 152 | 68 (44.7%)           |      |      |           |      |
| Animals responsible for transmission   | Female     | 198 | 153 (77.3%)          | 7.6  | 1.9  | 1.2-3     | 0.006|
| (only dog)                             | Male       | 152 | 97 (63.8%)           |      |      |           |      |
| First aid                              | Female     | 198 | 136 (68.7%)          | 3.8  | 1.5  | 1.2-4     | 0.05 |
|                                        | Male       | 152 | 89 (58.6%)           |      |      |           |      |
| ARV not safe during pregnancy          | Female     | 198 | 157 (79.3%)          | 10.3 | 2.1  | 1.3-3.5   | 0.001|
|                                        | Male       | 152 | 97 (63.8%)           |      |      |           |      |
| Not required to be immunized against   | Female     | 198 | 52 (26.3%)           | 8.1  | 2.2  | 1.2-3.9   | 0.004|
| tetanus following an animal bite       | Male       | 152 | 21 (13.8%)           |      |      |           |      |

Table 3: Association between knowledge and education

| Variables                              | Education             | n   | Frequency/percentage | X²   | OR   | 95% CI    | P    |
|----------------------------------------|-----------------------|-----|----------------------|------|------|-----------|------|
| Not heard of rabies                    | Illiterate/primary   | 271 | 80 (29.5%)           | 20   | 7.8  | 2.8-22.2  | 0.0001|
|                                        | /middle school/HSC   |     |                      |      |      |           |      |
|                                        | Professional/graduate | 79  | 4 (5.1%)             |      |      |           |      |
|                                        | /diploma             |     |                      |      |      |           |      |
| Fatality                               | Illiterate/primary   | 271 | 162 (59.8%)          | 31.3 | 4.7  | 2.6-8.3   | 0.0001|
|                                        | /middle school/HSC   |     |                      |      |      |           |      |
|                                        | Professional/graduate | 79  | 19 (24.1%)           |      |      |           |      |
|                                        | /diploma             |     |                      |      |      |           |      |
| Animals responsible for transmission   | Illiterate/primary   | 271 | 213 (78.6%)          | 30.2 | 4.1  | 2.4-7.1   | 0.0001|
| (only dog)                             | /middle school/HSC   |     |                      |      |      |           |      |
|                                        | Professional/graduate | 79  | 37 (46.8%)           |      |      |           |      |
|                                        | /diploma             |     |                      |      |      |           |      |
| Mode of transmission                   | Illiterate/primary   | 271 | 219 (80.8%)          | 15.2 | 2.9  | 1.7-4.9   | 0.0001|
|                                        | /middle school/HSC   |     |                      |      |      |           |      |
|                                        | Professional/graduate | 79  | 47 (59.5%)           |      |      |           |      |
|                                        | /diploma             |     |                      |      |      |           |      |
| First aid                              | Illiterate/primary   | 271 | 191 (70.5%)          | 20   | 3.2  | 1.9-5.3   | 0.0001|
|                                        | /middle school/HSC   |     |                      |      |      |           |      |
|                                        | Professional/graduate | 79  | 34 (43%)             |      |      |           |      |
|                                        | /diploma             |     |                      |      |      |           |      |
| ARV not safe during pregnancy          | Illiterate/primary   | 271 | 208 (76.8%)          | 10.5 | 2.4  | 1.4-4     | 0.001 |
|                                        | /middle school/HSC   |     |                      |      |      |           |      |
|                                        | Professional/graduate | 79  | 46 (58.2)            |      |      |           |      |

Table 4: Association between knowledge and age

| Variables                              | Age        | n   | Frequency/percentage | X²   | OR   | 95% CI   | P    |
|----------------------------------------|------------|-----|----------------------|------|------|----------|------|
| First aid                              | Above 40   | 164 | 121 (73.8%)          | 12.1 | 2.2  | 1.4-3.5  | 0.0001|
|                                        | Below 40   | 186 | 104 (55.9%)          | 11.2 | 2.3  | 1.4-3.8  | 0.001 |
| ARV not safe during pregnancy          | Above 40   | 164 | 133 (81.1%)          | 6.7  | 2    | 1.2-3.3  | 0.01  |
|                                        | Below 40   | 186 | 121 (65.1%)          |      |      |           |      |
| Not required to be immunized against   | Above 40   | 164 | 44 (26.8%)           | 6.7  | 2    | 1.2-3.3  | 0.01  |
| tetanus following an animal bite       | Below 40   | 186 | 29 (15.6%)           |      |      |           |      |

Table 5: Association between practice and family type

| Demographic variables                  | Determinants         | n   | Frequency/percentage | X²   | OR   | 95% CI   | P    |
|----------------------------------------|----------------------|-----|----------------------|------|------|----------|------|
| Not consulted doctor following an animal bite | Family Type         |     |                      |      |      |          |      |
|                                        | Joint and three      | 14  | 05 (35.7%)           | 8.6  | 7.5  | 1.7-33.3 | 0.003|
|                                        | generation           |     |                      |      |      |          |      |
|                                        | Nuclear              | 58  | 04 (6.9%)            |      |      |          |      |

of rabies, fatality, animals responsible for transmission, mode of transmission, first aid, and safety of ARV during pregnancy compared to those who had diploma or college education. [Table 3]

Knowledge and age

Individuals aged above 40 years were more at risk of lack of knowledge regarding first aid, the safety of ARV during pregnancy, and the importance of tetanus vaccination following animal bite compared to those who are 40 and below. [Table 4]

Practice and family type

Following animal bite about 35.7% of people living in a joint family did not consult the doctor compared to 6.9% of people living in a nuclear family, with an OR of 7.5 (1.7–33.3), the association was statistically significant (x² = 8.6, P < 0.003). [Table 5]
Sivagurunathan, et al.: KAP study on animal bite and rabies

In this study, the correlation was carried for the score of knowledge with attitude and practice, and the score of attitude and practice were plotted on a scatter diagram. There is strong positive correlation between knowledge and attitude ($r = 0.7$, $P < 0.0001$), knowledge and practice ($r = 0.5$, $P < 0.001$) and attitude and practice ($r = 0.5$, $P < 0.0001$).

Discussion

Our study reveals that 76% of the participants had “heard” of rabies, in that, about 36.5% of respondents are unaware of its fatal nature and 31.6% of subjects mentioned that bite, scratch, and lick by a rabid animal could transmit rabies. Only 36.2% of the participants were aware that washing with soap and running water is the appropriate first aid for an animal bite. Only 27.7% of the participants have adequate knowledge regarding animal bite and rabies. Age, gender, and education showed a statistical association with the knowledge of the participants. In a study done by Anandhan et al.,[6] in an urban area of Tamil Nadu reveals, about 25.3% of the participants had heard of rabies and 18% knows about its fatal nature, these findings are low when compared to our study. Observation of attitude towards

the application of indigenous material over the site of the bite (63.9%) and practicing wound wash with soap and running water (47%) were similar to our study findings.

A study done in Pondicherry[7] observed about 77.5% of participants believe rabies is a fatal disease, 6.9% knows that it is caused by a microorganism and 27.6% of the subjects said that the suspected animal should be watched for more than 10 days were in contrast with our findings. This study reported that about 38.2% of the participants knew the appropriate first aid for rabies and 89.8% of the participants knew ARV is necessary following a dog bite, which is similar to our findings. Observation of this study on practicing wound wash with soap and running water (38% is also similar but ARV following animal bite (50.5%) differs with our study results. This study also observes that age is significantly associated with the KAP of the participants and stated younger the age better is the KAP, our study found that participants aged 20-40 years had better knowledge than above 40 years. A study was done by Krishnamoorthy et al.[8] in Puducherry revealed 74.8% of the
study subject knows that rabies is a fatal disease, 40.9% feels that the wound should be washed with soap and water and 93.4% of the participants said that a vaccine is available to prevent rabies is similar with our findings. Observation of attitude towards completion of ARV is also similar to our study observation. The practice of appropriate first aid (62.9%) was a little high and completion of ARV schedule (88.8%) following an animal bite is less when compared with our findings. The observed results of a study done in Maharashtra\cite{19} were higher than our findings in knowledge determinants like heard of rabies, fatality, and mode of transmission but low in knowledge on preventing rabies with ARV. Attitude towards avoiding the application of indigenous material over the site of the bite is better than our finding.

Observations of Masthi et al.,\cite{20} were similar to our study in knowledge determinants like heard of rabies and fatality but lower in knowledge determinants like appropriate first aid in case of animal bite and preference of modern medicine. A study was done by Chandan et al.,\cite{21} reveals that 89% of the study subject had heard about rabies and 81% says it is an infection that was high but knowledge about the presence of vaccine for an animal bite is much lower than our findings. Attitude towards the application of indigenous material over the site of the bite is similar to our findings. The practice of appropriate first aid (36%) was similar and observing the dog for a few days is high compared to our findings. This study also reveals that knowledge score was associated with age, which was similar to our results. The attitude and practice score of this study was also associated with age, education, and socioeconomic status, which differed from our findings.

A study done at Manipur\cite{22} observes that 97.1% of the participants had heard about rabies and 87.9% know about its fatal nature, which was high, but knowledge about ARV and washing the site of the bite with water and soap are much lower than our study findings. Knowledge about tetanus vaccination following an animal bite is similar to our observation. This study also reveals that those who are graduates and above had better knowledge, which was similar, but the association between knowledge and age differs from our study. A study was done by Tripathy et al.,\cite{23} reveals that 84% of the study subjects had heard about rabies and 93.7% says that it is an infection, which was high, but knowledge on appropriate first aid (14.9%) is much lower than our findings. Attitude towards the application of indigenous material over the site of the bite (17%) is similar but the attitude towards completion of ARV (51%) differs from our study. This study also reveals that KAP scores were associated with age, gender, and education, however, in our study, only knowledge was associated with age, gender, and education.

A study done by Karmakar et al.,\cite{24} reveals that knowledge is better among participants with higher education and lower age groups, which was similar to our findings but the knowledge about the doses of ARV (46.5%), the safety of ARV during pregnancy (44.9%), and washing the animal bite wounds with soap and water (81%) were in contrast with our findings.

A study was done by Muthunuwana et al.,\cite{18} in Srilanka shows 90.5% of the participants knew washing the bite wound was an important first aid measure and about 93% were aware that rabies could be prevented by vaccination which was high compared to our observations. This study also reveals that knowledge was low regarding modes of transmission other than bites, which was similar to our findings. The practice of seeking treatment from a doctor or hospital after exposure (97%) is also similar to our observation.

A study was done in Ethiopia by Hagos et al.,\cite{25} reveals 87% of the participants had heard about rabies and 74.2% knows that rabies affects all warm-blooded animals including human and 60.3% knows the appropriate first aid for an animal bite which was high compared to our findings but knowledge regarding fatality (45.7%) and presence of vaccine for rabies (69.8%) is low. Attitude towards the application of indigenous material over the site of the bite (Holy water- 49.8%) was high and the practice of visiting health institution/doctor (77.5) was similar to our study findings. This study also reveals that males were at risk of lack of knowledge and other variables like occupation, dog ownership, and monthly income had a significant association with knowledge, which differs from our observations.

Another study done in Ethiopia\cite{26} differs in knowledge about the fatal nature of the disease (84.6%), awareness about the prevention of rabies with vaccination (65.9%), mode of transmission, and appropriate first aid. But this study is similar in the association of the knowledge level of the participants with education and gender to our study. Likewise, Alam et al.,\cite{27} observed a strong relationship between knowledge about rabies prevention and the level of education in Bangladesh. Ali et al.,\cite{28} also reported that a strongly significant positive correlation between knowledge and attitude, knowledge and practice, and attitude and practice. These findings were similar to our study.

Similar to other studies, most of this study participants are aware of symptoms of furious rabies alone (attacking without provocation, excessive salivation, and aggressiveness). Symptoms of paralytic rabies (weakness, loss of coordination, and paralysis), the commonest form of rabies in dogs, are not recognized by the majority of participants of this study as same as other studies on rabies. It is important to educate these details to the community, especially the pet owners and animal handlers to be cautious while handling animals.

About 94.9% of the participants agree that completion of ARV is necessary, but 35% of the participants alone practiced the same when they encountered animal bite. Knowledge about ARV during pregnancy in the participants is much less, which needs further exploration across the country. Likewise, Only 37.6% of participants mentioned that animals other than dogs could also transmit rabies, a similar query made in other studies also shows lower responses. Knowledge about the causative agent of rabies affects all warm-blooded animals including human and 60.3% knows the appropriate first aid for an animal bite which was high compared to our findings but knowledge regarding fatality (45.7%) and presence of vaccine for rabies (69.8%) is low. Attitude towards the application of indigenous material over the site of the bite (Holy water- 49.8%) was high and the practice of visiting health institution/doctor (77.5) was similar to our study findings. This study also reveals that males were at risk of lack of knowledge and other variables like occupation, dog ownership, and monthly income had a significant association with knowledge, which differs from our observations.
rabies and first aid for animal bites also less. These knowledge gaps must be mitigated through effective Information Education and Communication (IEC).

This study shows that attitude and practice are directly proportional to knowledge and there is a need for better knowledge to be imparted in the community to have the right attitude and better practice. The knowledge, practice, and misconceptions of the local community towards major dreadful public health diseases like rabies are to be addressed by the primary care physicians to implement preventive, promotive, and curative services. Since primary care physicians are the first point of contact for animal bites in rural and suburban areas, they should have a vast knowledge of the local community’s misconceptions. This study brought out the knowledge gap, misconception, and improper practice in the study area, which will aid them in breaking the barrier to treat animal bites and health educate the community consistently.

**Conclusion**

KAP scores regarding animal bite and rabies of the study participants were unsatisfactory. The successful elimination of human rabies needs a multisectoral collaborative approach. Improved community awareness, forestalling animal rabies, and better access to affordable and potent human rabies vaccines are essential for the elimination of human rabies. The omission of any of these components will lead to failure in achieving human rabies elimination, which recommends a comprehensive program embracing animal and human rabies control in India.

**Key Messages**

Knowledge, attitude, and practice level of the study participants were unsatisfactory. Education had a positive impact on the knowledge level of the participants. Improved community awareness, forestalling animal rabies, and better access to affordable and potent human rabies vaccines are essential for the elimination of human rabies.

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**Conflicts of interest**

There are no conflicts of interest.

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