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## Original Research Article

# Knowledge, attitude and practices on rabies prevention among the patient attending the antirabies vaccination clinics (ARV) in tertiary health care centre in central India

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### ABSTRACT

**Background:** We conducted KAP studies on Rabies Prevention among Patient attending ARV clinic of tertiary health care centre in central India. There is a paucity of published literature describing the public's knowledge, attitude and practices of rabies prevention in central India, information that is critical to developing effective interventions and government policies. Hence the present study was conducted among 135 study participant who are attending ARV clinics of tertiary health care centre in central India.

**Aim and Objectives:** To assess the knowledge, attitude and practices on rabies prevention among the patient attending the ARV clinics. To assess the Proportion of animal exposure in the study area and to find out the association of socio-demographic factors with knowledge, attitude and practices (KAP) related to rabies.

**Materials and Methods:** A cross-sectional study was conducted on 135 eligible participants in rabies vaccination clinics (ARV). We performed a face-to-face interview to investigate the rabies KAP of these participants using a self-designed questionnaire consulted with experts was done. Study was conducted from January to March 2022 by using consecutive sampling till the sample size was achieved.

**Results:** Factors associated with the KAP were evaluated using logistic regression models, 48.14 % participant aware regarding rabies disease, Younger age, and graduate and above had higher score compared to old age and less than high school, Participants who were younger ( $p < 0.000$ ), who received better education ( $p < 0.000$ ), and who reported good economic status ( $p = 0.05$ ) were more likely to have higher scores of attitudes, participant who had older age ( $p < 0.007$ ), who had less education ( $p < 0.00$ ), who had poor socio-economic status ( $p < 0.00$ ) had lower score.

**Conclusion:** Lack of knowledge and attitude is suboptimal in study participant however practice regarding rabies vaccination is good in male and younger population.

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## 1. 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 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. About 96% of the mortality and morbidity is associated with dog bites. Cats, wolf, jackal, mongoose and monkeys are other important reservoirs of rabies in India. Bat rabies has not been conclusively reported from the country. In India, rabies is a problem of considerable magnitude. India is endemic for rabies and except for the islands of Andaman

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and Nicobar and Lakshadweep, which are historically rabies-free. India is one of the countries that have the highest population of stray dogs in the world.<sup>1</sup>

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 behaviour during the animal bites, proper animal bite wound management, and vaccination strategies among the general public.

## 2. Materials and Methods

A cross-sectional study was conducted on 135 eligible participants in rabies vaccination clinics (ARV). We performed a face-to-face interview to investigate the rabies KAP of these participants using a self-designed questionnaire consulted with experts was done. Study was conducted from January to March 2022 by using consecutive sampling till the sample size was achieved.

### 2.1. Ethical consideration

The study was approved by Institutional Ethics committee (IEC) of Indira Gandhi Government Medical College, Nagpur, and Maharashtra, India. Written informed consent will be taken from participant before enrolling them in study; Confidentiality of the participant was assured and maintained throughout the study.

### 2.2. Study area

Anti-rabies vaccination out-patient department (ARV OPD) in tertiary health care center in central India.

#### Sample size estimation

$$n = \frac{3.84 \times p(1-p)}{d^2}$$

Where, n = sample size,

p = expected prevalence in proportion of one

d = precision in proportion of one.

For the level of confidence of 95%, this is conventional.

Z Value is 1.96 p=74% d = 10% relative error

To calculate values for “p” studies done by Herbert M, and et al (2012 Dec) in Bangalore, Karnataka was used as reference for expected prevalence [74%] of awareness of rabies among adults. Sample size came to be 135

### 2.3. Questionnaire and construction of KAP scores

The questionnaire was designed by reviewing similar literature<sup>2</sup> and consulting with experts. A preliminary test was conducted to ensure that the questions were clear and understandable. All the data were collected from the study participants by interview method and universal sampling

method was adopted for selection of study participants till the sample size is achieved.

The questionnaire consisted of four parts the first part was designed to obtain Socio-demographic characteristics, the first part was designed to obtain demographic characteristics including name, age, gender, educational level, place of resident, Socio-economic status, name of animal bites, circumstance of bite, site of exposure, and time spent to the rabies prevention clinics (ARV OPD), WHO category and reason for delay for vaccination, the second part investigated the knowledge of rabies which included nine questions: 1) Have you Ever Heard of Rabies, 2) Which Organism Causes Rabies, 3) Which Animal Harbours Rabies organism, 4) How does Rabies Spread, 5) Is the Disease Fatal, 6) Can Rabies be prevented by Vaccination?

7) whom will you Consult After Dog/Cat/other Suspected Animal Bite? 8) How to Avoid Rabies Infection and 9). Do you think rabies can be spread through contaminated food or water, except question number 8, all had a single correct answer, and respondents received one point for each correct answer and the question no.8 had three correct answers, and the respondent received one point for each correct choice and zero for an incorrect choice. The total correct responses were calculated to show the scores of overall knowledge, ranging from 0 to 11.

The third part, attitudes assessment towards rabies and its prevention and control involved nine questions: 1) Rabies is a risk to human health, 2) Elimination of dog-mediated and cat-mediated rabies is vital, 3) Vaccinating susceptible dogs and cats can prevent the transmission of rabies, 4) It is not necessary to vaccinate dogs and cats against rabies usually, 5) Injecting rabies vaccine as soon as possible after being bitten by suspected rabid animals, 6) Completing the full courses of vaccination after being bitten by suspected rabid animals, 7) Willing to learn the knowledge of rabies, 8) it is necessary to promote rabies knowledge in the community and 9) Is washing of dog bite wound with soap and water useful.

Each appropriate attitude item was scored on a five-point Likert scale ranging from ‘strongly agree’ to ‘strongly disagree’ coded with values from 5 to 1. Conversely, scores of 1 to 5 were assigned for each inappropriate attitude item, with the same response options. The maximum score of attitudes is 45 points, and a minimum score is 9 points.

The fourth part assessed the practices related to rabies prevention and control by six questions: 1) Taking the rabies vaccine on schedule, 2) Needing someone to remind you to get vaccinated when you were bitten, 3) Discontinuing the rabies regimen if the wound is not serious, 4) Advising bite victims to be vaccinated after a suspected rabid bite and 5) Keeping away from aggressive animals. Response options included ‘always,’ ‘often,’ ‘sometimes,’ and ‘never’, and scores of 4, 3, 2, and 1 were assigned for each proper

practices item. Conversely, scores of 1, 2, 3, and 4 were assigned for each improper practices item. The maximum score of practices is 20 points, and a minimum score is 5 points.

#### 2.4. Data analysis

Data analysis was done by using statistical software Microsoft office excel 2013 and SPSS Version 20(licensed). Continuous variables were described by mean and standard deviation (SD), and categorical data were described using frequency and percentage.

Analyses of variance (ANOVA) and independent student t-test were conducted to compare different groups' scores on knowledge, attitudes, and practices of rabies. Three separate multivariable logistic regression models were performed to explore the association of outcome variables with the socio-demographic characteristics of the victims. The cumulative score obtained for questions based on the three response criteria (knowledge, attitudes, and practices towards rabies, respectively) was converted into binomial outcomes by categorizing the respondents as having scored  $\leq$  or  $>$  the average score of each response criteria and then association was found by applying regression.

### 3. Result

#### 3.1. Distribution of study participants according to socio-demographic characteristics

Table 1. Presents distribution of study participants according to socio-demographic characteristics. Out of 135 participants majority are male (81.5%) with mean age of  $37.26 \pm 14.70$  years and with range of : 18-79 years. 18.5% were female participants with mean age of  $34.36 \pm 14.69$  years and range of 18-62 years. maximum number of participants are high school and intermediate school certificate holder 72(53%) and residing in urban area 120 (88.88%). Majority of participants belongs to upper socioeconomic class 88 (65%) Majority of participant having Dog bite 115(85%) and 85 (63%) participant having lower extremity site of exposure, maximum number of participant time to spend in ARV OPD are 67 % while 79% participant have less than or equal to 10 km distance from hospital.

#### 3.2. Knowledge

Table 2 Shows the knowledge of participant. Only 48.18 % participant aware about rabies disease. 18.51 % participant not able gave correct responds regarding causative agent of rabies however majority of respondents knew which animal harbor rabies. 71 % participant was aware about fatality of

rabies at the same time 64 % respondent aware about rabies can be prevented by vaccination. Although participant had less knowledge regarding rabies but 90 % participant had consulted doctor/hospital after animal bite. 16% participant had not idea regarding how to avoid rabies infection. 19 % participant had given correct response that rabies is not spread through food and water.

#### 3.3. Attitude

Table 3 Shows attitude of respondent towards rabies prevention and control. 50% participant believes that rabies is risk to human while 49% participants believe that elimination of dog-mediated and cat-mediated rabies is vital. Only 43% respondents were aware regarding vaccination susceptible dogs and cats can prevent the transmission of rabies however majority of participant were aware Injecting rabies vaccine as soon as possible after being bitten by suspected rabid animals. Majority of participants believes that it is necessary to completing the full courses of vaccination after being bitten by suspected rabid animals however majority of participant not willing to learn knowledge of rabies. 39% participant believes to promote rabies knowledge in the community while 38% were aware regarding washing dog bite wound with soap and water useful.

#### 3.4. Practices

Represents practice parameter of rabies among study participant. Most of the participant was taking rabies vaccine on schedule however majority of participant needs to remind someone for rabies vaccination. Majority of participant not discontinuing rabies vaccination if wound is not serious. 52% participant advising bite victims to be vaccinated after a suspected rabid bite while 49% participant keeps away from aggressive animal.

#### 3.5. Univariate analysis

Table 5 Shows KAP score based on participant characteristics and result of univariate analysis. The mean score of rabies knowledge was  $6.16 \pm SD=2.22$  from maximum of 11 points. Younger age group and graduate & above had higher score compared to older and less educated are statically significant. Participant belongs to lower socioeconomic class ( $p=0.01$ ) and distance from hospital more than or equal to 10 km (0.01) had lower score.

The mean score of rabies attitude was  $36.46 \pm 6.1SD$  from maximum of 45 points. Younger age group and graduate & above had higher score compared to older and less educated are statically significant. Participant belongs to lower socioeconomic class ( $p=0.05$ ) and distance from hospital more than or equal to 10 km (0.00) had lower score. The mean score of rabies practices was  $16.79 \pm 2.61SD$  from maximum of 20 points. Younger age group and

**Table 1:** Distribution of study participants according to socio-demographic characteristics.(n=135)

Demographics characteristics	Number	Percentages (%)
<b>Gender</b>		
Male	110	81.5
Female	25	18.5
<b>Age</b>		
≤30	59	44
31-60	66	49
>61	10	7
<b>Place of Residence</b>		
Urban	120	88.88
Rural	15	11.11
<b>Education level</b>		
Graduate and above	21	16
High school and intermediate	72	53
Less than high school	42	31
<b>Socioeconomic status</b>		
Upper Class	88	65
Middle class	28	21
Lower class	19	14
<b>Time spend in ARV OPD</b>		
< 30 min	91	67
≥ 30 min	36	27
<b>Distance from hospital</b>		
≤ 10 km	106	79
> 10 km	29	21
<b>Name of animal bite</b>		
Dog	115	85
Cat	16	12
Mongoose	3	2
Pig	1	1
<b>Site of exposure</b>		
Face	5	4
Neck	5	4
Abdomen/back	3	2
Upper extremities	37	27
Lower extremities	85	63

graduate & above had higher score compared to older and less educated are statically significant. Participant distance from hospital more than or equal to 10 km (0.01) had lower score.

Table 6. represents Multivariate logistic regression analysis of factor associated with KAP toward rabies where the dependent variable was level of knowledge, attitude and practices. Middle age (AOR=5.31, 95%CI: 1.232-22.09) and high school and intermediate (AOR=12.56, 95%CI: 4.055-38.93) similarly less than high school (AOR=30.40, 95%CI: 7.21-128.14) were associated with poor knowledge.

High school and intermediate (AOR=7.93, 95%CI: 2.97-21.18) and less than high school (AOR=36, 95%CI: 8.05-160) while middle class (AOR=3.36, 95%CI: 1.11-10.13) and distance more than 10 km (AOR=2.48, 95%CI: 1.03-5.96) were associated with inappropriate attitude. High school and intermediate (AOR=3.28, 95%CI: 1.37-7.83)

and less than high school (AOR=15.58, 95%CI: 4.18-58.05) were associated with inappropriate practices.

#### 4. Discussion

The present study showed that the 48.14% of respondents were aware that dogs and cats can spread rabies and that the disease can be transmitted via bites or licks from rabid animals. This is consistent with previous reports from Ethiopia,<sup>3,4</sup> Sri Lanka<sup>5</sup> and Indian.<sup>6</sup>

Similarly to other studies conducted in the china<sup>2</sup> and New Mexico,<sup>7</sup> more than 29% of respondents did not know that rabies is invariably fatal once the clinical signs are manifested in the present study. Given that insufficient knowledge of rabies might be a main reason for improper PEP<sup>7</sup> educational programs should be conducted to help the public have a comprehensive understanding of rabies.

**Table 2:** Knowledge parameter of rabies among study participant.(n=135)

Knowledge parameter	Number	%
1) Have you Ever Heard of Rabies?		
Yes	65	48.14
No	70	51.85
2) Which Organism Causes Rabies?		
Correct response	25	18.51
Incorrect response	110	81.48
3) Which Animal Harbours Rabies Organism?		
Correct response	83	61.48
Incorrect response	52	38.51
4) How does the rabies spread?		
Correct response	88	65.18
Incorrect response	47	34.81
5) Is the disease fatal?		
Yes	96	71
No	39	29
6) Can Rabies be prevented by Vaccination?		
Yes	86	64
No	49	36
7)Whom will you Consult After Dog/Cat/other Suspected Animal Bite		
Doctor/hospital	121	90
Local quack	10	7
Traditional healer	4	3
No one	0	0
8) How to Avoid Rabies Infection? *		
Pre-exposure Vaccination of Human	102	76
Avoiding Animal Contact	6	4
Anti-rabies Vaccination of Animals	5	4
Don't know	22	16
9) Do you think rabies can be spread through contaminated food or water?		
Yes	110	81
No	25	19

\*more than one correct response

More than 90% of the respondents believed that the rabies vaccine should be injected as soon as possible after a suspected rabid bite. This favourable attitude is in line with the World Health Organization guidelines on rabies that people should seek medical attention immediately when they are bitten by a suspected rabid animal,<sup>8</sup> Most respondents believed that vaccinating susceptible dogs and cats can prevent the transmission of rabies. Similar results were reported in Haiti<sup>9</sup> Poor family income or the high cost of vaccines may hinder individuals from vaccinating their pets or themselves despite awareness of the benefits of rabies vaccination.<sup>2</sup>

Previous studies showed that educational level was a major determinant of the level of rabies knowledge.<sup>3,10–12</sup> A similar result was found in our study that the knowledge score increased with the educational level. This may be because people with a better education had more learning opportunities and a better ability to acquire rabies knowledge.

## 5. Conclusion and Recommendation

This study was done at tertiary health care center; lack of knowledge and attitude is suboptimal however practice regarding rabies vaccination is good in male and younger population, this study concludes that knowledge and attitude regarding rabies should be highlighted in national rabies control programme of India to acknowledge Indian population regarding fatal rabies.

Public education campaigns need to be conducted to make people aware of rabies, especially in remote area and of the vital importance of seeking medical care immediately after an animal bite. Good knowledge and attitude regarding rabies will be definitely helpful in rabies prevention and effective efforts to eliminate this fatal disease.

## 6. Limitation

The main limitation of the study is pertaining to its observational nature. More community based multicentre

**Table 3:** Attitude parameter of rabies among study participant.(n=135)

Attitude parameter	N	%
1) Rabies is a risk to human health		
Strongly agree	68	50
Agree	48	36
Neutral	16	12
Disagree	2	1
Strongly disagree	1	1
2) Elimination of dog-mediated and cat-mediated rabies is vital.		
Strongly agree	66	49
Agree	43	32
Neutral	24	18
Disagree	1	1
Strongly disagree	1	1
3) Vaccinating susceptible dogs and cats can prevent the transmission of rabies		
Strongly agree	58	43
Agree	41	30
Neutral	32	24
Disagree	2	1
Strongly disagree	2	1
4) It is not necessary to vaccinate dogs and cats against rabies usually.		
Strongly agree	12	9
Agree	18	13
Neutral	43	32
Disagree	28	21
Strongly disagree	34	25
5) Injecting rabies vaccine as soon as possible after being bitten by suspected rabid animals		
Strongly agree	48	36
Agree	55	41
Neutral	21	16
Disagree	10	7
Strongly disagree	1	1
6) Completing the full courses of vaccination after being bitten by suspected rabid animals.		
Strongly agree	55	41
Agree	46	34
Neutral	27	20
Disagree	6	4
Strongly disagree	1	1
7) Willing to learn the knowledge of rabies.		
Strongly agree	58	43
Agree	41	30
Neutral	31	23
Disagree	4	3
Strongly disagree	1	1
8) It is necessary to promote rabies knowledge in the community		
Strongly agree	52	39
Agree	49	36
Neutral	29	21
Disagree	5	4
Strongly disagree	0	0
9) washing of dog bite wound with soap and water useful		
Strongly agree	52	38
Agree	38	28
Neutral	38	28
Disagree	7	5
Strongly disagree	0	0

**Table 4:** Practice parameter of rabies among study participant.(n=135)

Practice Parameter	Number	%
1) Taking the rabies vaccine on schedule		
Always	105	78
Often	26	19
Sometimes	2	1
Never	2	1
2) Needing someone to remind you to get vaccinated when you were		
Always	64	47
Often	42	31
Sometimes	19	14
Never	10	7
3) Discontinuing the rabies regimen if the wound is not serious		
Always	7	5
Often	18	13
Sometimes	36	27
Never	74	55
4) Advising bite victims to be vaccinated after a suspected rabid bite		
Always	70	52
Often	41	30
Sometimes	19	14
Never	5	4
5) Keeping away from aggressive animals		
Always	66	49
Often	40	30
Sometimes	27	20
Never	2	1

**Table 5:** Univariate analysis showing association of socio-demographic characteristics with mean KAP scores of study participants.

Characteristics	Knowledge score out of 11		Attitude score out of 45		Practice score out of 20	
	Mean ± (SD)	p-value	Mean± (SD)	p-value	Mean± (SD)	p-value
<b>All Respondents</b>	6.16 (2.22)		36.46(6.1)		16.79(2.61)	
<b>Gender</b>						
Male	6.17(2.22)	0.915	36.54(6.04)	0.782	16.83(2.66)	0.748 <sup>#</sup>
Female	6.12(2.24)		36.16(6.5)		16.64(2.24)	
<b>Age</b>						
≤30	7.08(2.13)	0.00	39.25(5.33)	0.00	17.58(2.39)	0.007*
31-60	5.48(2.05)		34.44(5.71)		16.12(2.68)	
>61	5.2(1.93)		33.4(6.88)		16.6(2.32)	
<b>Education level</b>						
Graduate and above	7.67(1.82)	0.00	42.1(4.21)	0.00	18.86(1.98)	0.00*
High school and intermediate	6.68(2.08)		37.19(5.65)		16.85(2.62)	
Less than high school	4.52(1.62)		32.4(4.88)		15.67(2.03)	
<b>Socioeconomic status</b>						
Upper class	6.45(2.06)	0.01	37.24(6)	0.05	16.84(2.73)	0.79*
Middle class	5.75(2.79)		35.96(6.75)		16.89(2.26)	
Lower class	5.42(1.77)		33.63(4.83)		16.42(2.61)	
<b>Time spend in ARV Clinic*</b>						
< 30 min	6.31(2.32)	0.19	36.46(6.22)	0.99	16.73(2.66)	0.63 <sup>#</sup>
≥ 30 min	5.75(1.77)		36.47(5.87)		16.97(1.51)	
<b>Distance from hospital</b>						
< 10 km	6.4(2.26)	0.01	37.18	0.00	17.08(2.52)	0.01 <sup>#</sup>
≥ 10 km	5.31(1.85)		33.86		15.72(2.71)	

\*- ANOVA test # - independent sample t-test

**Table 6:** Multivariate logistic regression analysis of factor associated with KAP scores towards rabies.

Characteristics	Knowledge score (≤6.16 vs. >6.16)			Attitude score (≤36.46 vs. >36.46)			Practice score (≤16.79 vs. >16.79)		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
<b>Gender.</b>									
Ref :Male									
Female	1.29	0.536-3.137	0.564	1.5	0.620-3.68	0.368	1.25	0.517-3.025	0.625
<b>Age</b>									
Ref: ≤30									
31-60	5.31	1.232-22.09	0.025	3.15	0.79-12.52	0.102	1.18	0.31-4.53	0.80
>61	0.81	0.188-3.488	0.777	0.7	0.178-2.74	0.609	0.53	0.14-2.04	0.36
<b>Education Level</b>									
Ref :Graduate and above									
High school and intermediate	12.56	4.055-38.93	0.00	7.93	2.97-21.18	0.00	3.28	1.37-7.83	0.007
Less than high school	30.40	7.21-128.14	0.00	36.00	8.05-160	0.00	15.58	4.18-58.05	0.00
<b>Socio-economics status.</b>									
Ref:Upper Class									
Middle class	0.61	0.26-1.47	0.27	3.36	1.11-10.13	0.031	1.56	0.56-4.34	0.39
Lower class	0.34	0.11-1.02	0.05	2.1	0.592-7.44	0.251	1.1	0.33-3.68	0.866
<b>Time Spend in ARV Clinic.</b>									
Ref :< 30 min									
≥ 30 min	1.66	0.759	0.204	1.22	0.569-2.636	0.604	1.00	0.464-2.155	1.00
<b>Distance from Hospital.</b>									
Ref:≤10 km									
> 10 km	2.14	0.893-5.128	0.088	2.48	1.03-5.96	0.041	2.06	0.860-4.93	0.105

studies are required to further confirm the findings since, it was done only in one institution.

## 7. Source of Funding

None.

## 8. Conflict of Interest

None.

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