

## A CROSS SECTIONAL STUDY TO ASSESS THE AWARENESS OF RABIES AMONG DOG BITE VICTIMS ATTENDING PRIMARY HEALTH CENTER, TIRUPPUR

E. Cowshik<sup>1</sup>, D. Shanmugapriya<sup>2</sup>

Received : 05/10/2023  
Received in revised form : 30/10/2023  
Accepted : 11/11/2023

**Keywords:**

Dog bite, Rabies, knowledge attitude practice.

**Corresponding Author:**

Dr. E. Cowshik,  
Email: cowshik.esswaran@gmail.com

DOI: 10.47009/jamp.2023.5.6.38

Source of Support: Nil,  
Conflict of Interest: None declared

Int J Acad Med Pharm  
2023; 5 (6); 184-190



<sup>1</sup>Assistant professor, Department of Community Medicine, Government Medical College Tiruppur, Tiruppur, Tamilnadu, India.

<sup>2</sup>Assistant professor, Department of Community Medicine, Coimbatore Medical College, Coimbatore, Tamilnadu, India.

### Abstract

**Background:** Rabies is an acute infectious zoonotic disease of Central Nervous System. Dogs are the main reservoir of Rabies in India. Rabies is transmitted through the saliva of infected animals India is endemic for Rabies, and accounts for 36% of the world's Rabies deaths. Rabies deaths in human are 100% preventable through prompt and appropriate medical care. The objective is to assess the knowledge, attitude and practice about Rabies and wound management among the cases of dog bite. To find out the association between sociodemographic details with knowledge, attitude and practice about the study participants. **Materials and Methods:** A cross sectional study was conducted from January to February 2023 among 210 patients with dog bite who attended Perumanallur CHC and Pongalur CHC in Tiruppur district using a pretested, semi structured, self-administered questionnaire. Data were entered in Excel and analyzed using SPSS version 25. **Result:** Around 60% of participants had good knowledge, 68% had good attitude and 74% had good practice in relation to Rabies. There was a significant association of good knowledge with good attitude and good knowledge with good practice ( $p < 0.05$ ). There was a significant association for good knowledge with age, educational qualification, occupation, monthly income and socioeconomic status. There was a significant association for good attitude with socioeconomic status and marital status. There was a significant association for good practice with age, educational qualification, occupation and socioeconomic status. **Conclusion:** Higher education levels and higher socioeconomic status had significantly higher proportion of good knowledge and practice. Health education and behavior change communication to general public especially those who are in lower socioeconomic status and less literacy levels will help to bridge the gap.

## INTRODUCTION

Rabies is an acute infectious zoonotic disease of Central Nervous System. Dogs are the main reservoir of Rabies in India.<sup>[1]</sup> Rabies is transmitted through the saliva of infected animals and in rare cases it can also be transmitted via organ transplantation. The Anti-Rabies treatment, namely post exposure prophylaxis is a life-saving treatment in definite dog bite.<sup>[2]</sup> India is endemic for Rabies, and accounts for 36% of the world's Rabies deaths.<sup>[3]</sup> True burden of Rabies in India is not fully known; although as per available information, it causes 18000-20000 deaths every year.<sup>[4]</sup> About 30-60% of reported Rabies cases and deaths in India occur in children under the age of 15 years as bites that occur in children often go unrecognized and unreported.<sup>[5]</sup> Vaccinating dogs is

the most cost-effective strategy for preventing Rabies in people.<sup>[6]</sup> Rabies deaths in human are 100% preventable through prompt and appropriate medical care.

### The objectives of the study are:

- To assess the knowledge about Rabies and wound management among the cases of dog bite.
- To find out the practice of first aid measures adopted by people after dog bite.
- To study the attitude of people on dog bite and Rabies.
- To find out the association between sociodemographic details with knowledge, attitude and practice about the study participants.

## MATERIALS AND METHODS

A hospital based cross sectional study was conducted over a period of two months from September to October 2023 among dog bite cases attending CHCs of Tiruppur district. The sample size was calculated to 210, considering a confidence interval of 95%, absolute precision of 7%, 10% to account for non-response and based on the previous study by Joice et al in Pondicherry which stated 61.4% as the proportion of good knowledge about Rabies. Convenient sampling was used. Ethical clearance was obtained from the Institutional Ethical Committee, Government Medical College, Tiruppur. Official permission to conduct the study was obtained from the health officials. Those who attended the CHC with complaints of dog bite for the first time and those who gave informed consent were included in the study. Those in follow-up schedule of ARV and those with animal bites other than dog bites were excluded. Pretested, semi-structured, interviewer administered questionnaire was used for data collection. The purpose of the study was briefed and rapport was established. Informed consent was obtained. The questionnaire had 4 sections. Section A: Included information on socio-demographic profile of the participants. Section B: included questions regarding the knowledge about Rabies and wound management. Section C: Included questions regarding attitude of people on dog bite and Rabies. Section D: Included questions regarding practice of first aid measures adopted by people after dog bite.

- 10 knowledge-related questions- Every right answer was awarded one mark and every wrong answer was awarded zero. The total score of knowledge-related questions were 10. 0 to 5 was considered average knowledge and 6 to 10 was considered as good knowledge.
- 6 attitude related questions- Maximum score was 24 and minimum score was 6. 6 to 15 was regarded as average attitude and 16 to 24 was regarded as good attitude.
- 5 questions regarding self-reported practice. Maximum score was 15 and minimum score was 5. Scores from 5 to 10 were scored as average practice and scores from 11 to 15 were regarded as good practice.

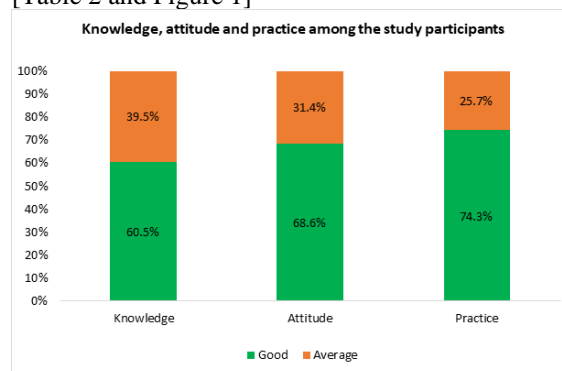
The data was entered in MS Excel and was analyzed using SPSS version 25. Descriptive statistics such as mean, standard deviation, frequency and percentage were used. Chi square test was used to test association. P value < 0.05 was considered significant. Data were expressed in tables and charts wherever necessary.

## RESULTS

The Mean age of the study participants was  $35.12 \pm 16.29$  years. Majority of participants were in 21 to 30 years of age (21.9%), followed by 20.5% in 31 to 40 years of age. Males were the majority with 68.6% and

females constituted 31%. 80% were Hindu followed by 11.5% were Christians. Among the educational qualification of study participants, majority (28.6%) were graduates or post graduates followed by 15.7% studied upto middle school. 11.4% were illiterate among the study participants. Among the occupation of the study participants, majority (27.6%) were skilled workers followed by 21.4% were semi-professional. 21.4% were unemployed among the study participants. Majority of study participants (34.8%) reported monthly income of below 10000 followed by 29.5% from 10001 to 20000. Among the socioeconomic status of study participants, 36.2% were upper lower followed by 29% were lower middle. [Table 1]

Among the study participants, 60.5% had good knowledge and 39.5% had average knowledge. 68.6% had good attitude and 31.4% had average attitude. 74.3% had good practice and 25.7% had average practice among the study participants. [Table 2 and Figure 1]



**Figure 1: Knowledge, attitude and practice among the study participants (n = 210)**

Among the knowledge-based questions, 71.4% mentioned Rabies as a fatal disease and 51.9% correctly mentioned Rabies as caused by a virus. 21% mentioned that dog bite alone does not cause Rabies. Only 21.4% told correctly that dog bite wound should not be sutured. 77.1% mentioned vaccination can prevent Rabies and 61% mentioned spread of Rabies by saliva. Only 36.7% mentioned hydrophobia as a symptom of Rabies and 39.5% mentioned dog bite would should be cleaned immediately with soap and water. [Table 3].

Among the attitude-based questions, Government is doing good measures to control street dogs was agreed by 39.5% of participants. 61.4% agreed that Government setup is having adequate anti Rabies vaccine. 58.1% agreed complete vaccination will reduce spread of Rabies. 57.6% agreed that fear of dog bite has increased recently and 55.2% agreed that animal birth control program could reduce Rabies. 58.6% were annoyed by the stray dogs in their locality. [Table 4]

Among the practice-based questions, 87.1% took treatment from a doctor or hospital as first preference. 38.1% had vaccinated their pet dogs, 25.7% had taken pre-exposure prophylaxis and 58.1% washed with running water and soap immediately after dog

bite. 88.1% had visited the PHC as first facility after bite and 35.7% came in a duration of 1 to 6 hours between bite and ARV. Majority had source of knowledge regarding ARV in PHC from family. 4.3% had a health worker who explained about ARV vaccine availability in PHC. [Table 5]

Association between sociodemographic details with good knowledge showed significant association for age, educational qualification, occupation, monthly income and socioeconomic status. Participants in age group of 21 to 30 and 31 to 40 had good knowledge as 82.6% and 74.4% respectively. Participants with graduate or post graduate degree had good knowledge of 95% followed by professional with 83.3%. Those who were professional had 97% good knowledge followed by semi-professional 95.6%. Those with monthly income of above 4000 had 95.5% good knowledge followed by monthly income of 30001 to 40000 having 91.3% good knowledge. All those in upper middle socioeconomic status had good knowledge and 94.7% in upper socioeconomic class had good knowledge. [Table 6]

Association between sociodemographic details with good attitude showed significant association for socioeconomic status and marital status. 83.3% in upper middle socioeconomic class had good attitude followed by 77% in lower middle socioeconomic

class. 76.6% of married participants had good attitude and 58.1% of unmarried participants had good attitude. [Table 6]

Association between sociodemographic details with good practice showed significant association for age, educational qualification, occupation and socioeconomic status. 90% of parents of 6 to 10 years age had good practice followed by 83.8% in 11 to 20 years age group. 93.3% of graduates had good practice followed by 83.3% of those who were professionals. 91.1% of semi-professional had good practice. 94.7% of upper class had good practice followed by 90% of upper middle class. [Table 6]

74.8% of study participants with good knowledge had good attitude and 59% of participants with average knowledge had good attitude. This difference was statistically significant by Chi square test. 87.4% of study participants with good knowledge had good practice and 54.2% of participants with average knowledge had good practice. This difference was statistically significant by Chi square test. [Table 7]

76.4% of study participants with good attitude had good practice and 69.7% of participants with average attitude had good practice. However, this difference was not statistically significant by Chi square test. [Table 8]

**Table 1: Sociodemographic details of study participants (n=210)**

Sociodemographic details		Frequency	Percentage
Age	6-10	10	4.8
	11-20	37	17.6
	21-30	46	21.9
	31-40	43	20.5
	41-50	35	16.7
	51-60	25	11.9
	61-70	10	4.8
	71-80	4	1.9
Gender	Male	144	68.6
	Female	65	31
	Transgender	1	0.4
Religion	Hindu	168	80
	Christian	24	11.5
	Muslim	15	7.1
	Others	3	1.4
Educational qualification	Profession or honors	18	8.6
	Graduate or post graduate	60	28.6
	Intermediate or post high school	24	11.4
	High school	31	14.8
	Middle school	33	15.7
	Primary school	20	9.5
	Illiterate	24	11.4
Occupation	Professional	33	15.7
	Semi professional	45	21.4
	Skilled	58	27.6
	Unskilled	29	13.8
	Unemployed	45	21.4
Monthly income of family	Below 10000	73	34.8
	10001-20000	62	29.5
	20001-30000	30	14.3
	30001-40000	23	11
	Above 40000	22	10.5
Socioeconomic status	Lower	24	11.4
	Upper lower	76	36.2
	Lower middle	61	29
	Upper middle	30	14.3
	Upper	19	9
Marital status	Married	124	59

	Unmarried	74	35.2
	Separated/ widower	12	5.7

**Table 2: Knowledge, attitude and practice among the study participants (n = 210)**

	Good	Average
Knowledge	127 (60.5%)	83 (39.5%)
Attitude	144 (68.6%)	66 (31.4%)
Practice	156 (74.3%)	54 (25.7%)

**Table 3. Knowledge based questions among study participants (n=210)**

Knowledge based questions		Frequency	Percentage
Rabies is fatal disease	Yes	150	71.4
	No	8	3.8
	Don't know	52	24.8
Cause of Rabies	Virus	109	51.9
	Bacteria	24	11.4
	Parasite	11	5.2
	Don't know	66	31.4
Only dog bite causes Rabies	Yes	94	44.8
	No	44	21
	Don't know	72	34.3
Human to human transmission of Rabies	Yes	46	21.9
	No	58	27.6
	Don't know	106	50.5
Dog bite wound to be sutured	Yes	73	34.8
	No	45	21.4
	Don't know	92	43.8
Vaccination easily prevents Rabies in humans and dogs	Yes	162	77.1
	No	1	0.5
	Don't know	47	22.4
Rabies spread through saliva of dogs	Yes	128	61
	No	22	10.5
	Don't know	60	28.5
Hydrophobia is a symptom of Rabies	Yes	77	36.7
	No	31	14.8
	Don't know	102	48.6
Dog bite should be immediately cleaned with	Soap and water	83	39.5
	Apply turmeric	41	19.5
	Get vaccinated	43	20.5
	Don't know	43	20.5

**Table 4: Attitude based questions among study participants (n=210)**

Attitude based questions	Strongly agree	Agree	Disagree	Strongly disagree
Government is doing good measures to control street dog in your locality	35 (16.7%)	83 (39.5%)	31 (14.8%)	61 (29%)
Government health centres have adequate anti-Rabies vaccine than private setups	78 (37.1%)	129 (61.4%)	3 (1.4%)	-
Complete vaccination will control the spread of Rabies	74 (35.2%)	122 (58.1%)	13 (6.2%)	1 (0.5%)
Fear of having a dog bite been increased in recent times	69 (32.9%)	121 (57.6%)	13 (6.2%)	7 (3.3%)
Animal birth control program could reduce the problem of Rabies	47 (22.4%)	116 (55.2%)	29 (13.8%)	18 (8.6%)
Annoyed with stray dogs in your locality	75 (35.7%)	123 (58.6%)	8 (3.8%)	4 (1.9%)

**Table 5: Practice based questions among study participants (n=210)**

Practice based questions		Frequency	Percentage
First preference for seeking treatment after dog bite	Doctor/ hospital	183	87.1
	Native/ traditional healers	17	8.1
	None	10	4.8
Vaccinated pet dogs against Rabies	Yes	80	38.1
	No	18	8.6
	I don't know about it	42	20
	I don't have any pets	70	33.3
Taken preexposure prophylaxis for Rabies	Yes	54	25.7
	No	70	33.3
	I don't know about it	86	41
Measure done immediately after dog bite	Washed with running water and soap	122	58.1
	Applied home remedy/ turmeric	53	25.2
	Covered the wound	21	10
	Others	14	6.7
First facility to visit after dog bite	PHC	185	88.1
	Another government setup	7	3.3
	Private setup	18	8.6

Duration between dog bite and first dose of ARV	< 1 hour	32	15.2
	1 – 6 hrs	75	35.7
	7 – 12 hrs	59	28.1
	13 – 24 hrs	38	18.1
	1 – 3 days	5	2.4
	> 3 days	1	0.5
Source of knowledge regarding Anti Rabies Vaccine in PHC	Family	65	31
	Self	59	28.1
	Friends	37	17.6
	Neighbours	28	13.3
	Health workers	9	4.3
	Internet/ social media	7	3.3
	Newspaper/ magazines	5	2.4

**Table 6: Association of Sociodemographic details with knowledge, attitude and practice of study participants (n=210)**

Sociodemographic details		Good Knowledge	P value	Good attitude	P value	Good practice	P value
Age	6-10	1 (10%)	< 0.001*	4 (40%)	0.12	9 (90%)	0.04*
	11-20	21 (56.8%)		15 (40.5%)		31 (83.8%)	
	21-30	38 (82.6%)		17 (37%)		38 (82.6%)	
	31-40	32 (74.4%)		9 (20.9%)		34 (79.1%)	
	41-50	18 (51.4%)		14 (40%)		21 (60%)	
	51-60	13 (52%)		3 (12%)		14 (56%)	
	61-70	3 (30%)		2 (20%)		7 (70%)	
71-80	1 (25%)	2 (50%)	2 (50%)				
Gender	Male	94 (65.3%)	0.05	97 (67.4%)	0.30	106 (73.6%)	0.90
	Female	33 (50.8%)		47 (72.3%)		49 (75.4%)	
	Transgender	0		0		1 (100%)	
Religion	Hindu	100 (59.5%)	0.30	119 (70.8%)	0.07	127 (75.6%)	0.002*
	Christian	14 (58.3%)		16 (66.7%)		12 (50%)	
	Muslim	12 (80%)		9 (60%)		15 (100%)	
	Others	1 (33.3%)		0		2 (66.7%)	
Educational qualification	Profession or honors	15 (83.3%)	< 0.001*	12 (66.7%)	0.37	15 (83.3%)	< 0.001*
	Graduate or post graduate	57 (95%)		46 (76.7%)		56 (93.3%)	
	Intermediate or post high school	18 (75%)		19 (79.2%)		20 (83.3%)	
	High school	20 (64.5%)		21 (67.7%)		18 (58.1%)	
	Middle school	13 (39.4%)		21 (63.6%)		25 (75.8%)	
	Primary school	4 (20%)		12 (60%)		12 (60%)	
	Illiterate	0		13 (54.2%)		10 (41.7%)	
Occupation	Professional	32 (97%)	< 0.001*	25 (75.8%)	0.05	29 (87.9%)	< 0.001*
	Semi professional	43 (95.6%)		36 (80%)		41 (91.1%)	
	Skilled	36 (62.1%)		40 (69%)		41 (70.7%)	
	Unskilled	2 (6.9%)		14 (48.3%)		10 (34.5%)	
	Unemployed	14 (31.1%)		29 (64.4%)		35 (77.8%)	
Monthly income of family	Below 10000	26 (35.6%)	< 0.001*	44 (60.3%)	0.39	51 (69.9%)	0.05
	10001-20000	38 (61.3%)		47 (75.8%)		42 (67.7%)	
	20001-30000	21 (70%)		21 (70%)		22 (73.3%)	
	30001-40000	21 (91.3%)		16 (69.6%)		20 (87%)	
	Above 40000	21 (95.5%)		16 (72.7%)		21 (95.5%)	
Socioeconomic status	Lower	1 (4.2%)	< 0.001*	17 (70.8%)	0.02*	13 (54.2%)	0.004*
	Upper lower	30 (39.5%)		42 (55.3%)		51 (67.1%)	
	Lower middle	48 (78.7%)		47 (77%)		47 (77%)	
	Upper middle	30 (100%)		25 (83.3%)		27 (90%)	
	Upper	18 (94.7%)		13 (68.4%)		18 (94.7%)	
Marital status	Married	77 (62.1%)	0.38	95 (76.6%)	0.007*	86 (69.4%)	0.003*
	Unmarried	45 (60.8%)		43 (58.1%)		64 (86.5%)	
	Separated/ widower	5 (41.7%)		6 (50%)		6 (50%)	

**Table 7: Association of knowledge with attitude and practice among the study participants (n=210)**

Knowledge	Attitude			Practice		
	Good	Average	Total	Good	Average	Total
Good	95 (74.8%)	32 (25.2%)	127 (100%)	111 (87.4%)	16 (12.6%)	127 (100%)
Average	49 (59%)	34 (41%)	83 (100%)	45 (54.2%)	38 (45.8%)	83 (100%)
Total	144 (68.6%)	66 (31.4%)	210 (100%)	156 (74.3%)	54 (25.7%)	210 (100%)
Chi square value	5.79			28.93		
P value	0.01*			< 0.001*		

\*. statistically significant by Chi square test

**Table 8: Association between attitude and practice among the study participants (n=210)**

Attitude	Practice			Chi square value	P value
	Good	Average	Total		
Good	110 (76.4%)	34 (23.6%)	144 (100%)	1.06	0.30
Average	46 (69.7%)	20 (30.3%)	66 (100%)		
Total	156 (74.3%)	54 (25.7%)	210 (100%)		

## DISCUSSION

In this study, 60.5% had good knowledge, 68.6% had good attitude and 74.3% had good practice among the study participants. This was similar to studies done by Joice et al,<sup>[1]</sup> Matibag et al and Chaudari et al.<sup>[7,8]</sup>

In our study, majority of study participants were less than 50 years of age. This was similar to studies done by Joice et al and Chaudari et al.<sup>[1,8]</sup>

In the current study, it was shown that 71.4 of the respondents were able to identify Rabies correctly, including its symptoms. These results are in line with those of a 2016 study that was carried out in Ethiopia.<sup>[9]</sup> Also, 51.9% people were able to the cause of Rabies. 71.4% of participants recognized Rabies as a fatal disease. This is similar to a study carried out in Karnataka's slums were 64% recognized that it is a lethal illness.<sup>[10]</sup> 77.1% believed that if bitten by a dog vaccination can prevent Rabies. This was similar to studies done before.<sup>[11-13]</sup>

In our study, 94.3% of participants agreed that they were annoyed with stray dogs in their locality. In contrast, in a different multicentric study funded by the WHO, 83% of participants reported the existence of stray dogs, and 23% thought it to be a threat.<sup>[14]</sup>

88.1% had visited the government setup in PHC for the first visit. It illustrates that failing to visit the hospital for ARV treatment may be due to ignorance. This was similar to studies done earlier which showed not knowing the place of treatment being a reason for delayed arrival.<sup>[15,16]</sup>

79% of participants had a duration of less than 12 hours between dog bite and first dose of ARV. This was similar to 80% in a Delhi study.<sup>[17]</sup> In contrast, in research done in North Bengal, the time for starting ARV ranged from 3 to 72 hours. Just 4 (0.02%) started ARV on the day of the bite, while 50 (39.0%) either did not have any knowledge of when ARV was begun or was started after 10 days of bite.<sup>[18]</sup>

The World Health Organization states that the best method for preventing infection after a bite is to properly cleanse the wound with soap and water. Only 58.1% of the dog bite patients in the current study performed local wound toilet, when the percentage is low in prior studies.<sup>[1,5,7,9,13]</sup>

In our study, association between sociodemographic details with good knowledge showed significant association for age, educational qualification, occupation, monthly income and socioeconomic status. Participants in age group of 21 to 30 and 31 to 40 had good knowledge as 82.6% and 74.4%. Graduate or post graduate degree had good knowledge of 95%. Thus literacy has a significant association with knowledge about Rabies which was also proved in previous studies.<sup>[1,7,10,12]</sup> Professional

had 97% good knowledge followed by semi-professional 95.6%. Monthly income of above 4000 had 95.5% good knowledge. All those in upper middle socioeconomic status had good knowledge and 94.7% in upper socioeconomic class had good knowledge. Similar to our results various studies have found significant association between higher levels of socioeconomic status and knowledge level of Rabies.<sup>[1,5,9,12,14,16]</sup>

In our study, association between sociodemographic details with good attitude showed significant association for socioeconomic status and marital status. 83.3% in upper middle socioeconomic class had good attitude. Previous studies have also found a link between higher socioeconomic status and good attitude.<sup>[1,5,9,14]</sup> 76.6% of married participants had good attitude.

In our study, association between sociodemographic details with good practice showed significant association for age, educational qualification, occupation and socioeconomic status. 90% of parents of 6 to 10 years age had good practice followed by 83.8% in 11 to 20 years age group. Children and young adults are more concerned about dog bite prevention and have a better practice rate. 93.3% of graduates had good practice followed by 83.3% of those who were professionals. Education levels are significant associated with good practice which is also mentioned in previous studies.<sup>[1,5,10,12]</sup> 94.7% of upper class had good practice followed by 90% of upper middle class. Similar to our results various studies have found significant association between higher levels of socioeconomic status and practice level of Rabies.<sup>[1,14,16]</sup>

In our study 74.8% of study participants with good knowledge had good attitude This difference was statistically significant by Chi square test. 87.4% of study participants with good knowledge had good practice. This difference was statistically significant by Chi square test. Thus, having a good knowledge about Rabies converts into a good attitude and eventually a good practice. This is similar to results of previous studies.<sup>[1,7,13,15]</sup>

In our study, 76.4% of study participants with good attitude had good practice However, this difference was not statistically significant by Chi square test. Thus, having a good attitude alone does not convert to good practice. This is in contrast to studies done before.<sup>[1,4,10]</sup>

### Limitations

As the study relied upon self-reported practices, some participants could have given socially acceptable responses.

## CONCLUSION

Around 60% of participants had good knowledge, 68% had good attitude and 74% had good practice in relation to Rabies. There was a significant association of good knowledge with good attitude and good knowledge with good practice. Higher education levels and higher socioeconomic status had significantly higher proportion of good knowledge and practice. Health education and behavior change communication to general public especially those who are in lower socioeconomic status and less literacy levels will help to bridge the gap.

### Acknowledgement

We would like to express our sincere gratitude to the Dean of GMCH Tiruppur, Faculty of Department of Community Medicine and co-CRMIs of GMCH Tiruppur. We would also like to thank the Block Medical Officers and health team of Perumanallur CHC and Pongalur CHC. We also thank the participants who participated in the study.

## REFERENCES

1. Joice YS, Singh Z, Datta SS. Knowledge, attitude and practices regarding dog bite and its management among adults in rural Tamil Nadu. *Medical Science*. 2016; 5(5).
2. Gill KP, Devgun P. Assessment of Knowledge, Attitude and Practices about Rabies in Urban Slums of Amritsar City (Punjab), India. 2018;9(6):199.
3. Tschopp R, Bekele S, Aseffa A. Dog Demography, Animal Bite Management and Rabies Knowledge Attitude and Practices in the Awash Basin, Eastern Ethiopia. *PLoS Negl Trop Dis*. 2016 Feb; 10(2): e0004471.
4. Herbert M, Basha R, Thangaraj S. Community perception regarding Rabies prevention and stray dog control in urban slums in India. *Journal of Infection and Public Health* (2012) 5, 374–380.
5. Sudarshan MK, Mahendra BJ, Madhusudana S. An epidemiological study of animal bites in India: Results of a WHO sponsored national multicentric Rabies survey. *The Journal of communicable diseases*. 2006; 38; 32-9.
6. Agarwal N, Reddaiah VP. Knowledge, attitude and practice following dog bite: a community based epidemiological study. *Health and population - perspectives and Issues*. 2003; 26 (4): 154-61.
7. Matibag GC, Kamigaki T, Kumarasiri PV. Knowledge, attitudes, and practices survey of Rabies in a community in Sri Lanka. *Environmental health and preventive medicine*. 2007; 12(2):84-9.
8. Singh U, Choudhary S. Knowledge, Attitude, Behavior and Practice Study on Dog-Bites and Its Management in the Context of Prevention of Rabies in a Rural Community of Gujarat. *Indian J Community Med*. 2005;30(3):81.
9. Samanta M, Mondal R, Shah A. Animal Bites and Rabies Prophylaxis in Rural Children: Indian Perspective. *Journal of Tropical Pediatrics*. 2016; 62(1): 55–62.
10. Sharma S, Agarwal A, Khan AM. Prevalence of Dog Bites in Rural and Urban Slums of Delhi: A Community-based Study. *Ann Med Health Sci Res*. 2016; 6(2): 115–9.
11. Venkatesan M, Dongre AR, Kalaiselvan G. An Epidemiological Study of Animal Bites and Envenomings in a Rural District of Tamilnadu, India. *Online J Health Allied Scs*. 2014;13(4):4.
12. Ichhpujani RL, Mala C, Veena M. Epidemiology of animal bites and Rabies cases in India. A multicentric study. *J Commun Dis*. 2008;40(1):27–36.
13. Sudarshan MK, Mahendra BJ, Madhusudana SN. An epidemiological study of animal bites in India: results of a WHO sponsored national multi-centric Rabies survey. *J Commun Di*. 2006; 38(1), 32-9.
14. Sharma AL, Bhuyar PA, Bhawalkar JS. Profile of management of animal bite cases among rural population in district Pune, Maharashtra. *Indian J Public Health*. 2007;51(1):62–3.
15. Shah V, Bala DV, Thakker J. Epidemiological determinants of animal bite cases attending the anti-Rabies clinic at VS General Hospital, Ahmedabad. *Health Line*. 2012;3(1):66–8.
16. Sudarshan MK, Mahendra BJ, Madhusudana SN. An epidemiological study of animal bites in India: results of a WHO sponsored national multi-centric Rabies survey. *J Commun Dis*. 2006;38(1):32–9.
17. Agarwal N, Reddaiah VP. Knowledge, attitude and practice following dog bite: a community-based epidemiological study. *Health Pop Perspect*. 2003;(2003):26.
18. Agarwal N, Reddajah VP. Epidemiology of dog bites: a community-based study in India. *Trop Doct*. 2004; 34(2):76–78.