

ORIGINAL ARTICLE

Knowledge, attitude, and practice of a local community towards the prevention and control of rabies in Gaibandha, Bangladesh

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ABSTRACT

Objectives: Knowledge, attitude, and practice (KAP) of rabies in the community are essential for developing post-exposure behavioral treatment and for understanding current prevention and control policy on rabies. This was a cross-sectional study in Gaibandha Sadar, a northern district of Bangladesh, investigating the level of KAP about rabies.

Materials and methods: A total of 368 interviewed respondents, of whom 280 (76.09%) were male, and 88 (23.91%) were female. A structured questionnaire was used for the data collection from respondents on socio-demographic information and KAP regarding rabies. The data analyzed with STATA-IC-11.0 and the association of independent variables with rabies KAP scores were calculated using Pearson's Chi-square.

Results: Most respondents had adequate KAP levels and positive thoughts on rabies prevention. The KAP scores were strongly associated with education and employment status ($p < 0.05$). Most respondents said that stray dogs are a headache in the area and believed that control of the dog population in Gaibandha is essential.

Conclusion: These outcomes also revealed that there is an information gap about rabies that might improve by developing an education program for awareness.

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Introduction

Rabies is well-known as one of the foremost vital public health issue that causes around 59,000 human deaths per annum worldwide [1]. When clinical signs and symptoms show, fatality rates become 100%. However, it is entirely remediable if victims treat with World Health Organization guided post-exposure prophylaxis (PEP), entailing vigorous washing of wound, instant rabies vaccination after probable exposure, and finally, in exceptional situation, rabies immunoglobulin [2,3]. In the developing countries, deprived portions of the society may not get this life-sparing treatment either because PEP treatment is exorbitant

or because individuals can't visit the clinic for remedy due to lack of awareness about rabies [4,5].

In Bangladesh, rabies remains endemic with high human health importance and holds the number three position among the rabies endemic nations [6]. Over 2,000 rabies-related human deaths have been estimated in the country, and children below 15-years ages are the most affected victims belonging to poor rural communities [6,7].

It is estimated that around 1.6 million dog populations in Bangladesh, of which 83% are free-roaming dogs [8]. Approximately, 300,000 humans are bitten by dogs each year in Bangladesh [9]. The knowledge of necessary preventive measures against rabies in the community is, therefore,

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essential for the advancement of post-exposure behavioral remedy and the understanding of modern rabies prevention and control policies, especially for poor people who cannot cope with financial crises in the right time [10,11]. In Bangladesh, victims get rabies PEP free of cost, but some people do not receive PEP because they are not aware of these prophylactic measures [1,12,13]. There are few studies so far conducted on rabies in different parts of Bangladesh [12,14,15]. But to best of our concern, no comprehensive research work has been carried out to assess the level of community knowledge, attitude, and practice (KAP) of rabies prevention and control in Gaibandha Sadar of Bangladesh. Therefore, we conducted the study to evaluate KAP levels of rabies in the Gaibandha Sadar community in Bangladesh.

Materials and Methods

Study site

The study was undertaken in Gaibandha Sadar, the northern sub-district of Bangladesh (Fig. 1). It has a total area of 302.20 km² between 25°020 and 25°390 to the north and 88°110 and 89°4600 to the east. In this district, the estimated population is 24,310,627 people. Of these, males make up 50.75% and females 49.25% with 1,244 villages and about 100,000 households (<http://www.gaibandha.gov.bd/>).

Study design

A structured and pre-tested questionnaire was used to measure the community's KAP level between July and

December 2017. The questionnaire was pre-tested to a few random numbers of individuals to rule out any personal, social, or cultural conflict. It was then formatted in English and converted to Bengali (local language) for accuracy and better understanding. Before questionnaires were distributed, the apparent consent of the respondents and the result of collective social interaction of the community and the purpose of the study were informed to the respondents. Moreover, the participation of the respondents was voluntary, and their answers were also kept confidential.

Inclusion and exclusion criteria

Households resided more than 6 months in the Gaibandha Sadar were considered permanent residents. In comparison, those households who lived <6 months, <15 years of age and those who were not even able to cooperate or communicate in local language were excluded from this study.

Ethical consideration

The respondents received informed consent. They were made aware that participation is voluntary and that there were no judicial or social consequences in case of nonparticipation. They were also informed that the questionnaire does not contain their names, religions, locations, and other demographic parameters that may bias the study plan. All information received had been kept confidential, and the ethical committee approved the study of the Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh.

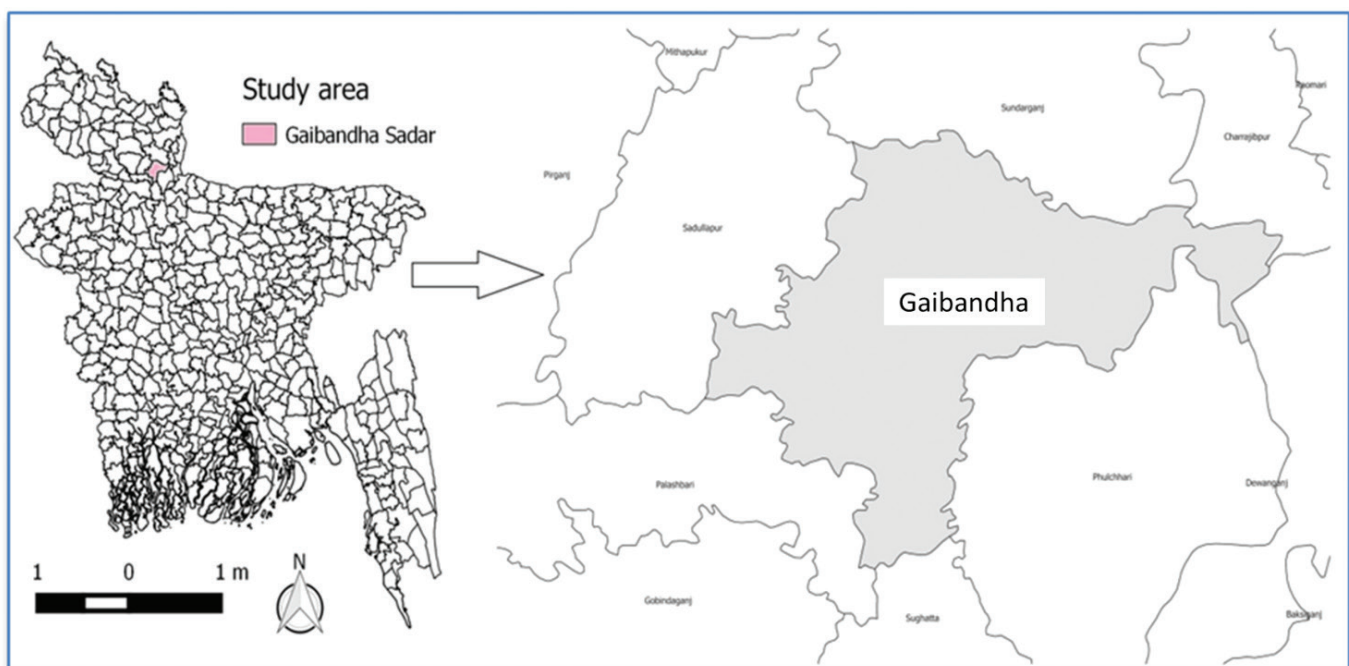


Figure 1. The map of the study area in Bangladesh.

Sampling and survey method

In total, 368 respondents were interviewed in the study following the grab sampling technique. Information was obtained from respondents using a structured questionnaire. The questionnaires contained information regarding socio-demographic variables and KAP about rabies.

Table 1. Socio-demographic characteristics of the respondents.

Variables	Category	Frequency (%)
Gender	Male	280 (76.09)
	Female	88 (23.91)
Age (in years)	15-29	119 (32.34)
	30-45	122 (33.15)
	>45	127 (34.51)
Family size	2-5	147 (39.95)
	5-10	171 (46.47)
	>10	50 (13.59)
Education status	Primary	41 (11.14)
	Secondary	73 (19.84)
	Higher secondary	167 (45.38)
	Graduation	87 (23.64)
Occupation	Student	63 (17.12)
	Job	92 (25)
	Business	151 (41.03)
	House-wife	48 (13.04)
	Unemployed	14 (3.80)
Religion	Muslim	297 (80.71)
	Hindu	48 (13.04)
	Buddhist	15 (4.08)
	Christian	8 (2.17)

Statistical analysis

Data from respondents were input into Microsoft Excel spreadsheet 2010 (Microsoft Corporation, Redmond, WA) and exported to STATA-IC-11.0 (StataCorp, College Station, TX) software for further analysis. Descriptive statistics were performed to analyze the data. The frequency distribution of different variables was expressed as a percentage. Pearson's Chi-square test was run to evaluate the association of independent variables and rabies KAP scores. A *p* values less than 0.05 were counted as significant.

Results

Socio-demographic evaluation of the respondents

The socio-demographic features of the participants are presented in Table 1. Among 368 respondents, males were 280 and females were 88. The majority of them were more than 45 years of age, among whom 45.38% had attended high school. In the context of religious belief, the highest (80.71%) respondents were Muslims, while 41.03% were businessmen.

Knowledge of the respondents on rabies

About 311 (84.51%) respondents were aware of rabies and referred to the disease in local language as "*Jolatongko*," meaning "water fovea". Most respondents, 157 (42.66%) and 120 (32.61%), described the virus as the causative agent of rabies, while dogs and humans were referred to as the most common species affected by rabies, respectively. Besides, most of the respondents knew rabies as the

Table 2. Knowledge of the respondents about rabies.

Variables	Category	Frequency (%)
Are you aware of rabies?	Yes	311 (84.51)
	No	57 (15.49)
The causative agent for rabies	Virus	157 (42.66)
	Bacteria	107 (29.08)
	I don't know	104 (28.26)
Species affected by rabies	Dogs only	59 (16.03)
	Human only	88 (23.91)
	Dog and human	120 (32.61)
	Human and other domestic animals	101 (27.45)
Mode of transmission	Bite only	121 (32.88)
	Contact with saliva only	88 (23.91)
	Bite and contact with an open wound	96 (26.09)
	Others	63 (17.12)
Signs and symptoms	Salivation only	84 (22.83)
	Sudden change in behavior	117 (31.79)
	Pain at site of the bite	102 (27.72)
	Stop eating & drinking	65 (17.66)
Is rabies fatal?	Yes	291 (79.08)
	No	57 (15.49)
	Don't know	20 (5.43)

deadliest disease, which transmitted through dog bite and manifested by a sudden behavioral change (Table 2).

Attitude and practice of the respondents about rabies

Of the 368 respondents, 270 (73.37%) had positive reactions to the vaccine against rabies, and 288 (78.26%) claimed that rabies could be prevented, and 124 (33.70%) gained knowledge of rabies through formal channels such as radio, television, and newspapers (Table 3). To escape from biting of a dog, 291 (79.08%) reported that suspected dogs should be kept tied up all day long, only 57 (15.49%) thought these dogs should be killed immediately. The majority of the respondents (65.49%) practiced wound washing as first aid, followed by post-exposure vaccination (64.40%). However, 67 (18.21%) of the victim went to a traditional healer upon practicing first aid. Animal birth control was considered as the best way of managing the dog population, followed by responsible dog ownership and killing of dogs. As reported by the majority of the respondents (46.74%), children were the utmost exposed group at risk of the disease.

Factors associated with community KAP on rabies

To assess the KAP of rabies, each respondent was asked a total of 21 questions. The queries were answered with multiple options in the answer sheets. Each correct answer given by respondents was computed and scored. The results were assembled, and then, the mean score

was calculated to evaluate the entire KAP of participants. Education and employment status showed a significant ($p < 0.05$) relationship with KAP scores (Table 4). The KAP values were highest in males (235) as compared to females (76). People having higher education showed adequate KAP on rabies.

Discussion

The present study showed that people in Gaibandha Sadar had a significant level of consciousness about rabies and its consequences. The participants' high level of KAP might be due to the endemicity of rabies and recurrent exposure of Mass Dog Vaccination (MDV) in the specified area [3,16]. It was stated that 84.51% of respondents were cognizant of rabies and said dog-bite is the most common way of rabies transmission. The vast numbers of dog-bite victims initially go to traditional healers to receive treatment. It comprises the use of herbs, red chilis, and oils and eating medicated bananas (locally named as "Kola Pora") and drinking water (locally called as "Pani Pora") offered by traditional healers [17]. Persisting myths and false beliefs regarding the management of dog-bite and, along with the dearth of institutional knowledge about rabies prevention, promote the respondent to seek these types of treatment methods. These findings are in agreement with several researches in Bangladesh and neighboring nations [18–20]. The fluctuations in values of these determinants might be due to variation in the occurrence of rabies in the

Table 3. Attitudes and practices of respondents about rabies.

Variables	Category	Frequency (%)
Can rabies be prevented by vaccine?	Yes	288 (78.26)
	No	50 (13.59)
	I don't know	30 (8.15)
Attitude to vaccine	Positive	270 (73.37)
	Negative	98 (26.63)
Source of information	Formal	124 (33.70)
	Informal	147 (39.95)
	Mixed	97 (29.08)
Measures were taken against attacking dog	Tie them	291 (79.08)
	Kill them	57 (15.49)
	Do nothing	20 (5.43)
First aid against dog-bite	Wound wash	241 (65.49)
	Attending clinic	97 (26.36)
	Don't know	30 (8.15)
Actions after first aid	Post-exposure vaccine	237 (64.40)
	Traditional treatment	67 (18.21)
	Both	64 (17.39)
Dog population management	Animal Birth Control	242 (65.76)
	Dog Ownership	54 (14.67)
	Killing	72 (19.57)
Most risky people	Children	172 (46.74)
	Young people	107 (29.08)
	Older people	89 (24.18)

Table 4. Factors associated with community KAP on rabies.

Variables	Category	Have knowledge (%)	No knowledge (%)	Chi-square	p value
Gender	Male	235 (83.93)	45 (16.07)	0.3033	0.58
	Female	76 (86.36)	12 (13.64)		
Age (years)	15–29	99 (83.19)	20 (16.81)	2.0734	0.35
	30–45	100 (81.97)	22 (18.03)		
	>45	112 (88.19)	15 (11.81)		
Family size	2–5	123 (83.67)	24 (16.33)	2.5034	0.29
	5–10	142 (83.04)	29 (16.96)		
	>10	46 (92)	4 (8)		
Education status	Primary	26 (63.41)	15 (36.59)	15.9594	0.001
	Secondary	65 (89.04)	8 (10.96)		
	Higher secondary	145 (86.83)	22 (13.17)		
	Graduation	75 (86.21)	12 (13.79)		
Occupation	Student	59 (93.65)	4 (6.35)	20.1423	0.000
	Job	81 (88.04)	11 (11.96)		
	Business	113 (74.83)	38 (25.17)		
	House-wife	44 (91.67)	4 (8.33)		
	Unemployed	14 (100)	0 (0)		
Religion	Muslim	252 (84.85)	45 (15.15)	2.9746	0.396
	Hindu	40 (83.33)	8 (16.67)		
	Buddhist	11 (73.33)	4 (26.67)		
	Christian	8 (100)	0 (0)		

research area, and lifestyle of the people as well as better knowledge about different diseases of animals, which could add to their current better understanding. Besides, they are better informed and have direct access to health facilities. The present findings also indicate that the individuals were awarded about rabies both from formal and informal sources, which recommends that the mass media and health and livestock workers could work together to circulate rabies-related information. Studies from India revealed that mass media could play an active role in disseminating the facts about rabies to the public [21,22].

According to this study, only 42.66% of the respondents perceived the real cause of rabies. Some respondents thought that rabies in dogs is occurred by bacteria, while others remained unknown. This might be due to the variation in community consciousness in the area. This misunderstanding could also probably be elucidated by the view of carrier dogs without rabies symptoms, which could show the progress of clinical signs at any stage. However, the idea of carrier dogs without rabies symptoms itself is a controversial matter, and the association of individual dog immunity, proper identification of clinical signs, which mainly depends on the owner's knowledge about clinical signs, and our results show that people have not informed about dumpy forms of rabies what might also be due to a lack of knowledge about this form. A percentage of 32.88% of respondents believed that the transmission of rabies occurs due to dog-bite. A survey in Thailand observed that only 16% of respondents aware that all mammals could be affected with rabies [23]. Local dogs could also act as

a source and carrier of rabies, both for other animals and humans, in various parts of the globe, particularly Africa and Asia, where 85%–90% of rabies incidents in humans were occurred by dog-bite [6]. The majority (78.26%) of the respondents believed that vaccines could prevent rabies and knew the need for dog vaccination [1,24]. This is in line with a previous study where MDV was the most suitable tool for controlling rabies and preventing human deaths [6,7].

Our result suggests that the majority of the individuals in the area had a positive reaction to vaccinations. Still, socio-economic status, such as lack of education, financial limitations, might make them reluctant to practice pre and post-exposure vaccination as well as encourage them to non-scientific traditional rabies treatment approaches.

In this study, it was found that most of the respondents recommended to tie and execute the dog as to minimize such attacks to others. A similar practice was also reported earlier [22,25]. Herbert et al. [22], in their study, noted that 43% of the participants believed killing suspected aggressive and ferocious dogs is the most effective way to mitigate rabies from street dogs. In Bangladesh, the killing of a dog is the usual practice. Moreover, there is no record that the slaughter of dogs can contribute a greater influence on dogs' numbers or transmission of rabies. It is commonly done to reduce the population of dogs.

As Bangladesh is predominantly a Muslim country, people have a lesser affinity to keep dogs in the household because of the Islamic faith; they believe a dog is not a virtuous animal. This tendency has also been recognized in

other Islamic nations of the world where the public is not accustomed to dog restraining and handling [26].

Increasing public awareness levels has been stated as a vital tool to control rabies by various researchers [27]. To improve rabies awareness, it is mandatory to organize education campaigns all over the country to circulate information, and afterward, educational institution-based control programs about rabies have to be executed. Both veterinarians and human health professionals could contribute to prevent and control rabies following the one-health technique. The participatory epidemiology method might also be followed for public engagement in rabies prevention and control programs. The Bangladesh government intends to eliminate rabies by the end of 2020 utilizing the following methodologies: MDV, animal birth control approach, advanced therapeutic measures, and dog population management. Neighboring nations, such as Bhutan and Sri Lanka have seen significant improvement in rabies eradication programs through these four techniques [28,29], but raising awareness is mostly believed to be the foremost step of rabies control. Eventually, the best method to affirm that rabies has been eradicated from a community is to have an active surveillance protocol and also a rabies diagnostic research laboratory. This designated establishment should have diagnostic facilities for both animal and human samples.

Because of limited technical supports and shorter time-bound, the present study could not attain the obligatory sample number. The research was carried out in a smaller part of Bangladesh. In contrast, randomly chosen households had comparable demographic measures to other larger parts of Bangladesh. Moreover, further studies are to be conducted to check these findings from the Bangladesh perspective.

Conclusion

This study revealed that rabies is a recognized disease in the Gaibandha Sadar area. The community people had sufficient awareness about rabies, their causal agents, and future consequences, which could play significant roles in preventing rabies in the area. On the contrary, there is a dearth of knowledge about PEP or may be due to financial conditions, such as quick visits to the clinic and the utilization of rabies PEP because of inadequate knowledge. The scanty treatment-seeking behavior shows that there are information gaps about rabies and its fatality and may be due to the inadequacy of entering public health facilities for rabies cure and vaccination. Therefore, we suggest increasing MDV throughout the country and dog population management to lessen the number of rabies cases and dog-bites along with mass awareness campaigns about rabies, dog control, and treatment of rabies in Bangladesh.

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Conflict of interest

The authors declare that they have no conflict of interest.

Authors' contribution

MMR carried out the research, collected the questionnaire data, and wrote the initial draft of the manuscript. AAMS and NU conducted the data analysis. BA and ST contributed to the manuscript writing. SG, URS, and MRF structured and supervised research work and finalized the manuscript. All authors read and approved the final manuscript.

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