

Evaluation of knowledge and practice of dog bite management among rural population

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Abstract

Aim: A survey was conducted to evaluate the knowledge and practices on rabies and dog bite management among rural people attended along with their patients at VIMS Pawapuri from December 2019 to October 2020 for dog bite. **Material and method:** A total of 50 people were surveyed. **Result :** It was noted that most of the dogs were street dogs (80%) and 62% of the dogs were never given any antirabies vaccine. Vaccination was regularly followed in 14% and only during the free camps in 24% of the dogs. In the present survey, people known about the fatality of rabies was 100% and dog bite as the route of transmission was 90%, but they had only 22% knowledge on under observation of suspected dog for rabies for 10 days. Awareness level on post exposure prophylaxis in dog-bitten cases was little low, viz., 20% people know thorough wound washing, 32% about application of antiseptic, and 20% about administration of tetanus toxoid. Majority of the people (92%) stated that the wound should be closed. Knowledge on active immunization is 100% but follow immediately after exposure in 24% of the cases. Some people (34%) were preferred traditional treatment. Nobody knows about the passive immunization. **Conclusion:** It was concluded that even though people know something about rabies transmission and post exposure prophylaxis, awareness must be strengthened to increase the vaccination of their dogs regularly, thorough wound washing for 10-15 minutes, application of antiseptics, administration of tetanus toxoid, immediate active immunization by consulting the physician, not closing the dog bitten wound and need of passive immunization.

Keywords: Rabies, Knowledge, Rural People, Antirabies Vaccination, Dog Bite Management.

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Introduction

Rabies is a most frightful deadly zoonotic infection overall [1, 2], with an expected 59,000 human passings every year [3], a large number of which are in youngsters [4]. Creature rabies keeps on being a genuine general medical condition in India and the

frequency of rabies in people is exceptionally high [5]. All warm blooded creatures are defenseless to rabies and can be tainted, and domestic canines are the significant source over 99% of human rabies through canine bites [1]. In spite of this it is 100% preventable by convenient and suitable post exposure prophylaxis (PEP) [2, 6]. It is basic that pet proprietors ensure that their creatures are immunized against rabies, and that their immunizations are stayed up with the latest. Immunized dogs is a ground-breaking and fundamental public health intervention to break the transmission cycle [4]. Human death because of rabies is assessed to be 95% in Africa and Asia, as a result of helpless

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preventive and control measure against canine rabies and restricted access to PEP [7]. Rabies kills around 20,000 individuals consistently in India [8]. Albeit all age groups are prone, rabies is generally normal in youngsters matured under 15 years [8]. There is no methodical observation program on rabies in India and additionally, it isn't in the rundown of modifiable infections. Subsequently, the figure might be a disparage [2]. Absence of getting PEP, inadequate course of PEP and low utilization of rabies immunoglobulin's (RIG) have assumed significant function in the human deaths keep on occurring. The helpless information on PEP is a direct result of absence of mindfulness [9]. The canine populace in India is assessed to be 25 million. Generally they are free wandering as stray dogs or semi-claimed, and which are generally unprotected for rabies. As expressed by WHO, frequencies of human rabies can be constrained by end of rabies in canines through standard prophylactic and yearly antirabies immunization. Obliviousness about the reality of rabies and absence of admittance to moderate administrations for PEP is additionally one reason for most elevated human deaths because of rabies in India [8]. The aim of this study was to conduct a survey among rural population to assess the knowledge and attitude on rabies, dog ownership status, dog bite management and post-exposure immune-prophylaxis.

Materials and Methods

Study area

The study was conducted at VIMS Pawapuri from December 2019 to October 2020. The study was approved by the institutional research and ethical committee. After taking informed and written consent this prospective and questionnaire study was undertaken.

Survey participants

A survey was conducted to know the knowledge level and attitude on rabies and dog bite management among rural people (n=50) attended along with their patients with the complaint of dog bite. A structured questionnaire was designed (Table 1) and used for collection information on ownership of the dogs, vaccination status of dogs against rabies, knowledge on rabies transmission, knowledge on dog bite management/PEP, active immunization, passive immunization and follow of traditional treatment (Table 1).

The percentage was calculated and interpreted. All the surveyed people were discussed to increase the awareness and provided with pamphlets on rabies and its details to be followed in future in case of dog bite to prevent clinical incidences of rabies in animals as well as in humans.

Results and Discussion

The percentage of awareness and attitude towards rabies transmission and PEP among people surveyed in this study is presented in the Table1.

Table 1: Survey questionnaire used to assess the knowledge level and attitude on rabies and dog bite management among the people

Parameters	Scores (%)
Ownership of the dog	
Completely owned	10 (20%)
Street dogs	40 (80%)
Vaccination status of dogs against rabies	
Never given ARV	31 (62%)
Vaccinated at free ARV camp	12 (24%)
Regularly given ARV	7 (14%)
Knowledge on rabies transmission	
Do you know the fatality of rabies?	50 (100%)
Dog bite	45 (90%)
Also by other animals	5 (10%)
Do you observe the rabies suspected dog for 10 days?	11 (22%)
Knowledge on dog bite management/PEP	
Thorough wound washing (10-15 minutes)	10 (20%)
Wound washing less than 5 minutes	40 (80%)
Application of antiseptic: Yes	16 (32%)
Application of antiseptic: No	34 (68%)
Injection of tetanus toxoid: Yes	10 (20%)

Injection of tetanus toxoid: No	40 (80%)
Do you close the wound?	46 (92%)
Active immunization - Yes	50 (100%)
Immediate	12 (24%)
In one or two days	38 (76%)
Passive immunization	0
Follow of traditional treatment	17 (34%)

Ownership of the dogs

Most of the dogs in the study area were reported to be street dog (80%) and few dogs (20%) were completely owned (Figure 1) in the present survey. Only in the township area few people kept dogs as pets and for companionship. The semi-owned relationship of dogs was followed mainly in the outskirts and rural areas for house watch. Hence, the dogs were roaming in and around their territorial places for search of food and want of breeding companionship. There was competition among the dogs for fulfilling their

requirement, which resulted in fighting among them and biting. The probability of disease transmission particularly rabies in livestock and human population from dogs could be higher under these circumstances. Awareness programme should be focused to all sections of the society irrespective of educational status concerned with proper pet rearing [10]. It was also reported that dog menace due to stray dogs maintained in houses for their shelter and increased threat of rabies spread due to an unsatisfactory pet care practices [8].

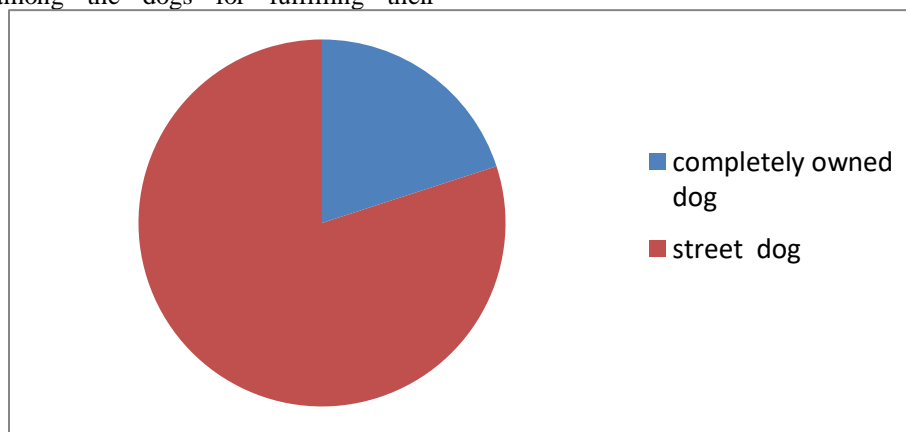


Fig 1:Ownership of dog(%)

Vaccination status of dogs against rabies

In this survey people reported that vaccination was regularly followed in 14% of their dogs, only during the free camps in 24%, and remaining 62% of the dogs were never given antirabies vaccine (Figure 2).

It could be due to the cost of vaccination and non availability of people to bring their dogs for vaccination as the reasons associated for non vaccination. It is suggested that the seriousness about the rabies needs to be stressed to the people to avoid spread of rabies through dog bite; and people have to be motivated through awareness programmes to increase the percentage of vaccination regularly to their dogs. In developing countries the cost of rabies vaccination is an important issue for the people with low income [11]. It was recommend that all pet dogs (and cats) in canine rabies endemic regions receive two rabies vaccine injections that is primary (third month)

and booster dose (1-3 months apart) and then annual boosters, because the dogs are more active and have closer contacts with humans, often children [12]. Vaccination of all the dogs needs to be done to reduce the dog bite incidences and subsequent development of rabies in animals and human beings [12]. The findings of the present study is in accordance with earlier report stated that only 24.4% of people knew that pets need vaccine against rabies and only 5.7% of persons have opinion that immunization to dogs may be a method of control of human rabies [13]. A study reported that community dogs (39.2%) and stray dogs (44.5%) were largely responsible for attacking humans and animals, and this may be due to the high density of free roaming dogs with correspondingly fewer pet dogs, hence high level of awareness is needed regarding rabies and its prevention[14].

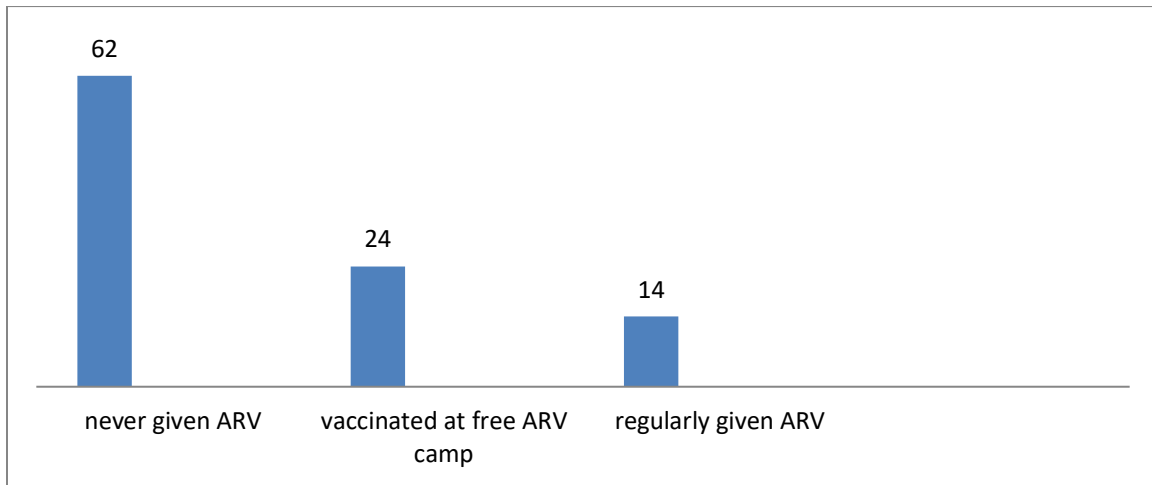


Fig 2:Vaccination status of dogs against rabies(%)

Knowledge on rabies transmission

People have very well known about the fatality of rabies (100%) and dog bite as the route of transmission (90%) in the study. But they had only 22% knowledge about under observation for rabies (UOR) of suspected dog for 10 days (Figure 3). Fear factor to observe and non traceable of the suspected dog for rabies were the major reasons people said during the survey, which resulted in deliberate killing of the dog in first case and death by inanition in the later case. Under these circumstances, people must follow PEP strictly as per the WHO guidelines. Still awareness is needed for the people to have vigil after exposure to the rabies suspected dog or any dog bite cases. Post-exposure treatment can be safely discontinued after 10 days of observation if the responsible animal remains in good health, and if none lived longer than 10 days during UOR because of behavior changes or overt illness [12].

It was reported in a survey that all of the individuals were aware about rabies that is 98.6% knew about its transmission by dog bite; 31.1% would like to apply first aid measure; 36.4% will visit to doctor; rest either do nothing or adopt some religious practices to prevent the development of rabies; 86.6% of individuals were aware about anti-rabies vaccine and 24.4% knew that pet dogs need vaccine against rabies [13]. In a study noted that, sometimes bites may take place with provocation from children like stone throwing, beating, chasing or running at the sight of the dogs [14]. Incidence in the children less than 15 years and various social classes (socio-economic status) are important determinants of dog bite exposure [8]. In the present study 90% of the survey participants reported that dog bite is mode rabies transmission which in accordance with earlier survey reports knowledge level on mode rabies transmission

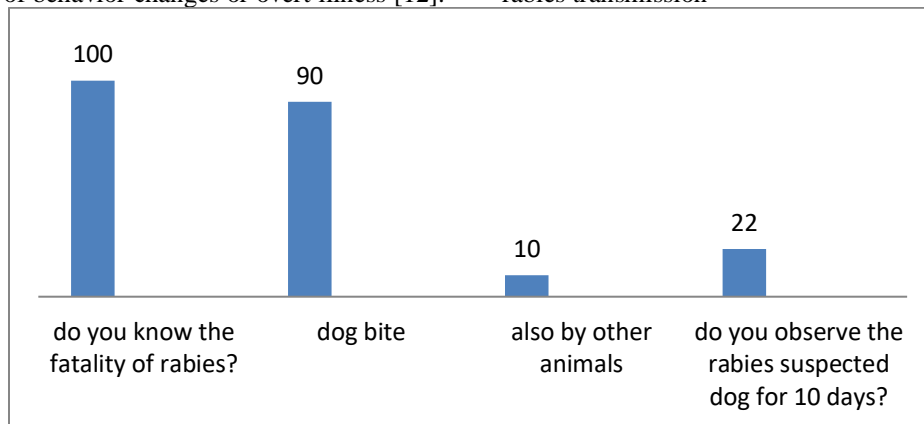


Fig 3:Knowledge on rabies transmission among people having dogs(%)

Knowledge on dog bite management/PEP

In the present study, awareness level on post exposure prophylaxis (PEP) in dog-bitten cases was little low, viz., 20% people known thorough wound washing, 32% about application of antiseptic, and 20% about administration of tetanus toxoid. Most of the people (80%) had reported that the dog-bitten wound could be washed for four to five minutes without giving importance to the wound washing for more than 10 minutes with carbolic soap water. Majority of the people (92%) stated that the wound has to be closed (Figure 4). A study reported that majority of the people (86.6%) are aware about anti-rabies vaccine but due to false beliefs in religious customs (19.2%) only 67.5% people are interested to apply it as a post-exposure prophylaxis, and there is definitely a gap in peoples knowledge, attitude, and practices about dog bite and its management [13]. The World Health Organization (WHO) recommends wound washing and vaccination immediately after contact with a suspect rabid animal which can prevent almost 100% of rabies deaths [14]. Many myths and false beliefs among the respondents associated with dog bite management and a lack of education regarding effective prevention of rabies. Furthermore, socioeconomic conditions (low level of education, financial constraints), insufficient vaccine and immunoglobulin supply to the government hospitals, distance from the dog bite victims place of residence to the government hospitals may be responsible for the low vaccine coverage among dog bite victims in this region [14]. The high level of awareness, knowledge and perception of rabies among the participants may be due to the endemicity of rabies and frequent reports of rabies incidence in the community, availability of information from various sources like government campaigns, mass media and free medical services available in government hospitals [14]. A study from India reported that mass media are the most effective tools for conveying information to the community [16]. Building awareness is generally thought to be the first step to control rabies. To enhance rabies awareness, first of all, it is necessary to use information and education campaigns throughout the country and school-based rabies control programmes should implement thereafter.

Veterinarians and physicians can play a crucial role in controlling rabies through a one-health approach by

linking animal and human health [14]. An unsatisfactory pet care practices and very low awareness regarding rabies, dog population control program and management of dog bite injuries. Management of dog bites injuries was grossly inadequate [8]. A lack of awareness about prophylaxis and post bite management was the important factors associated with spread of rabies [17,18]. Health education intervention involving a focused group like self-help group members using more than one method (lecture and video film in the present study) can be effectively used as a mode of dissemination of awareness regarding rabies [15]. Good awareness about rabies makes the dog owners as well as other people vulnerable to dog-bite injury and subsequent rabies [13,19]. Poor knowledge and practice regarding management of dog-bite cases was one of the causes for higher incidences of rabies in India [8]. Lower awareness regarding wound treatment with water and soap was reported in the several studies [8,13,15,20]. Many people are aware about the need of injection (84%) following dog bite but most of reported that single injection or tetanus toxoid vaccine is enough (66.3%), and very low awareness regarding rabies, dog population control program and management of dog bite injuries reported earlier [8] is in accordance with the present study findings.

Active and passive immunization

In the present study it was found that knowledge on active immunization was observed in 100% survey participants, but only 24% of the people said that immediately after exposure, whereas 76% of the people told in one or two days after exposure. Nobody had knowledge about passive immunization and its need (Figure 4). Animal bite patients often present with delay when wound infection is already well established. Immunoglobulin, administered at the onset of post-exposure treatment and injected into potential inoculation sites, represents a safety net for the patient till vaccine induced endogenous antibodies are formed [12]. Earlier studies reported that antirabies vaccines were received in higher percentage of dog bite cases but most of them received incomplete treatment [8,19,21,22], which is in accordance with the present study findings. Similarly, the percent of people receiving immunoglobulin is also very low [8].

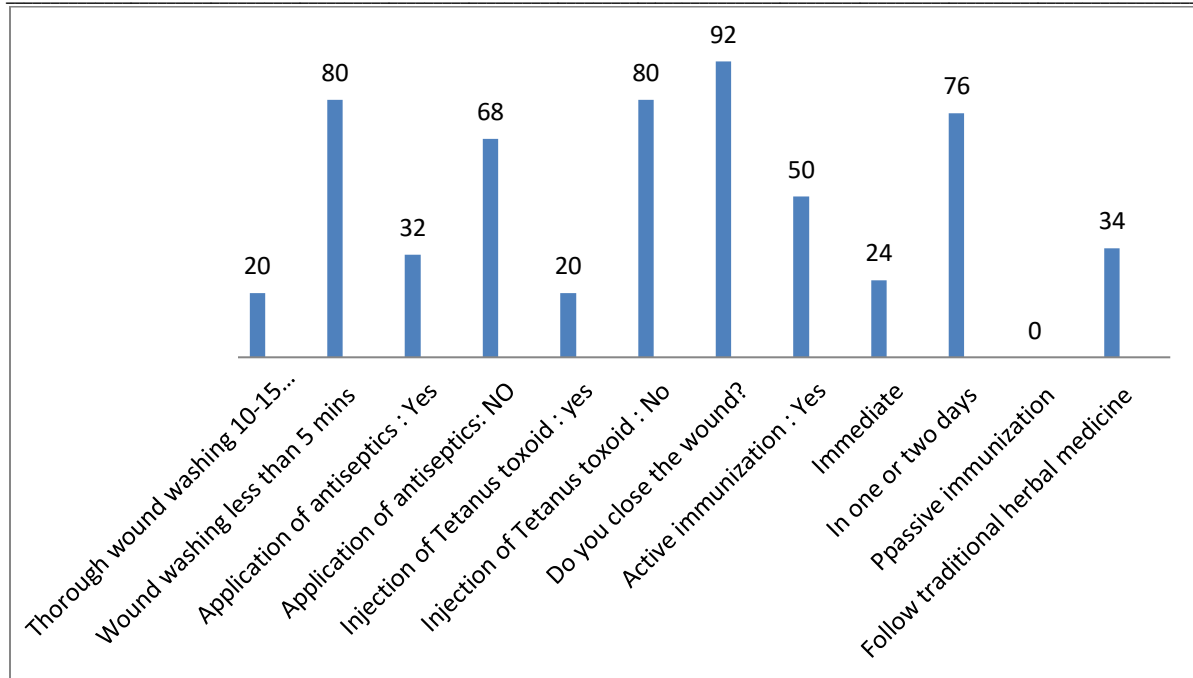


Fig 4: Knowledge on PEP, Active and passive immunization, and following the traditional medicine among people (%)

Rabies and its impact gaining paramount importance worldwide, particularly in South East Asian countries. India is endemic to rabies because of the rabies virus circulating in the stray dogs and wild animals. Antirabies vaccines are very well available commercially in all over India. However, the dog keepers must follow regular prophylactic vaccination schedule for their pets to prevent contraction of rabies even if there is exposure to the known rabid dog. Even though people had knowledge about the transmission of rabies and active immunization against it, attitude towards proper wound washing and its management, immediate active and passive immunization. It can be achieved through conduct of awareness programme regularly to the dog owners, licensing to keep pet dogs or semi-owned dogs for antirabies vaccination should become mandate, and control of breeding of stray dog population.

References

1. WHO Expert Consultation on Rabies. Second Report. WHO Technical Report Series 982, 2013. Available at: http://apps.who.int/iris/bitstream/10665/85346/1/9789240690943_eng.pdf. Accessed on 12.02.2018
2. Subramaniam Mani R. Human Rabies Survivors in India: An Emerging Paradox? PLoS Neglected Tropical Diseases. 2016;10(7):e0004774.
3. Hampson K, Coudeville L, Lembo T, Sambo M, Kieffer A, Attlan M, et al. Estimating the Global Burden of Endemic Canine Rabies. PLoS Neglected Tropical Diseases. 2015;9(4):e0003709.
4. Harischandra PAL, Gunesekeera A, Janakan N, Gongal G, Abela-Ridder B. Sri Lanka takes action towards a target of zero rabies death by 2020. WHO South-East Asia Journal of Public Health. 2016;5(2):113-116.
5. Kole AK, Roy R, Kole DC. Human rabies in India: A problem needing more attention. Bulletin of the World Health Organization. 2014;92:230.
6. Mission Rabies Uganda report. 2016. https://wvs.org.uk/sites/default/files/library/mission_rabies_uganda_report_2016_0.pdf. Accessed on 12.02.2018
7. Durrheim DN. Every rabies death is a veterinary and health system failure until proven otherwise. Vaccine. 2016;34(20):2294-5.
8. Kumar R, Sinha SP. Rapid evaluation of rabies control program: 30-cluster survey in rural area of Perambalur district, Tamilnadu, India. International Journal of Community Medicine and Public Health. 2016; 3(9):2627-2632.

9. Sudarshan MK, Madhusudana SN, Mahendra BJ, Rao NS, Ashwath Narayana DH, Abdul Rahman S, et al. Assessing the burden of human rabies in India: results of a national multi-center epidemiological survey. *International Journal of Infectious Diseases*. 2007; 11:29- 35.
10. Preena P, Balakrishnan S, Ganesan PI, Vijaya Bharathi M, Balan C, Jayaram AS, et al. Awareness of infectious disease prevention strategies among pet owners in Chennai city. *Proceedings of the Kerala Veterinary Science Congress, 2014*,260-264.
11. Goswami A, Favreau JP, Nicoloyannis N, Sampath G, Siddiqui MN, Zinsou JA. The real cost of rabies post- exposure treatments. *Vaccine*. 2005;23:2970-2976.
12. Wilde H, Khawplod P, Khamoltham T, Hemachudha T, Tepsumethanon V, Lumlerdacha B, et al. Rabies control in South and Southeast Asia. *Vaccine*. 2005; 23:2284- 2289.
13. Singh US, Choudhary SK. 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 Journal of Community Medicine*. 2005;30(3):81-83.
14. Ghosh S, Chowdhury S, Haider N, Bhowmik RK, Rana MS, Marma ASP, et al. Awareness of rabies and response to dog bites in a Bangladesh community. *Veterinary Medicine and Science*. 2016;2:161-169.
15. Kulkarni P, Sunil Kumar D, Siddalingappa H, Renuka M. Effectiveness of educational intervention on perception regarding rabies among women self-help group members in urban Mysore, Karnataka, India. *International Journal of Community Medicine and Public Health*. 2016; 3(5):1268-1272.
16. 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.
17. Naveen KV, Balakrishnan S, Sowmiya M, Preena P, Shefeena S, Vijaya Bharathi M. Awareness level on rabies and management of dog bite among pet owners in Chennai city. *Proceedings of Kerala Veterinary Science Congress, 2016*: 251.
18. Balakrishnan S, Anandharaj S, Dhivagar M, Dhanalakshmi M. Dog ecology and knowledge level on rabies in people at Orathanadu, Thanjavur district, Tamil Nadu, India. *Compendium of the XV Annual Conference of IAVPHS, 2017*,246.
19. Agarwal N, Reddaiah VP. Knowledge, attitude and practice following dog bite: a community-based epidemiological study. *Health & Population Perspectives and Issues*. 2003;26(4):154-161.
20. Ichhpujani RL, Chhabra M, Mittal V, Bhattacharya D, Singh J, Lal S. Knowledge, attitude and practices about animal bites and rabies in general community -a multi- centric study. *The Journal of Communicable Diseases*, 2006,355-61.
21. Sudarshan MK, Mahendra BJ, Narayan DH. A community survey of dog bites anti-rabies treatment, rabies and dog population management in Bangalore city. *The Journal of Communicable Diseases*. 2001; 33(4):245-51.
22. Lai P, Rawat A, Sagar A, Tiwari KN. Prevalence of dog- bites in Delhi: Knowledge and practices of residents regarding prevention and control of rabies. *Health & Population Perspectives and Issues*. 2005;28(2):50-57.
23. Agarwal N, Reddajah VP. Epidemiology of dog bites: a community-based study in India. *Tropical Doctor*. 2004; 34:76-80.

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