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Original Article

Assessment of Community's Knowledge, Attitudes and Practices towards Rabies in and around Jigjiga, Somali Region, Ethiopia

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Abstract
Rabies is a zoonotic viral disease. This study aimed to assess the knowledge, attitudes and practices of the community in Jigjiga and its surroundings. A cross-sectional study was conducted from February to July 2022. For this study, 384 individuals were participated. Of the respondents 68.2% were males. Of the participants 52.1% were secondary school. Of the respondents, 87.2% had no dogs, and 69% had awareness of rabies. Of the participants, 73.7% said that only dog is affected by rabies, and about 50% understood the mode of transmission. Majority (83.6%) knew that rabies is a fatal disease, and nearly 75% knew that rabies could be prevented by vaccination while 10.9% preferred holly water as a treatment. When they suspect a rabid dog, 86.2% suggested that they would kill the animal while 9.4% preferred to do nothing. There was a significant association between KAP score with occupation ($\chi^2 = 107.24$, $p < 0.0001$), educational status, ($\chi^2 = 284.4$, $p = 0.001$), religion ($\chi^2 = 24.03$, $p = 0, 0001$), residence ($\chi^2 = 154.654$, $p = 0.0001$), age ($\chi^2 = 202.613$, $p < 0.0001$), household size ($\chi^2 = 98.533$, $p = 0.0001$) and dog ownership ($\chi^2 = 24.311$, $p = 0.0001$). In conclusion, this study showed that rabies was well-known in the study region. The KAP level of rabies in the community of Jigjiga was found to be good although there were still some gaps. The educational status and occupation of the respondents were found to have a scientific association with good KAP score. Increasing awareness programs and conducting regular prevention and control interventions were suggested.
Keywords: Attitudes, Jigjiga, Knowledge, Practices, Rabies

Introduction

Rabies, 100% fatal and deadly disease, caused by bullet-shaped virus of the genus Lyssavirus and family Rhabdoviridae, is a rapidly progressive and fatal viral zoonosis that causes encephalitis (Blackmore et al., 2014; Gemechu, 2017). Transmission almost always occurs by an animal bite. The disease is characterized by severe neurological symptoms that lead to paralysis and death (Abera et al., 2015). In Ethiopia, rabies is an important disease known for centuries (Fekadu, 1982). Despite the endemic nature of rabies in Ethiopia, little is known about the level of community awareness in Jigjiga and its surroundings. This gap should be addressed for future disease control attend that could be made in the region. Thus, this KAP study aimed at generating information that will help to identify

knowledge gaps and act as baseline data for the evaluation of community awareness thereby helping the planning and implementation of rabies control programs.

Materials and methods

Study area

The study was conducted from February to July 2022 around Jigjiga town and its surrounding area, Eastern part of Ethiopia. Jigjiga is located approximately 80 km East of Harar and 60 km west of the border with Somalia and located at a distance of 628 km East of Addis Ababa. The area is geographically found at a latitude and longitude of 9°21'N and 42°48' E, respectively. The Somali region has bimodal pattern of rainfall; hence, pastoralists practice two cropping seasons, from March to April (long rainy season) and short rainy season from October to November (IPS, 2010). According to the national metrological service agency (NMSA, 2010), the mean annual rainfall is 660mm. The region has high ambient temperature as high as 30°C.

Study design and study population

The cross-section study design was conducted using a semi-structured questionnaire by face-to-face interviews with 384 randomly selected respondents to assess public awareness and practices about the disease. The study population was people living in and around Jigjiga town, and participants were chosen from them.

Sampling technique and sample size determination

The required sample size was estimated by considering the knowledge of 50% of the population on rabies, since no study on rabies has been conducted in the selected study area. Thus, the sample size calculated using a 95% confidence interval and 0.05 absolute precision. This is calculated using Cochran's sample size formula for categorical data (Bartlett, 2010).

$$n=\frac{(t)2\times P(q)}{d2}=\frac{(1.962)2\times 0.5(1-0.5)}{(0.05)2}=384$$

Where t is the value for selected alpha level of 0.025 in each tail = 1.96.

(p), (q)- is the estimate of variance = 0.25, d- Is the acceptable margin of error = 0.05.

Based on this assumption a total of 384 individuals were included in the study.

Data management and analysis

The data collected from structured and semi-structured questionnaire were coded and entered into Microsoft Excel and then transferred to the Statistical Packages for Social Sciences (SPSS) version 20. The knowledge, attitudes and practices were considered as independent variables. The frequency of both dependent and independent variables determined using descriptive statistics techniques (Frequency, mean, SD and percentage). The association between independent variables and rabies KAP level was calculated using Pearson's Chi-square and P-values less than 0.05 considered significant. To determine the KAP level we took 50% as a cut-off. Those responses who obtained less than 50% were coded as 0 and equal or above were coded as 1.

Results

Socio-demographic characteristics of the respondents

In this study, 384 respondents were interviewed during the study period. Of the respondents, 68.2% were males and 31.8% were females. Majority of respondents were in the age groups of 15-30 years accounting 271 (70.6%). Most of the respondents were Muslim 86.5% followed by Christian 13.5%. Regarding the residence, about 60.2% of the respondents were urban while that peri-urban was 39.8%. Among the study participants, 52.1% were in secondary school and 23.7% had completed higher education whereas 12.8%, 6.5% and 4.9% of the respondent were primary, informal and illiterate, respectively. Higher number of respondents were farmers and students (49.7%) followed by merchants (17.7%). Of the whole respondents in this study, 335 (87.2%) had no dogs while 42 (12.8%) had dogs (Table1).

Table 1- Socio-demographic features of respondents in Jigjiga town and its surroundings, 2022.

Socio-demographic characteristics	Frequency	Percent
Gender		
Male	262	68.2
Female	122	31.8
Residence		
Urban	231	60.2
Peri-urban	153	39.8
Age		
15-30	271	70.6
30-50	58	15.1
>50	55	14.3
Educational status		
Illiterate	19	4.9
Informal	25	6.5
Primary	49	12.8
Secondary	200	52.1
Higher education	91	23.7
Occupation		
Government employed	59	15.4
Un-employed	42	10.9
Merchant	68	17.7
House-wife	24	6.3
Farmer	166	43.2
Students	25	6.5
Religion		
Muslim	332	86.5
Christian	52	13.5
Household size		
1-3	84	21.9
4-8	203	52.9
>8	97	25.3
Dog ownership		
Without dog	335	87.2
With dog	49	12.8

Knowledge of the study participants about rabies

Of the respondents, 265 (69%) had awareness about rabies, and, 32.3% were known that the virus is the cause of rabies, whereas 23.4% and 13.4% of the respondents had a misperception about the causative agent of the disease, which was psychological problem and starvation, respectively. Nevertheless15.6% of the participants said I do not know the cause of rabies. Of those respondents, 283 (73.7%) said that only dog is affected by rabies while 69 (18%) of the participants claimed that rabies affect dogs and humans. Also 32 (8.3%) said that rabies affect other domestic animals. About fifty percent (50%) of respondents understood the rabies mode of transmission is through biting with saliva whereas 27% of the respondents knew that the means of transmission is through biting only. Regarding the clinical signs of rabies in animals, salivation and sudden behavior changes were reported by 55.7% of the participants. Although the majority of the respondents (83.6%) knew that rabies is a fatal disease, 16.4% did not know the fatal nature of the disease. However, more than 80% of them never received education about rabies. In this study, about 67% of respondents heard of a person

bitten by a rabid dog. Most, 74.5% were aware that rabies could be prevented by vaccinating dogs against the disease (Table 2).

Table 2- Knowledge of respondents on rabies in Jigjiga town and its surroundings, 2022.

Questions concerning knowledge of respondents	Frequency	Percent
Do you have awareness about rabies?		
Yes	265	69
No	119	31
What do you think about the cause of rabies?		
Virus	124	32.3
Starvation and thirst	52	13.5
Psychological problem	90	23.4
Bacteria	43	11.2
Protozoa	15	3.9
I don't know	60	15.6
What are the species affected by rabies?		
Dog only	283	73.7
Dog and human	69	18
Other domestic animals	32	8.3
What do you think about mode of transmission?		
Bite only	106	27.6
Bite with saliva	195	50.8
Contact with saliva only	52	13.5
Consumption of infected meat	9	2.3
I don't know	22	5.7
What are the signs of the disease?		
Salivation	69	18
Sudden change in behavior	101	26.3
Both	214	55.7
Is rabies fatal?		
Yes	321	83.6
No	63	16.4
What are the groups of people at risk?		
Children	229	59.6
Old people	155	40.4
Have you ever got training for rabies?		
Yes	48	12.5
No	336	87.5
Have you ever heard of dog bites in your community?		
Yes	258	67.2
No	126	32.8
Do you think rabies can be prevented by dog vaccination?	286	74.5
Yes	19	4.9
No	79	20.6
I don't know		

Attitude and practice of respondents towards rabies

In terms of attitude and practice, 246 (64.1%) of the respondents were willing to visit health centers and consult physicians if they were bitten by dogs while 52 (13.5%) of the participants were aware of using herbal extracts instead of going to health centers. Also 42 (10.9%) would prefer to holy water as a treatment. On the other hand, when asked about actions to be taken for the rabid animal majority of the participants 331 (86.2%)

suggested that they would kill the animal and 4.4% recommended tying the animal while 9.4% preferred to do nothing. Forty-four percent of the participants believed in traditional healers. Out of 384 respondents 147 (38.3%) claimed that dog vaccination exists in the study area. Of those who own dogs (49 dog owners), 32 (65.3%) of them received vaccination for their dogs. Concerning dog management practice77.6% managed their dogs indoors. Most respondents (95.9%) believed that dog registration is important for rabies control. Also 75.5% of the respondents claimed that they housed their dogs **(**Tables 3 and 4**)**.

Table 3- Descriptions of attitude of respondents toward rabies in Jigjiga town and its surroundings, 2022.

Practice	**Frequency**	**Percent**
Is rabies being treatable by traditional healer		
Yes	169	44
No	141	36.7
I don't know	74	19.3
Did you know about the vaccine campaign in your area?		
Yes	147	38.3
No	237	61.7

Table 4- Practice for dog owners in Jigjiga town and its surroundings, 2022.

Questions related to attitude and practice	**Frequency**	**Percent**
Immediate action for bitten man		
Visit health center	246	64.1
Apply herbal extract	52	13.5
Holly water	42	10.9
Washing with water and soap	39	10.2
Do nothing	5	1.3
Action for rabid animal		
Tie	17	4.4
Killing	331	86.2
Do nothing	36	9.4
Attitude		
Did you vaccinate your dog?		
Yes	32	65.3
No	17	34.7
Dog management practice		
Left free	11	22.4
Keep indoor	38	77.6
Rabies control by dog registration		
Yes	47	95.9
No	2	4.1
Have you registered your dog?		
Yes	22	44.9
No	27	55.1
Do you house your dog?		
Yes	37	75.5
No	12	24.5

KAP level of the respondents

The association between socio-demographic and KAP scores on rabies was assessed using Pearson's chi square (Table 5). There was highly significant association between KAP score with occupation (χ^2 = 107.24, p < 0.0001), educational status was also highly significantly associated with KAP scores (χ^2 = 284.4, p = 0.001) while gender (χ^2 = 3.785, p = 0.171) showed insignificant result although higher percentage noticed in males than females. And there was also significant association of religion with KAP scores (χ^2 = 24.03, p = 0, 0001) being higher in Christians than Muslims. There were also significant associations of residence (χ^2 = 154.654, p = 0.0001), age (χ^2 = 202.613, p < 0.0001), household size (χ^2 = 98.533, p = 0.0001) and dog ownership (χ^2 = 24.311, p = 0.0001) with KAP scores.

Table 5- KAP association with Socio-demographic characteristics in Jigjiga town and its surroundings, 2022.

Variables	**Good**	**Poor**	**X^2**	**P-value**
Gender				
Male	195(74.5%)	67(25.5%)	3.785	0.171
Female	79(65%)	43(35%)		
Age				
15-29	248(91%)	23(9%)	202.613	0.0001
30-50				
>50				
Education				
Illiterate	0(0%)	19(100%)	284.4	0.0001
Informal	1(1%)	24(99%)		
primary	3(5%)	46(95%)		
secondary	180(90%)	20(10%)		
Higher-education	91(100%)	0(0%)		
Occupation				
Government employed	59(100%)	0(0%)	107.24	0.0001
Un-employed	39(95%)	3(5%)		
Merchant	32(63%)	36(37%)		
Housewife	2(4%)	22(96%)		
Other (Farmer, Student)	143(74%)	48(26)		
Religion				
Muslim	222(67%)	110(33%)	24.03	0.0001
Christian	52(100%)	0(0%)		

Discussion

The results of the current study showed the importance of rabies in the study area. This study revealed that the community in and around Jigjiga is somewhat familiar with general information on rabies as the majority of the respondents were aware of it. This is in line with study done by Ichhupujani and colleagues (Ichhupujani et al., 2006) where they report 68.7% in a survey of knowledge, attitudes and practices about animal bite and rabies in the Indian community. Moreover, Jambeau et al. (2013) and Serebe et al. (2014) also reported a high level of awareness about rabies in different areas of Ethiopia. The high level of awareness among the respondents may be due to endemicity of rabies combined with an annual rabies control campaign in the area, and hearing from the news media about rabies. However, this finding was lower when compared with study done by Singh and Choudhary (2005) in the rural community of Gujarat, India, Digafe et al. (2015) in Gondar Zuria District, Yalemebrat et al. (2016) in Debark district, North Gondar, Ethiopia and Nejash et al.

(2017) in Dedo district, jimma zone who reported 98.6, 99.3, 100%, and 100% awareness about rabies, respectively.

However, many fallacies observed regarding the cause and means and source of transmission. In this study 32.3% of the participants replied that as virus was the cause of rabies. This result was slightly higher compared to Nejash et al. (2017) and Gebeyaw and Teshome (2020) where they reported 18%. This may be due to increased information and notice gained by media and frequent vaccination campaigns against rabies in the study area. This finding also revealed that bite was a means of transmission of the disease by large proportion of respondents however, some of the respondents (13.5%) also believed that any direct or indirect saliva contact with body of animal or human (irrespective of skin condition) could serve as means of transmission of rabies. Inoculation of infected saliva through the bite of a rabid animal appears to be the predominant mode of rabies transmission (Radostits et al., 2007). The majority of the respondents, claimed that both bite and saliva could transmit the disease, and this is supported by WHO (2014), reported contact of infected saliva with broken skin or mucous membrane can transmit the disease and also consumption or preparation of meat from rabid animals is a risk.

In this study, 73.3% of respondents knew that rabies can only affect dogs, which disagreed with Eidson et al. (2004), who reported that 71.9% of respondents in New York City know that the virus can affect humans and other domestic animals. This difference was probably explained by the lack of health education programs regarding rabies in Ethiopia. Contrary, Guadu et al. (2014) and Nejash et al. (2017) report a lower result (21.4%) from Bahir Dar town and about 57.7% of the Dedo district, Jimma zone, respectively. The possible reason for this could be due to the availability of different host ranges, level of awareness and educational status of the community as well as the period of study since there is a difference of 5 years from Jimma study and Eight years from Bahir Dar. In many parts of the world, especially in Africa and Asia, 85-95% of human rabies cases caused by a dog bites (Fitzpatrick et al., 2012; Fooks et al., 2014).

In the current study, only 10.2% of the respondents reported washing the wound using soap and water as first aid for bitten human(s). This result is lower when compared with the study in Dedo district (49.6), study in Debark District (76.4%; Yalemebrat et al., (2016) and study conducted in Gondar Zuria district (30.7%; Digafe et al., 2015) and in a rural community of Gujarat, India (31.1%; Singh and Choudhary, 2015); this difference could be associated with an awareness level of the community and lack of training on the disease. Washing rabies-infected wounds with soap and water can increase the survival of the victim by 50% (WHO, 2014).

In the present study, 64% of the participants prefer visiting a health center for bitten human(s) similarly; the study in Bahir Dar town reported a 55.7% response for immediate post-exposure vaccination (Guadu et al., 2014). The World Health Organization (WHO) also advises wound washing and vaccination immediately after contact with a suspected rabid animal which can prevent almost 100% of rabies deaths (WHO, 2013).

Furthermore, the association of education level with overall KAP about rabies revealed a statistically significant difference ($\chi^2 = 284.4$, $p = 0.0001$). The respondents at the secondary school education level were found to be better (90%) than illiterate (10%) in KAP score. This finding was also supported by a study conducted in Dedo district (Nejash et al., 2017); in Bahir Dar (GuAdu et al., 2014); in Addis Ababa (Abraham et al., 2013) and the studies conducted in Flagstaff, Arizona, USA (Andrea and Jesse, 2012). People with higher education know more about rabies (Palamar et al., 2013), while illiterate persons tend to know less about rabies (Herbert and Basha, 2012). The possible explanation could be that an educated person would have better information access and can easily understand the disease.

During analysis of KAP with independent variables, the chi-square analysis revealed that the

KAP score was significantly (χ^2 = 107.24, p = 0.000), associated with occupation being higher in government employed (100%) followed by unemployed (95%). On the other hand, a poor KAP score seen in housewives (4%). This finding disagreed with research done in Ambo (Dabuma et al., 2017). This may be due to academic knowledge of government employed and unemployed, and most of the time this group of people had the chance to get information from Medias, whereas housewives always stay at home and don't get any information and training on the disease.

Furthermore, the association of religion with overall KAP about rabies also revealed a statistically significant difference (χ^2 = 24.03, p = 0.0001) being higher in Christians (100%) than Muslims (67%). This result disagreed with research done in Dedo district, Jimma zone (Nejash et al., 2017). It also disagreed with the thesis done in Tamale, Ghana, which is higher in Muslims (68.8%) than Christians (25.6%; Mark, 1998). This difference could be due to the variation in the sample size and most of the dog owners are Christians, which helped them to get some information about rabies since they came into contact with pets, especially dogs.

Conclusions and recommendations

This study showed that rabies is a well-known disease in the study area. The KAP level about rabies in the community of Jigjiga was found to be good. But still there are some gaps in the community regarding the cause and mode of transmission, host range of the disease, clinical signs and attitude and practice to manage, if the person was bitten by a suspected or rabid animal. In addition, a large number of respondents did not have knowledge about what to do after exposure, such as immediate visits to health facilities, which might be due to lack of awareness creation. Moreover, the educational status and occupation of the respondents found to have a scientific association with good KAP scores. Therefore, in light of the above conclusion, programs to increase awarenessin the community, and regular prevention and control intervention through vaccination were suggested.

Conflict of interest statement

The Authors declare that there is no conflict of interest.

Ethical approval

It is obtained from College of Veterinary Medicine and Animals Science, University of Gondar, Ethiopia.

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