

## Assessment of Basic Knowledge, Attitude and Practice of Community on Rabies and Retrospective Survey in and around Ambo Town, West Shoa Zone of Ethiopia

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### Abstract

**Background:** Rabies is acute fatal encephalitis that affects all mammals and is a worldwide zoonotic disease caused by rabies virus. Knowledge, Attitudes and Practice (KAP) of the community on rabies is vital to prevent the neglected deadly disease. The aim of the study was to assess the KAP of the community on rabies in and around Ambo town, Ethiopia.

**Methods:** A cross sectional and retrospective studies were conducted from November 2015-April 2016 in and around Ambo town to assess knowledge, attitude and practice (KAP) of community on rabies; and to know a one-year status of human rabies suspected case in Ambo hospital. The study participants were enrolled consecutively, and data was collected using questionnaires. Data was cleaned, coded and entered for analysis by SPSS version 20 software. KAP were defined based on mean scores.

**Results:** The questioners survey indicated that the communities had poor knowledge, good attitude and good practice with (46.1%), (50.5%) and (63.5%), respectively. Hence the overall KAP scores were good (53.4%) implying that the communities had good awareness about rabies. There was no statically significant association between sex and age of respondents with knowledge, attitude and practice scores ( $p>0.05$ ). There was statistically significant association between educational level with knowledge and attitude scores ( $p<0.05$ ). The retrospective review showed that the majority of suspected cases were males (52.4%). Almost all suspected cases were bitten by dog (94.2%) followed by human bites (3.8%). Majority of suspected case were recorded in autumn and winter (35.6%).

**Conclusion:** This study showed that there was terrestrial rabies (human, canine, sylvatic) that leads to human rabies suspected case and awareness of respondents on rabies were good although poor about wound management for bitten individuals in the study areas. Further public awareness creation is still essential on multidimensional impacts of rabies, responsible pet ownership, managements of bitten animals, first aid treatment and on the use of traditional remedy.

**Keywords:** Ambo town; KAP; Rabies; Ethiopia

### Introduction

Human health is highly linked to animal health. The link is close in developing countries. More than one-half of the 1700 agents known to infect humans were reported to have association with animals [1]. Rabies is acute fatal encephalitis that affects all mammals and is a worldwide zoonotic disease caused by rabies virus [2]. The disease is one of the longest known infectious diseases in human history [3].

Rabies is a prime example of a neglected tropical disease that mostly affects poor communities, children and elderly people suffering from inequitable health care. In Africa, the highest recorded human death due to the disease for the year 1998 was reported from Ethiopia. The magnitude of the problem is higher in big cities like Addis Ababa linked with the presence of large population of stray dogs and associated factors [4,5].

Rabies was reported to be one of the public health concerns that need formulation of intervention strategy in Ethiopia. Information on occurrence of the rabies and associated risk factors in a given locality/community is crucial to plan and implement appropriate control the measures. Many studies have been carried out to assess the knowledge, attitudes and practices (KAP) of communities or physicians regarding rabies throughout the world.

KAP surveys of community have been undertaken in Ethiopia mainly in and around urban areas. However, a community based KAP

study with their associated risk factors haven't been carried out in and around Ambo town, yet. Hence, questionnaire survey of communities in and around Ambo town and retrospective and survey based study have been carried out in the Ambo town.

### Materials and Methods

#### Study setting and context

A community based cross sectional study and retrospective record review was conducted in Ambo, capital city of West Showa zone in Oromia Regional State, Ethiopia, from November 2015-April 2016. The town is located at 114 km west of Addis Ababa and has altitude of 2,185 meter above sea level (masl). The geographical location of Ambo town is

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approximately between 8°56'30"N and 8°59'30"N latitude and between 37°47'30"E and 37°55'15"E longitude. The mean annual temperature, the annual maximum and the annual minimum temperatures of the area were about 18.8, 26 and 10.76°C, respectively. The mean annual rainfall is about 1,143 mm and the highest rainfall occurs from June to September. Human population of the town was 67,514, out of which 34,276 (50.8%) were males and 33,238 (49.2%) were females [6]. There are approximately 112,236 heads of cattle, 24,966 heads of sheep and 16,399 heads of goats in Ambo district [7].

### Sample size and sampling technique

All data available in 2015 was used for the retrospective study and sample size for KAP was calculated using a single population proportion formula considering  $P=50\%$ . Thus, the sample size was calculated according to previous study [8], using 95% confidence interval and 0.05 absolute precision.

$$n = 1.96^2 \times P_{exp} (1 - P_{exp}) / d^2 \text{ where,}$$

$n$  = Required sample size,

$P$  = Expected proportion of population knowing about Rabies is 50%,

$d$  = Desired absolute precision (0.05)

Hence, 386 target populations were selected from the total sample size of 406 with 5% non-response rate. The study participants were enrolled consecutively.

### Data Collection

Retrospective data was collected from registered book of admitted individuals for the rabies case in 2015. For assessment of KAP of the communities open and close ended questionnaire survey was developed in English for the target population and translated to local language (Afan Oromo). Face to face interview was used to collect data after pretest was performed on 5% of the study population.

Variables	Number of case recorded	Percentage (%)
<b>Residence</b>		
Rural (Outside of Ambo town)	113	54.3
Urban (From Ambo town)	95	45.7
<b>Sex</b>		
Male	109	52.4
Female	99	47.6
<b>Age</b>		
Children (2-15)	102	49.0
Young (16-29)	71	34.1
Adult (30-43)	28	13.5
Old (44-70)	7	3.4
<b>Source of exposure</b>		
Dog	196	94.2
Animals (cats, equines, bovines)	2	1.0
Human	8	3.8
Fox	2	1.0
<b>Season</b>		
Summer	49	23.6
Autumn	74	35.6
Winter	74	35.6
Spring	11	5.3

**Table 1:** Retrospective study on occurrence of rabies suspected case from Ambo town for 2015.

### Data management and analysis

The information (raw data) that was gathered through questionnaire survey and retrospective record were coded and entered in to a Microsoft excel 2007 spread sheet computer program. Before the analysis of the coded data it was filtered. Descriptive statistics (percentage and frequency distribution) were utilized to summarize the data using Software program for Social Science (SPSS) version 20 to calculate the frequency of the respondents. P-Value was used to assess if there was association between risk factors (age, sex and education) and KAP scores. In all cases, a 95% CI was employed to estimate sample results to the target population in the study area. Values of  $P < 0.05$  were considered statistically significant. Knowledge, attitude and practice were classified as "poor" for those scored below mean and "good" for those scored above the mean.

### Ethical considerations

The study protocol was ethically reviewed and approved by the Departmental Research and Ethical Committee of Wollega University, School of Veterinary Medicine. Then the University sent a letter informing the Hospital administrators about the study and hence permission obtained from Health centers. Data were collected after obtaining written consent and confidentiality was maintained throughout the study by using codes.

### Inclusion and exclusion criteria

Randomly selected group of respondents were included in the questioner survey. Children less than 15 years, who cannot well express their ideas was excluded from interview. Exposed cases had complete record on rabies registration book in Ambo hospital was included while data which incompletely information was excluded in retrospective survey.

### Results

#### Retrospective study on rabies in Ambo town

A total of 209 rabies exposed patients were recorded from one-year (2015) rabies registration book during the study periods. The retrospective review showed that the majority of suspected cases were males (52.4%). Almost all suspected cases were bitten by dog (94.2%) followed by human bites (3.8%). Majority of suspected case were recorded in autumn and winter (35.6%) in Table 1.

#### Socio-demographic characteristics

A total of 386 individuals participated in the study. The highest (42.7%) of participants were within the age range of 31-50 years. The majority of respondent were Females (52.6%). The majority of the respondents have informal education (33.9%) and their occupation was business man (35.2%) (Table 2).

#### Knowledge, attitude and practice of communities on rabies

From the interviewed participants, 32.4% knew that heredity is the source of rabies. Majority (96.1%) responded that dog is the common source and 37% agreed that cats can transmit the disease like dogs. About 41% responded that rabid animals are the major means of rabies transmission. Majority (95.9%) of the respondent indicated that rabies case occurred in winter season. Only 9.8% of the respondents were aware of the presence of post exposure prophylaxis (PEP). A little more than the half (52.6%) knew as it is possible to manage rabies by Holy water. Around 36.5% respondents accepted that there was specific medical drug therapy in the Health centre (Table 3).

Among the attitude related variables, large population of stray dogs (59.6%), No curability of rabies after development of symptoms (52.1%), and insufficiency of responsible veterinarians (51.6%), religious taboo

Variables	Number of respondents	Percentage (%)
<b>Residence</b>		
Urban	193	50
Per urban	73	18.9
Rural	120	31.1
<b>Age</b>		
15-30	122	31.6
31-50	165	42.7
>50	99	25.6
<b>Sex</b>		
Male	183	47.4
Female	203	52.6
<b>Education</b>		
Informal school	131	33.9
Primary school	97	25.1
High/Prep. School	80	20.7
Higher education	78	20.2
<b>Occupation</b>		
Housewife	129	33.4
Businessman	136	35.2
Farmer	82	21.2
Employee	39	39 10.1

**Table 2:** Socio-demographic characteristics of respondents in and around Ambo town, 2016.

Knowledge related variable	Number of respondents	Percentage (%)
<b>What is the cause of rabies?</b>		
Spiritual	35	9.1
Germ	91	23.6
Heredity	125	32.4
Other	146	37.8
I don't know	118	30.6
<b>In which season rabies occurred more?</b>		
Autumn	98	25.4
Spring	133	34.5
Summer	97	25.1
Winter	370	95.9 1
Unknown	114	29.5
<b>How rabies is transmitted?</b>		
Bite by any rabid animal	157	40.7
Consumption of rabid animal meat	115	29.8
Inhalation	67	17.4
Other	143	37
I don't know	237	61.4
<b>Which animals transmit rabies?</b>		
Dogs	371	96.1
Dogs and Cats	143	37
Wild carnivores	77	19.9
<b>How rabies suspected bite is managed?</b>		
Herbal remedies	141	36.5
Specific drugs	147	38.1
Post exposure prophylaxis (PEP)	38	9.8
Holy water	203	52.6
I don't know	118	30.6

**Table 3:** Knowledge of respondents on rabies in and around Ambo town, 2016.

Attitude related variables	Number of respondents	Percentage (%)
<b>Constraints to prevent and control rabies</b>		
Insufficient budget	55	14.2
Insufficiency of responsible veterinarians	199	51.6
Religious taboo	131	33.9
Insufficiency of legislation	14	3.6
Awareness problem	102	26.4
Insufficient vaccine	128	33.2
Cultural constraints	8	2.1
Large population of stray dogs	230	59.6
Insufficient habit of vaccinating dogs or cats	214	55.4
Rabies was non-curable after the onset of symptoms	201	52.1

**Table 4:** Target interviewee response for their respective attitude against rabies, 2016.

Variables	Number of respondents	Percentage (%)
<b>Immediate action after exposure to pet or rabid animal bite?</b>		
Nothing	134	34.7
Washing wound	1	0.3
Consulting traditional healer	182	47.2
Medical management	328	84.9
Confining dog	134	34.7
Killing dog	132	34.2
Other	164	42.5

**Table 5:** Practice of the respondents on rabies in and around Ambo Town, 2016.

(33.9%), insufficient vaccine (33.2%) and awareness problem (26.4%) were responded by majority of the respondent in order of their level (degree) of constraint on the rabies prevention and control (Table 4).

Among the total respondents on immediate action after exposure to bite by rabid animal; nearly half (47.2%) of the respondents used to consult traditional healers while 0.3% of them used to wash wound after bitten by rabid animals. However, 84.9% of the interviewed respondents actively sought medical management after bitten by rabid animal (Table 5).

### KAP score and associated factors

Overall 53.9%, 50.5% and 63.5% of the participants had poor knowledge, good attitude and good practices, respectively (Table 6). Educational status significantly contributed to the level of knowledge. Accordingly, illiterates were 9.30 times more likely to have poor knowledge than those attended higher education [OR, 95% CI: 9.30 (3.5,24.78),  $P < 0.001$ ]. Similarly, educational status significantly affected attitudes of the respondents, but no significant factor affected the level of practices (Tables 6 and 7).

### Discussion

This retrospective study indicated that the majority of the exposed populations were from Ambo town (54.3). Of total exposed individuals, majority (52.4%) were males, which were due to bites especially either by domestic or stray dog (94.2%) which led them PEP treatment. This is consistent with the study done in Jimma Town [9]. Additionally, a study by Kabeta et al. [10], indicated that significant proportion of the interviewed households (97.2%) suggested rabies is transmitted to humans when they are bitten, scratched or licked by rabid dogs, cats and other animals. Another study by Kitalaa et al. [11] also reported that 97% of humans used post exposure treatments were due to dogs' bite in Kenya.

Variables			
Knowledge	Score	Frequency	Percentage (%)
Greater than mean	Good	178	46.1
Less than mean	Poor	208	53.9
Attitude			
Greater than mean	Good	195	50.5
Less than mean	Poor	191	49.5
Practice			
Greater than mean	Good	245	63.5
Less than mean	Poor	141	36.5

Table 6: Frequency of respondents according to KAP levels on rabies in and around Ambo town, 2016.

Variables	Knowledge score		P-value	OR (95%CI)	Attitude score		P-value	OR (95% CI)	Practice score		P-value	OR (95% CI)
	Poor n (%)	Good n (%)			Poor n (%)	Good n (%)			Poor n (%)	Good n (%)		
Sex												
Male	98 (25.4)	85 (22)	0.9	0.975 (0.65-1.45)	92 (23.8)	91 (23.6)	0.77	1.06 (0.71-1.60)	69 (17.9)	114 (29.5)	0.65	1.10 (0.73-1.67)
Female	110 (28.5)	93 (24.1)		1	99 (25.6)	104 (26.9)		1	72 (18.7)	131 (33.9)		1
Age												
15-30	73 (19)	49 (12.7)	0.43	1.241 (0.726-2.122)	57 (14.8)	65 (16.8)	0.39	0.79 (0.47-1.35)	38 (9.8)	84 (21.8)	0.15	0.67 (0.38-1.16)
31-50	81 (21)	84 (21.8)	0.39	0.804 (0.488-1.324)	82 (21.2)	83 (21.5)	0.66	0.89 (0.54-1.50)	63 (16.3)	102 (26.4)	0.72	0.91 (0.55-1.52)
>50	54 (14)	45 (11.7)	-	1	52 (13.5)	47 (12.2)	-	1	40 (10.4)	59 (15.3)	-	1
Education												
Illiterate	24 (6.2)	7 (1.8)	<0.001	9.30 (3.50-24.78)	14 (3.6)	17 (4.4)	0.12	0.52 (0.22-1.20)	12 (3.1)	19 (4.9)	0.6	1.26 (0.53-2.99)
Informal	60 (15.5)	40 (10.4)	<0.001	4.07 (2.15-7.73)	55 (14.2)	45 (11.7)	0.38	0.76 (0.42-1.40)	32 (8.3)	68 (17.6)	0.65	0.94 (0.50-1.77)
Primary	63 (16.3)	34 (8.8)	<0.001	5.03 (2.62-9.65)	41 (10.6)	56 (14.5)	0.01	0.46 (0.25-0.84)	36 (9.3)	61 (15.8)	0.6	1.18 (0.63-2.20)
High school	40 (10.4)	40 (10.4)	<0.001	2.71 (1.40-5.30)	33 (8.5)	47 (12.2)	0.01	0.44(0.23-.83)	35 (9.1)	45 (11.7)	0.73	1.56 (0.82-2.97)
Higher education	21 (5.4)	57 (14.8)	-	1	48 (12.4)	30 (7.8)	-	1	26 (6.7)	52 (13.5)	-	1

Table 7: Association of socio-demographic factors KAP of respondents on rabies in and around ambo Town, 2016.

In this study children suffered animals' bite more. This is in agreement with a study by Deressa et al. [12] which reported that the most fatal cases (42%) were from the age group 0-14 category and the least (15.54%) were recorded in 50 years and above age category. The WHO data reported that most (30% to 50%) of the victims of rabies reported from Africa and Asia were children [13].

Even though human-to-human transmission is extremely rare human rabies suspected cases were happened due to the human bite in present study which was 3.8%. Similar findings were reported by different studies [9,14]. Additionally, this result is in line with another study from Ethiopia [15] that reported possible human-to-human transmission of rabies in Ethiopia.

In this study, the KAP survey was conducted on the community by face to face interview. The result indicated that 53.9%, 50.5% and 63.5% had poor knowledge, good attitude and acceptable practices on different variables related to rabies. In contrast to this finding higher knowledge, more positive attitudes and higher scores in practice indicators regarding rabies was reported from Sri Lanka [16]. This difference might be probably due to the absence of rabies related community health teaching extension services and formal mass Medias by cooperation of government, medical and veterinary professionals in and around Ambo as it was indicated by the respondents such as awareness problem (26.4%) and insufficiency of responsible

veterinarians (51.6%). This poor knowledge level coincides with the insufficient level of knowledge about rabies dangers and prevention, particularly wound management and prompt PEP following exposure that was reported from Tanzania [17].

Some of the interviewees believed that rabies is caused by starvation; thirst and prolonged exposure to coldness and 30.6% of the respondents didn't know the cause of Rabies. About 29.8% of the respondents misunderstand that Rabies can spread from animal to human, animal to animal by utilizing the rabid animal flesh (the soft tissue of the body, especially muscle and fat) for food. Most the respondents especially the elders declare that if the animal died of the Rabies has been properly slaughtered and the carcass of that animal has been burned and inhaled it serves as one mechanism to cure animal infected of the disease.

In this study there was statistically significant association between educational level and knowledge scores of target respondents ( $P < 0.0001$ ) and there was no significant association between sex and age with knowledge scores ( $P > 0.05$ ). The respondents that have completed higher education has the highest knowledge scores (14.8%) as compared the one who was unable to read and write has the lowest scores (1.8%), attained primary (8.8%) and informal school (10.4%) which was similar with the findings of a study from Ethiopia [18]. This result is also supported by the result of the studies conducted in Flagstaff on community survey after rabies outbreaks in USA [19].



There was no statistically significant association between sex and age with their attitude scores which implies that there was no as such difference in rabies exposures attitude between male and female and among different age groups. In converse of the current findings a study by Andrea and Jesse [18] showed statistically significant association between age and attitude scores that might be caused by the different attitude in time, humans individual perceptions, study area, voluntariness (willingness) of the respondents and the ability of the interviewer to attract the attention of the participants by using different tactics. However, there was significant association between educational level and attitude ( $P=0.04$ ) that was in line of agreement with the same author ( $p<0.05$ ).

No statistically significant association have been acquired during the current study between age ( $p=0.31$ ) and practice scores which indicates there was no as such exaggerated knowledge variation between different age groups of respondents (15-30, 31-50, >50) that was consistent with the finding of Abraham et al ( $p=0.366$ ) [18]. The current study KAP analysis indicated that the average good KAP score of the community was about 53.4% that was lower than the previous data [19], that indicated about 64.1% of the respondents had good level of knowledge, attitude and practices about rabies that might be due absence of community awareness of the disease in the current finding.

About 54.3% of the exposed patient came from different rural areas surrounding Ambo town during the study period that might be because of many districts and inappropriate delivery of medical prophylaxis in their health centre or lack of health centre that carries out this rabies exposure management. As confirmed from the interview of exposed humans the highest incidence of bites has been occurred during autumn and winter (that strongly agrees with the study conducted by the author [9], (35.4%) which was 35.6% unlike the community survey of rabies basic knowledge.

## Conclusion

The current health centre based retrospective study indicated that the majority of humans suspected of rabies cases were males and children's that was most frequently caused by dog bites that occurred during Winter and autumn. The assessment of KAP of community in and around Ambo indicate that about 53.4% of the respondents have good level of KAP scores despite the poor knowledge (53.9%) of rabies and its suspected exposures management such as PEP. Most of the respondents have misunderstanding on the cause and modes of transmission of rabies. In this study education has statistically significant association with knowledge and attitude scores. Community knowledge such as the cause, means of transmission, prevention mechanisms by pets and humans vaccination and management of rabies exposures by PEP in health centre rather than to rely on herbal remedies should be raised through designing urgent periodic education,

## Competing Interests

All authors declare that they have no conflict of interest associated with the publication of this manuscript.

## Authors' Contributions

Conceived and designed the experiments: TD. Performed the experiments: TD. Analyzed the data: TD. Contributed reagents/materials/analysis tools: TD. Wrote the paper: TD. Assisted with design, analysis, and interpretation of data:

TK, HMM. Critical review of the manuscript: TK, HMM. Read and approved the final manuscript: TD, TK, HMM. Critical appraisal of the manuscript: TD, TK, HMM.

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