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Assessment of public knowledge, attitude and practices towards rabies in the community of Kombolcha, Southern Wollo, Amhara Reginal State, Ethiopia

Addis Kassahun Gebremeskel[1*], Bereket Molla Tanga[1], Abebaw Getachew[2] and Yimam Eshetu[2]

[1]School of Veterinary Medicine, Hawassa University, Hawassa, Ethiopia.
[2]College of Vterinary Medicine and Animal Sciences, Univeristy of Gondar, Gondar, Ethiopia.

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The study was conducted from November 2016 to April 2017 in 12 kebeles (the smallest administrative unit of Ethiopia) of Kombolcha, Southern Wollo Amhara Regional State, Ethiopia. The aims of the study were to assess the knowledge, attitudes and practices (KAP) of Kombolcha's community toward rabies and associated risk factors. A cross-sectional study design and multistage sampling procedures were employed to select households for the study. Kebeles were randomly selected using lottery method from list of kebeles in the study area, followed by selection of households from each kebele by systematic random sampling. Data were collected from 384 households through face to face interview using pre-tested and well-structured questionnaires. Socio-demographically, out of the 384 respondents interviewed, 223 (58.1%) were males and 161 (41.9%) were females. From 384 respondents, 345 (89.8%) had heard about rabies before and the majority of the study participants, 329 (85.7%) had good level of KAP. There were statistically significant associations (p<0.05) between KAP scores and age, house hold size, educational status, and occupation. In conclusion, the study revealed that, Kombolcha's community has good knowledge, attitude and practice toward rabies. However, there are some inconsistencies on mode of transmission, symptoms, appropriate prevention and treatment measures. Therefore, continuous and strategic health programs are expected from health professionals, governmental and non-governmental organizations to control and prevent the disease and secure rabies free zone.

Key words: Attitude, community, knowledge, kombolcha, practice, rabies.

INTRODUCTION

Rabies is a zoonotic, fatal and progressive neurological infection caused by rabies virus of the genus Lyssavirus

*Corresponding author. E-mail: addisk2013@gmail.com.

and family Rhabdoviridae. It affects all warm-blooded animals and the disease is prevalent throughout the world and endemic in many countries except in Islands such as Australia and Antarctica. Over 60,000 peoples die every year due to rabies, while approximately 15 million people receive rabies post-exposure prophylaxis (PEP) annually and transmitted mostly by carnivores to humans and livestock (Singh et al., 2017; Reta et al., 2014).

Despite of global vast attempt and implementation of extensive control schemes and public health awareness programmers about rabies, still over 95% of the mortality happens in Asia and Africa, where canine rabies is enzootic (WHO, 2013). In many developing countries like Ethiopia and Nigeria, mortality in humans due to rabies infection are low because of under-reporting, cultural beliefs, poor or inadequate rabies diagnostic units and poor knowledge on the mode of transmission and prevention of the disease (Otolorin et al., 2015). Under-reporting of rabies in endemic developing countries has resulted in the disease being ignored by medical professionals and subsequently poor assistance from international community and donor agencies (Otolorin et al., 2015).

Besides human mortality, rabies has significant effects on livestock economy. For example in Africa, rabies is a potential problem for cattle production in free-range production systems, such as the mixed crop-livestock and pastoral production systems, where dogs are kept close contact with cattle (Sillero-Zubiri et al., 2004; Jibat et al., 2016). Therefore, due to this circumstance, rabies has extensive economic impacts at the household and country levels (Okell et al., 2013; Jibat et al., 2016).

In Ethiopia, many households own dogs usually for guarding purpose. Although there are no formal documented studies, it is estimated that there is one owned dog per five households nationally (Deressa et al., 2010). Dog management is often poor and vaccination is limited to dogs in urban centers. The high population of dogs with poor management contributes to high endemic nature of canine rabies in the country (Jemberu et al., 2013). Individuals who are a victim of rabies virus often visit traditional healers for the diagnosis and treatment of the disease. These widespread traditional practices of handling rabies cases are believed to interfere with timely seeking of PEP. Rabies victims, especially from rural areas, seek PEP treatment after exhausting the traditional medicinal intervention and usually after a loss of life from family members (Tadesse Guadu, et al., 2014).

Poor public awareness towards rabies is considered as one of the bottle necks for the prevention and control of the disease in Ethiopia. Understanding communities' perceptions of causes, mode of transmission, symptoms, treatments and possible intervention measures of rabies are an important step towards developing strategies aimed at controlling the disease and determining the level of implementation of planned activities in the future. Hence, the objectives of this study were to assess the level of knowledge, attitudes, and practices of selected communities of Kombolcha and identifying factors associated with community knowledge, attitude and practice toward rabies in the study area. All the obtained information are vitally important in the prevention and control of rabies in Kombolcha and the country in general.

MATERIALS AND METHODS

Study area

The study was conducted in Kombolcha, North Wollo zone of Amhara Regional State, Ethiopia from November, 2016 to April, 2017. Geographically, Kombolcha is located in North Eastern part of Ethiopia at a distance of 379 km from the capital city, Addis Ababa at 11°4' 37"N and 39°44'42"E. The area has an altitude range of 1500 to 1840 m above sea level. The region is marked by numerous mountains, hilly, sloppy and plateaus areas having rivers and streams. There are three topographic categories; 14% high altitude-dega, 34% mid highland-weinadega, and 52% of low altitude-kola. The area experiences a bimodal rainfall with a minimum annual rainfall of 750 to 950 mm and a relative humidity of 23.9 to 79%. The average monthly recorded minimum and maximum temperatures were 13.6 and 27.8°C, respectively (CSA, 2013). Livestock population of the area comprises 20983 cattle, 22115 sheep, 37053 goats, 5712 horses, 1464 mules, 10248 donkeys, 3451 camels, and 348612 poultry (SWZARO, 2014).

Study population and study design

This study was done on community of Kombolcha town live in 12 kebele. A total of 384 people were selected from all age groups and both sexes. A cross-sectional quantitative study was carried out from among the community to study the knowledge, attitudes and practices (KAP) of the public toward rabies.

Sample size, sampling method and procedures

Sample size determination

Since there is no awareness study on rabies in the area before, the required sample size for this study was estimated by considering 50% of populations' knowledge about rabies. Thus, the sample size was calculated according to the formula given by Thrusfield (2005) using 95% confidence interval and 0.05 absolute precision.

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

where n = required sample size, P_{exp} = Expected proportion of population knowing about rabies (50%), and d^2 = Desired absolute precision (0.05).

Based on the formula, a total sample size of 384 was determined.

Sampling method and procedures

A multi-stage sampling technique was employed for the selections of the sampling units. The primary sampling units were kebeles and the secondary sampling units were households. From the entire primary sampling units (out of 12 kebeles), five kebeles were selected by simple random sampling technique. The individual households from the selected kebeles were selected using a systematic random sampling technique. The numbers of households to be included in each kebele were determined by a proportional allocation based on the total number of households found in each kebele.

Method of data collection

Information on the knowledge, attitude and practices of the residents is collected by a well-structured questionnaire consisting of 32 close-ended questions. The participants of the study were asked to properly fill the answers for each question on the questionnaire. The questionnaire has two sections. The first is targeted at the socio-demographic situations of the respondents like sex, age, house hold size, educational status occupation, and religion. The other part is rabies related questions, consisted of knowledge on the causes, mode of transmission, knowledge on clinical signs and fatal nature of rabies, practices and attitudes to control and prevent rabies during and after the suspected animal and other rabies related questions. The data were collected via face to face interview. The questionnaire was first developed in English and then translated to Amharic language (native language) for appropriateness and easiness in approaching the study participants.

Data management and analysis

After collecting, the data were cleaned and checked for its completeness. Those incomplete and inconsistent were corrected when possible and removed otherwise. After complete check-up, the data were coded and entered to Microsoft Excel and exported to SPSS version 20.0 statistical packages for windows and analysis was made. The frequency distribution of both dependent and independent variables were worked out by using descriptive statics techniques (Frequencies and percentage). Association between independent variables and KAP scores on rabies was calculated using Pearson's Chi square.

Ethical approval

The study collected responses from people about knowledge, attitudes and practice toward rabies. No animal was involved and subjected to suffer. Nevertheless, ethical approval was conducted by research ethical approval committee of University of Gondar, College of Veterinary Medicine and Animal Sciences.

RESULTS

Socio-demographic characteristics

A total of 384 respondents were responded to the questionnaire, which yielded a response rate of 100%. More than half of the total study population, 223 (58.1%) were males and 170 (44.3%) were between 15 and 25 age groups. Out of the 384 samples taken, 187 (48.7%) were from the family size of greater than six person and 136 (35.4%) of them had completed a first degree education and above followed by college diplomas, 106 (27.6%). From the total respondents, 124 (32.3%) were government employees followed by private employees, 117 (30.5%) and 218 (56.8%) were Muslim followed by Orthodox, 120 (31.2%) in religion, and 345 (89.8%) of the study participants had information on rabies. Out of the 345 samples, 144 (37.5%) have got the information from mass media (Radio/Television, Books/Magazines), and 106 (27.6%) from health as well as veterinary professionals and 95 (24.8%) of respondents heard about rabies from informal sources such as traditional healers and society. Moreover, 321 (83.6%) of the samples got training about rabies.

Community KAP about rabies in Kombolcha town

Thirty-two questions were enquired for each respondent regarding the cause, sources, mode of transmissions, clinical signs, prevention practices and treatment measures of rabies. The number of questions for which the respondent gave correct responses was counted and scored. This score was then pooled together and the average score was computed to determine the overall KAP of respondents, respondents who score greater than or equal to the average value grouped to good KAP and less than the average value poor KAP level. The data revealed that about 329 (85.7%) of the study participants were found to have good KAP toward rabies and 55 (14.3%) were found to have poor KAP level.

Knowledge of participants related to cause, mode of transmissions and host range of rabies

Majority of the respondents, 294 (76.6%) knew that virus is the cause of rabies. From 384 respondents, 243 (63.3%) said rabies affects brain while the rest of respondents, 29.7% knew that it affects the stomach and the bitten area. Most of the respondents, 272 (70.8%) have information that rabies transmitted from animal to human by biting and the remaining participants, 29.1% knew that transmission is by scratching and other route of transmission. Two hundred and eighty (72.9%) respondents knew that all species were susceptible to rabies. From 384 respondents, 317 (82.6%) respondent were aware that dog is the most common source of rabies followed by cat 24 (6.2%) (Table 1).

Knowledge of participants related to clinical signs and fatal nature of rabies

Three hundred and fifty-seven (93%) of the study

Table 1. Knowledge of participants related to cause, mode of transmissions and host range of rabies in Kombolcha, southern Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Characteristics	Frequency/Number	Proportion (%)
Causes of rabies *		
Psychological problem	29	7.6
Associated with religion	36	9.4
Virus	294	76.6
Shortage of feed and water	21	5.5
I do not know	4	1.0
Modes of transmission		
Biting	58	15.1
Scratching	30	7.8
Wound Licking	24	6.2
All	272	70.8
Susceptible hosts		
Human	53	13.8
Dog	15	3.9
Cat	8	2.1
Cattle	18	4.7
Sheep and Goat	5	1.3
Equines	3	0.8
Wild animals	2	0.5
All of these	280	72.9
Most common source of rabies **		
Dog	317	82.6
Cat	24	6.2
Cattle	16	4.2
Sheep and goat	7	1.8
Equine	8	2.1
Wild animal	8	2.1
I do not know	4	1.0

*Causes of rabies as it is believed by the respondents. **The source of infection from animals as incriminated leading to rabies in opinion of the respondents.

participants answered that rabies is a dangerous and fatal disease. The majority of the respondents 91.1% replied that rabies is not easily treatable after the onset of the clinical sign (Table 2).

Practices and attitudes to prevent rabies after suspected animal/dog bite

The majority of respondents (92.4%) washed the wound with water and soap immediately after bitten by a rabid animal. 89.3% seek health center after bitten by a rabid animal. The majority of respondents 89.8% had a positive attitude for PEP and 325 (84.6%) were aware of taking PEP vaccine immediately after being bitten by a suspected animal/dog. The majority of the respondents, 323 (84.1%) answered that killing the rabid animals and 59.3% responsive to stray dogs control. Most of the respondents (81.2%) reacted that timely vaccination prevents animals from a suspected dog bite. In a general scenario, the respondents in this study had a good level of practice (89.1%) and attitude (79.9%) towards rabies

Table 2. Knowledge of participants related to clinical signs and fatal nature of rabies in Kombolcha Southern Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Characteristics	Frequency/number	Percent
Clinical signs of rabid animal		
Stops eating and drinking	40	10.4
Biting and change in behavior	36	9.37
Paralysis	13	3.38
Salivation	16	4.1
Hydrophobia	9	2.3
All	210	54.6
Easily treated after the onset of clinical signs		
Yes	29	7.5
No	350	91.1
I don't know	5	1.3
Fatal nature of the rabies		
Yes	357	93
No	27	7.0
Group of population at higher risk		
Young	52	13.5
Adult	34	8.9
Male	28	7.3
Female	13	3.4
All	257	66.9
Fate of a person bitten by a rabid animal and didn't visit health centers		
He/She will die	331	86.2
He/She will remain sick	48	12.5
Nothing happens	4	1.0
I don't know	1	0.3

(Table 3).

Factors associated with community KAP on rabies in Kombolcha town

Association between independent variables and KAP scores toward rabies was calculated with Pearson's Chi square shown in Tables 4, 5, 6 and 7. There was significant association between KAP scores and age, house hold size, educational status and occupation ($p < 0.05$). The good scores were higher in 41 to 60 age groups, 85.8% among other age groups ($x^2 = 8.752$, $p < 0.033$). Educational status was significantly associated with KAP scores ($x^2 = 1.868$, $p < 0.000$). The good scores were higher in the first degree and above. Occupation is also significantly associated with KAP scores ($x^2 = 29.807$, $p < 0.000$) (Table 7).

DISCUSSION

The result of this study revealed that 85.7% of the study participants had a good level of knowledge, attitude and practice (KAP) toward rabies, which is supported by report from Sri Lanka (Gino et al., 2009). This result is higher than the result obtained from study conducted by Tadese et al. (2014) in Bahir Dar and Shumuye et al. (2014) in Gondar area accounting 65% of KAP score. This variability probably due to the difference in the area,

Table 3. Practices and attitudes to prevent rabies after suspected animal/dog bite in Kombolcha town (N=384) Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Characteristics	Frequency/Number	Percent
Immediate action after bitten by rabid animal at home* **		
Tie the wound	26	6.8
Wash with water and soap	355	92.4
No any action will be taken	3	0.8
Seek after bite of rabid animal** **		
Health center (go clinic)	343	89.3
Traditional healer	26	6.8
Holly water	12	3.1
Nothing	3	0.8
Attitude to anti-rabies vaccine		
Positive	345	89.8
Negative	39	10.2
At which stage of anti-rabies vaccine is effective after a suspected animal bite		
Immediately (post exposure)	325	84.6
Later	16	4.2
At any time	29	7.6
I don't know	14	3.6
Actions taken on rabid animals		
Let free	8	2.1
Tie	48	12.5
Killing	323	84.1
Nothing	5	1.3
Measures to control stray dogs		
Killing	21	5.5
Animal birth control	6	1.56
Aware the Society	228	59.3
Ting	5	1.3
Prevention animals from rabid animal		
Tying dogs always	31	8.1
Providing fresh food and water	20	5.2
Timed vaccination	312	81.2

Immediate action done after the person is beaten at home. * The preference of treatment option for a person beaten and suspected of rabies case.

socio-demographic differences, lack of health education programs and community awareness on the case.

Majority of the respondents (89.8%) had heard about rabies from different information sources such as mass media radio/TV and magazine (formal source). However, such information tended to be superficial and highlight, it did not adequately enable public to acquire an appropriate level of knowledge and awareness about rabies and related cases. The finding of this study is higher (68.7%) than in a survey of knowledge, attitudes and practices about the animal bite and rabies in general community of India and Zimbabwe conducted by Brooks (1990) and

Table 4. Relationships between knowledge scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good (%)	Poor (%)	Total	x^2	P -value
Sex					
Male	183 (67.5)	40 (32.5)	123	0.231	0.631
Female	129 (80.2)	32 (19.8)	161		
Age (in years)					
15-25	137 (80.6)	33 (19.4)	170		
26-40	64 (86.5)	10 (13.5)	74	2.737	0.434
41-60	96 (80.7)	23 (19.3)	119		
>60	15(71.5)	6 (28.5)	21		
Household size					
1-3	81 (79.5)	21 (20.5)	102		
4-6	72 (75.5)	23 (24.5)	95	3.836	0.147
>6	159 (85.1)	28 (14.9)	187		
Educational status					
Illiterate	12 (36.4)	21 (63.6)	33		
Primary school (1-8)	32 (69.6)	14 (30.4)	46		
Secondary school (9-10)	45 (71.5)	18 (28.5)	63	70.674	0.000
College	97 (91.6)	9 (8.4)	106		
First degree and above	126 (92.7)	10 (7.3)	136		
Occupation					
Government employees	104 (83.9)	20 (16.1)	124		
Private employees	100 (85.5)	17 (14.5)	117	8.042	0.154
Merchant	37 (68.6)	17 (31.4)	54		
Unemployed	20 (77)	6 (23)	26		
House wife	23 (82.2)	5 (17.8)	28	-	-
Student	28 (80)	7 (20)	35		
Religion					
Orthodox	95 (79.2)	25 (20.8)	120		
Muslim	181 (83.1)	37 (16.9)	218	1.636	0.651
Protestant	29 (80.6)	7 (19.4)	36		
Catholic	7 (69.7)	3 (30.3)	10		

Sudarshan (2007), respectively. However, KAP level of these countries is higher. This difference is mainly associated with the source of information determining the appropriateness of the knowledge transferred to the general public.

Out of the total surveyed participants, 22.5% had a misunderstanding about the causes of rabies. The outcome is lower than report achieved from a study conducted in Bahir Dar city, which indicated that most of the respondents (39.9%) believe that the disease in dogs is initiated by starvation, thirst and prolonged exposure to sun heat (Tadese et al., 2014). This study also stated that the majority of the respondents (70.8%) knew the correct mode of transmission. The recording of the present study is higher than the report from Debre Tabor (57.8%) (Awoke et al., 2015). Differences in sources of information could be justification for the variability of this result.

An estimated 93% of the total respondents recognized rabies as danger and a fatal disease, 72.9% knew that all warm blooded animals are susceptible to rabies and

Table 5. Relationships between attitude scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good	Poor	Total	x^2	P- value
Sex					
Male	178 (79.9)	45 (20.1)	223	0.005	0.942
Female	129 (80.2)	32 (19.8)	161		
Age (in years)					
15-25	146 (85.9)	24 (14.1)	170		
26-40	51 (69)	23 (31)	74	13.796	0.003
41-60	97 (81.6)	22 (18.4)	119		
>60	13 (62)	8 (38)	21		
Household size					
1-3	76 (74.6)	26 (25.4)	102		
4-6	75 (79)	20 (21)	95	3.349	0.187
>6	156 (83.5)	31 (16.5)	187		
Educational status					
Illiterate	2 (6.1)	31 (93.9)	33		
Primary school (1-8)	20 (43.5)	26 (56.5)	46		
Secondary school (9-10)	46 (73.1)	17 (26.9)	63	2.062	0.000
College	103 (97.2)	3 (2.8)	106		
First degree and above	136 (100)	0 (0)	136		
Occupation					
Government employees	113 (91.2)	11 (8.8)	124		
Private employees	100 (85.5)	17 (14.5)	117		
Merchant	31 (57.5)	23 (42.5)	54	38.247	0.000
Unemployed	19 (73.1)	7 (26.9)	26		
House wife	23 (82.2)	5 (17.8)	28		
Student	21 (60)	14 (40)	35		
Religion					
Orthodox	96 (80)	24 (20)	120		
Muslim	172 (78.9)	46 (21.1)	218	1.003	0.801
Protestant	31 (86.2)	5 (13.8)	36		
Catholic	8 (80)	2 (20)	10		

82.6% informed that dogs are the most common source of rabies. This result is consistent with a study conducted in New York City, USA which reported 94.1% of the study participants knew rabies as a killer disease and 13.8% of the respondents identified dogs are major sources for the spread of rabies in the human population (Hosmer and Lemeshow, 2000). Moreover, 54.6% of the respondents were aware of common clinical signs of rabies in animals. This finding is in line with a study conducted by Asabe et al. (2012) in Nigeria. The result indicated that 27.1% had a misunderstanding on the range of host that rabies could affect and 50.3% of the respondents were aware of common clinical signs of rabies in humans. In agreement with Awoke et al. (2015), the majority of the respondents (66.9%) knew that rabies can affect all group population regardless of individual background.

The finding in the current study reported that 92.4% of the respondents were aware of the fact that wound washing is an immediate post exposure (after dog bite) action. This result agreed with a study conducted in south-central Bhutan (Tenzin et al., 2012). But, higher than a study done in Bahir Dar (70.8%) (Tadese et al., 2014). This difference might be due to the perceptions, respondents believed that the infection could be treated

Table 6. Relationships between Practice scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good	Poor	Total	x^2	P -value
Sex					
Male	201 (90.2)	22 (9.8)	223	0.627	0.428
Female	141 (87.6)	20 (12.4)	161		
Age (in years)					
15-25	162 (95.3)	8 (4.7)	170	15.528	0.001
26-40	60 (81.1)	14 (18.9)	74		
41-60	104 (87.4)	15 (12.6)	119		
>60	16 (76.2)	5 (23.8)	21		
Household size					
1-3	88 (25.7)	14 (13.7)	102	6.159	0.046
4-6	80 (84.3)	15 (15.7)	95		
>6	174 (93.1)	13 (6.9)	187		
Educational status					
Illiterate	7 (21.3)	26 (78.7)	33	1.856	0.000
Primary school (1-8)	37 (80.5)	9 (19.5)	46		
Secondary school (9-10)	58 (92.1)	5 (7.9)	63		
College	106 (100)	0 (0)	106		
First degree and above	134 (98.6)	2 (1.4)	136		

with herbs and traditional healer. Out of all respondents, 89.3% of them seek medical care from health centers after being bitten by dogs, which is contrary to a study conducted in Dabat, Gondar, which reported that 84% of respondents used traditional medicine when exposed to the disease (Jemberu et al., 2013). This high variance could be as a result of lack of information, unavailability of health centers in the immediate vicinity and community perceptions toward health centers for rabies as well as their preference of traditional medicines than health centers for rabies cases. However, this report agreed with study from Sri Lanka, where almost all respondents consult health professionals in case of animal bite (Matibag et al., 2009).

An estimated 59.3% of the respondents in the present study indicated that the society is aware that the control of stray dogs is an effective measure for controlling and prevention of the disease in Kombolcha town. This finding agree with results recorded in Sir Lanka in which the majority of the participants were in favor of rabies control programs that mainly focused on stray dog population control (Gino et al., 2009). Furthermore, the majority of the respondents, 89.8% reported positive attitude to anti rabies vaccine and this is an indication of their willingness to vaccinate their pets and believe that vaccination program and depopulation of stray dogs are effective measures for controlling the disease in Kombolcha. The finding of the present study was also in consistence with results recorded in Sir Lanka, where the majority of the participants were in favor of rabies control programs that mainly focused on stray dog population control (Gino et al., 2009). The mainstream of the respondents (81.2%) already knew that rabies could be prevented by timed vaccination of dogs against the disease. This was similarly recorded (88.1%) by Gino et al. (2009).

This study indicated that the majority of the respondents had good level of knowledge (81.2%), attitude (79.9%) and practice (89.1%) towards rabies. This finding was higher than previous reports such as Ali et al. (2013) who obtained relatively lower proportion of knowledge (75.2%), attitude (52.3%) and practice (67%) in Addis Ababa, Ethiopia. However, a higher knowledge, more positive attitudes, and higher scores in practice regarding rabies were reported by Gino et al. (2009) relative to this finding. The variability of these studies could be due to factors such as lack of health education programs on the case, endemic nature of the disease, geographical and socio-demographical phenomena.

Relatively better KAP scores were higher in age group of 41 to 60 (85.8%) and there was statistical significant association ($p< 0.05$) among the age groups. This relative

Table 7. Relationships between KAP scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good	Poor	Total	x^2	P -value
Sex					
Male	192 (86.1)	31 (13.9%)	223	0.077	0.781
Female	137 (85.1)	24 (14.9%)	161		
Age (in years)					
15-25	152 (89.5)	18 (10.5)	170		
26-40	61 (82.5)	13 (17.5)	74	8.752	0.033
41-60	102 (85.8)	17 (14.2)	119		
>60	14 (66.7)	7 (33.3)	21		
Household size					
1-3	81 (79.5)	21 (20.5)	102		
4-6	78 (81.1)	17 (17.9)	95	8.422	0.015
>6	170 (81)	17 (9)	187		
Educational status					
Illiterate	4 (12.2)	29 (87.8)	33		
Primary school (1-8)	36 (78.3)	10 (21.7)	46		
Secondary school (9-10)	49 (77.8)	14 (22.2)	63	1.868	0.000
College	106 (100)	0 (0)	106		
First degree and above	134 (98.6)	2 (1.4)	136		
Occupation					
Government employees	117 (94.4)	7 (5.6)	124		
Private employees	106 (90.6)	11 (9.4)	117		
Merchant	36 (66.7)	18 (33.3)	54	29.807	0.000
Unemployed	20 (77)	6 (23)	26		
House wife	23 (86.2)	5 (17.8)	28		
Student	27 (87.2)	8 (22.8)	35		
Religion					
Orthodox	100 (83.3)	20 (16.7)	120		
Muslim	191 (87.1)	27 (22.9)	118	1.628	0.653
Protestant	30 (83.3)	6 (16.7)	36		
Catholic	8 (80)	2 (20)	10		

better KAP score among the older age groups could be as a result of increased curiosity, reading capacity and learning and life experiences.

Education is one the best methods for knowledge delivery. Educated individuals would have better information access, like access to hear, listen, print and read from electronic media or any other sources which occasionally give information about rabies, and can easily understand the disease. It seems, as finding of this research, education played very significant role for KAP. Statistically significant association ($p< 0.05$) was observed between KAP score and educational status where by higher levels of education were associated with higher KAP scores. All respondents with first degree and above had good level of KAP (98.6%) about the case of rabies. Similar results were recorded by previous researches such as Tadese et al. (2014) in Bahirdar city.

It is a general fact that, the types of occupations matter on KAP scores in any cases. The present study statistically proved the fact that, the types of occupations play significant role to KAP scores ($p=0.000$) on rabies. The probable justification could be types of the works, sharing of information between different people with different experience, status and social background, which

might be important factors for higher KAP score obtained.

There was no strong association between KAP scores and sex of respondents (x^2 =0.077, p= 0.781). The reasons could be that it is known that dog is the famous pet animal that live with human being for a long period of time in history and people raised dog for house guard and protection. Therefore, both sexes have equal opportunity of contacting and exposure to dogs.

The number of individual's in a given household (house hold size) plays significant role in KAP score. This significant association (p< 0.05) is suggested to be, as an increment of household size, the information access or information sharing would be better among the family members, who could have different occupations and educational status.

The types of religions, which the respondents follow plays insignificant role in KAP score (p>0.05) this is to mean that all individuals from different religious groups live in the same community with the same exposure for dog, information and any other rabies related issues.

Conclusion

The findings of this study revealed that Kombolcha's community has better KAP toward rabies and related issues. Majority of the community knew the fatal nature of rabies and its zoonotic importance. Almost all of the study participants had heard about the disease from different information sources and the majority of the study participants knew dog as the main species affected and responsible for the disease in humans mainly through bite. Age, house hold size, educational status, and occupational background of the respondents were the most important factors that play significant role in higher KAP score in Kombolcha's community. Even though KAP score in Kombolcha's community revealed to be good, awareness creation in the community should be continued. Different strategic programs on the prevention and control of rabies should be designed by governmental and none governmental organizations. While giving proper post exposure anti rabies vaccine, surveying rabies cases in human in different health centers in Kombolcha town provide future research warranty, which will escalate one health concept.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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