International Journal of Advanced Research in Biological Sciences
ISSN: 2348-8069
www.ijarbs.com
(A Peer Reviewed, Referred, Indexed and Open Access Journal)
DOI: 10.22192/ijarbs Coden: IJARQG (USA) Volume 13, Issue 4-2026

Research Article

DOI: http://dx.doi.org/10.22192/ijarbs.2026.13.04.007

Assessment of Community Knowledge, Attitude, and Practice towards Rabies in Bona-Zuria District, Eastern Zone of Sidama Region, Ethiopia.

Tamirat Demissie Walelign
Sidama Regional Veterinary Laboratory Center, Hawassa, Ethiopia.
*Corresponding author: *demissiet49@gmail.com*

Abstract

Despite the prevention and control efforts against rabies, it remains a health problem for humans and animals in Ethiopia. This study is designed to identify community knowledge, attitude, and practice towards rabies in Bona-Zuria district. A cross-sectional study design was employed from August, 2024 up-to November, 2024 to assess community KAP towards rabies in the Bona-Zuria district, Eastern zone of Sidama region, Ethiopia. Face-to-face interviews were used to collect data from 402 respondents during the study period and multistage sampling technique were employed to select the study population. 349(86.8%) of participants had heard of rabies before and 84% of their main source of information was the community and parents. Among interviewed respondents, 61.3% were contact with rabid animals transmit this disease and 60.5% replied that eating rabid animal flesh transmit the rabies disease. 204(58.5%) knew dogs are the most rabies transmitter than other animals and 182(52.1%) of respondents replied that rabies occurred during summer season of the year in study area, 317(90.8%) ways a person prevent from rabies through avoiding being bitten by rabies carrier animals. The majority of the respondents in the study were males 303(86.8%), while the number of females was 46(13.2%) and 180(51.5%) were between 31-50 years old and almost all, 338(96.8%) were protestants.Majority of the participant's practices about rabies were, 303(86.8%) treated by traditional medicine. In this study education status is significantly associated with knowledge of related to (the causes of rabies, species of animal transmitter rabies)of the interviewers, were ((x2=203.96, p=0.000);(x2=28.78, p=0.004)), respect-ively and education level is significantly associated with attitude of patients cured after the onset of the rabies symptoms (x2=15.32, p=0.004) and practice by traditional and modern methods on rabies is significantly associated (x2=14.56, p=0.006) among different education levels at the current study area. Data are stored in Microsoft (MS) Excel and analysis was done by using STATA version 13 and in all of the analysis, CI at 95% and P<0.05 was used for statistical significance level. In the study area rabies vaccination is till non-practicable. Therefore, further awareness and disease-related training are needed for the district population and beyond to improve their knowledge of rabies prevention and control.

Keywords: Attitude, Bona-Zuria, Cross-sectional study, Knowledge, Practice, Rabies

1.Introduction

Rabies is acute fatal encephalitis that affects all mammals and is a worldwide zoonotic disease that caused by rabies virus [1].It also causes a severe and long-term societal and financial burden on patients in poverty-stricken countries [2].Though all mammals are susceptible canids have been determined to be the main hosts of the rabies virus in Africa; in most cases they are also responsible for transmission of the virus to humans. In addition to canids, mongooses, raccoons, skunks and bats are involved in rabies epidemics [3].

The world health organization, the World Organization for Animal Health, the Food and Agriculture Organization of the United Nations and the global alliance for rabies control have set a global target of "zero human rabies deaths by 2030" [4].World Rabies Day was officially launched in 2007 which aims to raise public awareness regarding the health impacts of human and animal rabies [5]. Nationwide data on rabies are not available to reveal the actual magnitude of the problem. However, the distribution of vaccines to the various regions and the fragmented reports on human and animal rabies cases are strong indicators of the widespread nature of the disease in the country [6].Most human deaths due to rabies are dog mediated and human deaths due to rabies are largely seen in rural areas in communities with poor socio-economic status [7]. The main reason for human deaths is lack of awareness among people about the importance of post-exposure prophylaxis [7].
About 98% of the human rabies cases occur in developing countries than developed nations, this is because developing countries possess large number of dogs, many of which are stray [8]. In many developing countries where the disease is endemic, the domestic dog (*Canisfamiliaris*) is the reservoir and exposure commonly occurs following a bite [9, 10]. Approximately 10, 000 people were estimated to die of rabies annually in Ethiopia which makes it to be one of the worst affected countries in the world [11]. The causative agents of rabies are a member of the Lyssa virus genus of the Rhabdoviridae family of bullet-shaped viruses, which have a single-stranded RNA genome, is one of the oldest diseases accounting for significant public health issues [12, 13].

The clinical signs include sudden behavioral changes, hypersalivation, paralysis, hydrophobia and photophobia, restlessness, aggressiveness and biting inanimate objects [14].The likelihood of a productive rabies infection after exposure to the virus dependents on the dose, route of exposure, variant, host genetic makeup, pre and/or post-exposure prophylaxis(PEP) vaccination and treatment [15].

Bites and scratches related to dogs and cat represent the most important public health concern because of the associated physical trauma, they cause wound infection by different micro- organisms and the risk of the disease transmission [16]. The majority of rabies victims, particularly those from rural regions, visit health institutions when they give up using traditional treatments or when a family member is lost [6].

Knowledge, attitudes and practices (KAP) studies have been widely used around the world for different applications in public health based on the principle that increasing knowledge will result in changing attitudes and practices to minimize disease burden.Though rabies was reported to be endemic in most parts of Ethiopia there is no study conducted to assess the level of knowledge, attitude and practice of community so far in Bona-Zuria District, Eastern zone of Sidama region, Ethiopia. Therefore, semi-structured questionnaire survey of voluntary community members from both urban and rural section of the District was interviewed with the following objective:

1.1. Objectives

1.1.1. General objective

- This study is, therefore, is designed with the objectives to address the reliable information and to know the KAP of community about the disease of rabies in Bona-Zuria district Eastern zone of Sidama region, Ethiopia.

1.1.2. Specific objectives

- To assess the **knowledge** regarding rabies in Bona-Zuria District
- To identify the **attitude** toward rabies in the study area
- To have clear pictures on the level of **practices** against the disease

1.2. Statement of the problem

The disease is nearly always fatal after the onset of clinical signs. However, prevention of human rabies is possible with rapid-fire intervention, including washing of the bite wound and immediate treatment with post-exposure prophylaxis and rabies immunoglobulin. The cost of post-exposure prophylaxis for humans, the loss of livestock, and other rabies-related expenses made an estimated 8.6 billion USD annually in global economic burden [17]. Even though the disease is underreported and rabies diagnostic facilities aren't established to get the real figure of rabies cases. Ethiopia has a high endemicity of canine rabies due to the vast dog population size and ineffective dog management [18]. The magnitude of the problem is higher in big cities like Addis Ababa linked with the presence of a large population of stray dogs and associated factors [19]. Understanding communities' knowledge, attitude, and practice is crucial to plan and implement appropriate control measures. And also, no research is carried out till yet to assess community KAP and/or awareness against rabies in urban and rural areas of Bona-Zuria District while the present study tries its best in order to identify knowledge, attitude and practice gaps of residents and recommend necessary information. Understanding community's perceptions of cause, mode of transmission, symptoms, treatment and possible intervention measures of rabies is an important step towards developing strategies aimed at controlling the disease and determining the level of implementation of planned activities in the future.

1.3. Scope and Limitation of the Study

1.3.1. The Scope of the Study

This study was conducted in the Urban and Rural selected kebeles in Bona-Zuria District of Sidama regional state of Ethiopia. The study was focused on to assess KAP of community related rabies disease by using selected respondents.

1.3.2. Limitation of the Study

The researcher has faced some of the problems like late research budget release. The budgets were released inappropriate time to conduct this research in time. Secondly, the researcher faced some of other problems to conduct this research project works in given time interval due to his own additional governmental works. The researcher was busy to give veterinary services to the community.

2. Materials and Methods

2.1. Description of study areas

The study was conducted from August, 2024 up-to November, 2024 to assess community knowledge, attitude and practice towards rabies in Bona-Zuria District, Eastern zone of Sidama region, Ethiopia. The district is located about 374 km far from the Addis Ababa capital city of the Ethiopia and 107 km distant from regional town of the Hawassa. The geographical location of Bona-Zuria District is latitude 6.53047^{o} or 6^{o} 31'50" North and Longitude 38.71487^{o} or 38^{o} 42'54" East. The district receives between 1200 and 1500 mm of rainfall each year, and the average yearly temperature is between 12 and 29°C. The heavy rain fall occurs in the area from June toSeptember, while the shortage of rains occurs from January to March. Their altitudinal ranges are from 2000-2800 m.a.s.l. The District is bordered with different zonal woreda's and Oromia region Guji zone at South, at North Arbegona and Shafamoworeda, at East Bensa-dayeworeda, at Northwest Bursa and at West Chirone District in Sidama region. The District

has an estimated total population of 166,043 whom 83,304 were men and 82,739 were women. The total woreda has 25 kebeles, among these 21 kebeles are rural administration whereas, now a day 4 individual kebeles are municipalities within District. The livestock populations of the woreda were being estimated: as Cattle: 107,220; Goats: 18,243; Sheep: 32,625; Donkey: 4748; Horse: 485; Mule: 178; Poultry: 310,837 and Dog population: 1,236 (Bona district agriculture office statistically data, 2015E.C), [20].

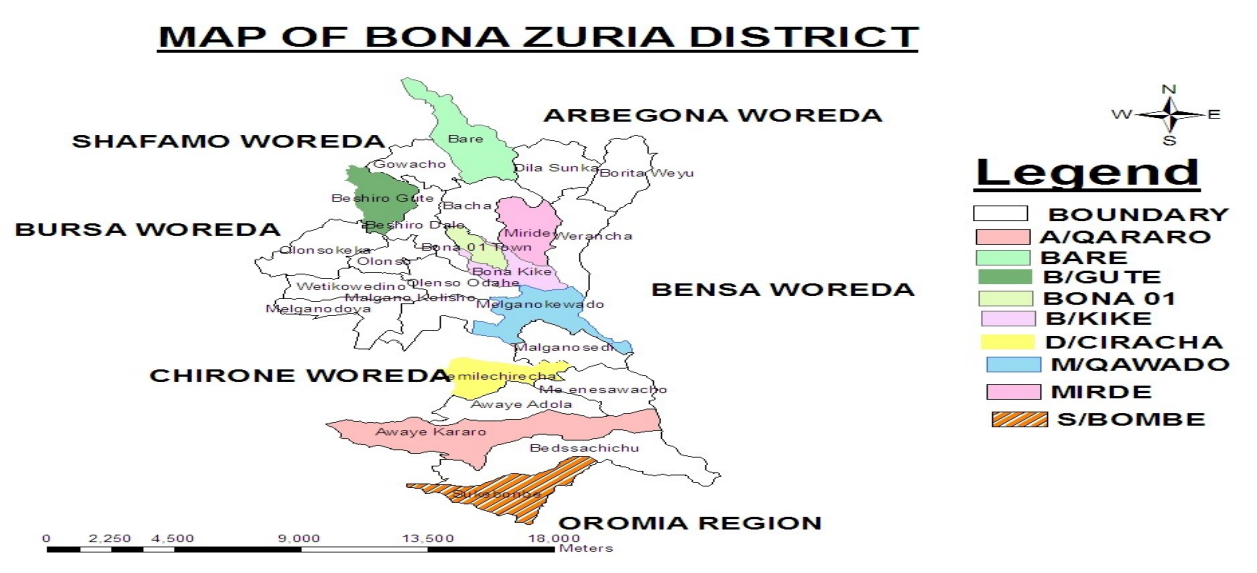

Figure 1: Map showing the study area

2.2. Study design and Sampling techniques

Cross-sectional study design and multistage probability sampling techniques were conducted for questionnaire survey of community KAP related to rabies in the study area from**August, 2024 up to November, 2024.**From study woreda, Kebeles (small administrative units) were selected using simple random sampling and the households in the selected areas were selected via a technique known as systematic random sampling then, it was interviewing individuals selected by random sampling to get total target population to be interviewed. Before the interview, the objective of the survey was explained and verbal consent were obtained from the respondents. It was initially written in English and then translated into Sidaamu Afoo for the study participants. Each of the questionnaires were considered the socio-demographic profile of the respondents. Randomly selected group of respondents were included in the questioner survey. To be eligible to participate in this survey, an inclusion criterion was set: either the head of the household or an adult member (≥18 years of age) and person who permanent residence in study area for ≥ 6 months, willing and able to provide informed consent. An exclusion criterion was set as household member less than 18 years old excluded from interview. Respondents was selected to form a heterogeneous group based on gender (male, female), age (between 18 and 30 years old, between 31 and 50 years old, and more than 50 years old), academic level (no school, informal school, elementary or junior, high school, college /higher education) and individual of dog owners or non-pet owners in order to capture the points of view of various types of stakeholders.

2.3. Study population

The study participants include individuals aged ≥ 18 years who have been permanent residents for at least six months in the Bona district, including urban and rural residents, who were recruited for the research. A total of 402 respondents are included during the study period, this study includes individuals of both sex, different age categories and occupation, different marital status and those which were found on different educational levels by simple random sampling. Besides, the target populations were interviewed with specific questions related to assessment, knowledge, attitude, and practice of the community regarding rabies. After selecting the first household, the next nearest household with interval 20^{th} household was selected and interviewed in urban and in the rural area, every 10^{th} household was visited until the target number of respondents was interviewed but, only one person from each household was interviewed. If the selected household was empty or if there was no one at home or under age, the next closest household was selected for an interview.

2.4. Data collection method

Data collection procedures were carried out by face-to-face interview of voluntary community members with the help of questionnaires. The questionnaires were checked or tested for neatness of the questions prior to the interview and objective of the study were briefly explained for respondents. Following that, the actual interview questions were presented for the respondents (Annex I). For this study, open and close ended questionnaires were used to collect information about the respondents' knowledge, attitude and practice of the disease. Each sex was included.

2.5. Sample size determination

The sample size required for an expected prevalence of the given area is 50% by considering 5% absolute precision and at 95% confidence level sample size was calculated according to Thursfield (2018) [21]formula as follows:

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

Where, N= Sample size required,

Z (1.96) = The value of Z at 95% confidence interval,
Pexp= Expected prevalence and d= Desired absolute precision.

Based on the formula, the total number of respondents required for each of the urban and rural study sites was 384. But this was increased by adding of 10% calculated sample size so, total respondents were 422 for urban and rural households to made up for the maximize precision.Hence, 422 target populations were selected, from the total 5%(20 respondents) were incomplete the interviews due to different factors and also among 402 participants were interviewed only 349 respondents answered have heard about rabies disease, but 53 answered have no idea about rabies.

2.6. Data management and Statistical analysis

Data was obtained from a semi-structured questionnaire survey were coded and entered into spread sheet of Microsoft excel 2016 application program and analyses was done using STATA version 13.0 for windows (Stata Corp. College Station, Texas, USA) statistical software programs. Semi-structured questionnaire data was analyzed by descriptive statistics were utilized to summarize frequency distribution and percentage of KAP towards rabies parameters. Before the analysis of the coded data, it was filtered. Pearson's chi-square (x^2) test and p-value were used for calculating the association between the independent variable and dependent variable (KAP) about rabies. In all cases, a 95% CI was employed to estimate data results to the target population in the study area. Values of $P < 0.05$ were used for the statistical significance level.

3. Results

3.1. Socio-demographic status of respondents in study area

The socio-demographic profiles of the respondents of the selected populations are presented in (Table1). The present study revealed that majority of the respondents were male (86.8%) than female (13.2%), and about (24.6%) were no school who didn't take any of education before, 30.7% were joined informal school, 20.3% were studied elementary school, 17.7% were completed high school, 6.6% were joined college/higher education. From the age distribution of study communi- ties, (26.4%) were between 18-30 years of age, (51.5%) were between 30-50 years of age which the most productive age, (22.1%) were more than 50 years of age. Regards the occupation, farmers (51.6%) were the most respondents followed by businessmen and employees and a comparable number of respondents resided lived in the rural areas (66.8%) and (33.2%) lived in urban area of Bona-zuriaworeda. From the religious point of view, protestants constitute the highest percentage (96.8%) followed by Orthodox (1.7%), Muslim (0.86%) and the lowest number of respondents were sampled from followers of Catholic (0.57%).

Table 1: Socio-demographic profiles of the respondents participated in the survey on knowledge, attitudes and practices of rabies in the Bona-Zuria District of Sidama Region

Description of variable		Frequency	Percentage (%)
Residence			
	Urban	116	33.2
	Rural	233	66.8
Age of respondents			
	Between 18-30 years	92	26.4
	Between 31-50 years	180	51.5
	>50 years old	77	22.1
Sex			
	Male	303	86.8
	Female	46	13.2
Religion			
	Orthodox	6	1.7
	Protestant	338	96.8
	Muslim	2	0.57
	Catholic	3	0.86
Education level			
	No school	86	24.6
	Informal school	107	30.7
	Elementary/Junior	71	20.3
	High school	62	17.7
	College/Higher education	23	6.6
Marital status			
	Single	48	13.7
	Married	288	82.5
	Divorced	7	2.01
	Widowed	6	1.72
Occupation			
	Housewives	20	5.7
	Businessmen	90	25.8
	Employees	59	16.9
	Farmers	180	51.6

3.2.Knowledge of the respondents on rabies disease

The present study showed that a total of 402 target population were selected from the Bona-Zuria district, 86.8% of the participants had heard about rabies. The Respondents were known the person prevented from rabies disease by avoiding being bitten (90.8%) and vaccination of dogs (83.7%) and participants knew the prevention way of rabies in animals by (61.9%) were application of herbal medicine, (39.3%) were vaccination and (40.4%) were killing rabid ones.Out of 349 respondents 58.5% of the respondents know about the most common source of rabies were dogs followed by (27.8%) were foxes. From total respondents, (93.7%) of the person dies, if rabies untreated. With regards to transmission, majority (61.3%) of the respondents described contact with rabid animals as causes of the rabies disease and (60.5%) respondents who know the disease mentioned that eating rabid animal meat as a means of transmission. From the interviewed respondents their agreement (yes) on the cause, Season of rabies was placed in percentage as follows respectively: (62.75%) germ, (11.75%) heredity, (6.88%) spiritual and (18.62%) I don't know and (52.1%) Summer, (18.1%) Autumn, (2.3%) Spring and (27.5%) I don't know. Out of participants 26.6% of interviewers said that the sign of rabid animals was appear in humans within two to twelve weeks followed by, (21.8%) the respondents had one week after exposure shown in (Table 2).

Table 2: Knowledge of respondents regarding rabies disease in Bona-Zuria District

Variable	Frequency	Percentage(%)
Have you heard about disease of rabies?		
Yes	349	86.8
No	53	13.2
Source of rabies information?		
Community and parents	293	84
Television and/or social media	56	16
The causes of rabies		
Spiritual	24	6.88
Germ	219	62.75
Hereditary	41	11.75
I don'tknow	65	18.62
How do people get rabies?		
Contact with rabid animals	214	61.3
Eating rabid animal meat	211	60.5
Living with animals	5	1.4
I don't know	83	23.8
Do rabies is curable?		
Yes	233	66.8
No, I don't know	116	33.2
Which animals do you think that they were transmitted rabies?		
Dogs	204	58.5
Cats	11	3.2
Fox	97	27.8
I do not know	37	10.6
Do you know rabies is transmitted from human to human?		
Yes I know	243	69.6
No I don't know	74	21.2
Uncertain	32	9.2

Did rabies seasonal occurred?		
Yes	253	72.5
No, don't know	96	27.5
If yes, in which season of the year?		
summer	182	52.1
Autumn	63	18.1
Spring	8	2.3
I don't know	96	27.5
Rabies disease be cured by		
Herbal remedies	270	77.4
Home rest without medicine	7	2.01
Praying	5	1.4
Specific drugs given by health center	178	51
Vaccination	114	32.7
Holy water	2	0.57
No, don't know	7	2.01
Is there any problem if rabies diseases are untreated?		
Yes, infected Persons are dying	327	93.7
Yes, infected Persons are healing but will not be the same as before	13	3.7
I don't know	8	2.3
Ways a person prevent from rabies		
Avoiding being bitten by rabies carrier animals	317	90.8
Through vaccination pets	292	83.7
Good nutrition (Providing balanced diets)	8	2.3
Praying	3	0.86
Holy water (it means Tsebel)	5	1.43
I don't know	2	0.57
Where did person go if he/she has bitten by rabies infected animals?		
To traditional healers	273	78.2
To spiritual healers	14	4.01
To health facilities	119	34.1
What is clinical sign of rabies in humans?		
Fever	174	49.8
Headache	89	25.5
Muscle pain	81	23.2
Altered mental status	327	93.7
Paralysis/difficult swallowing	46	13.2
Hydrophobia	255	73.1
Hyper salivation	222	63.6
Photophobia	80	22.9
I don't know	2	0.57
How long After exposure do symptoms appear in humans		
Two to twelve weeks	93	26.6
One week	76	21.8
Immediately	14	4.01
In months	39	11.2
Don't Know	127	36.4
Clinical signs of rabies in animals		
Abnormally animals behave	305	87.4
Show a lack of fear, be aggressive and disoriented	224	64.2
Paralyzed and partially paralyzed	47	13.5

Salivate excessively	254	72.8
Pawing at ground	109	31.2
Hydrophobia	178	51
Photophobia	86	24.6
Prevention way ways/methods of rabies in animals		
Vaccination	137	39.3
Application of herbal medicine	216	61.9
Killing rabid ones	141	40.4

3.3. Attitude of the respondents towards rabies in Bona-ZuriaDistrict

In the present study, showed that 182(52.1%) of respondents believe that after the onset the rabies symptoms patients were cured. The respondent's opinion (yes) on the major constraints to controlof rabies was highlighted as the follows respectively in Percentage: 252(72.2%) lack of adequate awareness, 209(59.9%) lack of coordination (human and veterinary profession), 94 (26.9%) lack of appropriate legislation, 28(8.02%) an insufficient budget, 10(2.8%) religious taboo, 6 (1.7%) I do not know. Among the attitude related variables, 315(90.3%) always keep dogs tied, 298(85.4%) by eliminate stray dogs and 190(54.4%) by regular vaccinate, were responded by majority of the respondent in order of their degree of actions to be taken to supervise dogs so that they don't bite humans. The findings from the study about the attitudes of the respondents towards rabies are presented in (Table 3).

Table 3: Attitude of the respondents towards rabies in the study area

Variable	Frequency	Percentage(%)
Do you believe after the onset the rabies symptoms patients will be cured		
Yes	182	52.1
No	167	47.8
What do you think are the necessary actions to be taken to supervise dogs so that they don't bite humans?		
By regular vaccinate	190	54.4
By eliminate stray dogs	298	85.4
Always keep dogs tied	315	90.3
Major constraints to control rabies		
An insufficient budget	28	8.02
Lack of coordination(Human and veterinary profession)	209	59.9
Religious taboo	10	2.8
Lack of appropriate legislation	94	26.9
Lack of adequate Awareness	252	72.2
I do not know	6	1.7
Where do you prefer to go thought you are exposed to rabies		
Go to health facilities	125	35.8
Go to traditional healer	194	55.6
Go to pharmacy	30	8.6

3.4. Practices about disease of rabies prevention and control

The study showed that majority of the participants were 297(85.1%) treated by traditional medicine, 44(12.6%) isolation while 8(2.3%) go to health center of respondents were responded during interview were responded, if a dog bites an individual and lost. Among the total respon- dents on immediate action taken after exposure to bite by rabid animal; 288(82.5%) of the respondents consulted with traditional healer, 282(80.8%) killed rabid dogs while 231 (66.2%) confined the dog for observation. However, 66 (18.9%) of the interviewed respondents actively sought medical treatment after exposure by rabid animal. Most of the respondents were reported to be non-pet owners (77.9%) rather than other living with pet owners were revealed in Table 4.

Table 4: Practice of the respondents towards rabies in Bona-Zuria District

Variable	Frequency	Percentage(%)
Do you have home pets		
Yes	77	22.1
No	272	77.9
Do you take your pet (dog) for vaccination?		
Yes	-	-
No	349	100
When do you take your pet (dog) for vaccination?		
After it is sick	-	-
Regularly	-	-
I never take to vaccination	349	100
Vaccinate at three months of age	-	-
Every three years	-	-
What do you suggest if someone has been bitten by animals(Dogs)?		
Urge the victim to seek medical care immediately	141	40.4
Refer for traditional healers	175	50.1
Refer for vaccination	28	8.02
I do not know what to do	5	1.43
What did you do immediately after the exposure		
Nothing	4	1.15
Washed wound	10	2.87
Consulted with traditional healer	288	82.5
Actively sought medical treatment	66	18.9
Confined the dog for observation	231	66.2
Submitted dog for disease testing	16	4.6
Killed rabid dogs	282	80.8
Wound suture	6	1.7
Is there any known government intervention for the prevention and eradication of the disease from the country		
Yes	40	11.5
No	309	88.5

By what method does the community treat human rabies cases		
Traditional	303	86.8
Modern	46	13.2
If a dog bites an individual and lost,what should you do		
Treated by traditional medicine	297	85.1
Isolation	44	12.6
Go to health center	8	2.3

3.5. Associated of knowledge, attitude and practice of the respondents towards rabies within different educational level

Educational status significantly contributed to the level of knowledge, attitude and practices towards rabies in the study area. 204(58.5%) of respondents knew that dogs are transmitted the rabies. More than half of the respondents (69.6%) mentioned as rabies can have transmitted from human to human. Educational status significantly associated with knowledge related to (cause of rabies, species of animal transmit rabies, period of symptoms appear in humans after exposure, rabies is transmitted from human to human) of the interviewers, were ((x^2 =203.96, p=0.000); (x^2 =28.78, p=0.004), (x^2 =32.39, p=0.009), (x^2 =26.28, p=0.001)) respectively, but the rest factors non-significant level of knowledge (season of the year and curability of the disease). The study showed that 52.1% of respondents agreed with a patients cured after the onset of the rabies symptoms and this was statistically significant ((x^2 =15.32, p=0.004)) among different education levels. Regarding practices agreement, 63(52.5%) and 167(47.85%) respondents of the community treat human rabies cases by traditional methods and modern ways respectively. However, there were statistically significant (($x^{2=}$14.56, p=0.006)) in their practices with traditional and modern methods on rabies among different education levels at the current study area the findings presented in (Table 5).

Table 5: Associated of knowledge, attitude and practice of the respondents on rabies within different educational level

Variable	No school	Informal school	Elementary school	High school	College/higher education	Chi-square (X^2) and P-value
Knowledge						
The causes of rabies						
Spiritual	8(9.3)	8(7.47)	0	3(4.83)	5(21.7)	
Germ	8(9.3)	85(79.4)	62(87.3)	57(91.9)	7(30.4)	203.96
Hereditary	19(22.1)	8(7.7)	9(12.7)	2(3.22)	3(13.04)	(0.000)
I don't know	51(59.3)	6(5.6)	0	0	8(34.78)	
Which animals do you think that they were transmitted rabies?						
Dogs	57(66.27)	62(57.9)	33(46.47)	34(54.8)	18(78.26)	28.78
Cats	1(1.16)	7(6.54)	0	3(4.83)	0	(0.004)
Foxes	23(26.74)	22(20.6)	32(45.1)	17(27.4)	3(13.04)	
I don't know	5(5.81)	16(14.95)	6(8.45)	8(12.9)	2(8.69)	

How long After exposure do symptoms appear in humans						
Two to twelve weeks	31(36.05)	22(20.56)	24(33.80)	7(11.29)	9(39.13)	32.39
One week	15(17.44)	28(26.16)	11(15.49)	19(30.6)	3(13.04)	(0.009)
Immediately	1(1.16)	5(4.67)	3(4.22)	4(6.45)	1(4.34)	
In months	13(15.12)	17(15.88)	3(4.22)	4(6.45)	2(8.69)	
Don't know	26(30.23)	35(32.71)	30(42.25)	28(45.2)	8(34.78)	
Do you know rabies is transmitted from human to human?						
Yes, I know	55 (63.95)	83(77.57)	50(70.42)	43(69.4)	12(52.2)	26.28
No, I don't know	15(17.44)	24(22.42)	14(19.71)	15(24.9)	6(26.1)	(0.001)
Uncertain	16(18.60)	0	7(9.85)	4(6.45)	5(21.7)	
Do rabies is curable?						
Yes	58(67.44)	63(58.87)	49(69.01)	45(72.6)	18(78.3)	5.49
No, I do not know	28(32.55)	44(41.12)	22(30.98)	17(27.4)	5(21.7)	(0.24)
Did rabies seasonal occurred?						
Yes	66(76.74)	79(73.83)	50(70.42)	43(69.4)	15(65.2)	1.94
No, don't know	20(23.25)	28(26.17)	21(29.57)	19(30.6)	8(34.7)	(0.75)
If yes, in which season of the year?						
Summer	41(47.67)	60(56.07)	38(53.52)	30(48.4)	13(56.5)	16.21
Autumn	20(23.25)	15(14.01)	10(14.08)	12(19.4)	6(26.1)	(0.18)
Spring	2(2.32)	0	5(7.04)	1(1.6)	0	
I don't know	23(26.74)	32(29.90)	18(25.35)	19(30.6)	4(17.4)	
Attitudes						
Do you believe after the onset the rabies symptoms patients will be cured						
Yes	42(48.83)	53(49.53)	41(57.74)	26(41.9)	20(86.9)	15.32
No	44(51.16)	54(50.46)	30(42.25)	36(58.1)	3(13.04)	(0.004)
Where do you prefer to go thought you are exposed to rabies						
Go to health facilities	18(20.93)	37(34.57)	25(35.21)	36(58.1)	9(39.1)	64.07
Go to traditionalhealer	68(79.06)	47(43.92)	45(63.38)	21(33.8)	13(56.5)	(0.000)
Go to pharmacy	0	23(21.49)	1(1.41)	5(8.1)	1(4.3)	
Practices						
What do you suggest if someone has been bitten by animals(Dogs)						
Urge the victim to seek medical care immediately	30(34.88)	42(39.25)	28(39.43)	29(46.7)	12(52.1)	16.21 (0.182)
Refer for traditional healers	52(60.46)	51(47.66)	38(53.52)	25(40.3)	9(39.1)	
Refer for vaccination	4(4.65)	10(9.34)	4(5.63)	8(12.9)	2(8.7)	
I don't know, what to do	0	4(3.73)	1(1.41)	0	0	

By what method does the community treat human rabies cases?						
Traditional	82(95.34)	95(86.8)	57(50.28)	53(85.5)	16(69.5)	14.56
Modern	4(4.65)	12(11.2)	14(19.71)	9(14.5)	7(30.4)	(0.006)
If a dog bites an individual and lost, what should you do?						
Treated by traditional medicine	73(84.88)	92(85.98)	62(87.32)	50(80.6)	20(86.9)	6.38 (0.604)
Isolation	13(15.11)	13(12.15)	6(8.45)	10(16.1)	2(8.7)	
Go to health center	0	2(1.87)	3(4.22)	2(3.2)	1(4.3)	

4. Discussion

In the present study, out of 402 participants the majority of respondents 349(86.8%) heard about rabies, species of animal transmitter of rabies and rabies is transmitted from human to human, human acquired rabies could be through contact with rabid animals and eating rabid animal meat, seasonal occurrence case of the rabies, person could be prevented from rabies via avoiding being bitten and prevention way of rabies in animals by application of herbal medicine, killed rabid ones and vaccination of rabies vaccine pre-exposures.

The present study showed that almost all, (86.8%) of the respondents had heard about rabies from both urban and rural of study area, this helps with the control strategy of the disease. This study is similar with the study conducted in Asella, Arsi zone by Abera*et al.* [22], Addis Abeba Ethiopia Ali *et al*. [23], Mekelle by (Hagos*et al.* [24] and Asella, Arsi zone by Adanech. [25], who reported 83.4%, 83%, 88.2% and 82% knowledge on rabies, respectively. This finding was higher when compared with the findings reported by Ichhpujani*et al.*[26], who reported 68.7% knowledge of rabies in a survey of knowledge, attitudes and practices about animal bites and rabies in general community in India and Zimbabwe, it was reported that 70% of the households were aware of rabies [27]. The current finding is lower than the result of studies reported from different areas in Ethiopa [28, 29, 30, 31] and other countries by Singh and Choudhary. [32], in the rural community of India which reported 100%, 99.3%, 100%, 92.7% and 96.6%, respectively. This variation might be associated with differences in awareness of the community between different study areas.

Our findings show that, 303(86.8%) the community treat human rabies cases by traditional methods this result agreement with the study conducted in North Gondar were 84% of the respondents said they would take use of traditional medicine if they were exposed to rabies virus [33]. This is lower with findings from a survey of 53.3% by Hunde*et al.*[34], in Mendi town, west wollegaOromia used traditional treatment as the best option for dog bites and 27.3% by Gemechis and Baisa. [35], in Nejo area of Oromia region used traditional medicine. The difference can be attributed to the difference in the awareness status of the community in the study area and this traditional method were preferable due to, easy access to traditional medicine and cheap, limitation of rabies vaccine availability and lack of education regarding effective prevention of rabies in the current study area.

The present study showed that, none of pet owners in the present study had never vaccinated their dogs these were poorly practiced among dog owners in study area, this findings disagreement with the study conducted in Asella (4%) by Adanech. [25], Gondar (42%) by Digafe*et al*. [29], Mekelle (79%) by Hagos*et al.* [24], Addis Abeba the capital city of Ethiopia (3.9%) by kidane*et al.*[36], Indonesia (74%) by Widyastuti*et al*. [37], Srilanka (76%) by Matibag*et al.*[38], had gotten theirs vaccination. This may be attributed to a number of factors that include to a various factor that include unavailability of

animal rabies vaccines and poor information sharing in this study area.

In this study moderate knowledge and practice was seen in educated respondents as comparable than uneducated respondents. Community awareness about rabies has significant role in rabies prevention and control [39, 40], knowledge, attitudes and practices studies have been used widely to increase community knowledge and thus chance attitude and improve practices that may help in disease prevention and control [41]. The possible reason could be that educated person would have better information access and can easily understand the disease.

On the other hand, current study findings of respondents who know the disease mentioned human acquired rabies by contact with rabid animals and eating rabid animal meat, (61.3%) and (60.5%), respectively. This result is lower when compared with the result obtained from study conducted in India most common way of transmission for rabies (90%) is bite of infected animals like dogs and cats [42]. In the current findings is higher result of rabies transmitted than by bite and saliva was reported study in Amhara region, North Carolina, Hawassa, Munessa, Dedo and Mersa, town by Adane*et al*. [43], Palamar, *et al*. [44], Yergashewa*et al* [45], Abdela and Teshome. [40], Abdela*et al*. [46], and Jemal*et al*. [47], with 44.9%, 41%, 52.2%, 21.3%, 51.9%, and 30%, respectively. This could be associated with difference in awareness of the community about the potential risk of rabies transmission through the contact of with rabid animals and handling of infected animal fresh meat in the study areas.

The finding of the present study revealed that the most common signs and symptoms mentioned by respondents, 87.4%, 72.8%, 64.2%, 51%, 31.2%, 24.6% and 13.5% were abnormally animals behave, salivate excessively, show a lack of fear, be aggressive and disoriented, hydrophobia, Pawing at ground, photophobia and paralyzed and partially paralyzed, respectively. This is supported by other [25, 39, 48, 49], clinical signs of rabies including aggression, biting inanimate objects, salivation, running over long distances, stopping eating, change in behavior, hydrophobia, coma and paralysis.

Out of total study 52.1% of respondents replied that believe after the onset the rabies symptoms patients were cured. This is not consistent with the facts that ones the clinical signs are seen there is no way for recovery [50]. There was statistically significant (p=0.004) on attitude of respondents on rabies were curable once the clinical signs of the disease appear of rabid patients among different education level of participants. While the virus affects virtually all mammals and infected species invariably die from the disease once clinical signs are manifested [51]. This difference could be associated with the awareness level of the communityas well as community could be believed that traditional medicine was cured.Rabies is incurable (100% fatal) once the clinical signs of the disease appear [6]. However, it is possible to prevent a person exposed to the virus from getting ill to rabies by neutralizing virus with antibodies before the virus invades the nervous tissue. This is done through vaccination and/or use of immunoglobulins, so called post-exposure prophylaxis [52]. Therefore, the study suggested that awareness and educational programs were required in the communities of current study area about irreversibility of the disease once after symptoms appeared and control rabies.

Among immediate action taken for bitten of rabies carrier 82.5% participants consulted with traditional healers, which employs the use of herbs for immediate action for bitten man and animal. Findings agreement with the study conducted in Bahir-dar 70.8% [16], of the study participants had strong beliefs in traditional medicine. The 82.5 % findings in this study higher compared to study conducted in Bangladesh 16.15% by Sohel*et al*. [53], Sri Lanka 3.8% by Gino *et al*. [54], Gondar-zuria district (30.7%) by Digafe*et al*. [29], in Jimma town 7% by Kabeta*et al* [55], in Munesa 49.35% by Abdela and Teshome. [40], Mersa town 46.67% byJemal*et al* [47], and in a rural community of Gujarat, India (31.1%) by Singh and Choudhary.

[32]. This variation may be due to the study area and awareness level of the community.

However, over-half of study participants (52.1%) were rabies occurrences on summer season of the years. This study showed that rabies occurred commonly in the big rainy season from June to September. This finding is in agreement with the previous reports who found the seasonal occurrence of rabies outbreaks between July and September by Moges. [13]; Helao*et al*. [56], seasonal occurrence of rabies in Summer were 43.3%by Wakgari*et al*. [57], in BunoBedele zone, West Ethiopia and 46.8% by Gemechis and Baisa. [35], in Nejoworeda, Oromia region, Ethiopia. The lowest result study findings conducted were 39% by Yizengaw*et al*. [58], in Northwestern Amhara, Ethiopia.This might be due to the high movement of stray dogs in search of food and breeding season which bring together several dogs and exacerbate the spread of the infection.

The findings from our study revealed that the respondents had 62.75% knew that the causative agent of rabies was germ in study area. This finding in line with the results reported in different studies areas of in Dedo district of Jima zone, in and nearby Gondar City and around Dessie City reported of 67.6%, 60.7% and 67.6% of the respondents knew about the causative agents of rabies, respectively by Alie *et al.* [23]; Serebe *et al*. [59]; Gebeyaw and Teshome. [60]. Current finding was lower compared to the study conducted by Bhalla*etal*. [61], in India, 85%and 78% by Nejash *et al.*[62], in Munisa district of Arisi zone. Lowest findings showed that in and around Ambo, 23.6% by Dabuma*et al*. [63]. This difference could be associated with educational status and awareness level of the community in urban and rural areas.

Of respondents, 69.6% were responded reported possible human-to-human transmission of rabies in the study area. Similar findings were reported by different studies [23, 64]. Additionally, this result is in line with another study from Ethiopia by Kabeta*et al.*[55]; Fekadu*et al.*[65], that reported possible human-to-human transmission of rabies in Ethiopia and (65.9%) were responded the human to human transmission of rabies is possible in Gemechis and Baisa. [35], in Nejo district and lower result of respondents 3.8% in and around Ambo town by Dabuma*et al.* [63].

Moreover, among the respondents, (58.5%) of the respondents know that the main source of rabies in humans is dogs. This is in agreement with the WHO report that 99% of rabies in humans is from rabid dog bites by WOAH. [66], (93.6%) of the respondent were knows that dogs are source of human rabiesby Gemechis and Baisa. [35], in Nejo district and (96.1%) of the respondents in and around Ambo town responded that dog is the common source human rabies by (Dabuma*et al.* [63]. This is not consistent with the epidemiology of the disease as it can also be contracted from other rabies susceptible species by Hampson*et al.* [67]. This suggests the need for creating awareness about the potential sources of rabies to humans other than dogs.

5. Conclusion and Recommendations

The assessment of KAP of community in Bona-Zuria district indicated that 86.8% of the respondents treat human rabies cases by traditional methods. The extensive use of traditional medications and lacks of vaccination coverage in the study area was challenges related to the prevention and control rabies. In the present study revealed that the majority of the respondents were heard about rabies. None of dog owners were had never vaccinated their dogs in study area. However, contact with rabid animals and consumption of rabid animal meat should also be considered as a risk of get rabies. Therefore, control of the disease can be best achieved with a combination of vaccination, killing of stray dogs and training of community. Practice by traditional and modern methods on rabies is significantly associated ((x^2=14.56, p=0.006)) among different education levels at the current study area. Moreover, among the respondents, (58.5%) of the respondents know that the main source of rabies in humans is dogs. Of respondents, 52.1% were

rabies occurrences on summer season of the years and almost all, 90.8% of respondents a person prevent from rabies were by avoiding being bitten by rabies carrier animals. In conclusion, multi-sectoral collaboration and integration of one health initiatives through the participation of local authorities is essential elements of rabies elimination program with sustainable commitments at both national and international levels and providing resources is critical to achieve the goal of rabies elimination by 2030.
Based on the above conclusion the following recommendations are forwarded: -

- Veterinary sectors, health professionals and other stakeholders should give due attention to increasing rabies awareness and prevention measures as mandatory to vaccinating pets against rabies and seeking post-exposure vaccination in the communities.
- Raising awareness and disease-related training should be given to increase theknowledge and attitude of community, which will help the preventive practice of the disease.
- A country wide study has to be conducted to influence policy makers, allocate required fund and implement rabies control and eradication program.

6. References

1. Kobayashi, Y., A. Ogawa, G. Sato, T. Sato, T. Itou and SI. Samara, 2006. Geographical distribution of vampire bat-related bovine rabies in Brazil. *J. Ve.t Med. Sci*., **68**:1097–100.
2. WOAH (World Organization for Animal Health), 2019. Protecting animals, preserving our future. OIE - Terrestrial Animal Health Code World Organization for Animal Health (WOAH). Paris, France Pp. 107-126.
3. Umoh, J. U. and E. D. Belino, 2008. Rabies in Nigeria: a historical review. *International Journal of Zoonoses*, **6**: 41-48.
4. WHO, FAO and WOAH (World Health Organization; Food and Agricultural Organization (FAO); World Organization for Animal Healt), 2018. Zero by 30: the global strategic plan to end human deaths from dog-mediated rabies by 2030. World Health Organization; Food and Agricultural Organization (FAO); World Organization for Animal Health (WOAH) Retrieved from https://www.who.int/ public cations/i/item/9789241513838.
5. Tandon, S., S. K. Kotwal, M. A. Malik, M. Singh, D. Kumar, M. Shafiq and M. A. Kumar, 2017. Community based survey on rabies control and prevention using KAP in Jammu, India. J .Ani. Res.,**7**(6):1019-1028.
6. Deresa, A., A. Ali, M. Beyene, B. Newayeselassie, K. Hussein and E. Yimer, 2010. The status of rabies in Ethiopia: A retrospective recorded review. *Ethiop. J. Hlth. Dev*., **24**(2): 127-132.
7. Kumar, S. A., 2019. Preliminary survey of knowledge, attitudes and practice regarding rabies in West Bengal, India. Sri Lankan J Infect Dis., **9**(1).
8. WHO (World Health Organization), 2004. First Report of Expert the WHO Consultation on Rabies: *TechnicalReport Series* 931. Geneva, Switzerland.
9. Lai, P., A. Rawat, A. Sagar and K. N. Tiwari, 2005. Prevalence of dog-bites in Delhi: Knowledge, attitude and practices of residents regarding prevention and control of rabies. *Health and Population Perspective andIssues,* **28**: 50-57.
10. Sudarshan, M. K., S. N. Madhusudana, B. J. Mahendra, N. S. N. Rao, D. H. Narayana, S. AdbulRahman and K. Gangaboraiah, 2007. Assessing the burden of human rabies in India: A result of a national multi-centre epidemiological survey. *International Journal of Infectious Diseases*, **11**: 29-35.
11. Eshetu, Y., N. Bethlehem, T. Girma, M. Yared and B. Yoseph, 2000. Situation of rabies in Ethiopia: A retrospective study 1990–2000. Ethiopian J. of health develop.,**16**:105-112.
12. Nilsson, M., 2015. Effect of rabies education programs on rabies awareness, attitudes towards Dogs and animal welfare among children in Lilongwe, Malawi. https://stud.epsilon.slu.se/6516/7/nilsson-m-

140320.pdf.
13. Moges, N., 2015. Rabies in Ethiopia: Review Article. *Academic J. Anim. Sci.***4**(2): 74-81.
14. Kloos, H. and Y. Berhane, 2006. Zoonotic diseases of public health importance. Epidemiology and Ecology of Health and Diseases in Ethiopia. 1st edition. Addis Ababa: Shama books, 692-700.
15. CDC (Center for Disease Control), 2008. Centre for disease prevention and control: Human rabies prevention united states recommendations of the advisory committee on Immunization practices. MMWR Rec. Rep; **57**: 1-28.
16. Ali, A., F. Mengistu, K. Hussein, G. Getahun, A. Deressa, E. Yimer and K. Tafesse, (2010): Overview of rabies in and around Addis Ababa, in animals examined in EHNRI zoonosis laboratory between, 2003 and 2009. *Ethiop. Vet. J.,***14**(2): 91-101.
17. WHO (World Health Organization), 2023. Neglected tropical diseases. World Health Organization (WHO). Retrieved from https://www.who.int/health-topics/neglected-tropical-diseases#tab=tab1.
18. Zulu, G., C. Sabeta and J. V. R. Nell, 2009. Molecular epidemiology of rabies: focus on domestic dogs (Canisfamiliaris) and black-backed jackals (Canismesomelas) from northern South Africa. *Virus Res*, **140**(1-2):71-78.
19. Yimer, E., A. Mesfin, M. Beyene, A. Bekele, G. Taye, B. Zewdie and T. Alemayehu, 2012. Study on knowledge, attitude and dog ownership patterns related to rabies prevention and control in Addis Ababa, Ethiopia. Ethiopian Veterinary J. **16**: 27-39.
20. Bona District Agricultural Statistically Data (BDASD), 20123. Agricultural sample survey report on livestock and livestock characterstics (private peasant holdings). Statistical bulletin 570, Addis Ababa, Ethiopia.
21. Thrusfield, M., 2018. *Veterinary Epidemiology, 4rd Ed.* Black well Science Ltd, London, UK.
22. Abera, G., N. Kumar, T. Gebrewahd and H. Yizengaw, 2016. Study on assessment of community awareness towards common zoonotic diseases in and around Asella, eastern arsi zone, Ethiopia. International Journal of Livestock Research, **6**(5): 83-90.
23. Ali, A., E. Y. Ahmed and D. Sifer, 2013. A study on knowledge, attitude and practice ofrabies among residents in Addis Ababa, Ethiopia. Ethiop Vet. J., **17**: Pp 19-35.
24. Hagos,W. G., K. F. Muchie, G. G. Gebru, G. G, Mezgebe, K. A. Reda and B. A. Dachew, 2020. Assessment of knowledge, attitude and practice towards rabies and associated factors among household heads in Mekelle city, Ethiopia, BMC Public Health, **20**(1): 1-7.
25. Adanech, A. G., 2024.Assessment of Knowledge, Attitude and Practice (KAP) on Rabies among residents in and Around Asella Town, Arsi Zone, Ethiopia. Intern. J. of Basic and Applied Virolog.,**13**(1): 20-31.
26. Ichhpujani, R.L., M. Chhabra, V. Mittal, D. Bhattacharya, J. Singh and S. Lal. S., 2006. Know ledge, attitude and practices about animal bites and rabies in general community a multi- centric study. The Journal of Communicable Diseases, **38**(4): 355-361.
27. Brooks, R., 2007. Survey of the dog population of Zimbabwe and its level of rabies vaccination. The Veterinary Record, **127**(24):592-596.
28. Nejash, A., M. Boru, J. Jemal and A. Wezir, 2017. Knowledge, attitudes, and practices towards rabies in Dedo district of Jimma zone, southwestern Ethiopia: A community-based cross-sectional study. *Int. J. Med. Med. Sci.,* **9**(5): 61-71.
29. Digafe, R.T., L. J. Kifelew and A. F. Mechesso, 2015. Knowledge, attitudes and practices towards rabies: questionnaire survey in rural household heads of Gondar Zuria District, Ethiopia. BMC Research Notes, **8**(1): 1-7.
30. Yalemebrat, N., T. Bekele and M. Melaku, 2016. Assessment of public knowledge, attitude and Gondar, Ethiopia. Journal of Veterinary Medicine and Animal Health, **8**(11): 183-192.
31. Fami, A., B. B, Abebe, A. Takeleand L. A. Solomon, 2024.Assessment of community knowledge, attitude, and practice towards rabies and its determinants in Kersa District,

East Hararghe Zone, Oromia Region, Ethiopia. *Vet. J., **28** (1), 15-35.*
32. Singh, U.S. and S. K. Choudhary, 2005. 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 J. of Community Medicine, **30**(3): 81.-83.
33. Jemberu, W.T., W. Molla, G. Almaw and S. Alemu, 2013. Incidence of rabies in humans and domestic animals and people's awareness in North Gondar Zone, Ethiopia, PLoS neglected Tropical Diseases, **7**(5): 22-16.
34. Hunde, W., A. Alemitu and G. U. Jemal, 2023. Knowledge, Attitude and Practice on Rabies in and Around Mendi Town, West Wollega, Oromia, Ethiopia.Clin. Res. Anim. Sci. **3**(1).
35. Gemechis, B. and F, Baisa, 2022. Assesment of Community Knowledge, Attitude and Practice on Rabies in Nejoworeda, Oromia region, Ethiopia. archives of veterinary and animal sciences, **4**(2).
36. Kidane, A., D. Sefir, T. Bejiga and A. Pal, 2016. Rabies in Animals with emphasis on dogs and cats in Ethiopia. World Vet. J., **6**(1):123-129.
37. Widyastuti, M. D. W., K. L. Bardosh, C. Basri, E. Basuno, A. Jatikusumah, R. A. Arief, A. A. G. Putra, A. Rukmantara, A. T. S. Estoepangestie, I. Willyanto and I. K. G. Natakesuma, 2015. On dogs, people and a rabies epidemic: results from a sociocultural study in Bali, Indonesia. Infectious Diseases of Poverty, **4**(1): 1-18.
38. Matibag, G.C., Y. Ohbayashi, K. Kanda,H. Yamashina, W. B. Kumara, I. G. Perera, D. N. Silva, G. P. D. S. Gunawardena, A. Jayasinghe, R. A. Ditangco and H, Tamashiro, 2009. A pilot study on the usefulness of information and education campaign materials in enhancing the knowledge, attitude and practice on rabies in rural Sri Lanka. The J. of Infect. In Develop.Countries, **3**(1): 55-64.
39. Chernet, B. and A. Nejash, 2016. Review of Rabies Control and Prevention Journal of Medicine, Physiology and Biophysics, **23**: 45-53.
40. Abdela, N. and E. Teshome, 2017. Community based cross-sectional study on knowledge, attitudes and practices towards rabies in Munesa District, Arsi Zone, South-Eastern Ethiopia. J. of Public Health and Epidemiology, **9**(6): 161-170.
41. Sambo, M., T. Lembo, S. Cleaveland, H. M. Ferguson,L. Sikana and C. Simon, 2014.Knowledge, attitudes and practices (KAP) about rabies prevention and control:a community survey in Tanzania, PLoS Neglected Trop. Dis. **8** (12).
42. Chhabra, M. and R. L. Ichhpujani, 2003. Animal bites: the current management guidelines. Indian J. of Pediatrics, **70**(1): 11-6.
43. Adane, B., M. Wassie, Y. Liuel, A. M. Sefinew and T. J. Wudu, 2022. Knowledge, attitude and practice related to rabies among residents of Amhara region, Ethiopia.The Authors Published by Elsevier. J.homepage.,**8**(3).
44. Palamar, M. B., M. N. Peterson, C. S. Deperno and M. T. Correa, 2013. Assessing Rabies Knowledge and Perceptions Among Ethnic Minorities in Greensboro, North Carolina. The Journal of Wildlife Management, **77**(7): 1321-1326.
45. Yergashewa, M., M. Nibret and Z. Mebrie, 2016. Study on the Knowledge, Attitude and Practice of the Community about Rabies in Hawassa Town, Southern Ethiopia. Middle-East Journal of Scientific Research, **24**(8): 2538-2546.
46. Abdela, N., B. Midekso, J. Jabir and W. Abdela, 2017. Knowledge, attitudes and practices towards rabies in Dedo district of Jimma zone, Southwestern Ethiopia: A community based cross-sectional study. International Journal of Medicine and Medical Sciences, **9**(5): 61-71.
47. Jemal, G., K. Friat and F, Haben, 2020. Assessment of Community Knowledge, Attitude and Practice towards Rabies in Mersa Town, Amhara Regional State, Ethiopia. Research Studies in Microbiology and Biotechnology (IJRSMB).Volume **6**(2): 6-13.

48. Hankins, D.G. and J. A. Rosekrans, 2004. Over view prevention and treatment of rabies. In Mayo Clinic Proceedings, **79**(5): 671-676.
49. Knobel, D.L., S. Cleaveland, P. G. Coleman, E. M. Fèvre, M. I. Meltzer, M. E. G. Miranda, A. Shaw, J. Zinsstag and F. X. Meslin, 2005. Re-evaluating the burden of rabies in Africa and Asia. Bulletin of the World Health Organization, **83**: 360-368.
50. Masiira, B., I. Makumbi, J. K. B. Matovu, A. R. Ario, I. Nabukenya and C. Kihembo, 2018. Long term trends and spatial distribution of animal bite injuries and deaths due to human rabies infection in Uganda, 2001-2015, PLoS One **13**(8).
51. Rupprecht, C., C. Hanlon and T. Hemachudha, 2002. Rabies re-examined. Lancet Infectious Disease, **2**: 327-43.
52. Permpalung, N., S. Wongrakpanich, S. Korpaisarn, P. Tanratana and J. Angsanakul, 2013. Trend of human rabies prophylaxis in developing countries: **31**(38): 4079-4083.
53. Sohel, R. M .D., A. J. Afsana, S. M. GolamKaisar, R. S. Umme R, S. Subir, A. B. MstIsmat, G. Sumon, S. Sudeb, A. Be-Nazir and M. S. Abulkhair , 2021. Knowledge, attitudes and perceptions about rabies among the people in the community, healthcare professionals and veterinary practitioners in Bangladesh.J.homepage One Health
54. Gino, C., G. C. Matibag, K. Taro, V. R. Pallegoda, G. Thula, W. Anil, D.R..Kalupahana and H, Tamashiro, 2007. Knowledge, Attitudes, and Practices Survey of Rabies in a Community in SriLanka. Environmental Health and Preventive Medicine, **12**: 84–89.
55. Kabeta, T., W. Tigre and B. Deressa, 2014. Occurrence of suspected rabies cases in humans Jimmazone and surrounding areas, south West Ethiopia. International J. of Basic and Applied Virology, **3**(2): 28-34.
56. Helao, M., E. H. Hikufe, C. M. Freuling, R. Athingo, A. Shilongo and E. E. Ndevaetela, 2019. Ecology and epidemiology of rabies in humans, domestic animals, and wildlife in Nami bia, 2011-2017. *PLoS. Negl. Trop. Dis.***13**(4).
57. Wakgari, M., G. Getachew, G. Van'tKlooster, T. Nega, F. Kivaria and C. Bebay, 2022. Participatory epidemiological study on the burden of rabies in animals and humans in three districts of BunoBedele Zone, West Ethiopia. Vet. J., **26** (2): 93-106.
58. Yizengaw, E., T. Getahun, W. Mulu, M. Ashagrie, I. Abdela and M. Geta, 2018. Incidence of human rabies virus exposure in northwestern Amhara, Ethiopia. BMC Infectious Diseases, **18**(1): 1-7.
59. Serebe, S. G., K. A. Tadesse, H. A. Yizengaw and S. M. Tamrat, 2014. Study on community knowledge, attitude, and practice of rabies in and nearby Gonda town, Northwest Ethiopia. *J. Public Health Epidemiol.,*6(12), 429-435.
60. Gebeyaw, S. and D. Teshome, 2016. Study on community knowledge, attitude, and practice of rabies in and around Dessie City. *Austin J. Vet. Sci. Anim. Husb.,* **3**(1): 1020.
61. Bhalla, S., J. P. Mehta and A. Singh, 2005. Knowledge and practice among general practitioner of Jamnagar city regarding animal bite. Indian J. Commun. Med., **30**: 94–96.
62. Nejash, A. and T. Endale, 2017: Community based cross-sectional study on knowledge, attitudes and practices towards rabies in Munesa District, Arsi Zone, South-Eastern Ethiopia. J. of Public Health and Epidemiology, **9**(6): 161-170.
63. Dabuma,T., T. Kabeta and HM. Mengist, 2017. Assessment of Basic Knowledge, Attitude and Practice of Community on Rabies and Retrospective Survey in and around Ambo Town, West Shoa Zone of Ethiopia. J. Med. MicrobDiagn**20**: 263.
64. Carter, J. B. and V. A. Saunders, 2007. Virology: Principles and applications. John Wiley and Sons Ltd, England, UK. Pp 175-184.
65. Fekadu, M., T. Endeshaw, W. Alemu, Y. Bogale and T. Teshager, 1996. Possible human-to-human transmission of rabies in Ethiopia. Ethiop. Med. J. **34**: 123-127.
66. WOAH (World Organization for Animal Health), 2022. Rabies. One Health, Zero Deaths. Africa Rabies Webinar (World Rabies Day). World Organization for Animal Health

(WOAH). Paris, France. Retrieved from https://www.woah.org/en.
67. Hampson, K., F. Ventura, R. Steenson,R. Mancy, C. Trotter and L. Cooper, 2019. The potential effect of improved provision of rabies post-exposure prophylaxis in Gavieligible countries: a modelling study, Lancet Infect. Dis. **19** (1):102-111

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DOI:10.22192/ijarbs.2026.13.04.007	

How to cite this article:
Tamirat Demissie Walelign. (2026). Assessment of Community Knowledge, Attitude, and Practice towards Rabies in Bona-Zuria District, Eastern Zone of Sidama Region, Ethiopia. Int. J. Adv. Res. Biol. Sci. 13(4): 65-84.
DOI: http://dx.doi.org/10.22192/ijarbs.2026.13.04.007