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ORIGINAL ARTICLE

Assessment of Community Awareness towards Common Zoonotic Diseases and Attitude to one Health Approach in Shalla District, West Arsi Zone, Ethiopia

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ABSTRACT
A total of 404 study participants, selected purposively, cross-sectional questionnaire survey was performed from a period, September 2019 to March 2020. Farmers, students, butchers, restaurant workers, medical professionals and veterinarians were included. The study was undertaken to evaluate community`s awareness towards common zoonotic diseases and their attitude to One Health approach in and around Shalla District, West Arsi Zone, Ethiopia. 92.07% (372/404) of study respondents were heard about zoonosis. Diseases mentioned were rabies (80.9%), anthrax (48.5%), taeniasis (37.1%), corona virus (27.7%), bovine tuberculosis (26.2%),ebola virus (25.2%), brucellosis (21.02%) and echinococcosis (20.04%). 92.8% and 24.35%of respondents aware the transmission of the disease from animal to human and human to animal, respectively. Modes of transmissions mentioned includes, dog bite (89.1%), ingestion (70.5%), inhalation (38.6%), contact (26.2%), and vector born (17.8%). 81.7% of participants know that the disease could be acquired from diseased animal food products such as meat (70.8%) and milk (32.7%). 20.04% of participants aware about echinococcosis, which was low compared to other disease.80.7% and19.3% of participants had positive and negative attitude on One Health approach, respectively. Statistically insignificant difference in the level of awareness about One Health approach in age classifications (P=0.232) was recorded. However, statistically significant difference (P<0.05) in sex (P=0.013), education level (P=0.001) and profession (P=0.001) were recorded. Education through awareness creation and inter-disciplinary one health approach among veterinarians, public health practitioners and policy makers should be undertaken in order to improve recent low level of public awareness about zoonotic diseases.
Key words: *Attitude, Awareness, Community, One Health, Shalla, Zoonotic Diseases*

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INTRODUCTION

Based on Central Statistical Agency report in 2017, Ethiopia, country found in east Africa, is known to have a large number of animal populations, first from Africa and tenth from the world. The agency reported, 55.02 million cattle's, 27.35 million sheep's, 28.16 million goats, 1.1 million camels, 1.96 million horses, 6.95 million donkeys, 0.36 million mules, 51.35 million poultry and 5.05 million beehives were mentioned to be found in Ethiopia [1]. In most developing countries, the association between animals and their owners are tight [2] and there is also a circumstance in which animals and humans live in the same house without separate area. If there is no appropriate care in such conditions, there could be a serious public health hazard to the communities and then huge economic crisis in the country will be followed [3].

According to World Health Organizations (WHO) explanations regarding to Zoonoses, disease can be said to be zoonosis if it can be naturally transmitted from humans to animals and also from animals to humans [3]. Some diseases which are caused by viruses, bacteria, fungus, parasite and prion diseases are zoonotic. To mention some of them: 1) Viruses: Ebola virus, rabies virus, corona virus [4]. 2). Bacteria: anthrax,

brucellosis, Bovine tuberculosis [5] and also some fungal, parasitic diseases (echinococcosis, Hydatidosis, Cysticercosis, Taeniasis, Toxoplasmosis and prion diseases [6]. Different wild life animals, livestock, pet animals (cat, dog) and birds are known to be animal reservoirs in the transmission life cycle [7]. Transmissions of these diseases can be occurred via direct contact with the diseased animal, vectors including fleas, ticks and food and water contamination by diseased animal. These risk factors play an important role in the transmission of diseases from diseased animals to the apparently healthy animals [7, 8].

According to World Health Organizations (WHO) report, from all infectious disease pathogens that exist in nature, zoonosis diseases account above 60 percent. It also accounts around seventy five percent from emerging pathogens that exist all over the world [3,9].So attention should be needed for prevention and control of zoonotic diseases. Previously and also currently, the world is experiencing an emergency of new zoonotic diseases [10]. As different researchers reported, in both emerging and reemerging diseases, disease transmission route due to vector is becoming an important aspect [11].

Mostly bioterrorists use zoonotic agents, around 80 percent, as a terror mechanism to kill/infect different peoples, leaders and target groups in the world [8,12]

Prevention and control of zoonotic diseases are difficult because of shortages of different resources combined with multiple factors, which are responsible in zoonotic diseases life cycle. These problems are solved by creating awareness in a communities and genuinely facilitating cooperation between different stakeholders including veterinarians, medical doctors and agricultural personnel's. In this case, one health approach should be remembered [3, 13]. Different diseases which have public health significance can have an effect in the country's economy. If one country had higher prevalence of zoonotic diseases, different countries are not willing to import animal products from this country. Additionally, the country exports with cheap cost even if they eradicate the public health important diseases [14, 15].

Zoonotic diseases have been causing different impacts to the wellbeing of individuals. Millions of peoples have died due to zoonotic diseases, from which most of them are children's and adults. Annually mortality of peoples due to zoonotic diseases is increase [3, 9]. Susceptibility of populations by zoonotic diseases can be increased by different factors. Natural and human made factors, increment of population, migration of peoples from rural to urban areas are an important factor that increases the susceptibility of peoples in zoonotic diseases [8,9].Factors that are associated with high prevalence of zoonotic diseases in developing countries includes: life style, educational status, culture of food habit, lack of awareness and presence of high number of reservoir animal in developing countries [16].World Health Organization has reported that among zoonotic diseases present in nature, rabies virus are still uncontrolled and leading to death of higher number of peoples globally [3,17]. Therefore, attention must be given by all stakeholders in order to prevent and control this hazardous disease [10,13].

Researchers all over the world have been working and studying the prevalence of zoonotic diseases so far in different parts of the world [15]. In Ethiopia, different researchers are reported prevalence's of zoonotic diseases in different areas of the country. To mention prevalence of 2.93% (*Taenia saginata*) and 31.44% (hydatidosis) reported in and around jimma area by Tolosa et al. [18]. The concept about zoonotic diseases was heard by 76.8% of respondents in dodola as Gezmu *et al*. [19] reported. According to report of Hiko *et al*., [13] in Bahirdar, respondents listed rabies, anthrax, taeniasis, bovine tuberculosis and brucellosis,68.8%, 50.8%, 53.1%, 49.5%, and 22.7%, respectively as zoonotic diseases that they heard/know. In India, Andra Pradesh, Out of all study participants, 28.06% peoples responded that they are aware of zoonotic diseases as reported by Babu *et al*., [8].

In order to guide and control different kinds of infectious emerging diseases, presently the world is giving attention to the cooperative work of different professionals for common benefit [20]. One health approach refers to cooperation of different stakeholders i.e. human, animal and environmental health professionals for prevention and eradication of different zoonotic diseases which indirectly leads to reduction of mortalities and health risks happening due to those diseases [21,22]. This can be accomplished if the government supports and gives attention to the animal health and human health sectors [10,23].

If the communities aware about zoonotic disease, it can help for accurate and timely distribution of information [3,24], which also aids in the prevention and control of diseases. It is important to give or create awareness in communities to prevent the risk, mortality and safety of the community. Additionally, it could support the economy of the country by export of different animal products which indirectly solves the shortage of currency in many developing countries [10,24]. There are few studies conducted on the awareness and knowledge of communities in zoonotic diseases in Ethiopia. There are a lot of endemic animal diseases in shalla district, west arsi zone of Oromia regional state, Ethiopia. However still there

was no any study performed on the assessment of community awareness towards common zoonotic diseases and people's perception about one health approach.
Therefore, this study was performed with the aim of assessing community awareness towards common zoonotic diseases and their attitude on One Health approach in Shalla district, West Arsi Zone, Oromia Regional State, of Ethiopia.

MATERIAL AND METHODS

Study area

The study was carried out in Shalla District, West Arsi Zone, Oromia Regional State, of Ethiopiafrom September 2019 to March 2020. Shalla District is found in west arsi zone of oromia regional state andbordered on south by siraro district, on west by the Southern Nations and Nationalities and Peoples Region, on the north by Lake Shalla which separates it from Negelle Arsi, and on the east by Shashemene Zuria. Lake Shalla, which is the deepest lake (257m) and the largest crater, was found in shalla district. The administrative center of this District is Aje town. It is situated about 32km from Shashemene and 272 Km south of capital city Addis Ababa, and located at an average elevation of ranging 1000-2300 meters above sea level. The Shalla district is composed of 40 village administrations (Kebele) out of which 38 of them are rural kebeles while 2 of them are town administrations (Aje 01 and Senbeteshalla) [25].The district is categorized by bi-modal rainfall which comes from long and short rainy seasons. The average minimum and maximum annual temperature ranges between 14.4°C and 26.7°C, respectively. The district gets annual mean rainfall ranging from 1000 to 1200 mm [25].The 2007 national census reported a total population of 149,804. Farming is the major livelihood of the community. Cultivation of maize and teff are the major means of subsistence as well as source of income for families [25].

Study Design

A questionnaire based cross-sectional study with purposive sampling method was employed during assessment. Semi structured questionnaires supplemented with face-to-face interview were administered to 404 study participants approached to assess their awareness towards zoonotic diseases and their attitude to One Health approach. Firstly, the questionnaire was pretested to assess simplicity and time requirements by farmers attending Shalla District Veterinary Clinic in Aje town, and adjusted in line with comment from the pre-test.

Study population

The study populations were residents of Shalla District and its surroundings who have contact with animals and animal origin. The study units was selected using purposive sampling techniques based on their interest to be included in the study, animal ownership, contact with animal and consumption practice of animal origin foods. Thus, the farmers, butchers, teachers, students, office workers, merchants, health workers, veterinarians and restaurant workers were included.

Sample size determination

Since there was no study conducted previously on assessment of community awareness towards common zoonotic diseases and attitude to One Health approach in Shalla District, the desired sample size was estimated by expecting 50% of population could have knowledge, attitude and practice towards common zoonotic diseases and have positive attitude towards One Health approach. Thus, the sample size was calculated according to Thrusfied [26] using 95% confidence interval and 0.05 absolute precision.

$$N = 1.96^2 \times (1\text{-}pexp)/d^2$$

Where: n = required sample size; Pexp= expected prevalence d= desired absolute precision. Hence, by using this formula, the sample size was calculated to be 384 where 5% was added in case if some may fail to respond. The final sample was 404 individuals.

Data collection methodology

A semi-structured questionnaire was pre-tested and used for the face-to-face interview to evaluate the awareness of the community about the common zoonotic disease and attitude on One Health approach. The questionnaire were first developed in English and then translated in to the local language Afan Oromo for appropriateness and easiness in approaching the study participants. The questionnaire contains questions that can evaluate demographic characteristics (age, sex, education level, profession and occupation). On average, 10 minutes were spent with each respondent.
The farmers included in the study were purposively selected from six kebeles (Kerensa kubi, Awara Gama, Ore shibibo, Lalle, Albula Geto, Lajo Kertefa and Aje 01) of Shalla District and practice mixed crop-livestock production system. In addition, the respondents were also asked questions regarding the use of traditional medicines for the treatment of zoonotic diseases in their area. They were also asked if they had faced anyone infected or had died of zoonotic diseases. Post interview, scientific based risk of zoonosis and role of One Health in the livelihood were presented to participants.

Study procedure

This questionnaire based cross-sectional study was carried out from September 2019 to March 2020. An approval letter was sent from the Haramaya University, College of Veterinary Medicine to the Shalla district administration office, who were able to approve the study.

Ethical approval

Ethical clearance was obtained from Haramaya University, College of Veterinary Medicine Ethical Committee. All participants were notified about the objective and techniques of the study, and also the involvement were on voluntary basis. Principles and guidelines set in the World Medical Association declaration of Helsinki concerning ethical principles for medical research involving human subjects were followed [28].

Data Collection and Analysis

The data was collected, coded and entered into a spread Excel 2016 and double checked against paper copies for possible data entry errors. Percentages were calculated using SPSS Version 20. Chi square and p-value were also calculated. The knowledge of the importance of major zoonotic diseases was presented in the form of binary variable (Yes=1 and No=0) and taken as the dependent variable, while occupation, sex, and level of educations were taken as explanatory variables. A P-value <0.05 was considered to represent a significant difference.

RESULT

Socio-demographic characteristics of respondents

A total number of 404 respondents (164(40.6%) respondents from urban and 240(59.4%) from rural areas) were selected purposively and supplied to fill the questionnaire and interviewed. Participants selected from rural residents were people living in Peasant associations of shalla district and villages surrounding Aje town, the administrative center of Shalla district and mixed crop-livestock production system was practiced by majority of peoples. Butchers, Drivers, Bank employees, Office workers and City residents were reside in Aje town. Males accounted for 63.4% (256) and 36% (148) of females the respondents. The highest numbers of respondents were in age group 31 to 50 years. Educational status and occupation of the study participants were recorded properly (Table 1).

Community attitude toward one health approach

According to the present finding, participants of the study having age between 21-30 years had more positive attitude 123(87.2%) on cooperative working of veterinarians and human health professionals than other age groups included in the study. Depending on educational status, participants having above first degree had more positive attitude (100%) than other participants having below first degree education. About 82.03% of male, 78.4% of female, 84.1% of urban, 78.3% of rural residents had positive attitude towards One Health approach. Regarding to profession, Medical professionals had the highest awareness/attitude (95.4%) towards cooperative working of veterinarians and human health workers. Generally, from all participants included in the study, the majorities (80.7%) had positive attitude towards cooperative working of veterinarians and human health workers. Statistically significant difference ($P<0.05$) was obtained on attitude of community towards one health approach in sex ($P=0.013$), educational status ($P=0.001$) and professions. ($P=0.001$). However, statistically insignificant difference ($P>0.05$) was obtained among age groups ($P=0.232$).(Table 1).

Regarding to knowledge assessment of the respondents, the present study indicated statistically significant difference ($P<0.05$) on knowledge of the respondents among urban and rural areas. From 404 study participants, majority of them (92.07%) were heard about zoonosis with significantly ($P<0.05$) higher in urban area (67.2%) than rural areas (32.8%). The study participants got information about zoonotic diseases from mass-media only (4.5%), electronic media only (1.5%), family and friends only (30.9%), school and teachers only (19.3%), written materials only (1.9%), more than one sources (33.9%). However, 7.9% of respondents never heard about zoonosis. Our result showed that majority of the respondents get information about zoonotic diseases from family and friends as well as from school or more than one sources (Table 2).

Table 1: Results showing attitude of the study area communities on one health approach

Variables	No. of respondents	Attitude on One Health Program		Chi-square(χ2)	P-value
		Positive	**Negative**		
Sex					
Male	256	210(82.03)	46(17.9)	4.12	0.013
Female	148	116(78.4)	32(21.6)		
Age					
10-15	15	9(60)	6(40)		
16-20	33	25(75.7)	8(24.2)	5.15	0.232
21-30	141	123(87.2)	18(12.7)		
31-50	203	159(78.3)	44(21.7)		
above 50	12	10(83.3)	2(16.7)	3.14	0.015
Residence					
Urban	164	138(84.1)	26(15.8)		
Rural	240	188(78.3)	52(21.7)		
Educational level					
Illiterate (cannot read and write)	25	15(50)	10(40)	38.77	0.001
Primary school					
Secondary school	72	41(56.9)	31(43.06)		
College	61	47(77.04)	14(22.9)		
First Degree	132	112(84.8)	20(15.1)		
Above First Degree	110	107(97.3)	3(2.7)		
Occupation	4	4(100)	0(0.0)		
Farmer					
Student	120	77(64.2)	43(35.8)		
Restaurant worker	46	41(89.1)	5(10.9)	39.01	0.001
Butcher	15	12(80)	3(20)		
Medical professional	10	9(90)	1(10)		
Veterinarian	22	21(95.4)	1(4.5)		
Driver	20	19(95)	1(5)		
Day labor	7	5(71.4)	2(28.6)		
Bank employee	25	19(76)	6(24)		
Private employee	5	4(80)	1(20)		
Merchant	34	30(88.2)	4(11.8)		
Teacher	40	34(85)	6(15)		
Office worker	20	18(90)	2(10)		
	40	37(92.5)	3(7.5)		
Total	**404**	**326(80.7)**	**78(19.3)**		

Table 2: Knowledge Assessment of the Study Participants (n=404)

Categories	No of respondents		Total	P-value
	Urban	**Rural**		
Heard about zoonotic disease?				
Yes	250(67.2)	122(32.8)	372(92.07)	
No	11(34.4)	21(65.6)	32(7.9)	0.001
Source of information				
Mass-media	13(72.2)	5(27.8)	18(4.5)	
Electronic media	5(83.3)	1(16.7)	6(1.5)	
Family and friends	62(49.6)	63(50.4)	125(30.9)	0.023
School and Teachers	40(51.3)	38(48.7)	78(19.3)	
Written materials	5(62.5)	3(37.5)	8(1.9)	
More than one sources	96(70.07)	41(29.9)	137(33.9)	
Not heard about zoonosis	11(34.4)	21(65.6)	32(7.9)	
Zoonotic disease they heard?				
Rabies	192(58.7)	135(41.3)	327(80.9)	
Tuberculosis	72(67.9)	34(32.07)	106(26.2)	
Taeniasis	96(64)	54(36)	150(37.1)	
Anthrax	113(57.6)	83(42.3)	196(48.5)	
Brucellosis	63(74.1)	22(25.9)	85(21.03)	0.001
Ebola Virus	86(84.3)	16(15.7)	102(25.2)	
Corona Virus	91(81.3)	21(18.8)	112(27.7)	
Echinococcosis	43(53.08)	38(46.9)	81(20.04)	

About 80.9% respondents had heard about zoonotic nature of rabies. Most of them mentioned dog bite as a means of transmission of rabies.26.2% of respondents heard about tuberculosis. About only 18% respondents were recognized transmission of tuberculosis from cattle to human. From 404 respondents selected, 48.5% heard about anthrax. However, Only 21.03% of study participants aware about modes of transmission of the disease.Only 21.03% respondents were aware about zoonotic nature of brucellosis.

They mentioned abortion occurred at 3rd trimester were due to brucellosis. The overall proportion of respondents having knowledge of taeniasis as a zoonotic disease was 37.1%. Only 25% of respondents knew modes of transmission of taeniasis. Echinococcosis was reported only by 20% (81/404) of interviewed persons as a zoonotic disease transmitted from dogs to humans. From 404 study participants, 27.7% was heard about zoonotic nature of Corona Virus. From those heard, all of them knew the modes of transmission. About 25.2% respondent knew that Ebola virus can be transmitted from animal to human. 19.8% respondents know modes of transmission of the disease.

The present finding indicated that from 404 study participants selected, 35.9%, 4.9%, 63.1%, 17.07%, 17.3%, 39.8%, 21.03% and 47.5% of the sample under study had no information about zoonotic nature of Bovine Tuberculosis, Rabies, Brucellosis, Taeniasis, Corona, Ebola, Anthrax and Echinococcosis, respectively (Table 3). From 404 study participant's majority of participants which had university degree had more awareness regarding to zoonotic nature of the diseases, modes of transmission and signs of the disease. There was a significant difference ($P<0.05$) on the level of awareness among the different respondents which had different educational level.

Table 3: Awareness of communities on zoonotic diseases based on educational level (n=404)

		Education status				Total
		Elementary	**High school**	**Preparatory**	**University Degree**	
Bovine Tuberculosis	Don't know	80(55.2)	33(22.7)	22(15.1)	10(6.8)	145(35.9)
	Only heard of	0(0.0)	1(0.9)	27(25.4)	78(73.6)	106(26.2)
	Know mode of transmission	5(6.8)	8(10.9)	15()	45(61.6)	73(18)
	Know the signs	2(2.5)	10(12.5)	23(28.7)	45(56.3)	80(19.8)
Rabies	Don't know	12(60)	6(9)	2(10)	0(0.0)	20(4.9)
	Only heard of	17(5.2)	71(21.7)	95(29.05)	144(44.03)	327(80.9)
	Know mode of transmission	2(8)	3(12)	5(20)	15(60)	25(6.2)
	Know the signs	3(9.4)	4(12.5)	7(21.9)	18(56.25)	32(7.9)
Brucellosis	Don't know	149(58.4)	55(21.6)	32(12.5)	19(7.4)	255(63.1)
	Only heard of	1(1.2)	15(17.6)	23(27.05)	46(54.1)	85(21.03)
	Know mode of transmission	0(0.0)	8(21.6)	11(29.7)	18(48.6)	37(9.1)
	Know the signs	0(0.0)	7(25.9)	8(29.6)	12(44.4)	27(6.6)
Taeniasis (CysticercusBovis)	Don't know	32(46.4)	15(21.7)	12(17.4)	10(14.5)	69(17.07)
	Only heard of	2(1.3)	15(10)	35(23.3)	98(65.3)	150(37.1)
	Know mode of transmission	0(0.0)	19(18.8)	32(31.7)	50(49.5)	101(25)
	Know the signs	0(0.0)	15(17.9)	22(26.2)	47(55.9)	84(20.8)
Corona Virus	Don't know	27(38.6)	19(27.1)	15(21.4)	9(12.8)	70(17.3)
	Only heard of	11(9.8)	19(16.9)	29(25.9)	53(47.3)	112(27.7)
	Know mode of transmission	10(9.09)	18(16.4)	29(26.3)	53(48.1)	110(27.2)
	Know the signs	11(9.8)	19(16.9)	29(25.9)	53(47.3)	112(27.7)
Ebola Virus	Don't know	93(57.7)	35(21.7)	21(13.04)	12(7.4)	161(39.8)
	Only heard of	4(3.9)	19(18.6)	27(26.5)	52(50.9)	102(25.2)
	Know mode of transmission	1(1.3)	11(13.7)	20(25)	48(60)	80(19.8)
	Know the signs	1(1.6)	6(9.8)	9(14.7)	45(73.7)	61(15.09)
Anthrax	Don't know	42(49.4)	28(32.9)	10(11.8)	5(5.8)	85(21.03)
	Only heard of	3(1.5)	14(7.1)	70(35.7)	109(55.6)	196(48.5)
	Know mode of transmission	0(0.0)	10(11.7)	27(31.7)	48(56.5)	85(21.03)
	Know the signs	0(0.0)	5(13.1)	12(31.5)	21(55.3)	38(9.4)
Echinococosis	Don't know	120(62.5)	44(22.9)	20(10.4)	8(4.2)	192(47.5)
	Only heard of	1(1.2)	11(13.6)	22(27.1)	47(58.02)	81(20.04)
	Know mode of transmission	0(0.0)	8(11.8)	15(22.05)	45(66.2)	68(16.8)
	Know the signs	0(0.0)	8(12.7)	15(23.8)	40(63.5)	63(15.6)

The findings of the current study indicated significant difference (P<0.05) in the attitude of the respondents among urban and rural area. About 92.8% [Urban (58.7%) and Rural (41.3%)] participants of the study had a perception of zoonotic disease transmission from animal to human and others (4.4%) did not have awareness about role of animal in transmission of zoonotic disease. Majority of participants responded inhalation (38.6%), ingestion (70.5%), contact (26.2%), dog bite (89.1%), and vector born (17.8%) as mode of transmission. Only one participant of the study responded that cause of zoonotic disease to be spiritual while 7.9% respondents did not knew the mode of transmission. Regarding to awareness about the animals that transmit disease to humans, majority responded pets (dogs and cats) (94.05%), sheep and goat (6.9%), equines (0.99%), pigs (0.7%) and poultry (0.5%) for transmission of disease to humans. 30.1% responded that more than one livestock species are responsible for transmission of disease from animals to humans(Table 4).

Table 4: Awareness Assessment of the Study Participants (n=404)

Categories	No of respondents		Total	P-value
	Urban	**Rural**		
Disease can transmit from animal to human?				
Yes	220(58.7)	155(41.3)	375(92.8)	
No	5(45.4)	6(54.5)	11(2.7)	0.001
Don't know	12(66.6)	6(33.3)	18(4.4)	
Disease can transmit from human to animals?				
Yes	47(47.9)	51(52.04)	98(24.3)	
No	70(57.4)	52(42.6)	122(30.2)	0.001
Don't know	86(46.7)	98(53.3)	184(45.5)	
Mode of transmission of zoonotic disease?				
Inhalation	88(56.4)	68(43.6)	156(38.6)	
Ingestion	170(59.6)	115(40.4)	285(70.5)	
Contact	82(77.3)	24(22.6)	106(26.2)	0.001
Dog bite	210(58.3)	150(41.7)	360(89.1)	
Vector born	31(43.05)	41(56.9)	72(17.8)	
Spiritual	0(0.0)	1(100)	1(100)	
Don't know	12(37.5)	20(62.5)	32(7.9)	
Which animal transmits disease to human?				
Cattle	66(44.6)	82(55.4)	148(36.6)	
Pets (dogs and cats)	192(50.5)	188(49.5)	380(94.05)	
Sheep and goat	12(42.9)	16(57.1)	28(6.9)	
Equines	1(25)	3(75)	4(0.99)	0.001
Pigs	2(66.7)	1(33.3)	3(0.7)	
Poultry	1(50)	1(50)	2(0.5)	
More than one animal	76(62.3)	46(37.7)	122(30.1)	
Don't know	12(37.5)	20(62.5)	32(7.9)	

From study participants, majority of them (81.7%) responded that disease could be acquired from contaminated or diseased animal food products among which meat (70.8%) and milk (32.7%) were mentioned. 21.3% respondents did not aware of whether food products spread disease or not. From all 404 study participants, 70.8% and 32.7% had awareness thatraw meat and milk could transmit zoonotic disease respectively. 33.2% and 7.9% respondents did not believe that milk and meat could transmit zoonotic disease, respectively(Table 5).

From the total 404 study participants selected, 77.2% responded that person affected by zoonotic disease can be treated and 63.8% participants believe that prevention of zoonotic disease can be possible. For the prevention of zoonotic diseases, 50% and 55.9% responded that it could be prevented by vaccinating animals and by consuming cooked animal products, respectively. Some responded hygiene and sanitation, (17.8%), creating awareness (19.5%), consuming inspected and treated animal products (9.1%) and isolation of diseased animals (6.9%) as measure for the prevention of zoonotic disease while 12.9% respondents have no idea about prevention of zoonotic diseases (Table 6).

Table 5: Awareness Assessment of the Study Participants (n=404)

Categories	No of respondents		Total	P-value
	Urban	**Rural**		
Food products from diseased animal lead to disease?				
Yes	216(65.4)	114(34.5)	330(81.7)	0.011
No	16(44.4)	20(55.6)	36(8.9)	
Don't know	21(55.3)	17(44.7)	38(9.4)	
Which food products spread disease?				
Meat	150(52.4)	136(47.5)	286(70.8)	
Milk	82(62.1)	50(37.9)	132(32.7)	
Egg	26(61.9)	16(38.09)	42(10.4)	0.021
Fish	24(63.2)	14(36.8)	38(9.4)	
Vegetable	4(66.7)	2(33.3)	6(1.5)	
Don't know	38(44.2)	48(55.8)	86(21.3)	
Consuming raw meat leads to zoonotic disease?				
Yes	170(53.1)	150(46.9)	320(79.2)	
No	12(37.5)	20(62.5)	32(7.9)	0.011
Don't know	14(26.9)	38(73.07)	52(12.9)	
Consuming raw milk leads to zoonotic disease?				
Yes	120(59.4)	82(40.6)	202(50)	
No	62(46.3)	72(53.7)	134(33.2)	0.011
Don't know	28(41.2)	40(58.8)	68(16.8)	

Table 6: Awareness Assessment of Study Participants (n=404)

Categories	No. of respondents		Total	P-value
	Urban	**Rural**		
Treatment for zoonotic disease?				
Yes	194(62.2)	118(37.8)	312(77.2)	0.001
No	15(50)	15(50)	30(7.4)	
Don't know	26(41.9)	36(58.06)	62(15.3)	
Prevention of zoonotic disease possible?				
Yes	158(61.2)	100(38.8)	258(63.8)	
No	18(37.5)	30(62.5)	48(11.8)	0.001
Don't know	30(30.6)	68(69.4)	98(24.3)	
Prevention method of Zoonotic disease?				
Vaccination of animals	138(68.3)	66(32.7)	202(50)	
Consuming well-cooked animal products	128(56.6)	98(43.4)	226(55.9)	
Hygiene and sanitation	40(55.6)	32(44.4)	72(17.8)	0.001
Creating awareness	43(54.4)	36(45.6)	79(19.5)	
Consuming inspected and treated animal products	24(64.9)	13(35.1)	37(9.1)	
Isolation of diseased animals	12(42.8)	16(57.1)	28(6.9)	
Don't know how to prevent	20(38.5)	32(61.5)	52(12.9)	

Table 7: Overall practice of the respondents (n=404)

Categories	No of respondents		Total	P-value
	Urban	**Rural**		
Consume meat frequently?				
Yes	172(46.5)	198(53.5)	370(91.5)	0.002
No	20(58.8)	14(41.2)	34(8.4)	
Source of meat?				
Hotel or Restaurant	170(80.9)	40(19.04)	210(51.9)	
Supermarket	0(0.0)	0(0.0)	0(0.0)	0.011
Slaughter at home	50(42.3)	68(57.6)	118(29.2)	
Group slaughter (Kircha)	56(48.7)	59(51.3)	115(28.4)	
Not eat	5(33.3)	10(66.7)	15(3.7)	
Consume raw meat?				
Yes	176(49.4)	180(50.5)	356(88.1)	
No	30(62.5)	18(37.5)	48(11.8)	0.011
Consume raw milk?				
Yes	164(43.9)	209(56.03)	373(92.3)	0.003
No	20(64.5)	11(35.5)	31(7.6)	

Regarding to assessment of general practice of study participants about Zoonosis**,** Many of them (91.5%) consume meat. Hotel/Restaurant (51.9%), slaughtered at home (29.2%) and group slaughter (locally ''Kircha'') (28.4%) were mentioned as a source of their meat market while 3.7% of respondents did not

consume meat and its products. Out of 404respondents, 88.1% and 92.3% respondents of the study area were consuming raw meat and milk respectively (Table 7).

DISCUSSION

The current study conducted in shalla district, Oromia regional state of Ethiopia, showed that greater part of respondents (92.07%) were heard about zoonoses which was significantly (P<0.05) higher in urban area (67.2%) than rural areas (32.8%). This finding indicates lower knowledge of communities on zoonotic diseases than previous report in other cities of Ethiopia. For instance, in Addis Ababa, capital city of Ethiopia, 100% respondents heard about zoonotic disease as reported by Girma *et al*. [29] and also in Yabello district, located in borena zone of southern Ethiopia, 98.2% respondents heard about zoonotic diseases [30]. Our findings have variation with previous studies conducted in the above two cities of Ethiopia; thiscould be due to difference in community's access to information about zoonotic diseases by different means. This finding is higher than the 76.8% reports of Gezmu *et al*., [19] in Dodola, West arsi zone, Oromia regional state of Ethiopia. The current study was in agreement with the findings of Abera *et al*., [31] and Zewdie *et al*., [30] who reported, 91.2%(Assela) and 98.2%(Yabello) of respondents were heard about zoonotic diseases, respectively.

Among respondents who had heard of zoonotic diseases, 4.5% got information from mass-media only, 1.5% from electronic media only, 30.9% from family and friends only, 19.3% from schools and teachers only, 1.9% fromwritten materials only and33.9% of respondents got information about zoonotic diseases frommore than one sources Majority of them got information about zoonotic diseases from family and friends, from school and from more than one sources. This finding is different from reports recorded by Amenu *et al*. [32] from Arsi-Negele district, west arsi zone, Ethiopia, who reported majority of respondents acquire information regarding to zoonotic diseases from elders (34.7%) and secondly fromtheir personal observation (32.7%). Another study conducted by Sisay*et al*., [33] in and around Addis Abeba, capital city of Ethiopia, reported majority of participants gain information from families in the form of advice (85.42%), which is in agreement with our findings. In contrast to our study, Kidane*et al*., [34] reported electronic media like radio and television as a major source of information among high school students in Addis Ababa, Ethiopia.

From 404 study participants, 80.9% of respondents heard about rabies, 26.2% heard about tuberculosis, 37.1% heard about taeniasis, 48.5% heard about anthrax, 21.03% heard about brucellosis, 25.2% heard about ebola virus, 27.7% heard about corona virus, 20.04% heard about echinococcosis while 7.9% of respondents did not heard about zoonosis.The majority of the respondents knew and aware of rabies (80.9%) which is in agreement with 100% the reports of Girma *et al*., [29], 88.7% report of Chikerema *et al*., [35], 97.1% report of Tesfaye *et al*., [10] and 94.7% report of Tirsit *et al*., [36] in different parts of Ethiopia. Rabies virus was recognized by most respondents of our study area. This could be due to high prevalence of rabies in the study area as a result most of them mentioned rabies as zoonotic disease. The present findings were also lower than the reports of Tesfaye *etal*., [10] on Taeniasis (83.4%) and anthrax (55.4%) in Jimma. On the other hand slightly similar findings were reported by Hiko *et al*., [13] on Taeniasis (36.1%), Echinococcosis (17.7%) and Tuberculosis (30.2%) in Bahir Dar, Gezmu *et al*., [19]reported respondents was heard about Brucellosis (22.7%) and Anthrax (50.8%) in Dodola, Abera *et al*., [31] reported on Taeniasis (33.2%), Rabies (83.4%) and Brucellosis (21.6%) in Asella, Chikerema *et al*. [35] reported on brucellosis (20.9%) in Zimbabwe, Tesfaye *etal*. [10]reported on bovine tuberculosis (29.1%) in Jimma, Kuma *et al*., [37]reported on rabies (83.3%), and brucellosis (22.1%) in Mana and Limmukosa Districts of Jimma Zone, South West Ethiopia and Tirsit *et al*. [36] on brucellosis (29.2%). This variation of reports could be due to difference between the community's living standard, educational level, communication and exposures. Different studies conducted in other parts of the world indicate that many infections and deaths of zoonotic diseases occur due to lack of awareness [15,38].

From respondents who had heard of zoonotic diseases, 25.2% heard about corona virus, which is higher than that of previous studies conducted in different parts of the world. It could be due to recent outbreak of the disease and rapid spread to most parts of the world including Ethiopia. However, most of respondents didn't know zoonotic nature of the disease. Most of study participants aware of clinical sign and mode of transmission of corona virus.Our study findings revealed that, echinococcosis (20.04%) were higher than the reports of Tesfaye *et al*. [10]in Jimma, on Echinococcosis (4%), Kebede *et al*. [39] and Zelalem [40] who indicated an awareness level of 0 and 8%, respectively. But lower than the reports of Tirsit *et al*. [36] in Jimma, which was 68.6%, Tigre [41] also reported that 32.2% of the study participants in Jimma zone had awareness about echinococcosis. The variation occurred as compared with our study could be due to the difference in the study groups. All of studies above mentioned are conducted only on

butchers and abattoir workers, who are familiar with the problem unlike our study groups which incorporates a variety of respondents.

Transmission of zoonotic diseases from animal to human was recognized by 92.8% respondents and others (4.4%) didn't have awareness about the role of animals in zoonotic disease transmission. This finding was higher as compared to the 81.6% report from Arsi Negele district, west arsi zone, Oromia regional state of Ethiopia by Amenu *et al.,* [32] and 15.6% responded from Mana and Limmukosa Districts of Jimma Zone, South West Ethiopia [37].The difference could be due to variation on educational status of the respondents. Slightly similar finding (93.2%) was reported by Abera *et al*., [31] in Asella, Arsi Zone, Ethiopia. Only 24.3% responded that, disease could transmit from human to animal which was slightly similar with reports of Abera *et al*., [31] in Asella, Arsi Zone, Ethiopia

Respondents were asked about the mode of transmission of zoonotic diseases. Majority responded dog bite (89.1%), ingestion (70.5%), inhalation (38.6%), contact (26.2%), and vector born (17.8%). This finding was in agreement with reports in Asella, Arsi zone, Ethiopia by Abera *et al*., [31] on inhalation (37.6%), ingestion (55.8%), contact (25.6%), dog bite (81.6%), and vector born (15.6%) as mode of transmission This finding was lower than reports of Kidane *et al*., [34] who reported inhalation (94.1%) and contact (52%) in Addis Ababa, Ethiopia and Gezmu *et al*., [19] who reported inhalation (45.1%) and contact (45.6%) in Dodola, Ethiopia, as modes of transmission of zoonotic disease. The variations in these findings show the presence of knowledge gap from place to place and between city and rural residents. Such variability could be due to the difference in the participants' educational status, their access to media and other public health information services and the prevalence of the diseases in that specific area.

Most of our study respondents (81.7%) recognized that disease could be acquired from contaminated or diseased animal food products among which meat (70.8%) and milk (32.7%) were reported most by the respondents which is in agreement with reports of Abera*et al*., [31]in Asella, Arsi Zone of Ethiopia, who reported meat (60.4%) and milk (30.8%). However, this finding is lower than the report of Amenu *et al.,* [32] in Arsi-Negele District, Ethiopia, who reported consumption of meat (96.3%) and milk (51.3%) as means of zoonotic disease transmission.

Among all respondents selected for this study, 77.2% responded that treatment can cure person affected by zoonotic disease and 63.8% of participants reported that, prevention of zoonotic disease can be possible by different means. This finding was similar with reports of Abera *et al*., [31] in Asella, Arsi zone, Ethiopia, in which 74.8% responded that person affected by zoonotic disease can be treated, and 64.6% responded prevention of zoonotic diseases is possible by different means. Regarding to the prevention of zoonotic disease, 50% and 55.9% responded vaccinating animals and consuming cooked animal products as a prevention method, respectively. This finding is higher that reports of Kuma *et al.,* [37] in Jimma, Ethiopia, few numbers (4.6%) of respondents knew that vaccination of animals as prevention method of zoonosis. Some participants also recognized, hygiene and sanitation, (17.8%), creating awareness (19.5%), consuming inspected and treated animal products (9.1%) and isolation of diseased animals (6.9%) as a measure for the prevention of zoonotic disease.

Out of 404 respondents, 88.1% and 92.3% respondents of the study area were consuming raw meat and milk, respectively. This finding was higher than the reports of Abera *et al*., [31] who reported that 77% and 87% respondents consumed raw meat and milk, respectively in Asella, Ethiopia, Amenu *et al.,* [32] who reported that 58.2% and 57.1% respondents consumed raw meat and milk in Arsi-Negele District, Ethiopia and Kuma *et al*., [37] reported that 56.8% respondents consumed raw food of animal origin in Mana and Limmukosa Districts of Jimma Zone, South West Ethiopia. Raw meat consumption was also reported by large proportion of respondents (69.1%) in Jimma, Southwestern Ethiopia (Tesfaye *et al*., [10]. In Ethiopia, consumption of raw meat is mostly practiced by majority of peoples as it passed as cultural heritage from generation to generation. Other countries like Russia, Cuba and some countries in Africa are also known to consume raw meat [42]. So in order to reduce such kind of habits, awareness creation should be undertaken about the risk of raw meat consumption in the community. Since raw meat consumption can predispose to taeniasis and other food borne pathogens like anthrax and bovine tuberculosis.

The concept of one health approach is important to improve the health of all species including humans and animals through integration of different stakeholders. i.e veterinarians, human health care professionals and environmental health professionals [43].If there is absence of integration, zoonosis will lead to public health hazards with economic consequences [32,43]. Many studies conducted on zoo noses in different parts of world indicated there were unsatisfactory outcomes [44,45].

The present finding revealed that,326 (80.7%) of respondents had positive attitude towards cooperative working of veterinarians and human health in the form of One Health approach. This finding was higher

than the reports of Hiko *et al*., [13] in Bahirdar, in which 78.47% of respondents had positive attitude towards cooperative working of veterinarians and human health professionals. The difference could be due to participants' educational status, their access to media and other public health information services. Statistically insignificant difference in the level of awareness about One Health approach in age classifications (P=0.232). However, statistically significant difference (P<0.05) in sex (P=0.013), education level (P=0.001) and profession (P=0.001). This finding was in agreement with reports of Hiko *et al*., [12], who reported except age classification; all variables such as sex, education level, and profession are statistically significant. Primary school educated individuals (56.9%) and farmers (64.0%), the majorities (greater than 70%) in spite of age, gender, education and profession had positive attitude towards One Health approach for control and prevention of zoonosis. The result signified the optimistic role and future necessity of the approach for better zoonotic disease prevention and control strategies.

CONCLUSIONS AND RECOMMENDATIONS

Very low result was obtained in the study area regarding to attitude of communities on ways of transmission, prevention and control of common zoonotic diseases. Awareness' about diseases such as Echinococcosis, brucellosis and ebola virus in shalla district was very low. Even if enhancements are desired, the awareness level on rabies, anthrax and taeniasis are good as compared to other diseases.The assessed community's attitude on zoonotic diseases in the study area is not adequate which shows as further work is mandatory. Variation was observed significantly between participant's education level and experience. Positive attitude was obtained by most of (70%) interviewed community regarding to the role of One Health approach for control and prevention of zoonotic diseases. Continuous education and awareness creation platforms should be needed in communities since we don't know which disease will emerge next. Cooperation between veterinarians, human health care professionals, agricultural personnel and policy makers were believed to be essential in planning and performing of disease prevention and control strategies properly. Furthermore, an extension education campaign mostly in the rural areas has also an important impact. Generally,in order to minimize risks of zoonotic diseases successful prevention and control measures such as human and animal vaccination, veterinary supervision up on slaughtering of animals, quality control of animal products are significant and critical.

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