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Household Knowledge, Attitudes and Practices Related to Pet Contact and Associated Zoonosis in Bishoftu, Ethiopia

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Abstract: Community based questionnaire survey was conducted with the objective of assessing the household knowledge, attitude and practice of the community on common pet associated zoonotic diseases in Bishoftu between the period of November 2015 to April 2016. Structured questionnaire was prepared and administered to the total of 384 respondents .The respondents were stratified into two groups based on educational level and based on occupational level. Educational level and occupation level of respondents have statistically significant influence ($p<0.05$) on most of the parameter used to assess the awareness of respondent about pet related zoonosis. There was great knowledge gap between different education level as well as occupations related to pets as a source of zoonosis. From 63 housewives 50.8% heard of zoonosis and 33.3% housewives didn't know pets as source of zoonosis. Whereas 92.9% civil servants heard pets as a source of zoonosis. Most of the respondent (71.9%) knew rabies as the only zoonotic disease that human acquire from pet. In general, the present study revealed a very low level of awareness of the public about major zoonotic diseases, signifying the need for public health promotion through education and inter-disciplinary one health approach with close collaboration among veterinarians, public health practitioners and policy makers.

Key words: Education · Knowledge · Occupation · Pets · Zoonoses

INTRODUCTION

Pet is a term of endearment that reflecting the bond between people with their companion animals [1]. While dogs and cats are the most popular pets, people keep multiple domestic species as companion animals, including birds, rabbits, horses, guinea pigs, ferrets and pigeons. The dog was the first animal to be domesticated, beginning over 10,000 years ago [2].

Household pets, defined as any animals kept within households by people for company, enjoyment, work or psychological support [3], play an important role in the development and treatment of behavioral problems of children, the well-being of the elderly and decrease work leave through illness and visits to the doctor and Companion animals enhance the psychological and physiological well-being of the human [4]. Pets sometimes have the role of a child; sometimes the pet can be a working partner or companion. Pets can also act as replacements for human family members, either augmenting or interfering with human dynamics [5].

Although the proportion varies by continent and country, studies indicate that in most countries the majority of households had own pets. Cats and dogs are the most frequently owned pets, but other species are often reported [6]. However, despite the important roles played by pets in human wellbeing, it has become increasingly apparent that pets are important sources of zoonotic infections. Approximately 30 to 40 organisms that cause zoonotic infections are known in companion animals such as cats and dogs [7].

Zoonosis are defined as those diseases and infections naturally transmitted between people and vertebrate animals and vice versa [8]. Zoonosis constitutes a diverse group of viral, bacterial, rickettsial, fungal and parasitic diseases with a variety of animal reservoirs, including wild life, livestock, pet animals and birds [9]. Of infectious diseases affecting humans, 61% are zoonotic; 75% of new or emerging diseases around the world are zoonotic [10]. Contributing factors include increasing urbanization, human encroachment on wildlife habitat, climate change, international travel and increasing

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intimacy of animals with humans [11]. The young, old, pregnant, immunocompromised and mentally challenged are at higher risk of contracting diseases, including zoonosis [12].

Today, cats and dogs are our companions but in addition also, friends, family members and sometimes also substitutes for children [12]. As pets are increasingly considered as a member of the family, physical contact is very common [4].

Many human infections are transmitted through contact with animals (zoonoses), including household pets. Although pet ownership is common in most countries and non-pet owners may have frequent contact with pets, there is limited knowledge of the public's pet contact practices and awareness of zoonotic disease risks from pets [6].

Pet-associated zoonoses represent a relatively neglected area compared with food borne zoonoses. However, the close contact between household pets and people offers favorable conditions for transmission by direct contact (e.g. petting, licking or physical injuries) or indirectly through contamination of food and domestic environments. Indeed, frequent sharing of skin microbiota between people and their dogs has been shown, thus emphasizing the role of contact [3]. Based on the report of WHO some zoonotic diseases were listed as bacterial (salmonellosis, tuberculosis, campylobacteriosis, anthrax, brucellosis etc.), Parasitic (Taeniasis, trematodosis, echinococcosis/hydatidosis, toxoplasmosis and trichinellosis), Viral (Rabies, avian influenza, Crimean Congo hemorrhagic fever, Ebola and Rift Valley fever) and Fungal (Dermatophytosis and Sporotrichosis) [13].

Zoonoses are of special concern for people who are young, old, pregnant or immunocompromised and therefore particularly susceptible to infections. Furthermore, young children may be more exposed to bacteria originating from household pets due to lower hygiene standards and closer physical contact with these animals and the household environment (e.g. floors and carpets). Dog and cat bites are frequent injuries among pet owners and those coming into more frequent contact with animals (e.g. veterinarians and animal-related workers). Bites are one of the main sources of bacterial infections related to pet ownership [14].

Furthermore, pet owners have been reported to be well informed about rabies and the need to vaccinate their animals; but however, their knowledge of other zoonotic risks such as viral, bacterial, parasitic, protozoan, fungal and other scratches due to bite is usually absent or incorrect [14].

Comprehensive documentation of Community awareness is a key and prerequisite to effectively prevent and control zoonosis. However to-date, there was no enough study conducted to evaluate the general public's knowledge of pet-associated zoonoses in the current study area.

Therefore, objective of this study was:

- To assess the general public's knowledge, attitudes and practice related to pet ownership and pet associated zoonoses in Bishoftu, Ethipia.

MATERIALS AND METHODS

Study Area: The study was conducted from November 2015- April 2016 at Bishoftu (Debre-Zeit) which is located at 9°N and 40°E, in Oromia National Regional State about 47 km southeast of the capital city of Ethiopia, Addis Ababa.

Study Methodology

Study Population and Sample Size Determination: The study population comprised of all households that were found in Bishoftu (Debre-zeit). Questionnaire based cross-sectional study was conducted on randomly selected respondents. The questionnaire was designed to assess the household knowledge, attitudes and practice related to pet ownership and pet associated zoonoses of respondent. The survey was conducted using face to face interview. A total of 384 respondents from Bishoftu district were selected randomly. Each respondent was informed about the purpose of the study and Participation in the study was voluntary and respondents were free to withdraw from the study at any time. The questionnaire was developed in English and interviewed by Amharic for administration.

Study Design and Data Collection: Community based cross-sectional study was conducted to assess the household knowledge, attitudes and practices of the community on to pet associated zoonoses. Structured questionnaire was administered to 384 participants using face to face interview. The participants were selected randomly and were involved in the study based on the informed consent. Respondents were free to withdraw from the study at any time.

Inclusion and Exclusion Criteria: Respondent who lived for more than six months as resident in the area was included in the study. However, respondents

who lived for less than six months didn't communicate and below 15 years of age were excluded from the study.

Data Management and Data Analysis: Data collected was entered to MS-Excel sheet, 2007. Analysis was done by IBM-SPSS 20 version (2010). Descriptive statistics was used to summarize the response. A Pearson Chi-Square test was used to evaluate the presence of statistical significance of difference on KAP of the respondent rabies among respondents of different education level and occupation. A P-value <0.05 was consider as significant.

RESULTS

Demographic Characteristics of the Study Participants: From the total of 384 respondents, 218 (56.8%) were females, 137 (35.7%) of the total respondents had attended high school. Within occupation the respondents were included from 63(16.4%) house wife, 132(34.4%) farmers, 84(21.9%) civil servant and 12(3.1%) health professionals. Majority 352(91.7%) of the respondents are Christians where Muslim respondents were 32(8.3) from the total 384 respondents (Table 1).

Table 1: Demographic characteristics of the study participants

Questionnaire	Response	Number(n)	Percent (%)
Sex	Male	166	43.2
	Female	218	56.8
Marital status	Single	155	40.4
	Married	214	55.7
	Divorced	15	3.9
Age	≥15	84	21.9
	15-35	184	47.9
	>35	116	30.2
Family size	Single	20	5.2
	More than one	364	94.8
Religion	Christian	352	91.7
	Muslim	32	8.3
Occupation	Housewife	63	16.4
	Civil servant	84	21.9
	Student	93	24.2
	Health professional	12	3.1
	Farmers	132	34.4
Educational status	Illiterate	63	16.4
	Read and write	26	6.8
	Elementary	55	14.3
	High school	137	35.7
	Some college/ university level	103	26.8

Household Dog and Cat Ownership: Among the total respondents, 359(93.5%) had their own household pets and 25(6.5%) respondents had no pets in their household. From 359 pet owners, 66(18.4%) had one dog and one cat, 168(46.8%) had one dog only, 24(6.7%) had one cat only and 101(28.1%) respondents had more than one dog/cat in their household (Table 2).

Table 2: Household pet ownership

Variables	Number	Percent	Total
Do you have pets?			384
Yes	359	93.5	
No	25	6.5	
How many dog/cat do you have?			359
1 dog and 1 cat	66	18.4	
1 dog only	168	46.8	
1 cat only	24	6.7	
More than one dog/cat	101	28.1	

Influence of Educational Level on Management Practice of Pets: Educational level of respondents has statistically significant influence (p<0.05) on most of the parameters used to assess the household management and practices of the respondents. Among 63 illiterate respondents only 63.5% cleaned the dog houses including feces. However, 88.4% respondent with college level clean pet houses and feces. Similarly education level has also influence on dog vaccination practice of the respondent where only 28.6% of illiterate respondents were vaccinated their pets against rabies whereas, 93% of college level respondent did vaccinate their dogs. Most of illiterates and read and write levels, 57.1 and 68% of respondents respectively, dispose the feces to anywhere but 57% college level buried it. Although 64% of higher education level respondents buried or throw away internal organs of none inspected home slaughtered animal offal, most of respondents gave for pet as feed. Hand washing habit of children after touching pets was below half in all education level. In this study, most of pet owners allowed pets to roam outside their home and the p-value is not significantly different at all (p-value=0.121) with different education level (Table 3).

Influences of Education Level on Attitude and Knowledge of Respondents: Education levels of respondents had a significant difference (p-value <0.05) on attitudes and knowledge of the respondents about pet related zoonosis. Most of the respondents, 95 (92.2%) with college and university level educated respondents didn't allow their cats to sleep on children bed as they believed it might have health risk. On the other hand only 55.6% of the illiterate respondents believed that allowing cats to sleep on children had health risk. From 103 respondents, 94.2% of college and university level respondents heard about zoonosis and 36.5, 61.5, 63.6 and 62% of illiterate, read and

Table 3: Influence of educational level on management practice of pets

Variable of management practices	Education level of respondents in number (%) from 359 pet owners					χ^2(p-value)
	Illiterate	Read and write	Elementary	High school	College/univeristy	
Do you tie your pet/s?	(n=63)	(n=25)	(n=55)	(n=130)	(n=86)	37.494(0.000)
Never	38(60.3)	13(52)	29(52.7)	68(58)	18(20.9)	
Always	6(9.5)	3(12)	7(12.7)	25(19.2)	14(16.3)	
In day time	19(30.2)	9(36)	19(34.5)	37(28.3)	54(62.5)	
Always clean up your pet house?						41.912(0.000)
Yes	40(63.5)	17(68)	41(74.5)	98(71.5)	76(88.4)	
No	23(36.5)	8(32)	14(25.5)	39(28.5)	10(11.6)	
How dispose the feces?						38.399(0.000)
Anywhere	36(57.1)	17(68)	30(54.5)	56(43.1)	25(29.1)	
Buried	18(28.6)	6(24)	13(23.6)	49(37.7)	49(57)	
Used as fertilizer	0(0)	2(8)	1(1.8)	5(3.8)	0(0)	
None	9(14.3)	0(0)	11(20)	20(15.4)	12(14)	
Did you dog roam outside the home?						7.303(0.121)
Yes	47(74.6)	16(64)	35(63.6)	77(59.2)	49(57)	
No	16(25.4)	9(36)	20(36.4)	53(40.8)	37(43)	
Taking pet to clinic at least once/ year.						36.025(0.000)
Yes	24(38.1)	18(72)	25(45.5)	82(63.1)	70(81.4)	
No	39(61.9)	7(28)	30(54.5)	48(36.9)	16(18.6)	
Condition to take to clinic						55.702(0.000)
When sick	10(40)	0(0)	8(27.6)	17(19.1)	20(26.7)	
For vaccination	1(4)	8(44.4)	21(72.4)	38(42.7)	12(16)	
For both	14(56)	10(55.6)	0(0)	34(38.2)	43(57.3)	
Offal of home slaughtered animal						47.752(0.000)
Through away	8(12.7)	4(16)	12(21.8))	34(26.2)	24(27.9)	
Used for pet feed	47(74.6)	19(76)	42(74.6)	78(60)	31(36)	
Buried/burnt	8(12.7)	2(8)	8(12.7)	18(13.8)	31(36)	
Children wash hand after touching						74.945(0.000)
Always	24(38.1)	7(28)	24(38.1)	23(17.8)	38(44.2)	
Usually	0(0)	5(20)	0(0)	26(20.2)	28(32.6)	
Sometimes	32(50.8)	8(32)	32(50.8)	55(42.6)	14(16.3)	
Never	7(11.1)	5(20)	7(11.1)	25(19.4)	6(7)	
Did you vaccinate your dog?						68.672(0.000)
Yes	18(28.6)	16(64)	18(28.6)	90(69.2)	80(93)	
No	45(71.4)	9(36)	45(71.4)	40(30.8)	6(7)	

Table 4: Influence of Educational level on attitude and knowledge of respondents

	Education level of respondents in no. (%) from total 384 participants					
Variables	Illiterate	Read and write	Elementary	High school	College/university	x^2(p-value)
Problem if pets sleep on children bed	(n=63)	(n=26)	(n=55)	(n=137)	(n=103)	58.7(0.000)
Yes	35(55.6)	17(65.4)	47(85.5)	70(51.1)	95(92.2)	
No	28(44.4)	9(34.6)	8(14.5)	67(48.9)	8(7.8)	
Have you ever heard of zoonses?						62.711(0.000)
Yes	23(36.5)	16(61.5)	35(63.6)	85(62)	97(94.2)	
No	40(63.5)	10(38.5)	20(36.4)	52(38)	6(5.8)	
What was the source of information?						60.892(0.000)
Media	4(17.4)	6(33.3)	10(28.6)	23(25.8)	14(14.5)	
Traditional healer	13(56.7)	4(22.2)	13(37.1)	40(44.9)	20(20.6)	
Friends/relatives	2(8.7)	3(16.7)	7(20)	13(14.6)	5(5.2)	
Health professionals	4(17.4)	5(27.8)	5(14.3)	13(14.6)	58(59.8)	
Pets could be source of diseases						41.080(0.000)
Yes	38(60.3)	19(73.1)	45(81.8)	107(78.1)	102(99)	
No	25(39.7)	7(26.9)	10(18.2)	30(21.9)	1(1)	
Common zoonotic diseases you know						81.853(0.000)
Rabies	52(82.5)	15(57.7)	49(89.1)	82(59.9)	78(75.7)	
Anthrax	8(12.7)	0(0)	1(1.8)	5(3.6)	2(1.9)	
Cysticercosis/taeniasis	0(0)	0(0)	0(0)	0(0)	7(6.8)	
Others	0(0)	6(23.1)	3(5.5)	36(26.3)	16(15.5)	
I dno't know	3(4.8)	5(19.2)	2(3.6)	14(10.2)	0(0)	
Causative agent for that diseases						116.965(0.000)
Correctly answered	16(25.4)	8(30.8)	14(25.4)	30(21.9)	77(74.8)	
Incorrectly answered	47(74.6)	18(69.2)	41(74.5)	107(78.1)	26(25.2)	
How prevent zoonosis?						73.619(0.000)
Avoid contact of infected	5(19.2)	8(12.7)	16(29.1)	27(19.7)	12(11.7)	
Washing hands after touching pets	0(0)	12(19)	11(20)	21(15.3)	6(5.8)	
Eating well cooked meat/milk	0(0)	2(3.2)	0(0)	0(0)	0(0)	
vaccination	15(57.7)	33(52.4)	19(34.5)	69(50.4)	34(33)	
All	6(23)	8(12.7)	9(16.4)	20(14.6)	51(49.5)	
Public education before						41.458(0.000)
Yes	5(7.9)	1(3.8)	11(20)	22(16.1)	44(42.7)	
No	58(92.1)	25(96.2)	44(80)	115(83.9)	59(57.3)	

Table 5: Influence of occupation on management practice of pet animals

Variable of management practices	Occupation of respondents in n (%) from 359 pet owners					χ^2(p-value)
	Housewife (n=63)	Farmers (n=128)	Students (n=89)	Civil servant (n=68)	Health professional(n=11)	
Do you tie your pet/s?						54.172(0.000)
Never	30(47.6)	80(62.5)	38(42.7)	18(26.5)	0(0)	
Always	16(25.4)	20(15.6)	5(5.6)	11(16.2)	3(27.3)	
In daytime	17(27)	28(21.9)	46(51.7)	39(57.4)	8(72.7)	
Always clean up your pet house?						22.416(0.000)
Yes	38(60.3)	75(58.6)	53(59.6)	58(85.3)	11(100)	
No	25(39.7)	53(41.4)	36(40.4)	10(14.7)	0(0)	
How dispose the feces?						47.935(0.000)
Anywhere	47(74.6)	58(45.3)	36(40.4)	21(30.9)	2(18.2)	
Buried	10(15.9)	40(31.2)	41(46.1)	38(55.9)	6(54.5)	
Used as fertilizer	0(0)	4(3.1)	4(4.5)	0(0)	0(0)	
None	6(9.5)	26(20)	8(9)	9(13.2)	3(27.3)	
Did you dog roam outside the home?						12.528(0.014)
Yes	45(71.4)	86(67.2)	51(57.3)	38(55.9)	4(36.4)	
No	18(28.6)	42(32.8)	38(42.7)	30(44.1)	7(63.6)	
Taking pet to clinic at least once/ year.						32.249(0.000)
Yes	39(61.9)	64(50)	47(52.8)	60(88.2)	9(81.2)	
No	24(38.1)	64(50)	42(47.2)	8(11.8)	2(18.2)	
Condition to take to clinic						48.570(0.000)
When sick	14(32.6)	6(9.1)	7(13.2)	26(41.3)	2(18.2)	
For vaccination	5(11.6)	34(51.5)	29(54.7)	9(14.3)	3(27.3)	
For both	24(55.8)	26(39.4)	17(32.1)	28(44.4)	6(54.5)	
Offal of home slaughtered animal						64.239(0.000)
Through away	6(9.5)	36(28.1)	11(12.4)	25(36.8)	4(36.4)	
Used for pet feed	54(85.7)	75(58.6)	65(73)	22(32.4)	1(9.1)	
Buried/burnt	3(4.8)	17(13.3)	13(14.6)	21(30.9)	6(54.5)	
Children wash hand after touching						47.889(0.000)
Always	11(17.5)	37(28.9)	25(28.4)	28(41.2)	5(45.5)	
Usually	9(14.3)	23(18)	19(21.6)	20(29.4)	6(54.5)	
Sometimes	28(44.4)	47(36.7)	20(22.7)	20(29.4)	0(0)	
Never	15(23.8)	21(16.4)	24(27.3)	0(0)	0(0)	
Did you vaccinate your dog?						63.005(0.000)
Yes	40(63.5)	57(44.5)	64(71.9)	66(97.1)	11(100)	
No	23(36.5)	71(55.5)	25(28.1)	2(2.9)	0(0)	

write, illiterate, elementary and high school level respondents respectively ever heard of zoonosis. From 63 illiterate respondents 60.3% knew that pets could be source of diseases for human being and from 103 some college/university level respondents 102 (99%) knew that pets could be a source of or health professionals only 21.6% of all education level got education but most of the respondents know about rabies although most of the respondents didn't know the diseases for man. As indicated in the next table most of the respondents didn't get any public education about pet related zoonosis and related topics with any veterinarian causative agent correctly. Very few number of respondents believed that frequent contact with pets had a risk for human and washing hands after touching or playing with pets is necessary (Table 3).

Influence of Occupation on Management Practices of Pet Animal: Different occupations of pet owners had a significant difference (p-value<0.05) with all of the management practices. From a total of 63 housewives 60.3% cleaned their pet houses and where as all 11 health professionals who had pet in his/her household, cleaned their pet houses. The respondents habit of taking pets to the clinic were housewives 61.9% from 63, students 52.8% from 89, farmers 50% from 128, civil servants 88.2% from 68 and 81.2% health professionals taken their pets to the clinic at least once a year. Most of the respondents dispose the feces of pets to the surrounding area they found only 54.5 and 55.9% of health professional and educated civil servants did bury it. However, most of others respondents dispose to anywhere, used as a fertilizer or add to garbage and other disposals. The respondents of housewife (85%) and farmers (58%) gave non inspected offal and internal organs to their pets. The practice of vaccinating dogs against rabies was more than half in all groups except farmers (only 44.5%) (Table 5).

Influence of Occupation on Attitude and Knowledge of Respondents: Occupation had significant difference (p-value<0.005) towards different attitudes and knowledge of respondents. From the total of 384 respondents, 40(63.5%) of 63 housewives thought that sleeping of pets especially cats on children's bed could have a problem for children where all 12 health professionals did know the problem of pets contact with children bed. In a similar manner farmers respond 86(62.1%) from a total of 132 respondents, students 46(49.5%) from 93 students and 84(100%) civil servants answered there might be a problem in children's health if pets sleep on children bed. From 63 housewives 32(50.8%) heard of zoonosis, farmers, students, civil servants and health professionals heard about zoonosis

Table 6. Influences of occupation on attitude and knowledge of respondents

Variables of knowledge and attitude	Occupations of respondents in number (n) and percents (%) from 384 total participants					χ^2(p-value)
	Housewife	Farmers	Students	Civil servants	Health professionals	
Problem if pets sleep on children bed	(n=63)	(n=132)	(n=93)	(n=84)	(n=12)	63.250(0.000)
Yes	40(63.5)	82(62.1)	46(49.5)	84(100)	12(100)	
No	23(36.5)	50(37.9)	47(50.5)	0(0)	0(0)	
Have you ever heard of zoonsis?						44.661(0.000)
Yes	32(50.8)	81(61.4)	53(57)	78(92.9)	12(100)	
No	31(49.2)	51(38.6)	40(43)	6(7.1)	0(0)	
Source of information						112.899(0.000)
Media	4(12.5)	32(36.8)	9(17)	8(10.3)	4(33.3)	
Traditional healer	16(50)	39(44.8)	24(45.3)	11(14.1)	0(0)	
Friends/relatives	10(32.2)	5(5.7)	10(18.9)	5(6.4)	0(0)	
Health professionals	2(6.2)	11(12.6)	10(18.9)	54(69.2)	8(66.7)	
Pets could be source of diseases						45.104(0.000)
Yes	42(66.7)	91(68.9)	83(89.2)	83(98.8)	12(100)	
No	21(33.3)	41(31.1)	10(10.8)	1(1.2)	0(0)	
Common zoonotic diseases you know						104.214(0.000)
Rabies	40(63.5)	107(81.1)	64(68.8)	57(67.9)	8(66.7)	
Anthrax	13(20.5)	1(0.8)	0(0)	1(1.2)	1(8.3)	
Cysticercosis/taeniasis	0(0)	0(0)	0(0)	5(6)	2(16.7)	
Others	4(6.3)	13(9.8)	22(23.7)	21(25)	1(8.3)	
I don't know	6(9.5)	11(8.3)	7(7.5)	0(0)	0(0)	
Causative agent for that diseases						114.128(0.000)
Correctly answered	17(17)	31(23.5)	23(24.7)	63(75)	11(91.7)	
Incorrectly answered	46(73)	101(76.5)	70(75.3)	21(25)	1(8.3)	
How prevent zoonosis?						74.636(0.000)
Avoid contact of infected	4(6.3)	35(26.5)	15(16.1)	14(16.7)	0(0)	
Washing hands after touching pets	12(19)	15(11.4)	15(16.1)	8(9.5)	0(0)	
Eating well cooked meat/milk	0(0)	0(0)	2(2.2)	0(0)	0(0)	
vaccination	39(61.9)	59(44.7)	41(44.1)	31(36.9)	0(0)	
All	8(12.7)	23(17.4)	20(21.5)	31(36.9)	12(100)	
Public education before						65.868(0.000)
Yes	11(17.5)	20(15.2)	6(6.5)	36(42.9)	10(83.3)	
No	52(82.5)	112(84.8)	87(93.5)	48(57.1)	2(16.7)	

with a frequency 81(61.4%), 53(57%), 78(92.9%) and 12(100%) respectively. In terms of pets as a source of zoonosis, 33.3% of housewives didn't know that pets might be a source of diseases for human. Farmers 31.1%, students 10.8%, civil servants 1.2% didn't know pet contact related zoonosis. On the other hand, all 12 health professionals answered that they know pets could be a source of zoonosis (Table 6).

DISCUSSION

In this study, from a total of 384 respondents 56.8% were females and 43.2% males, 94.8% of respondents had more than one family size, 47.9% were at the age between 15-35, 30.2% were above 35 years old and the rest 21.9% were below 15 years old with a minimum age were 15 years old. From the total respondents 93.5% participants owned dog(s) and/or cat(s), 224 (62.4%) of them said they let their dogs freely roam outside their compound but this count is differ in different educational level of respondents and/or occupational level. From 128 farmers 86 (67.2%) and from 63 illiterates 74.6% pets roam outside family home where some college or university level respondents lowered the percent to 57% and in health professional also decreased to 36.4%. The education level was not significant (p-value=0.121) but occupation had a positive significant difference (p-value=0.014) which is lower than 0.05.

The presence of large numbers of non-restricted dogs plays a crucial role not only in transmission of rabies but also in contaminating the environment with tapeworm eggs which could subsequently infect humans. Among the dog owners, 60.4% of them reported that they fed offal to their dogs regardless of the safety status of the offal. Feeding the viscera of infected slaughter animals to dogs was reported to facilitate the transmission of the sheep strain of *Echinococcus granulosus* and this was suggested to consequently increase the risk that humans will become infected [15]. According to a study conducted by Carmena *et al*. [16], the type of feed given to dogs was found to significantly affect the prevalence of cystic echinococcosis in humans.

According to the European Scientific Council Companion Animal Practices (ESCCAP) guidelines and depending on the different scenarios (e.g. presence of children or outdoor access), the frequency of treatment against internal parasites should be at least four times per year, at intervals not exceeding three months apart or preferably a monthly treatment, while treatment against ectoparasites should also be done monthly [17]. But in this present study, from 359 respondents who had household pets 219(61%) taken their pets to the veterinary clinic at least once a year with different reasons including for vaccination against rabies and when their pets got sick. On the other hand 140(39%) of the pet owners didn't taken their pets to the veterinary clinic at

least once per year. That was far different from the study of [18] resulted 67.7 % (285/421) of the dog owners and 71.1 % (145/204) of the cat owners treated their pets against endo-parasites at every four, three or one months in Portuguese. That indicates there is higher risk of zoonosis from pets because there are a lot of diseases that are transmitted from pets other than rabies. The pet owners who taken his/her pet for vaccination against rabies was more likely increased to 61% of the above mentioned result. Read and write taken their pets to the clinic when sick only, for vaccination as well as for both (when diseased and for vaccination) with 0(0%), 8(44.4%) and 10(55.6%) of frequency respectively. While college/university level 20(26.7%) 12(16%) and 43(57.3%) take their pets when got sick, for vaccination and for both respectively. Educational level with clinic taking practice of pets was statistically significant difference (p-value< 0.05). This indicates that there is a knowledge gap between pet management practice and educational level as well as occupation of pet owners.

In this study from a total of 359 owned pets 65.5% clean up the pet houses and feces. Only 34.5% of pet owners didn't clean their pet house. Among the respondents, 58.6% farmers cleaned pet houses and 100% health professionals cleaned their pet house and feces. This result shows that there is a significant knowledge difference in management practice pets in household between illiterate and educated as well as health professional and farmers. Most of non educated respondents didn't bury the feces. This might be a source for parasitic diseases for human being. As ESCCAP [17] indicates, the risk of acquiring an infection can be reduced by hygienic measures including daily removal of feces from kennels and thorough cleaning and disinfection of litter areas in breeding units.

Among the respondents who owned dogs, 66.3% of them reported that they were treating or vaccinating their dogs against rabies. This result is greater than the report of Tesfaye *et al*. [19] who reported 25.6%. The variation in the level of awareness could be due to the difference in the study groups, where the previous study was conducted on farmers, small scale dairy farmers, butchers and city residents who might not be familiar with the problem unlike our study groups which incorporates a variety of respondents including, students, housewives, health professionals and civil servants. Also it might be with difference of resident that our study area Bishoftu is near to Addis Ababa, the capital city of Ethiopia and it's a location of the first veterinary medicine college of the country, which might increase the awareness of the community.

From respondents 71% of illiterate and 55% of farmers didn't vaccinate their dogs against rabies. The poor management of owned dogs and the presence of high populations of unvaccinated stray dogs are responsible for the frequent occurrence of rabies [20]. Rabies is a neglected zoonotic disease which kills up to 60,000 people a year, where rabid dog bites account for 99% of the infection, most of them in Africa and Asia. In the majority of developing countries, the number of patients receiving post exposure prophylaxis has steadily increased over time, particularly in urban areas due to dog related rabies [21].

From the total 384 respondents 81% did know that pets should be for source of diseases for human. Only 19% didn't think that dog and cats used as a source of diseases. This result is similar to a study which reported that 19% participants were of the opinion that dogs do not transmit any disease to humans [22]. Results from the survey showed respondents had statistically significant awareness that transmission of diseases from animals was possible compared to those who did not think such transmission was possible ($x^2 = 41.08$, $p < 0.05$) in different educational and ($x^2 = 45.104$, $p < 0.05$) occupational levels. However Paige *et al*. [23] showed that individual characteristics such as gender, occupation, location and age were not significantly predictive of awareness of humans to zoonosis from livestock's. This survey resulted with the positive relation of awareness and educational level as well as occupation level with awareness of pet contact and associated zoonosis and it transmitted from pets to pet owners.

When asked to list the name of diseases which are transmitted from dogs or cat to humans, participants mentioned following diseases i.e., rabies, anthrax, cysticercosis, taeniasis, ascariasis, ringworm infection, flea and ticks. From listed diseases rabies was more known by 71.9% from the total participants followed by anthrax 4.2%, cysticercosis and taeniasis 1.8%, others (brucellosis, salmonellosis**,** toxoplasmosis and trichinellosis, dermatophytoses, tick infestation and flea infestation) 15.9% and 6.2% respondents didn't know any zoonotic diseases from the listed. This result is lower than that of Tesfaye *et al* [19] who reported about 97.1% of the respondents said they were familiar that rabies can be transmitted from dogs to humans. The knowledge of rabies as a zoonotic disease among the different respondent groups was not significantly (P>0.05) different. But in this study knowledge of rabies in different educational levels and different occupation groups was significant (p<0.05). The difference between two studies might be study area prevalence or exposure of respondent groups.

From a total 384 respondents 66.7% heard before about zoonosis. But there was significant difference between different groups of educational level and occupation. Hundred percent health professionals heard about zoonosis and 61.4, 50.8, 57 and 92.9% farmers, housewives, students and civil servants heard about zoonosis. When asked about their primary source of information regarding this knowledge, 21.8% media (television, radio, magazines, news papers and books), 34.4% traditional healer, 11.5% friends or relative and 32.4% quoted health professionals which was same as compared to 33% health professionals was quoted in a similar study conducted in Zimbabwe [24]. But it is lower from a study of Sandhu and Singh [22] that 40% of participants quoted their veterinarian as their primary source of information regarding zoonotic diseases, This higher proportion was because sampled population in this study was from a developing nation as compared to sampled population by Sandhu and Singh of Ithaca, New York.

Physicians in developing countries need to educate their patients on the zoonotic aspect of diseases. For a layman, the effect of such information regarding awareness about zoonotic diseases, when delivered by a physician is more profound as compared to other sources. However, from the total of 384 participants only 21.6% had got public education before. Liberal availability of zoonotic diseases related client education material or brochures in the client waiting area should be encouraged both in veterinary and human hospitals. The habit of awareness creation about zoonotic diseases related to pet contact was low.

Generally, many people in this study lacked knowledge about zoonotic diseases which could seriously impact their health and the health of their families. It is important to find effective methods of providing information to the public in order to correct this deficiency in knowledge. As Bingham *et al*. [25] stated, health education is a basic tool in veterinary public health and in particular in prevention and control of zoonosis based on source of infection, life cycle, way of transmission, control and prevention methods in humans and animals. Bringing together veterinary and medical organizations, data and control activities at all levels is essential if zoonotic diseases are to be the effectively dealt with WHO [26].

CONCLUSIONS AND RECOMMENDATIONS

Worldwide, dogs and cats are the two most common household companion animals. Because of this, they can be direct or indirect source of many human infections. The present study revealed a very low level of awareness of the public about major pet contact related zoonotic diseases. The current finding revealed the presence of mal-practices that are important risks and condition of pet associated zoonoses in the study participant. The knowledge and attitude of the respondent on pet related zoonoses were also found low. Education level and occupation were also found determinants of the knowledge, attitude and practice of the respondent. Considering the level of awareness of the public pet related zoonotic diseases are the major threat of public health in the present study area. Hence this signifying the need for public health intervention program in the area.

Therefore, based on the above conclusion the following recommendations are forwarded:

- Extensive public education about pet related zoonoses is mandatory to create awareness on the public and minimize the risk disease.
- Veterinary extension program is needed to encourage the people to bring pet to health care facilities for treatment and other medical service.
- There should be medical and veterinary profession collaboration to design effective zoonotic disease prevention and control program.
- Regular vaccination program and deworming of dog is also mandatory to minimize the risk.

REFERENCES

1. Walsh, F., 2009. Human-animal bonds II: the role of pets in family systems and family therapy. Fam. Process, 48: 481-499.
2. Trut, L., 1999. Early canid domestication: the farm-fox experiment. Am Sci., 87: 160-9.
3. Song, S.J., C. Lauber, E.K. Costello, C.A. Lozupone, G. Humphrey, D. Berg-Lyons, J.G. Caporaso, D. Knights, J.C. Clemente, S. Nakielny, J.I. Gordon, N. Fierer and R. Knight, 2013. Cohabiting family members share microbiota with one another and with their dogs. Elife. 2013 Apr 16;2:e00458. doi:10.7554/ eLife.00458.Availabel at: https:// www.ncbi.nlm.nih.gov/ pubmed/23599893 : Accessed in June, 2017.
4. Beck, A.M. and N.M. Meyers, 1996. Health enhancement and companion animal ownership. Ann. Rev. Public Health., 17: 247-257.

5. Hodgson, K. and M. Darling, 2011. Pets in the family: practical approaches. J Am Anim. Hosp. Assoc., 47: 299-305.
6. Stull, J.W., A.S. Peregrine, J.M. Sargeant and J.S. Weese, 2012. Household knowledge, attitudes and practices related to pet contact and associated zoonoses in Ontario, Canada. BMC Public Health, 12(1): 553.
7. Greene, C.E. and J.K. Levy, 2006. Immunocompromised people and shared human and animal infections: zoonoses, saprozoonoses and anthropozoonoses. In: Infectious Diseases of the Dog and Cat. 3rd ed.. Ed., Greene, C.E. St. Louis, Missouri, Saunders Elsevier, pp: 1051-1068.
8. WHO, 2005. The Control of Neglected Zoonotic Diseases. Report of a Joint WHO/DFID-AHP Meeting with the participation of FAO and OIE. Geneva, September 2005. Available at; http://whqlibdoc.who.int/publications/2005/9789241594301_eng.pdf. Accessed in: April, 2016.
9. Nkuchia, M.M., L. Ruth, A.B. Chris and V. Henriette, 2007. Infectious Disease Surveillance. Blackwell Publishing Inc. Malden, Massachusetts 02148-5020 USA, pp: 246-248.
10. Taylor, L.H., S.M. Latham and M.E.J. Woolhouse, 2001. Risk factors for human disease emergence. Philos Trans R Soc Lond B Biol Sci., 356: 983-989.
11. Perrin, T., 2009. The Business of Urban Animals Survey: The facts and statistics on companion animals in Canada. Can Vet J., 50:48-52.
12. Hodgson, K., L. Barton, M. Darling, Hon, V. Antao, Florence, A. Kim and A. Monavvari, 2015. Pets' Impact on Your Patients' Health: Leveraging Benefits and Mitigating Risk. JABFM, 28(4): 526-534.
13. WHO, 2013. Advancing Food Safety Initiatives Strategic Plan for Food Safety Including Food has borne Zoonoses Available at: http:// Www.Who.Int/ Entity/ Foodsafety/About/Flyer_Zoonoses.Pdf. Accessed in April, 2016.
14. Fontaine, R.E. and P.M. Schantz, 1989. Pet ownership and knowledge of zoonotic diseases in Dekalb County, Georgia. Anthozoos, 3: 45-49.
15. Moro, P. and P.M. Schantz, 2009. Echinococcosis: a review. Int. J. Infect. Dis., 13: 125-133.
16. Carmena, D., L.P. Sancez -Serrano and I.B. Martinez, 2008. Echinococcus granulosus infection in Spain. Vet. Parasitol., 109: 676-681.
17. ESCCAP, 2011. Guideline No.6 Control of Intestinal Protozoa in Dogs and Cats. pp: 1-24: available at: (http://www.esccap.org/) : Accessed on May, 2016.
18. Pereira, A., Â. Martins, H. Brancal, H. Vilhena, P. Silva, P. Pimenta, D. Diz-Lopes, N. Neves, M. Coimbra, Catarina, A. Alves, L. Cardoso and C. Maia, 2016. Parasitic zoonoses associated with dogs and cats: a survey of Portuguese pet owners' awareness and deworming practices. BioMed Central, Parasites & Vectors ; 9 (245):1-9, DOI 10.1186/s13071-016-1533-2
19. Tesfaye, D., D. Fekede, W. Tigre, A. Regassa and A. Fekadu, 2013. Perception of the public on the common zoonotic diseases in Jimma, Southwestern Ethiopia: Int. J. Med. and Med. Sciences, 5(6): 279-285.
20. Deressa, A., A. Ali, M. Beyene, S.B. Newaye, E. Yimer and K. Hussen, 2010. The status of rabies in Ethiopia: A retrospective record review. Ethiop. J. Health Dev., 24(2): 127-132.
21. Aga, A.M., B. Hurisa and K. Urga, 2016. Current Situation of Rabies Prevention and Control in Developing Countries: Ethiopia Perspective. JAnc Dis Prev Rem. 4: 128. doi:10.4172/2329-8731.1000128
22. Sandhu, G.K. and D. Singh, 2014. Level of Awareness Regarding Some Zoonotic Diseases, Among Dog Owners of Ithaca, New York. Journal of Family Medicine and Primary Care, 3(4): 418-413.
23. Paige, S., C. Malave, E. Mbabazi, J. Mayer and T.L. Goldberg, 2015. Uncovering Zoonoses awareness in an emerging disease 'hotspot'. Social Science and Medicine, 129: 78-86.
24. Pfukenyi, D.M., S.L. Chipunga, L. Dinginya and E. Matenga, 2010. A survey of pet ownership, awareness and public knowledge of pet zoonoses with particular reference to round worms and hookworms in Harare, Zimbabwe. Trop Anim Health Prod., 42: 247-52.
25. Bingham, G.M., C.M. Budke and M.R. Slater, 2010. Knowledge and perceptions of dog zoonoses: Brazos County, Texas, USA. Prev Vet Med 2010, 93:211-221.
26. WHO, 2006. Zoonotic diseases of public health importance. Geneva, Switzerland, pp: 1-148.