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By Subash Rimal, Asmita Shrestha, Rabina Ghimire & Dr. Arjun Chapagain

Tribhuvan University

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Assessment of Knowledge and Associated Risk Factors Regarding Zoonotic Disease among Community Members of Siddharthanagar Municipality, Bhairahawa, Rupandehi

Subash Rimal ^α, Asmita Shrestha ^σ, Rabina Ghimire ^ρ & Dr. Arjun Chapagain ^ω

Abstract- Zoonoses are the common cause of disease occurrence in animals and humans in Bhairahawa. Many zoonotic disease such as Tuberculosis, Rabies, Heartworm, Brucella, Leptospira has been encountered in Veterinary Teaching Hospital, Institute of Agriculture and Animal Science (IAAS), Tribhuvan University from Bhairahawa periphery. We conducted a cross-sectional purposive random survey of total 303 villagers of Siddharthanagar Municipality, Bhairahawa, Rupandehi to study awareness status about zoonosis. Out of total individuals interviewed, 176 (58%) heard about the zoonotic disease and radio/television (37.5%) were the source of information. 66.7% female and 56.9% male knew about zoonosis. 72.9% of youths (30-50 years), 36.6% farmers, 33.33% Dalit and 40.2% Madheshi, 58.6% Hindu, 66.7% Buddhist, 66.7% of Christian knew about zoonosis. 86% of aware people knew about direct transmission route of zoonotic disease, and 100%, 77.84%, 100%, 100% and 47.72% respondents knew about the contaminated food, milk, meat, bite, and secretion transmission route respectively. Age, education, ethnicity, occupation play highly significant ($P < 0.05$) effect on zoonosis, where religion had significant ($P < 0.05$) effect but sex had no significant relationship. Hence our study suggests that zoonotic disease pose a threat to people but the risk grossly underestimated.

Keywords: survey, zoonoses, siddharthanagar, veterinary teaching hospital, bhairahawa.

I. INTRODUCTION

a) Background

Zoonoses caused by infection that spread between animal and people. Of the known pathogen species implicated in human disease, 61% are zoonotic. Comparatively neglected among this vast group of pathogens are endemic zoonoses. Many endemic zoonoses not only cause considerable human disability but also impair livestock productivity, imposing multiple burdens on poor communities. Developing and under developed countries are being comparatively more affected by these zoonotic diseases due to lack of proper education on zoonoses, awareness, and improper management of farms (Chowdhury et. al., 2018). And this situation is alarming.

Author α σ ρ : B.V.Sc. & A. H., Institute of Agriculture and Animal Science, Tribhuvan University, e-mail: subashrimal2051@gmail.com

Author ω : Assistant Professor, Institute of Agriculture and Animal Science, Tribhuvan University.

In context of Nepal, people are mainly dependent on the animal and the animal husbandry practice as their source of an income, and there is a very close association of animals with humans. Many people interact with the animals in their daily lives, both at home and away from home. Pets offer companionship and entertainment, with millions of households having one or more pets. We might come into close contact with the animals at a county fair or petting zoo, or encounter wildlife while enjoying outdoor activities. Also, livestock animals are an important food source for human and provide meat, dairy and eggs. Because of the close connection between people and animals, numbers of diseases transfer from animal to human and vice-versa. But in Nepal due to risk factors such as lack of awareness, education, poverty, large populations are unknown about zoonotic disease.

b) Statement of problem

Zoonoses are the common cause of disease occurrence in animals and humans in Bhairahawa. There are large numbers of dog bites cases admitted to veterinary hospitals as well as a human hospital of Bhairahawa. Rabies, Tuberculosis, Brucellosis, Echinococcosis, Heartworm, Leptospirosis are most zoonoses encountered on Veterinary Teaching Hospital, IAAS Paklihawa. These all disease has zoonotic importance, but many people are unknown about these diseases which have a high risk of transmission. The exact status of zoonotic disease and its consequences have not been access in Nepal. Since humans share their environment with animals, it was decided to study the level of awareness among humans regarding some of the zoonotic diseases spread by animals.

c) Rationale of study

The major rationale of this study is to assess the level of awareness among the farmers, risk factors associated with the zoonoses and concerned personnel. This study also aims to assess the zoonotic risks associated with infected animals and help to make policy about awareness of zoonoses because this study provides status and conditions of awareness about zoonoses around the Bhairahawa periphery.

d) Objectives

i. General objectives

To assess the knowledge and associated risk factors regarding the zoonotic disease among community members of Siddharthanagar Municipality, Bhairahawa, Rupandehi.

ii. Specific objectives

- To assess the effect of sex, age, ethnicity, education on zoonoses.
- To assess the mode of transmission and other factors in zoonoses.

II. METHODS AND METHODOLOGY

a) Study area

Siddharthanagar (formerly Bhairahawa) municipality is the administrative headquarter of Rupandehi District on the Outer Terai plains of Nepal, 265 km (165 mi) west of Kathmandu Nepal's capital. It is also the "Gateway of Lumbini." Lumbini, the birthplace of Gautama Buddha is 25 km to the west. It borders India, Sonauli in Maharajganj district of Uttar Pradesh. This study were conducted at Bhairahawa periphery, Siddharthanagar Municipality, Rupandehi Nepal.

b) Study design

A cross-sectional purposive sampling was conducted with irrespective of; age, sex, cast, were done by stratified random sampling method.

c) Sample size

The Sample size were estimated by using ausvetEpitools epidemiological calculators assuming:

Estimated Proportion=0.3, Desired precision of estimate= 0.05, Confidence level= 0.95 and Population size of Siddharthanagara municipality was 163483 in 2011. By this way, the sample size was 323, but only 303 villagers were selected in the study.

d) Methods

A total of 303 villagers were selected randomly from Siddharthanagar Municipality, Bhairahawa, Nepal and interviewed with a questionnaire containing both open- and close-ended questions on various aspects of zoonotic diseases and test their knowledge and awareness about zoonotic diseases. The questionnaire contains general zoonoses knowledge; reported a recent experience of zoonoses cases; knowledge of signs and symptoms of selected zoonoses in humans and animals; knowledge of zoonoses transmission; and testing, prevention, and treatment practices, etc. The section assessing knowledge of disease symptoms and signs consisted of a series of closed (yes/no response) questions asking whether a particular symptom or sign was commonly associated with each disease. Listed symptoms and signs included those commonly associated with each named disease as well as others not typically associated with any of these diseases.

III. STATISTICAL ANALYSIS

The data were collected, coded and tested by using SPSS-tools and were analyzed by chi-square test and descriptive analysis was done by using MS-excel.

IV. RESULT

Total 303 individuals of Siddharthanagar Municipality, Rupandehi were interviewed for assessing the knowledge and associated risk factors regarding zoonotic disease among community members of Siddharthanagar Municipality, Bhairahawa, Rupandehi.

a) Descriptive Analysis

i. Heard about zoonosis and their source of knowledge

Out of total individuals interviewed 176 (58%) have heard about zoonotic disease whereas 127 (42%) have not.

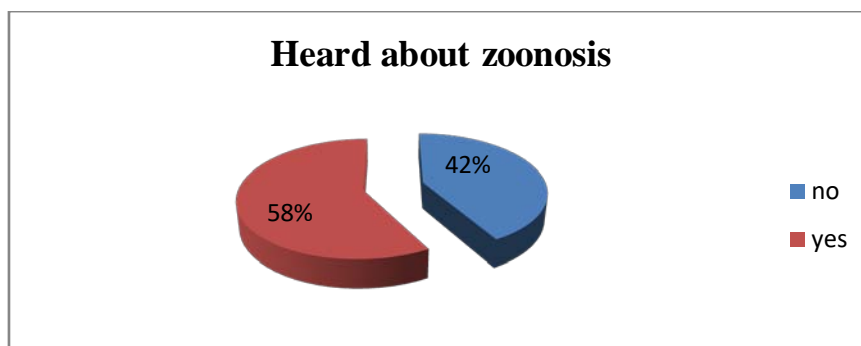


Fig. 1: Status of people who have heard about zoonosis

Among the individuals who have heard about zoonosis, 66 (37.5%) have it from Radio/TV, six from printed materials, 13 have from both Radio/TV and printed materials and six from more than two sources above.

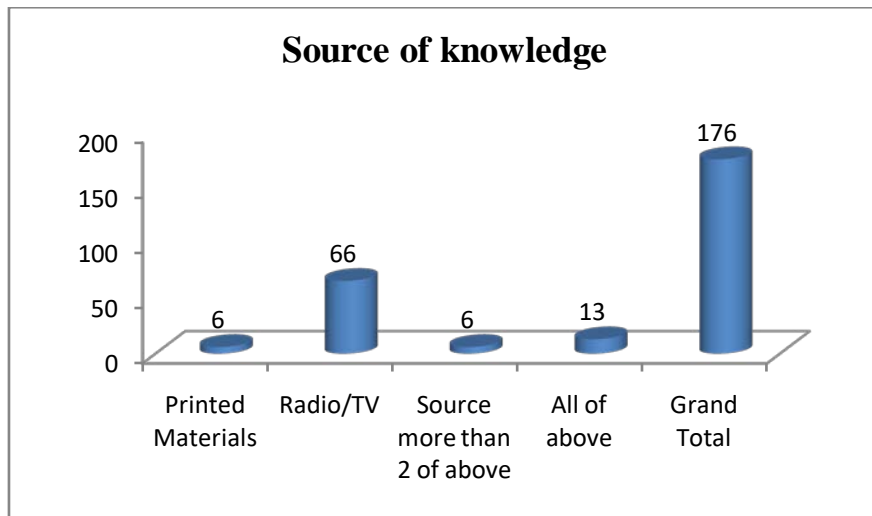


Fig. 2: Source of knowledge in individuals who have heard about zoonosis

- ii. **Age** zoonotic disease followed by individuals of age group 16-30 years, i.e., 71.8% with least knowledge in individuals of age group 50-70 years.
- Individuals of age group 30-50 years were mostly interviewed. Among them, 72.9% know about

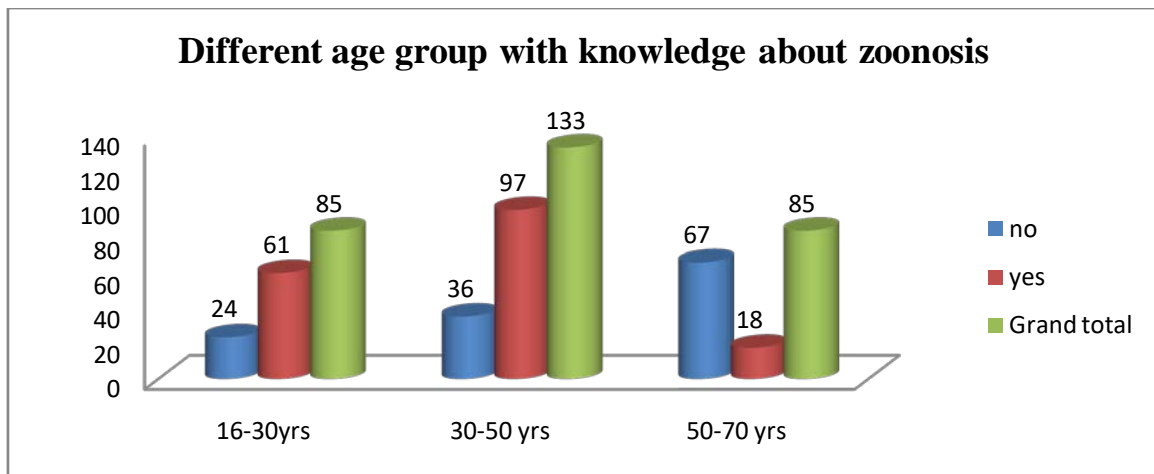


Fig. 3: Different age group with knowledge about zoonosis

Table 1: Different age group with knowledge about zoonosis

			Do you know about zoonotic disease		Total
			Yes	No	
Age of respondent	16-30 yrs	% Within age of respondent	71.8%	28.2%	100.0%
	30-50 yrs	% Within age of respondent	72.9%	27.1%	100.0%
	50-70 yrs	% Within age of respondent	21.2%	78.8%	100.0%

- iii. **Gender**
- 267 male and 36 female were interviewed. Among total males, 152 (56.9%) have heard about zoonosis, and among total females, 24 (66.7%) have heard about it.

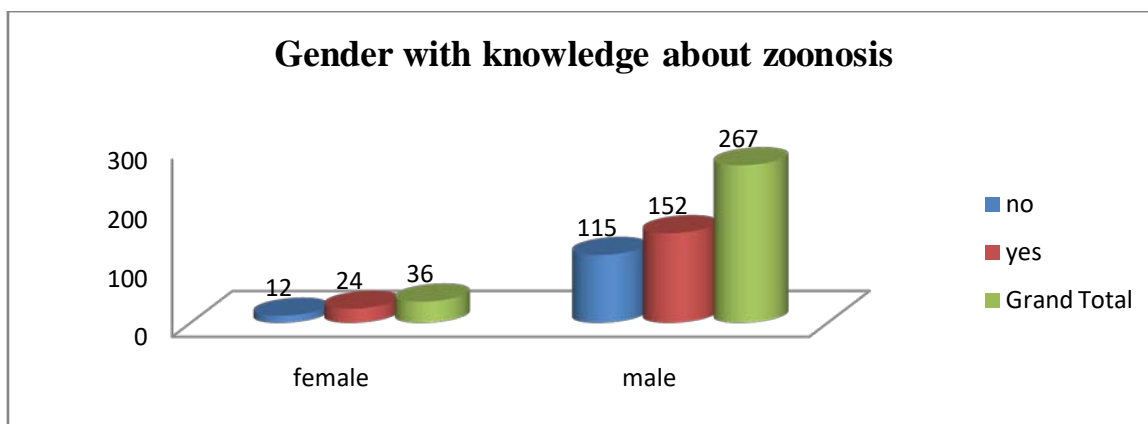


Fig. 4: Gender with knowledge about zoonosis

Table 2: Gender with knowledge about zoonosis

		Do you know about zoonotic disease		Total	
		Yes	No		
Gender of respondent	Male	Count	152	115	267
		% within gender of respondent	56.9%	43.1%	100.0%
	Female	Count	24	12	36
		% within gender of respondent	66.7%	33.3%	100.0%

iv. Occupation

People involved in agriculture (115/303) were mostly interviewed. However, only 42 (36.5%) have heard about zoonosis.

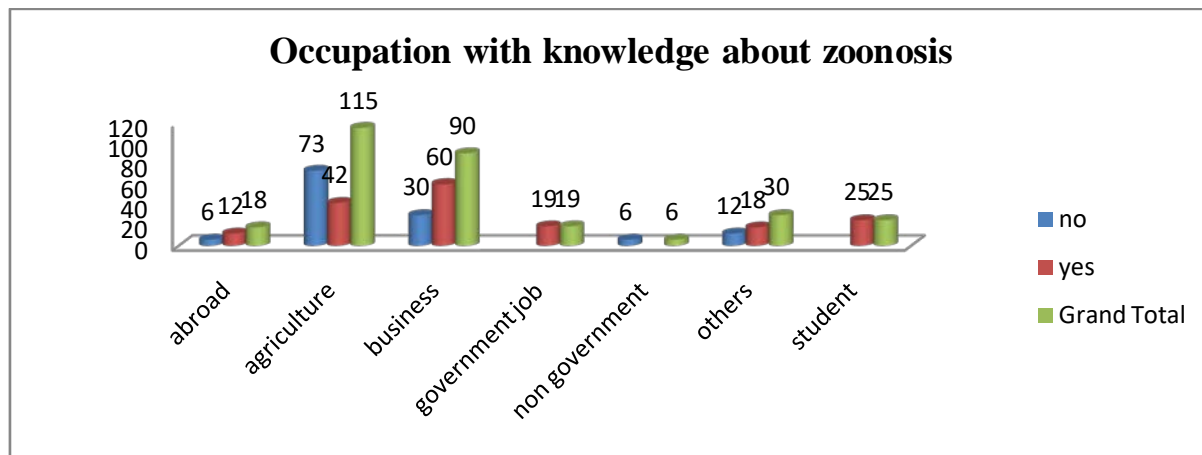


Fig. 5: Occupation with knowledge about zoonosis

Table 3: Occupation with knowledge about zoonosis

		Do you know about zoonotic disease		Total	
		Yes	No		
Occupation of Respondent	Agriculture	Count	42	73	115
		% within occupation of respondent	36.5%	63.5%	100.0%
	Business	Count	60	30	90
		% within occupation of respondent	66.7%	33.3%	100.0%
	Government Job	Count	19	0	19
		% within occupation of respondent	100.0%	0.0%	100.0%
	Non Government	Count	0	6	6
		% within occupation of respondent	0.0%	100.0%	100.0%
	Abroad	Count	12	6	18
		% within occupation of respondent	66.7%	33.3%	100.0%

	others	Count	18	12	30
		% within occupation of respondent	60.0%	40.0%	100.0%
	student	Count	25	0	25
		% within occupation of respondent	100.0%	0.0%	100.0%

v. *Ethnicity*

Individuals from Madhesi Community (122/303) were mostly interviewed. However, only 49 (40.2%) have heard about zoonosis.

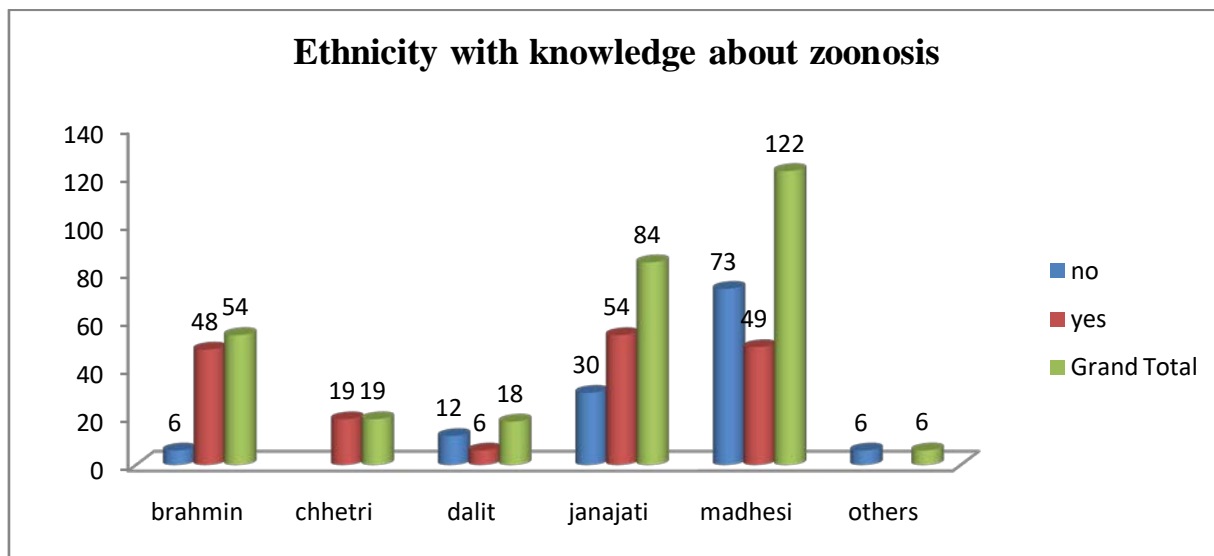


Fig. 6: Ethnicity with knowledge about zoonosis

Table 4: Ethnicity with knowledge about zoonosis

		Do you know about zoonotic disease		Total	
		Yes	No		
Ethnicity of respondent	Brahmin	Count	48	6	54
		% Within ethnicity of respondent	88.9%	11.1%	100.0%
	Chhetri	Count	19	0	19
		% Within ethnicity of respondent	100.0%	0.0%	100.0%
	Janajati	Count	54	30	84
		% Within ethnicity of respondent	64.3%	35.7%	100.0%
	Madhesi	Count	49	73	122
		% Within ethnicity of respondent	40.2%	59.8%	100.0%
	Dalit	Count	6	12	18
		% Within ethnicity of respondent	33.3%	66.7%	100.0%
	Others	Count	0	6	6
		% Within ethnicity of respondent	0.0%	100.0%	100.0%

vi. *Education Level*

Respondents were mostly educated at and upto primary level (84/303). Illiterate people have the least knowledge about zoonosis i.e., only 12 (38.7%) whereas all respondents (100%) from Bachelor's and above have heard about zoonosis.

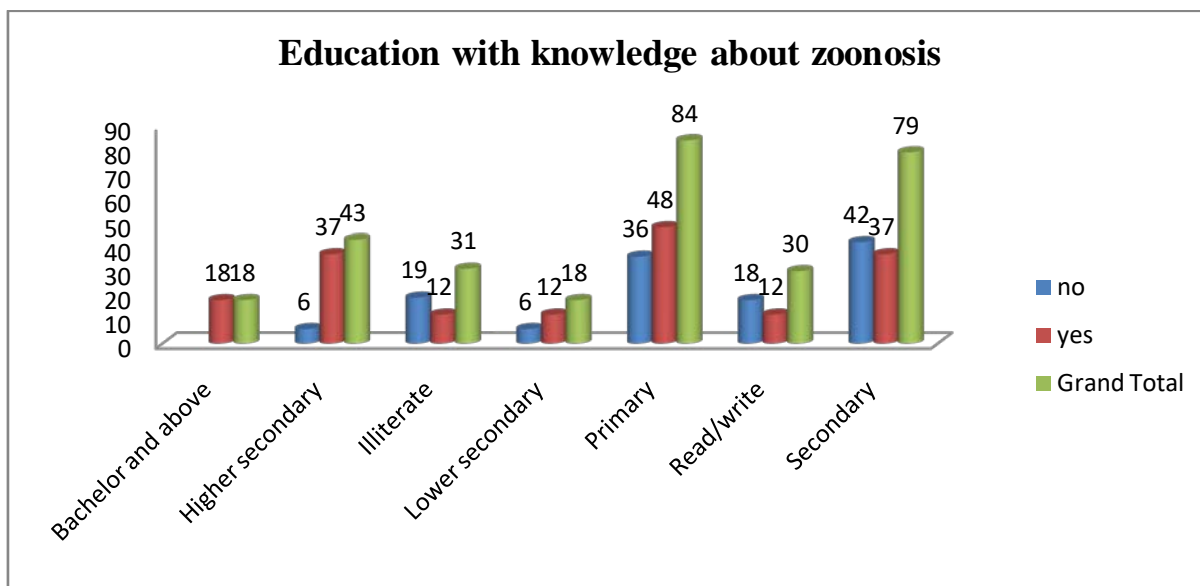


Fig. 7: Education with knowledge about zoonosis

Table 5: Education with knowledge about zoonosis

			Do you know about zoonotic disease		Total
			Yes	No	
Educational status of the respondents	Illiterate	Count	12	19	31
		% Within educational status of the respondents	38.7%	61.3%	100.0%
	Read/write	Count	12	18	30
		% Within educational status of the respondents	40.0%	60.0%	100.0%
	Primary	Count	48	36	84
		% Within educational status of the respondents	57.1%	42.9%	100.0%
	Lower secondary	Count	12	6	18
		% Within educational status of the respondents	66.7%	33.3%	100.0%
	Secondary	Count	37	42	79
		% Within educational status of the respondents	46.8%	53.2%	100.0%
	Higher secondary	Count	37	6	43
		% Within educational status of the respondents	86.0%	14.0%	100.0%
	Bachelor and above	Count	18	0	18
		% Within educational status of the respondents	100.0%	0.0%	100.0%

vii. Religion

Most of the respondents were Hindu (249/303). Among Hindu, 146 (58.6%) have heard about zoonosis.

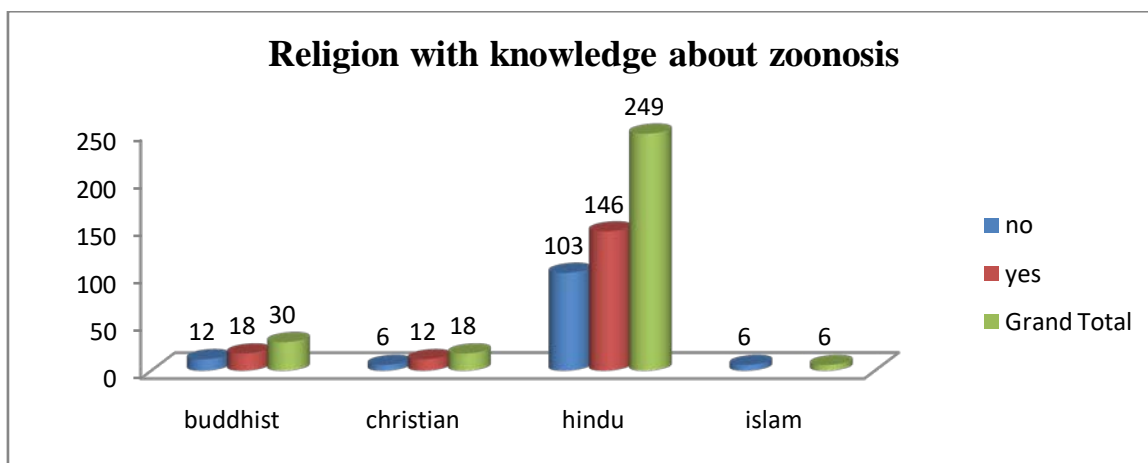


Fig. 8: Religion with knowledge about zoonosis

Table 6: Religion with knowledge about zoonosis

		Do you know about zoonotic disease		Total	
		Yes	No		
Religion of the respondent	Hindu	Count	146	103	249
		% Within religion of the respondent	58.6%	41.4%	100.0%
	Buddhist	Count	18	12	30
		% Within religion of the respondent	60.0%	40.0%	100.0%
	Christian	Count	12	6	18
		% Within religion of the respondent	66.7%	33.3%	100.0%
	Islam	Count	0	6	6
		% Within religion of the respondent	0.0%	100.0%	100.0%

viii. *People in household*

Most of the respondents have a family size of 4 (181/303) followed by the family size of 4 to 6 (79/303) and 6 to 10 (43/303).

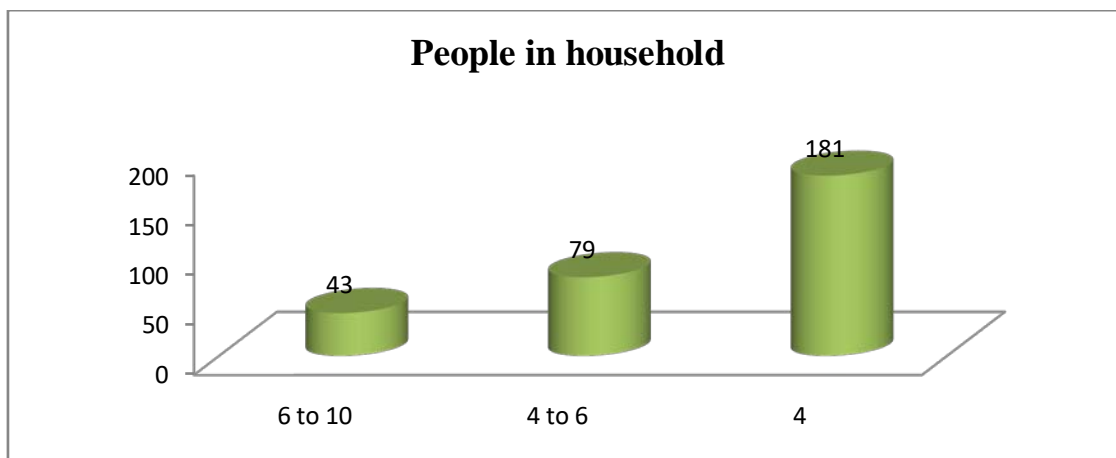


Fig. 9: People in household

ix. *Transmission of zoonotic disease*

a. *Direct Transmission*

Out of total of 176 individuals who have heard about zoonosis, 86% thinks that transmits directly from animal to human.

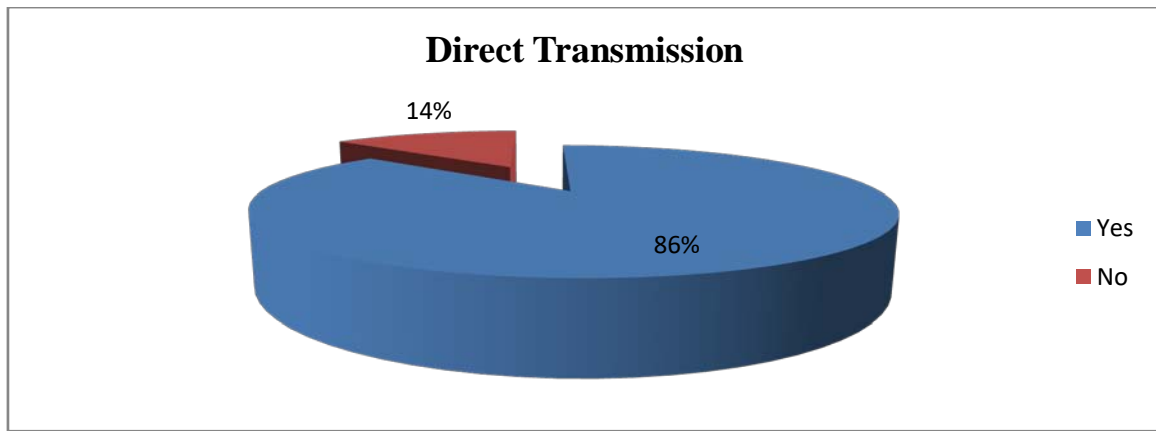


Fig. 10: Knowledge in people regarding the direct transmission of zoonosis

b. *Contaminated food*

Out of 176 individuals, 100% thinks that zoonosis transmit through contaminated food.

c. *Milk Transmission*

Out of 176 individuals, 137 (77.84%) thinks that zoonotic disease could be transmitted through the consumption of milk from the infected animals.

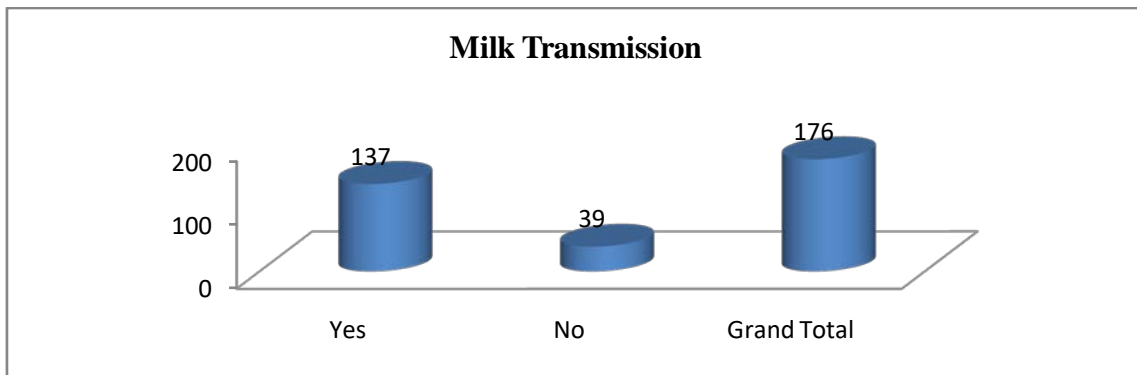


Fig. 11: Knowledge in people regarding the transmission of zoonosis through the milk

d. *Meat Transmission*

Out of 176 individuals, 100% assumes that zoonosis transmits through the contaminated food.

f. *Secretion Transmission*

Out of 176 individuals, 84 thinks zoonosis can transmit through secretion of an infected animal.

e. *Bite Transmission*

Out of 176 individuals, 100% assumes that zoonosis transmits through the bite of an infected rhenimal.

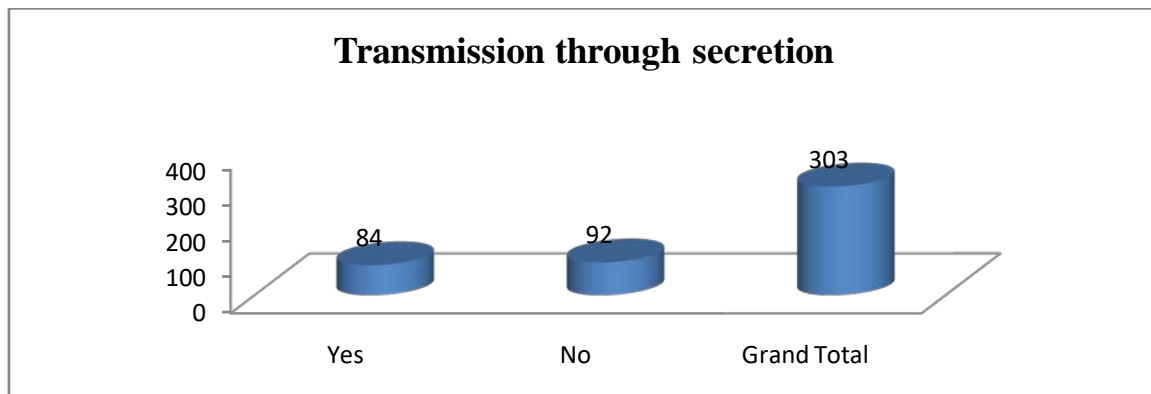


Fig. 12: Knowledge in people regarding the transmission of zoonosis through secretion

x. Zoonotic disease from animal

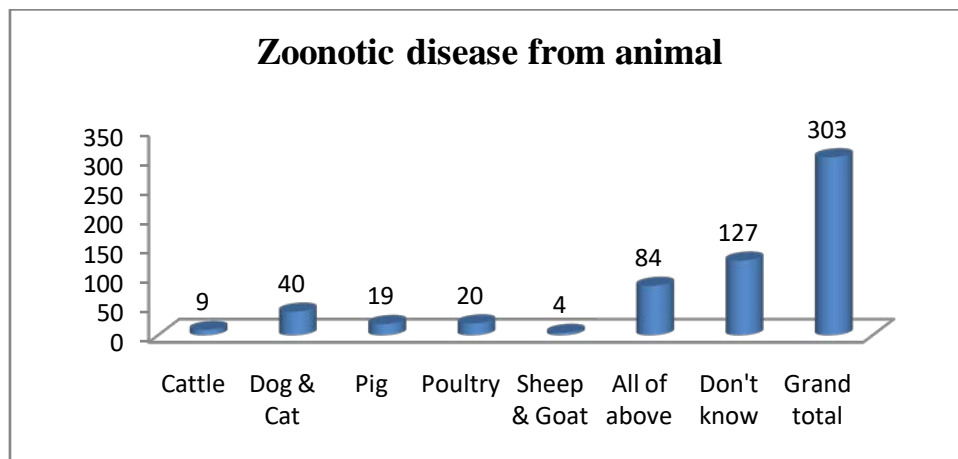


Fig. 13: Zonotic from animal

xi. Family Affected by zoonotic animal

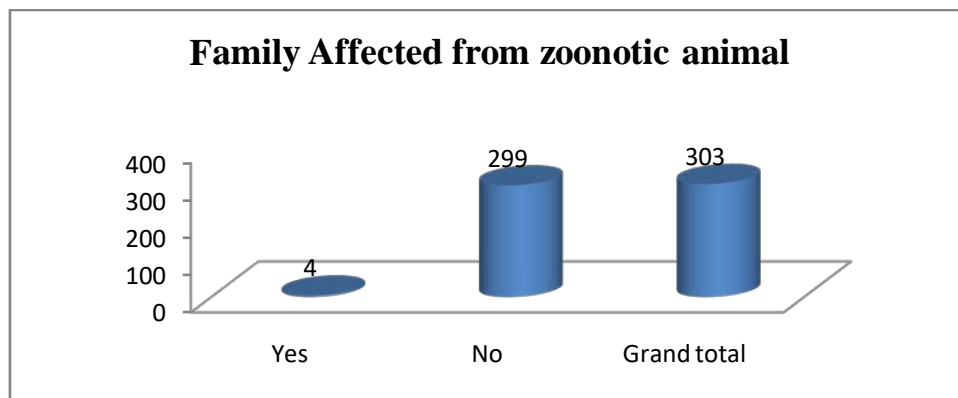


Fig. 14: Family affected by zoonotic animal

xii. Heard of any zoonotic disease

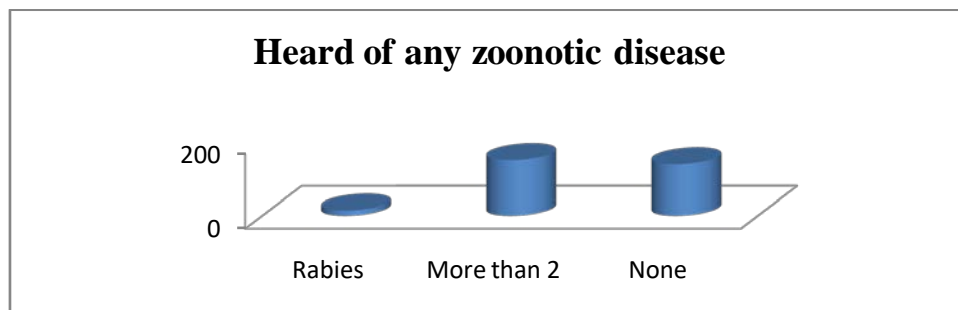


Fig. 15: Heard of any zoonotic disease

b) Statistical Analysis

S. No.		χ^2 value	p-value	Significant or Non-Significant	Cramer's V value	Effect size
1.	Age of Resondent	66.136	0.000	Very Highly Significant	0.467	Medium effect
2.	Gender of respondent	1.236	0.266	Non-significant	-	-
3.	Occupation of Respondent	65.341	0.000	Very Highly Significant	0.464	Medium effect
4.	Ethnicity of Respondent	65.021	0.000	Very Highly Significant	0.463	Medium effect
5.	Educational status of respondent	65.341	0.000	Very Highly Significant	0.464	Medium effect
6.	Religion of respondent	8.935	0.30	Significant	0.172	Weak effect

V. DISCUSSION

In our study, out of total individuals interviewed 58% have heard about zoonotic disease whereas 42% haven't heard about the zoonotic disease. This result is lower than Singh et al., 2019; Wario et al., 2018; Ozioko et al., 2018. The lower level of knowledge regarding zoonoses is likely to cause exposure at increased risks to these diseases.

Television and radio are the source of information to most respondents who know about zoonosis accounting to 37.5%. This might be due to the easy access to radio and television.

Age of respondent significantly influenced the knowledge about zoonosis ($p=0.000$). The people of higher age group ie, above 50 years had less about zoonosis compared to the lower age group. This might be because younger people are more educated than, the older age group.

267 male and 36 female household were interviewed, but only 56.9% male have heard about zoonosis, and 66.7% female have about it but the results were statistically non-significant. Males are at a higher risk of zoonotic disease transmission due to their occupational exposure.

Respondents were mostly educated up to primary level. Illiterate people have the least knowledge about zoonosis ie, only 38.7% whereas all respondents 100% from Bachelor's, and above have heard about zoonosis. The educational status of respondents showed a highly significant difference ($p=0.000$) responding to the knowledge about zoonosis. The lower level of knowledge about zoonosis is due to a low level of education level in people.

People with a different occupation were interviewed, among which people involved in agriculture were mostly interviewed. However, only 36.5% of the agricultural respondents knew about zoonotic diseases. Knowledge about zoonosis was significantly affected by the occupation of respondents ($p=0.000$). Livestock and animal holders are more at risk of zoonosis due to their close contact with animals, but due to lack of awareness among them, they may contract these diseases. All students interviewed knew about zoonotic diseases.

Most of our respondents consist of Madhesi ethnicity, and there is a low level of zoonotic knowledge among them. Also, the dalit community had a lower level of regarding zoonosis. Other ethnic groups like Brahmin, Chhetri, Janjati were comparatively more aware of the diseases. The result was statistically significant ($p=0.000$). Sidharthanagar municipality consists of more Madhesi community. The lower level of awareness among these communities may be due to the lower level of literacy and marginalized living standard. They are at more risk of contracting zoonotic diseases.

In this study, 86%, 100%, 77.84%, 100%, 100% and 47.72% respondents who know about zoonotic diseases think that zoonotic disease can be transmitted directly from animal to man, through contaminated food, milk, meat, bite, and secretion respectively. Most respondents knowing about zoonotic diseases are aware that the transmission takes place in different ways. This awareness is likely to decrease the risk of contracting zoonotic diseases, and they can take proper precautions.

Many respondents knew that zoonotic disease were transmitted from dogs, and cats and less of them knew about transmission through other animals. Majority of the respondents knew that rabies is transmitted by the bite of the dog. People are aware about vaccination against rabies after any dog bite. Out of the respondents interviewed, four people's family have been previously affected with the zoonotic disease.

VI. CONCLUSION

This study suggests that the zoonotic disease pose a threat to people, but the risks were grossly underestimated. Despite the risks possessed by the zoonotic diseases, only a few people are aware and know zoonosis in Siddharthanagar municipality, Rupandehi. Age, gender, occupation, ethnicity, educational status of the respondents showed a significant difference concerning about zoonosis, which may have been because of the higher level of literacy among the specific risk factors. Thus, awareness is to be raised in the people regarding the threats and risks of zoonotic diseases to humans by the collaborative efforts of veterinarians, human health professionals as well as the government by conducting awareness campaigns, dramas or advertisements in the radio or television or by a distribution of pamphlets and printed materials among people.

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