Nepalese Journal of Zoology

ISSN: 2705-4403 (Print) & 2705-4411 (Online)
https://www.nepjol.info/index.php/njz

Volume 10 | Issue 1 | June 2026

https://doi.org/10.3126/njz.v10i1.98857

Research article

Knowledge, attitude, and practices regarding zoonoses among stakeholders in rural Nepal: A cross-sectional study

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Suggested citation: Paudel N., Ojha K.C., Shah Y., Pant D.K., Singh A.K. and Rimal S. 2026. Knowledge, attitude, and practices regarding zoonoses among stakeholders in rural Nepal: A cross-sectional study. Nepalese Journal of Zoology, 10(1):10–18.
https://doi.org/10.3126/njz.v10i1.98857

Article history:
Received: 09 October 2025
Revised: 13 June 2026
Accepted: 23 June 2026

Publisher's note: The statements, opinions and data contained in the publication are solely those of the individual author(s) and do not necessarily reflect those of the editorial board and the publisher of the NJZ.

Abstract

Zoonotic diseases, which can be transmitted from animals to humans, pose significant health risks globally. Understanding the Knowledge, Attitude, and Practices of communities towards zoonotic diseases is essential for effective prevention and control of the diseases. This study aimed to assess KAP related to zoonotic diseases among various stakeholders in Haldibari Rural Municipality of Jhapa district, Nepal. A cross-sectional survey, comprising 200 respondents, was carried out during the period of July to August 2023. Data was collected using semi-structured questionnaires and analyzed using SPSS v25. The study revealed that most respondents (68.0%) were unaware of the term "zoonoses" and only 12.0% could accurately define zoonotic diseases. Knowledge levels varied significantly by ward, gender, age, education level, and occupation (P<0.001). In ward 5 males youngers, individuals, students, teachers and those with higher education levels demonstrated better understanding. While diseases like rabies and bird flu, were commonly recognized, awareness of brucellosis, echinococcosis and neurocysticercosis were low. Attitudes toward zoonotic disease prevention and control, varied significantly among occupation groups P<0.001). Students and teachers exhibited more positive attitudes toward zoonotic diseases. Practices, including hand hygiene and food consumption during farm tasks, varied significantly among groups (P<0.001). Deworming animals was a positive practice across all groups. The study emphasizes the need for targeted awareness campaigns, improved hygiene, safe livestock management and collaborative efforts to reduce zoonotic disease risks.

Keywords: Knowledge, Attitude, Practices, Occupation, Nepal, Zoonoses

1 | Introduction

The disease or infection that is naturally transmissible from vertebrate animals to humans and vice versa is classified as a zoonosis (WHO 2020). Zoonotic diseases can be caused by viruses, bacteria, rickettsia, fungi, helminths, protozoa, and arthropods. Globally, approximately 75% of emerging infectious diseases affecting humans during the past decade have originated from animals or their products (Chomel et al. 2007). Zoonotic disease represents a major public health concern, remarkably in low and middle countries where close interaction among human, livestock and wildlife are common. It has been estimated that 13 major zoonotic diseases cause about 2.4 billion cases of illness and 2.7 million human deaths annually, many of these diseases affect animal health and decrease livestock production (Grace et al. 2012). Professionals that work closely with animals, such as livestock farmers, veterinarians, and para-veterinarians, are more susceptible to this condition. Similarly, zoonotic illnesses are more likely to affect residents of places close to the human-wildlife interfaces, such as buffer zones in protected areas (Niroula 2016). Zoonoses like taeniasis / cysticercosis / neurocysticercosis, leptospirosis, hydatidosis, brucellosis, toxoplasmosis, rabies, and avian influenza are found to have epidemic potential and have been identified as Priorities Zoonotic Diseases in Nepal (Adhikari & Bagale 2019; Poudel et al. 2020; Devleesschauwer et al. 2014; Shah et al. 2022; Ojha et al. 2018). Rabies remains one of the most significant zoonotic diseases in Nepal, which has one of the highest per-capita human rabies mortality rates globally. Approximately100-200 people and around 100 livestock die annually due to rabies-related dog bites, while thousands require post-exposure prophylaxis each year (Gongal & Wright 2011; Devleesschauwer et al. 2016). Similarly, outbreaks of avian influenza have caused substantial economic losses in the poultry sector. Tuberculosis (TB) is another major public health concern, with an estimated 117,000 people living with the disease and approximately 7000 deaths annually in Nepal. The increasing occurrence of multi-drug resistant, extra pulmonary and

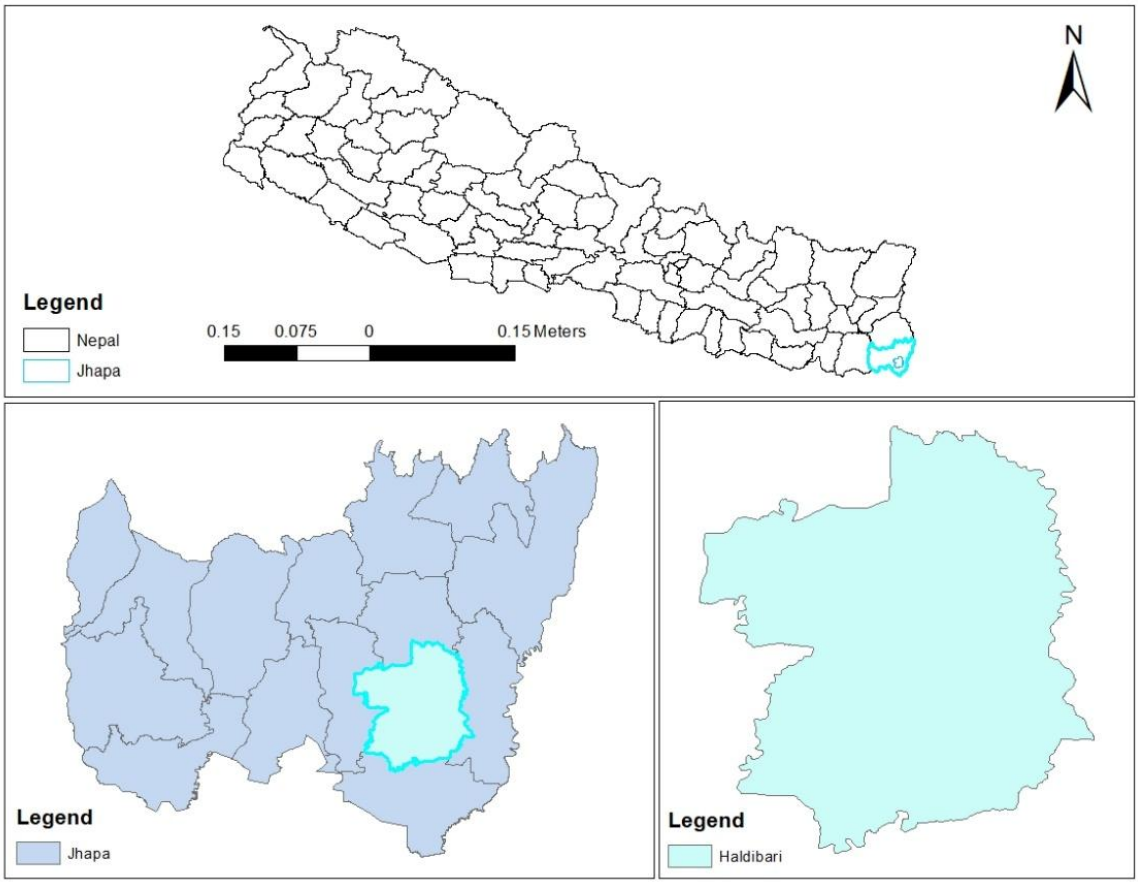

Figure1. Study Area Map showing Jhapa district and Haldibari Rural Municipality

Table 1. Socio demographic characteristics of the respondents in Haldibari Rural Municipality

Variables	Attributes	Frequency	Percentage
Ward	Haldibari-1	20	10.0
	Haldibari-2	97	48.5
	Haldibari-3	33	16.5
	Haldibari-4	27	13.5
	Haldibari-5	23	11.5
Sex	Female	59	29.5
	Male	141	70.5
Age	14-28	57	28.5
	29-43	40	20.0
	44-58	67	33.5
	59 and above	36	18.0
Education	No formal education	49	24.5
	Primary school	30	15.0
	Secondary school	72	36.0
	College	49	24.5
Occupation	Farmers	50	25.0
	Meat sellers	50	25.0
	Students	50	25.0
	Teachers	50	25.0
Involved in livestock farming	Yes	165	82.5
	No	35	17.5
Average monthly income	Rs 10,000-40,000	96	48.0
	Rs 41,000-80,000	54	27.0
	Rs 81,000-1,50,000	2	1.0
	Don't have	48	24.0

zoonotic TB further complicate disease control efforts (Gompo et al. 2020; Shah et al. 2022). Brucellosis and leptospirosis are also widely reported in both human and livestock in Nepal. Many studies have reported varying prevalence rates of brucellosis among cattle, buffaloes, goats, and humans, while leptospirosis has been reported in several livestock species as well as humans (Pandeya et al. 2016; Jha 2021). Likewise, taeniasis, cysticercosis and neurocysticercosis remain important zoonotic diseases, specifically in certain ethnic communities and rearing regions, with considerable prevalence reported in both human and pigs (Joshi et al. 2003; Joshi et. al. 2007). Despite the burden of zoonotic diseases, only a limited number of studies have assessed the public awareness and knowledge regarding zoonoses in Nepal. Prior studies mainly focused on individual diseases such as rabies, avian influenza, and tuberculosis, revealing that although people were generally aware of these diseases, their understanding of causes, transmission routes, and preventive measures remained inadequate (Niraula et al. 2020: Pal et al. 2021; Paneru et al. 2014). Additionally, comprehensive assessments covering multiple zoonotic diseases are lacking. Therefore, this study aimed to assess the knowledge, attitudes and practices of communities regarding zoonotic diseases in Jhapa District, Koshi Province, Nepal.

2 | Materials and methods

2.1 | Ethical declaration

The ethical approval obtained before conducted study (Permission number 118/2079-80) from Department of Veterinary Public health and Epidemiology, HICAST, Kirtipur Kathmandu, and oral consent was taken individually from participants prior interview with explanation of study objective.

2.2 | Study area

Haldibari is a rural municipality with geographical coordinates of its headquarter at 26.50°N latitude and 87.90°E longitude, with a total area of 117.3 km^2 and a population density of 278.9 people per km^2 located in the Jhapa district of Nepal (Fig. 1). In 2021, Haldibari has a population of 32,722 consisting of 15,611 men and 17,111 women with 81.3% of population above five years of age able to read and write: however, their educational level is unclear. The average annual growth rate is 1.2% from 2011 to 2021 (CBS 2021).

A cross-sectional study was carried out from July to August 2023 to evaluate the knowledge, attitude, and practice of zoonotic diseases among various stakeholders. A randomized stratified sampling procedure was employed to include all individuals based on their occupation residing within the Haldibari Rural Municipality. The study population comprised residents of Haldibari with diverse socio-demographic characteristics, encompassing individuals of all genders, various age groups, different occupations, income levels, and varying educational backgrounds. Additionally, the target population participated in interviews that addressed specific questions related to the community's knowledge, attitudes, and practices concerning the control of zoonotic diseases.

2.3 | Sample size determination

The study population of the current study comprised of randomly selected students, teachers, farmers, and meat sellers that were found in Haldibari Rural Municipality. Thus, the required sample size for this study was estimated by considering the formula given by Yamane (Yamane 1967) for the questionnaire survey. A 95% confidence interval was considered to calculate the sample size. A total of 200 participants were selected to increase precision.

$$n = N / (1+N*(e)^2)$$

Where,
n= sample size,
N = population size = 32,722
E = acceptable sampling error
*95% confidence level and p= 0.05 are assumed.

2.3 | Data collection and analysis

A cross-sectional sampling stratified by occupation**.** sampling method was employed to select the respondents. Data was collected through semi-structured, pre-tested questionnaires and face to face interviews containing questions with demographic information, awareness, knowledge, risks, attitude, and practices regarding zoonotic disease. The data were entered into a MS-Excel-2007 program and analyzed with the help of SPSS v25 for descriptive statistics and possible associations between the variables.

3 | Results

3.1 | Socio-demographic status of respondents

A total of 200 respondents were included in this survey study with 18% of the non-response rate. The distribution of respondents was as follows: 48.5% were from Ward 2, 16.5% from ward 3, 13.5% from Ward 4, 11.5% from ward 5 and 10% from ward 1. Within this group, 70.5% were male and 29.5% were female. The study included 25% of individuals from four different groups: farmers, meat sellers, students, and teachers, and 24.5% received informal education (Table 1). Among the 200 respondents, the mean age of students was 17.58±2.07 years (ranging from 15 to 29), teachers had a mean age of 39.98±10.44 years (ranging from 17 to 62), meat sellers had a mean age of 51.84±10.46 years (ranging from 28 to 72), and farmers had a mean age of 57.38 ± 16.14 years (ranging from 32 to 99). More than two-thirds 82.5% of respondents were involved in livestock farming and 24% of respondents did not have income followed by 27.0% in between Rs 41,000-80,000.

Table 2. Knowledge of respondents regarding zoonotic disease in Haldibari Rural Municipality

Variables		Knowledge related to zoonotic diseases			
		Yes N (%)	No N (%)	χ^2	P-value
Ward	Haldibari-1	7 (35.0)	13 (65.0)	3.670 (df=4)	0.452
	Haldibari-2	26 (26.8)	71 (73.2)		
	Haldibari-3	10 (30.3)	23 (69.7)		
	Haldibari-4	11 (40.7)	16 (59.3)		
	Haldibari-5	10 (43.5)	13 (56.5)		
Sex	Male	51 (36.2)	90 (63.8)	3.820 (df=1)	0.051
	Female	13 (22.0)	48 (78.0)		
Age	14-28	33 (57.9)	24 (42.1)	29.835 (df=3)	<0.001
	29-43	14 (35.0)	26 (65.0)		
	44-58	13 (19.4)	54 (80.6)		
	59 and above	4 (11.1)	32 (88.9)		
Education	No formal education	1 (2.0)	48 (98.0)	45.234 (df=3)	<0.001
	Primary school	3 (10.0)	27 (90.0)		
	Secondary school	33 (45.8)	39 (54.2)		
	College	27 (55.1)	22 (44.9)		
Occupation	Farmers	3 (6.0)	47 (94.0)	57.537 (df=3)	<0.001
	Meat sellers	4 (8.0)	46 (92.0)		
	Students	29 (58.0)	21 (42.0)		
	Teachers	28 (56.0)	22 (44.0)		
Involved in livestock farming	Yes	48 (29.1)	117 (70.9)	3.667 (df=1)	0.056
	No	16 (45.7)	54.3 (19)		
Average monthly Income	Rs 10,000-40,000	12 (12.5)	84 (87.5)	35.155 (df=3)	<0.001
	Rs 41,000-80,000	23 (42.6)	31 (57.4)		
	Rs 81,000-1,50,000	1 (50.0)	1 (50.0)		
	Don't have	28 (58.3)	20 (41.7)		

3.2 | Knowledge of the respondents on zoonotic disease

Among the 200 respondents, 32.0% (64) had heard the term zoonoses but only 12% could correctly explain the term. The rest 68% (136) were unaware about this term (Figure 2). The result revealed that ward 2 had higher knowledge of the zoonotic disease (26.8%) followed by ward 4 (40.7%), ward 3 (30.3%), ward 5 (43.5%) and ward 1 (35.0%) and there was no statistically significant difference (P>0.05) between ward of respondents and knowledge about zoonoses.

Likewise, the result showed that males had higher knowledge of the zoonotic disease (36.2%) than females (22.0%) and there was statistically significant difference (P≤0.05) between sex of respondents and knowledge about zoonoses. However, the age of respondents was significantly associated with knowledge of respondent (P≤0.05) and respondents between the age of 14-28 had higher knowledge (57.9%). Similarly, the educational status of the respondents was found to be statistically significant (P≤0.05) with knowledge status with college level having higher knowledge (55.1%) towards zoonotic disease followed by respondents with secondary school and primary school level (Table 2). Moreover, statistically significant association was observed in occupation and average monthly income of the respondents. The findings showed that students had better knowledge of zoonotic disease (58.0%) followed

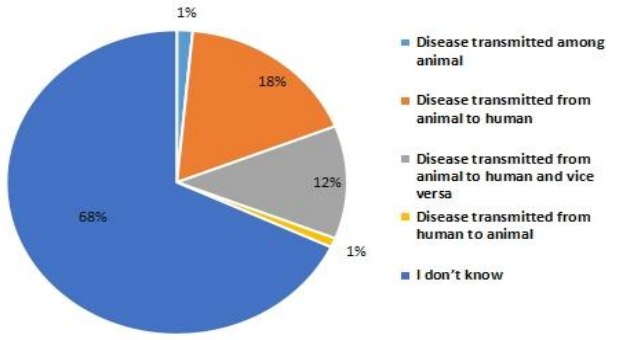

Figure 2. Knowledge on definition of zoonoses among respondents

by teachers (56.0%), meat sellers (8.0%) and farmers (6.0%). Some examples of zoonotic disease given by the respondents were rabies, bird flu, COVID-19, swine flu, tuberculosis, monkey pox, Ebola, FMD and so on as shown in Figure 3.

The study revealed that 192 (96.0%) of respondents had heard about rabies mentioning 180 (58.44%) dogs were susceptible to rabies. 8 (2.68%) of respondents could not mention the symptoms of rabies in animals and humans whereas other symptoms mentioned were 154 (51.50%) hydrophobia, 108 (36.12%) salivation, 24 (8.03%) altered personality and 5 (1.67%) aerophobia. A total of 155 (77.5%) of respondents were familiar with bird flu, with 105 (52.50%) identifying it as a disease of poultry and 48 (24.0%) recognizing that both humans and poultry could be susceptible to this disease (Fig. 4). Only few 17 (8.5%) of respondents had heard about bovine tuberculosis but 183 (91.5%) hadn't heard about it. Majority, 164 (82.0%) of respondents had knowledge about human tuberculosis. Regarding the transmission of disease, 129 (45.90%) respondents said contaminated secretions as the cause followed by 80 (28.47%) direct contact and 36 (12.81%) consuming raw milk. However, only 11 (5.5%) of respondents knew about brucellosis whereas 189 (94.5%) hadn't heard about it in the study. Likewise, very few respondents 8 (4.0%) in the study knew about echinococcosis/neurocysticercosis.

3.3 | Attitude of the respondents on zoonotic disease with respect to their occupation

The attitude of respondents on zoonotic disease treatment, prevention, control and consumption of dead animal with their occupation was assessed and the study revealed that statistically significant differences (P≤0.05) were observed. However, the association of deworming of animals and occupation was statistically insignificant (P>0.05). Of those who have a positive perception of zoonotic treatment, about 36.4% of respondents were students while 40.5% of those who did not have a positive perception of the zoonotic disease treatment were farmers. About 36.3% of those who have a positive perception of the possibility of zoonotic disease prevention were students whereas 43.4% of those who didn't have a positive perception of the possibility of zoonotic disease prevention were meat sellers. Furthermore, the study depicted that the attitude of respondents towards zoonotic disease control possibilities was better in those with students and teachers compared to those meat sellers and farmers (P≤0.05). Similarly, majority of respondents who were teachers had positive perception towards deworming animals and disposal of carcass of diseased animals while 29.4% respondents having negative perception were farmers (Table S1).

3.4 | Practice of the respondents on zoonotic disease based on occupation

The practice of drinking raw milk was also found to be higher in meat sellers and farmers compared to those with students and teachers (P≤0.05). 21.9% of respondents who didn't wash their hands after contact with animals were farmers and meat sellers. Similarly, there was statistically significant difference in how aborted fetuses and placenta are disposed of among different groups, with teachers and students more likely to respond "Yes" compared to meat sellers and farmers (P≤0.05). Correspondingly,

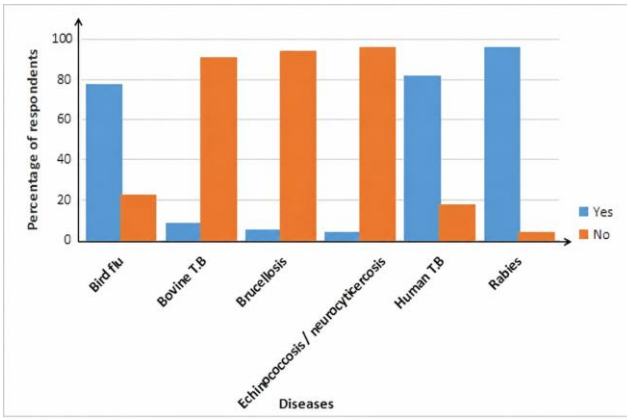

Figure 4. Knowledge of different zoonotic diseases among respondents

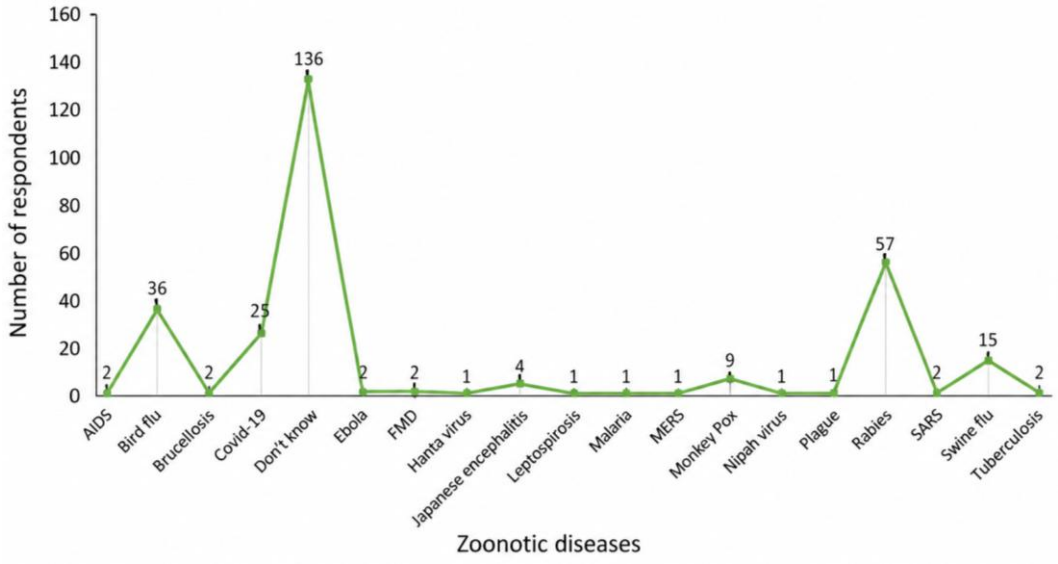

Figure 3. Examples of zoonotic diseases given by respondents

there was no statistically significant association between different occupations (Farmers, Meat sellers, Students, and Teachers) and the occurrence of health issues after coming into contact with animals or their waste (P>0.05. Furthermore, there was a statistically significant difference in the behavior or practices related to buying animals only from farms with known health status and consuming food or drinks during farm tasks among different occupation (p≤0.05). However, deworming of animals was significantly associated with occupation of respondents as each group showed positive practice towards deworming. The practice of implementing quarantine measures and testing of animals to identify any potential zoonotic agents was not observed (Table S2).

4 | Discussion

This study revealed that only 32% of the respondents in our community possessed knowledge about zoonotic diseases. This result indicates a comparatively lower level of awareness when juxtaposed with a study conducted in Western Nepal (Niraula et al. 2020) where a substantial 74% of the population demonstrated familiarity with the term zoonosis. Additionally, these results differ from those of a study conducted in Central Nepal (Kelly et al. 2018) where awareness regarding disease transmission between animals and humans stood at 55% among farmers.

Several factors were found to influence knowledge about zoonotic diseases, including ward, gender, age, education level, occupation, and income (Rajkumar et al. 2016). Males exhibited significantly higher knowledge levels than females, emphasizing the importance of targeted education for women (Rai et al. 2025). It might be male often have greater mobility wider social networks, and more frequent participation in activities such as farming, livestock management resulting in more frequent contact with potential zoonotic disease reservoirs. Younger respondents (age 14-28) demonstrated higher knowledge levels, suggesting that youth engagement programs could be effective in improving awareness (Rajkumar et al. 2016).While this study also revealed that respondents from various occupations demonstrated a degree of awareness regarding the zoonotic potential of rabies virus and Bird flu, it also highlighted a notable gap in awareness concerning other crucial livestock-associated zoonotic diseases prevalent in Nepal (Niraula et al. 2021). Diseases such as tuberculosis, brucellosis, toxoplasmosis, Foot and Mouth Disease, and various parasitic diseases appeared to be less recognized within this surveyed population (Rajkumar et al. 2016) Furthermore, this research illuminated the fact that respondents engaged in farming and meat selling, particularly those with limited literacy or lacking formal education, displayed minimal knowledge about zoonotic diseases. These findings resonate with the outcomes of surveys conducted among smallholder livestock owners in central Nepal (Kelly et al. 2018) Tajikistan (Lindahl et al. 2015) and Senegal (Tebug et al. 2015) which consistently reported similar trends in zoonotic disease awareness.

In this study, it was observed that a significant majority of the respondents possessed positive knowledge and displayed a favorable attitude towards the prevention of zoonotic diseases (Mamun et al. 2024). However, Students and teachers exhibited more positive attitudes toward zoonotic disease treatment, prevention, control, and the consumption of dead animals, compared to meat sellers and farmers (Samadi et al. 2026). The gap between awareness and practice may be due to factors such as farmers and meat sellers limited understanding of disease transmission modes, their perception of disease risk, and doubts about their capacity to implement preventive measures on their farms (Kelly et al. 2018). For example, despite the frequent occurrence of abortions among various animal species, none of the respondents reported conducting testing or vaccinations for Brucellosis in their livestock (Jackson et al. 2014; Pandeya et al. 2016; Acharya et al. 2016).

In this study, a significant majority of respondents (32%) reported the practice of consuming raw milk, which is notably higher than in another study conducted by (Kelly et al. 2018) where none of the participants engaged in this practice. Our findings, however, align with those from other regions, with 23.9% of farmers in Punjab, India (Singh et al. 2019) and a substantial 95.0% in Senegal (Tebug et al. 2015) acknowledging the consumption of raw milk. Similarly, a significant majority of livestock owners (87%) reported the practice of deworming, which surpasses the findings of a study conducted in Punjab, where only 72.52% of participants practiced the use of anthelminthic drugs. Handwashing after contact with animals was notably low among farmers and meat sellers, highlighting a hygiene concern that requires targeted intervention.

The practice of buying animals from farms with known health status and consuming food or drinks during farm tasks varied by occupation, underlining the importance of reinforcing safe practices across all stakeholder groups (Losacco et al. 2025). The attitude and practices of farmers and meat sellers pose several potential risks (Abunna et al 2024). For instance, the consumption of raw milk represents a potential hazard for the transmission of diseases such as brucellosis and tuberculosis (Lucey 2015; Adetunji et al. 2020). However, the implementation of deworming practices appears to mitigate the potential threats of zoonotic infections arising from parasites like neurocysticercosis, taeniasis, and echinococcosis (Okello & Thomas 2017). Therefore, it is crucial to maintain continuous community motivation and improve education while sensitizing government officials to actively engage in mass awareness campaigns about zoonotic diseases.

5 | Conclusion

This cross-sectional study has assessed the knowledge, attitude, and practices of residents of Haldibari Rural Municipality towards zoonotic diseases and examined differences across occupational groups. The findings revealed important gaps in knowledge and the presence of potentially risky practices, including the consumption of raw milk handlining dead animal parturition without protective equipment. This practice may increase potential risk of zoonotic diseases, particularly among occupational groups with frequent contact. Future research should explore the factors influencing these practices and evaluate the effectiveness of targeted educational and preventive interventions in reducing zoonotic disease risks.

Acknowledgements

We would like to thank residents of the Haldibari with diverse socio-Rural Municipality demographic characteristics, which included individuals of all genders, various age groups, different occupations, income levels, and varying educational backgrounds. We are also thankful to Himalayan College of Agriculture Science & Technology, Pokhara University for providing ethical approval for study.

Authors' contributions

N.P., K.C.O. and S.R. wrote the first draft. N.P., K.C.O., Y.S., D.K.P., A.K.S. and S.R. revised the manuscript. All authors read and approved the final manuscript for submission.

Conflicts of interest

The authors declare no conflict of interest.

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Supplementary Table S1. Comparison of occupation with the attitude of respondents regarding zoonotic disease in Haldibari Rural Municipality

Variables		Attitudes Vs Occupation of respondents					
		Farmers N (%)	Meat sellers N (%)	Students N (%)	Teachers N (%)	Chi-square (X^2)	P-value
Do you believe that zoonotic disease transmitted by animal pose a significant threat to public health?	Yes	16 (14.7)	12 (11.0)	41 (37.6)	40 (36.7)	57.324 (df=1)	<0.001***
	No	34 (37.4)	38 (41.8)	9 (9.9)	10 (11.0)		
Do you believe that an animal that died with disease should be buried and covered with lime or other disinfectant?	Yes	34 (21.4)	36 (22.6)	41 (25.8)	48 (30.2)	14.325 (df=1)	0.002**
	No	16 (39.0)	14 (34.1)	9 (22.0)	2 (4.9)		
Do you believe animal should have to be dewormed?	Yes	45 (24.6)	46 (25.1)	43 (23.5)	49 (26.8)	4.822 (df=1)	0.185
	No	5 (29.4)	4 (23.5)	7 (41.2)	1 (5.9)		
Do you think dead animal should not be used for consumption?	Yes	42 (25.3)	34 (20.5)	42 (25.3)	48 (28.9)	14.033 (df=1)	0.003**
	No	8 (23.5)	16 (47.1)	8 (23.5)	2 (5.9)		
Do you think throwing aborted fetuses and placenta to the environment contribute the spread of the diseases in your farm?	Yes	24 (19.4)	13 (10.5)	43 (34.7)	44 (35.5)	58.324 (df=1)	<0.001***
	No	26 (34.2)	37 (48.7)	7 (9.2)	6 (7.9)		
Do you think zoonotic disease can be treated?	Yes	18 (14.9)	16 (13.2)	44 (36.4)	43 (35.5)	58.981 (df=1)	<0.001***
	No	32 (40.5)	34 (43.0)	6 (7.6)	7 (8.9)		
Do you think zoonotic disease can be prevented?	Yes	21 (16.9)	17 (13.7)	45 (36.3)	41 (33.1)	50.255 (df=1)	<0.001***
	No	29 (38.2)	33 (43.4)	5 (6.6)	9 (11.8)		
Do you think zoonotic disease can be controlled?	Yes	21 (16.5)	19 (15.0)	45 (35.4)	42 (33.1)	48.215 (df=1)	<0.001***
	No	29 (39.7)	31 (42.5)	5 (6.8)	8 (11.0)		
Do you believe that farmers have responsibility to prevent the transmission of zoonotic diseases?	Yes	20 (16.7)	13 (10.8)	45 (37.5)	42 (35.0)	63.167 (df=1)	<0.001***
	No	30 (37.5)	37 (46.2)	5 (6.2)	8 (10.0)		
Do you think there is a need for more education and training for farmers on zoonotic disease and their prevention?	Yes	17 (15.2)	13 (11.6)	41 (36.6)	41 (36.6)	55.519 (df=1)	<0.001***
	No	33 (37.5)	37 (42.0)	9 (10.2)	9 (10.2)		

[Note: * presents significant at 0.05 level of significance; ** presents significant at 0.01 level of significance and *** presents significant at 0.001 level of significance; df: degree of freedom

Supplementary Table S2. Comparison of occupation with the practice of respondents regarding zoonotic diseases in Haldibari Rural Municipality

Variables		Practices Vs Occupation of respondents					
		Farmers N (%)	Meat sellers N (%)	Students N (%)	Teachers N (%)	Chi-square (X2)	P-value
Do you drink raw milk or consume products made from raw milk?	Yes	19 (29.7)	25 (39.1)	15 (23.4)	5 (7.8)	19.485 (df=1)	<0.001***
	No	31 (22.8)	25 (18.4)	35 (25.7)	45 (33.1)		
Do you wash your hands after coming into contact with animals?	Yes	37 (21.9)	37 (21.9)	48 (28.4)	47 (27.8)	16.912 (df=1)	0.001***
	No	13 (41.9)	13 (41.9)	2 (6.5)	3 (9.7)		
Do you use gloves while performing tasks on the farm?	Yes	1 (3.4)	3 (10.3)	23 (79.3)	2 (6.9)	53.680 (df=1)	<0.001***
	No	49 (28.7)	47 (27.5)	27 (15.8)	48 (28.1)		
Do you wear specific attire or clothing when working on the farm?	Yes	2 (8.0)	1 (4.0)	20 (80.0)	2 (8.0)	46.217 (df=1)	<0.001***
	No	48 (27.4)	49 (28.0)	30 (17.1)	48 (27.4)		
Do you wear gloves while performing tasks that may cause abrasions or cuts?	Yes	2 (4.3)	2 (4.3)	30 (65.2)	12 (26.1)	59.063 (df=1)	<0.001***
	No	48 (31.2)	48 (31.2)	20 (13.0)	38 (24.7)		
Do you dispose aborted fetus and placenta properly?	Yes	37 (26.2)	16 (11.3)	44 (31.2)	44 (41.2)	50.655 (df=1)	<0.001***
	No	13 (20.0)	34 (57.6)	6 (10.2)	6 (10.2)		
Have you ever faced any health issues after encountering animals or their waste?	Yes	3 (30.0)	2 (20.0)	4 (40.0)	1 (10.0)	2.105 (df=1)	0.551
	No	47 (24.7)	48 (25.3)	46 (24.2)	49 (25.8)		
Do you wear protective equipment such as gloves when assisting animals in parturition and handling birth material?	Yes	3 (8.1)	2 (5.4)	24 (64.9)	8 (21.6)	41.220 (df=1)	<0.001***
	No	47 (28.8)	48 (29.4)	26 (16.0)	42 (25.8)		
Have you ever done deworming of your animals?	Yes	49 (28.2)	49 (28.2)	32 (18.4)	44 (25.3)	34.129 (df=1)	<0.001***
	No	1 (3.8)	1 (3.8)	18 (69.2)	6 (23.1)		
Do you buy animals only from farms with known health status?	Yes	3 (12.0)	3 (12.0)	12 (48.0)	7 (28.0)	10.011 (df=1)	0.018*
	No	47 (26.9)	47 (26.9)	38 (21.7)	43 (24.6)		
Do you implement quarantine measures and conduct tests on the animals you purchase to identify any potential zoonotic agents?	Yes	0 (0.0)	0 (0.0)	11 (78.6)	3 (21.4)	24.885 (df=1)	<0.001***
	No	50 (26.9)	50 (26.9)	39 (21.0)	47 (25.3)		
Do you consume food or drinks during farm tasks?	Yes	6 (15.0)	14 (35.0)	16 (40.0)	4 (10.0)	13.000 (df=1)	0.005**
	No	44 (27.5)	36 (22.5)	34 (21.2)	46 (28.7)		

[Note: * presents significant at 0.05 level of significance; ** presents significant at 0.01 level of significance and *** presents significant at 0.001 level of significance; df: degree of freedom