Assessment of practice towards zoonotic diseases among cattle owners

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Assessment of practices towards zoonotic diseases among cattle owners

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Statement of Author

I, Urbi Anika Islam, hereby declare that I have successfully completed all of the tasks listed in this report. Books, regional and worldwide publications, and other sources were used to collect the data. The required citations have all been made. As a result, I am entirely accountable for gathering, processing, maintaining, and disseminating all information gathered for this report.

_____

The Author

List of Acronyms Symbols Used

Abbreviation	Elaboration
%	Percentage
P	The P-value is known as the level of marginal significance
SD	Standard Deviation
OR	Odd ratio
CI	Confidence interval
No, N	Number
*	Expected Answer
>	Greater than
<	Less than
e.g.,	Example
etc.	Et cetera
et. al	And his associate
CVASU	Chattogram Veterinary and Animal Sciences University

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Abstract

Zoonotic diseases have a negative impact on both human and animal health and are very common in underdeveloped nations. By raising knowledge and advocating preventive measures among those who manage animals, the impact of these diseases could be minimized. The goal of the study was to assess the level of practice and its possible risk factors among the cattle owners. Pre-structured questionnaire used to know the practices and other characteristics. Chi-square test was used to magnify the association between different characteristics and practice. A logistic regression was used to quantify the potential risk factors which triggering practice. The average age of the respondents were 43 years old. The average experience of cattle rearing was 10 years. 66.2% respondents exhibits good practice and 33.8 % exhibits poor practices regarding zoonotic disease among cattle owners. The average age of the respondents were 43 years old. The average experience of cattle rearing was 10 years. About 94% people think handwashing is important to handle cattle to prevent this disease. Education, cattle rearing and disease training, and yearly income from cow were the significant predictors for practice. The preventative practices of respondents were found to be highly influenced by socio-demographic, and farm characteristics. Age, education, income, training, experience of farming was associated with practice towards zoonotic disease. Increasing awareness and training could reduce the risks of zoonotic diseases.

Keywords: Zoonotic diseases, awareness, practices, cattle owners, Bangladesh

Chapter 1. Introduction

Zoonotic diseases have a significant impact on the economy, public health, and cattle productivity (FAO, 2002). Zoonotic infections have an impact on livestock health and productivity both directly and indirectly (Smits & Cutler, 2004). To fulfill the rising need for animal protein, livestock output is rising globally. As more frequent encounters between humans and livestock are possible in a constrained area as a result of an increase in both populations, this has consequences for the spread of zoonotic illnesses (Klous et al., 2016; Majekodunmi et al., 2019).Zoonotic diseases have the potential to have three major effects on society: (1) they threaten animal health, resulting in illness, reduced productivity, and death; (2) they endanger the way of life of people who depend on livestock as a major source of income; and (3) they infect and kill humans, resulting in further economic and societal loss(Grace et al.2012; Yalemebrat et al. 2016).

Zoonotic diseases can be acquired or transmitted in a number of ways, including through the air (aerosol), direct contact, contact with an inanimate object that has the disease on it (fomite transmission), oral consumption, and insect transmission (Pelzer and Currin, 2005). According to the World Health Organization (WHO), there are seven endemic zoonoses that warrant concern: brucellosis, rabies, human African trypanosomiasis, bovine tuberculosis (BTB), cysticercosis, echinococcosis, and anthrax. In addition to causing enormous financial losses for the livestock industry, zoonoses also result in human mortality and morbidity (WHO, 2005). Additionally, zoonotic illnesses harm the economy by creating trade barriers and lowering market demand for goods (McDermottand and Arimi, 2002).

Zoonotic infections are detrimental to the health of humans and animals in developing countries (Halliday et al. 2015). Infections may be transmitted by contact with animal fur or hair, faeces, or the usage of animal waste as farm manure (Conrad et al., 2017). Also, zoonotic diseases in the human population have also been linked to a lack of awareness, along with inadequate attitudes and behaviours toward proper animal husbandry in cow farming (WHO 2019; Taylor et al., 2000, Rajkumar et al., 2016, Asbjer, 2009, Jhon et al., 2007). According to the WHO's 2018 Facts on Zoonosis, the majority of these underprivileged groups frequently exhibit inadequate healthcare systems that are unable to identify zoonotic illnesses in their early stages. One of the main causes of the emergence of zoonotic diseases in humans is a lack of understanding these illnesses. Livestock producers' two main professions are agriculture and animal husbandry, which exposes them to a number of deadly zoonotic infections (Munisamy et al., 2017). As the same issue with health

education is recognized in industrialised nations as well, there is a lack of understanding among cattle producers about the need of preventing cow-related zoonotic infections (Viana et al., 2012). In order to prevent and manage the spread of zoonotic illnesses, it may be beneficial to raise livestock owners' awareness of the need for proper disease diagnosis methods. Understanding public perception and farmer behavior has therefore attracted a lot of interest recently and could be a useful tool in creating and upgrading current regulatory measures. Veterinary professionals and medical professionals must collaborate to control zoonotic disease because the former lack extensive training in the clinical aspects of human disease and the latter frequently overlook the role of animals in disease transmission (Gezmu et al., 2017, Grant and Olsen, 1999).

Despite the criticality of zoonotic diseases and their ramifications, there is a dearth of comprehensive investigations focusing on cattle owners' Knowledge, Attitude, and Practices (KAP) regarding zoonotic diseases in Bangladesh. This research endeavors to bridge this gap by conducting a thorough evaluation of cattle owners' preventive practices in specific regions of Bangladesh, such as Chittagong and its surrounding areas. The study's objectives encompass evaluating cattle owners' preventive practices towards zoonotic diseases.

1.1. Objectives of the study

Investigating practices related to zoonotic diseases in cattle was the main goal of this study. The study also aimed to look into other factors that might affect how farmers engage in these practices.

These were the specific objectives:

1)To determine the severity of zoonotic disease management techniques among farmers in a specific geographic area.

2)To investigate the relationships between socio-demographic factors, traits associated with cattle and farming, and the intensity of practices.

3)To identify potential risk variables that might affect the levels of practices and are related to sociodemographic factors, livestock and farming characteristics, etc.

Chapter 2. Materials and Methods

2.1 Study setting and design

The study was conducted in three Upazilas in Bangladesh: Hathazari and Karnaphuli, situated in the Chattogram district, and Chakaria in the Cox's Bazar district of Bangladesh. Hathazari and Karnaphuli are part of the Chattogram Division. The coordinates of Hathazari are 22.5083°N 91.8083°E. The population is 431,748 in total. Its overall size is 251.28 km^2 and there are 52,594 houses there. Agriculture is the secondary source of revenue, with services as the primary one (BBS, 2011). In Hathazari, the average literacy rate is 57.9%, with 61.1% for males and 54.6% for females (Syed, S., 2012). Distance is 260 km from the capital, Dhaka. Karnaphuli is the 490th Upazila in Bangladesh. It was established on 27 May 2000 with five unions. Chakaria is located at 21.7861°N 92.0778°E. It has 63671 households and a total area of 643.46 km^2. According to the 1991 Bangladesh census, Chakaria had a population of 409, 346. Males constituted 51.87% of the population, and females 48.13%. Average literacy 33.48%; Male 39.18%, Female 30.54%. Distance is 276 km from the capital, Dhaka. Numerous dairy farms surround the entire area, and the majority of farmers rely only on the income from these farms.

Farmers from the Hathazari, Karnaphuli, and Chakaria Upazilas were included in the study's population, along with individuals who exhibited a range of sociodemographic characteristics. In addition, the target groups were questioned about their knowledge, attitudes, and practices regarding a specific public health strategy for zoonotic disease control.

2.2 Study population

The study population in the chosen locations consisted of only cattle farmers. Farmers who rear cattle for commercial or subsistence purposes in the chosen locations of Hathazari, Karnaphuli and Chakaria are referred to as the study unit for the purposes of this study, which aims to evaluate their practices regarding cattle-related zoonotic illnesses. Farmers of cattle who are both male and female meet the inclusion criteria. Both commercial and subsistence farmers who raise cattle are required. Must provide permission to take part in the study. Participants were excluded if they were unwilling to provide informed consent, regardless of whether they were cattle farmers or not.

2.3 Sampling design and ethics

A cross-sectional study was conducted from March 2023 to May 2023 to evaluate the community's awareness of the knowledge, attitude, and practice of an integrated one-health strategy to reducing zoonosis disease. The respondents were questioned on their knowledge of zoonosis, the hygienic practices used by farmers, the transmission of zoonosis from animals and their products, their understanding of the management of pet and wild animals, and the availability of government and private sector extension services on zoonosis. The goals were achieved by using a convenience sampling design. From the three chosen Upazilas, a total of 302 data were collected. Data collection for this study was done in accordance with the Helsinki ethical guidelines. During the interview, the respondent was asked for a written informed consent.

2.4 Data collection procedure

To evaluate the knowledge, attitude, and practices of the farmers who live in the study areas, a systematic questionnaire was developed. During the interview, the questionnaire was appropriately translated into the Chittagonian language and given to the inhabitants that reside in the study areas. Additionally, before the interview began, they were informed of the survey's goal and asked for their permission. There are both closed- and open-ended questions on the survey. It is divided into three sections. First, socio-demographic data included details such as age, marital status, religion, education, occupation, family income, family structure, and number of wage earners. Second, characteristics pertaining to livestock and farms included the quantity of animals, yearly income from cows, training for disease and cattle husbandry, and so on. Thirdly, questions about zoonotic disease knowledge, attitude, and practice. There were nine knowledge-related questions. the inquiries on zoonotic disease transmission, outbreak, management, awareness, and training. The attitude-related query had a score of 7. Consumption habits, vaccinations, public health, preventive, and control were among the attitude-related inquiries. Nine were the practice-related questions. It asked about things like hand washing, using soap, managing animals, managing carcasses, etc. Questions on practice got yes or no answers. The score is 1 for a "yes" response and 0 for a "no." For analysis purpose, we categorized binary of practice score with the help of median.

The practices of the participants were assessed on a score of 0-9. A score of less than six (6), was designated as poor practices and a score of six (6) or more was designated as good practices. The scale expresses good reliability in the present study with a Cronbach's alfa of 0.81 for assessment of practice.

2.5 Statistical analysis

Mean, standard deviation and frequency, percentages were calculated for continuous variable and categorical variable The categorical variables were presented as a bar graph. An association was quantified for all categorical variables by chi-square test and fisher exact test. A logistic regression model was employed to find out the significant predictors on practice. Hosmer and Lemeshow test was applied for goodness of fit model. A likelihood ratio test was applied for significance of the model parameters. Odds ratio (OR) was used to interpret the parameters and confidence interval (CI) was used to make understand significance of the parameters. All analyses were done using SAS version 9.3 software, 5% significance level was considered with two tailed test.

Chapter 3. Data analysis and Presentation

3.1 Socio-demographic and socioeconomic characteristics of the respondent

In this survey study, 302 respondents were analyzed to capture the demographic landscape. Males represented 80.8% of the population, with females making up 19.2% of it. According to age groups, the majority (60.3%) of people were between the ages of 36 and 50, while 18.9% of people were under 35 and 20.9% were over 50. With a variance of 9.41 years, the average age was 43.35 years. Participants who reported their marital status as married (97.4%) were more common than those who did not: 1.0% reported being single, 1.0% divorced, and 0.7% reported being widowed. According to educational levels, the majority (47.7%) had only received a primary education; 13.6% had a secondary education or higher; and 5% were illiterate. Participants' occupations ranged widely: farmers made up the majority (76.5%), followed by businessmen (18.2%), housewives (3.0%), and a number of other professions. In terms of religion, Islam was the most prevalent (97.7%), followed by Hinduism (2.3%). The average household income was around 52238 taka. Family structures included nuclear (54.3%) and joint (45.7%) arrangements. Families ranged in size from 2 to 10 members, with 6 to 10 being the most common (58.3%), 2 to 5 being at 30.8%, and over 10 being at 10.9%. Families with incomes varied widely, with single earners dominating (41.1%). The average number of wage earners per family was 2.0298; the standard deviation was 1.24256. These results offer a thorough breakdown of the demographic traits of the survey respondents.

Table 1: Socio-demographic information of the respondents of Hathazari, Karnaphuli and Chakaria Upazilas (n=302)

Parameters	Category	Frequency (%)	Mean ± SD
Age in years	≤ 35	57 (18.9)	43.35 ± 9.41
	36-50	182 (60.3)	
	> 50	63 (20.9)	
Gender	Female	58 (19.2)	
	Male	244 (80.8)	
Education	Illiterate	15 (5)	
	Primary	144 (47.7)	
	Secondary	102 (33.8)	
	Higher secondary & above	41 (13.6)	
Marital status	Married	294 (97.4)	
	Single	3 (1.0)	
	Divorce	3 (1.0)	
	Widow	2 (.7)	
Profession	Business	55 (18.2)	
	Farmer	231 (76.4)	
	Housewife	9 (3.0)	
	Others	7 (2.4)	
Religion	Islam	295 (97.7)	
	Hindu	2.3 (2.3)	
Family income monthly	<=30000	47 (15.6)	52238.4106 ± 28572.97206
	31000-50000	156 (51.7)	
	>50000	99 (32.8)	
Family type	nuclear	164 (54.3)	
	joint	138 (45.7)	
Family member	2-5	93 (30.8)	7.1225±2.60492
	6-10	176 (58.3)	
	>10	33 (10.9)	
Earning family member	one member	124 (41.1)	2.0298±1.24256
	two members	101 (33.4)	
	more than 2	77 (25.5)	

Othres (banker, politician, lawyer, teacher)

3.2 Cattle and farm related characteristics of the respondent

Table 2 gives a general overview of several aspects of farming and cattle rearing, such as farm ownership, education, knowledge of cow diseases, living arrangements, experience, yearly income, and cattle numbers across various farm types. 58.3% of individuals had received training in cattle rearing, compared to 41.7% who had not. The mean yearly earnings were 519933.7748 Taka, while the standard deviation was 488829.36534. Following those with 1–5 years and 11–15 years of expertise in cattle rearing was the majority of participants, who had 6–10 years of experience on average. Additionally, 224 (74.2%) have family or medium farms, with herd sizes ranging from 4 to 16.

Table 2: Frequency and percentages of cattle and farm related characteristics

Parameters	Category	Frequency (%)	Mean ± SD
Any training on rearing cattle	Yes	176 (58.3)	
	No	126 (41.7)	
Method of rearing cattle	intensive	252 (83.4)	
	extensive	5 (1.7)	
	semi-intensive	45 (14.9)	
Any training on cattle disease	yes	85 (28.1)	
	no	217 (71.9)	
Living beside cowshed	yes	217 (71.9)	
	no	85 (28.1)	
Year of experience of rearing cattle	1-5	78 (25.8)	10.63±6.42
	6-10	114 (37.7)	
	11-15	65 (21.5)	
	16-20	28 (9.3)	
	>20	17 (5.6)	
Yearly income form cattle (taka)	≤ 200000	56 (18.5)	519933.78± 488829.37
	200001-400000	101 (33.4)	
	400001-600000	92 (30.5)	
	> 600000	53 (17.5)	
No. of cattle	Household farm	24 (7.9)	12.5397±11.75568
	Family farm	224 (74.2)	
	Business farm	54 (17.9)	

3.3 Practice score level of livestock farmers relating to zoonotic disease

Out of the 302 study participants,200 (66.2%) of the participants exhibited good practice, whereas 102 (33.8%) equally exhibited poor practice score. This suggests that a sizable section of the populace thinks effective management and prevention of zoonotic illnesses are possible.A remarkable majority of respondents, accounting for 97.7%, showed their dedication to hygiene by confirming that they wash their hands after dealing with livestock. However, a small portion of 2.3% admitted to neglecting this crucial step. While 63.2% claimed to consistently use soap while washing their hands, 36.8% were inconsistent in adopting this necessary practice. It is worth noting that an impressive 93.7% of participants acknowledged the importance of hand washing in livestock handling, with only 6.3% failing to recognize its significance. Further analysis revealed that 9.6% of respondents take a protective approach by wearing protective clothing before interacting with cattle. On the other hand, a significant majority of 90.4% chose not to take this precautionary measure. Additionally, there is an interesting discovery regarding the differing views on the involvement of animals in preventing outbreaks of abortion. Almost half, or 47.7% of the respondents, believed that animals do play a part in preventing such outbreaks, while the remaining 52.3% held the opposite view. The importance of biosecurity in managing diseases also emerged as a significant factor, with different perspectives among the respondents. A majority, or 77.5%, expressed confidence in their own animal care practices. On the other hand, 22.5% of respondents acknowledged having uncertainties about the approaches they were using. In terms of maintaining distance between human living spaces and animal housing, 64.6% reported having enough separation, while 35.4% indicated insufficient distancing. This aspect highlights the need for awareness initiatives and educational efforts to promote optimal distancing practices. Taking immediate action during disease outbreaks is crucial in order to effectively manage the spread of contagion. An impressive 87.4% of farmers surveyed expressed their dedication to promptly addressing communicable diseases. However, a significant 12.6% admitted to a lag in their response, highlighting the importance of targeted interventions and education to ensure timely reactions. The analysis presents a wide range of views and actions among farmers, including various hygiene measures, biosecurity practices, and disease management strategies. This diversity highlights the intricate nature of the agricultural community's beliefs and behaviors. These finding illuminate on specific areas where raising awareness can promote positive improvements in livestock health, biosecurity, and disease control strategies. It is crucial to acknowledge that

these findings represent the perspectives of the surveyed individuals and provide a snapshot of the current situation in this important and ever- changing industry.

Table 3: Frequency table for practice score answers of livestock farmers relating to zoonotic diseases in Chattogram and Cox's Bazar District, Bangladesh.

Variables	Response	Number (%)
1. Wash your hands after handling any livestock?	Yes	295 (97.7)
	No	7 (2.3)
2. Do you always use soap when washing your hands?	Yes	191 (63.2)
	No	111 (36.8)
3. Do you think hand washing is important in handling livestock?	Yes	283 (93.7)
	No	19 (6.3)
4. Do you use any protective clothing before approaching cattle?	Yes	29 (9.6)
	No	273 (90.4)
5. Dispose of the aborted fetus and placenta correctly?	Yes	228 (75.5)
	No	74 (24.5)
6. Do animals take different preventive measures to stop the outbreak of abortion?	Yes	144 (47.7)
	No	158 (52.3)
7. Is there enough distance between your house and animal house?	Yes	195 (64.6)
	No	107 (35.4)
8. Do you think your husbandry is correct?	Yes	234 (77.5)
	No	68 (22.5)
9. Do you act promptly in case of communicable diseases?	Yes	264 (87.4)
	No	38 (12.6)

TABLE 3

3.4 Bar graph of zoonotic disease known by participants, media and control method

Our study's findings shed light on the participants' understanding of various zoonotic disease prevention strategies. The information is displayed in Fig 3. Notably, a significant number of individuals (71 participants, or 23.5%) claimed ignorance of zoonotic disease control strategies. 72 individuals (23.8%) identified cooked meat and pasteurized milk as control measures, whereas 53 participants (17.5%) and 54 participants (17.9%) respectively recognized vaccination of people and animals. 52 participants (17.2%) reported knowing that medicines are used to control zoonoses.

FIGURE 1

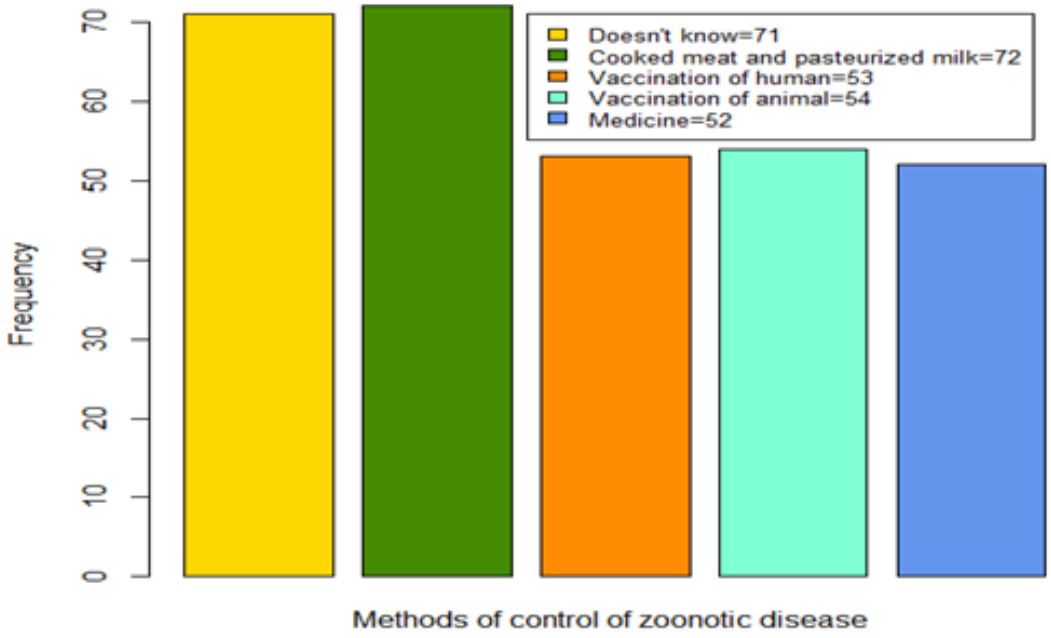

Fig. 1: Methods of control of zoonotic diseases

3.4 Distribution of practice across socio-demographic characteristics

Participants aged 35 and below has significantly better practice compared to those aged 35 to 50 and over 50 years old. Education significantly affects practice. Participants with higher education levels (secondary and above) exhibit better practice (p=.0001) compared to those with lower education levels. Family income is significantly associated with knowledge. Participants with higher family income levels tend to have better practice. Profession significantly impacts practice. Participants in the business and farming professions show better practice.

Table 4: Relationship between socio-demographic characteristics, level of practice

Variables	Practice		Chi-square / FET	P value
	Good d(n, %)	Poor r(n, %)		
Age in years				
≤ 35	40 (70.2)	17 (29.8)	2.13	0.345
35-50	123 (67.6)	59 (32.4)		
> 50	37 (58.7)	26 (41.3)		
Gender				
Female	32 (55.2)	26 (44.8)	3.92	0.048*
Male	168 (68.9)	76 (31.1)		
Marital status				
Married	195 (66.3)	99 (33.7)	0.94	1.000
Single	2 (66.7)	1 (33.3)		
Divorce	2 (66.7)	1 (33.3)		
Widow	1 (50)	1 (50)		
Religion				
Islam	198 (67.1)	97 (32.9)	4.54	0.05
Hindu	2 (28.6)	5 (71.4)		
Education				
Illiterate	6 (40)	9 (50)	19.20	0.0001***
Primary	83 (57.6)	61 (42.4)		
Secondary	76 (74.5)	26 (25.5)		
Higher secondary & above	35 (85.4)	6 (14.6)		
Family income				
≤30000	31 (66)	16 (34)	2.15	0.342
31000-50000	98 (62.8)	58 (37.2)		
>50000	71 (71.7)	28 (28.3)		
Profession				
Business	41 (74.5)	14 (25.5)	2.83	0.420
Farmer	150 (64.9)	81 (35.1)		
Housewife	5 (55.6)	4 (44.4)		
Others	4 (57.1)	3 (42.9)		
Family type				
Nuclear	109 (66.5)	55 (33.4)	0.009	0.924
Joint	91 (65.9)	47 (34.1)		
Earning family member				
One	90 (72.6)	34 (27.4)	5.95	0.051
Two	67 (66.3)	34 (33.7)		
More than two	43 (55.8)	34 (44.2)		

TABLE 4

Others (banker, politician, lawyer, teacher); * Significant at P<0.05; ** Significant at P<0.01; ***Significant at P<0.001; FET=Fisher exact test

3.5 Distribution of practice across cattle and farm related characteristics

Table 5 provides a comprehensive analysis of participant characteristics, attitudes, and practices across cattle and farm related characteristics. The result revealed that cattle rearing training significantly impacts knowledge, attitude, and practice. Participants who have received cattle rearing training exhibit better knowledge (p=.0001), attitude (p=.0001), and practice (p=.0001) compared to those who haven't received such training. Farmers who engage in intensive farming typically have better practice (p=.01). Cattle disease training significantly influences knowledge, attitude, and practice. Participants who have received cattle disease training exhibit better knowledge (p=.0001), attitude (p=.0001), and practice (p=.0001) compared to those who haven't received such training. Cattle rearing experience significantly impacts knowledge and attitude. Participants with more years of cattle rearing experience tend to have better knowledge (p=.006) and attitude (p=.0001). Knowledge and attitude were associated with living beside cowshed. No. of cattle was associated with knowledge. Knowledge and attitude were associated with yearly income from cowshed.

Table 5: Relationship between cattle and farm related characteristics, level of practice

Variables	Practice		Chi-square / FET	P value
	Good d(n, %)	Poor r(n, %)		
Cattle rearing				
Intensive	158 (62.7)	94 (37.3)	8.83	0.010*
Extensive	4 (80)	1 (20)		
Semi-intensive	38 (84.4)	7 (15.6)		
Cattle rearing training				
Yes	142 (80.7)	34 (19.3)	39.42	0.0001***
No	58 (46)	68 (54)		
Cattle disease training				
Yes	81 (95.3)	4 (4.7)	44.69	0.0001***
No	119 (54.8)	98 (45.2)		
Living beside cowshed				
Yes	146 (67.3)	71 (32.7)	0.384	0.535
No	54 (63.5)	31 (36.5)		
No. of cattle				
Household farm (1-3)	13 (54.2)	11 (45.8)	1.71	0.426
Family farm (4-16)	151 (67.4)	73 (32.6)		
Business farm (> 16)	36 (66.7)	18 (33.3)		
Cattle rearing experience				
1-5	54 (69.2)	24 (30.8)	2.08	0.72
6-10	74 (64.9)	40 (35.1)		
11-15	43 (66.2)	22 (33.8)		
16-20	20 (71.4)	8 (28.6)		
>20	9 (52.9)	8 (47.1)		
Yearly income from cow				
≤200000	43 (76.8)	13 (23.2)	5.78	0.123
200001-400000	60 (59.4)	41 (40.6)		
400001-600000	59 (64.1)	33 (35.9)		
>60000	38 (71.7)	15 (28.3)		

TABLE 5

*** Significant at P<0.05; ** Significant at P<0.01; ***Significant at P<0.001; FET=Fisher exact test**

3.6 Effects of socio-demographic characteristics on Practice

Table 6 presents the association between socio-demographic variables on practice. Education was associated with practice. The illiterate and primary level educated person practice were more less than higher secondary & above educated person towards zoonotic disease.

Table 6: Multiple logistic regression analysis of sociodemographic variables on practice

Parameters	Odds ratio (OR), 95% CI
Education	
Illiterate	0.11 (0.03 - 0.44) **
Primary	0.23 (0.09 - 1.59)
Secondary	0.50 (0.19 - 1.33)
Higher secondary & above	

*** Significant at P<0.05; ** Significant at P<0.01; ***Significant at P<0.001; CI=Confidence interval**

3.6 Effects of cattle and farm related characteristics on Practice

Table 7 presents the cattle and farm related variables on practice towards zoonotic disease. Without training of cattle rearing and diseases have poor practice than trained one. Lower level of yearly income had poor practice than higher level of yearly income towards zoonotic disease.

Table 7: Multiple logistic regression analysis of cattle and farm related variables on practice

Parameters	Odds ratio (OR), 95% CI
Cattle rearing training	
No	0.32 (0.18 - 0.57) ***
Yes	1
Cattle disease training	
No	0.09 (0.03 - 0.26) ***
Yes	1
Yearly income from cow	-
≤200000	1.85 (0.71 - 4.78)
200001-400000	0.68 (0.30 - 1.52)
400001-600000	0.50 (0.22 - 0. 58)*
>60000	1

TABLE 7

*** Significant at P<0.05; ** Significant at P<0.01; ***Significant at P<0.001; CI=Confidence interval**

Chapter 4. Discussion

The study focused on socio-demographic, socioeconomic, and cattle-related factors as well as respondents' levels of zoonotic disease practice. Both a healthy herd and healthy livestock farmers are crucial. The study objectives were to assess the level of practice and related factors of practice. Our study emphasizes the need to increase the understanding of Bangladeshi livestock farmers about zoonoses and to continue promoting current and new strategies to lower the risk of zoonotic disease transmission.

The study provides an in-depth assessment of the respondents' practice of zoonotic illnesses as they relate to Bangladeshi cattle husbandry. Out of the 302 study participants 200 (66.2%) of the participants exhibited good practice, whereas 102 (33.8%) equally exhibited poor practice score. This may be because fewer people are aware of these illnesses even when infections are present. Other possible causes include a lack of health facilities, awareness camps, training programs for handling animals, and poor literacy rates. A similar research result was found (Hundal et al., 2016; Munyeme et al., 2010). Another research found that the practices towards cattle related zoonotic diseases good scores was 16% (Adam, 2021).

Younger people would be more open to health-related information and interventions. This may be explained by the fact that younger people are exposed to more information via the internet and social media, raising awareness of the dangers of zoonotic diseases that spread from animals to humans. Drinking raw milk, consumption of raw meat are not common practices in the study regions which is common among people in African region (Ngoshe et al., 2022). Although the effect size is tiny, this may suggest that there are certain gender-related characteristics influencing views of zoonotic illnesses.

Practice was significantly influenced by education level. Compared to those with higher education, illiterate people and those with only an elementary education were less likely to have a positive practice. This emphasizes the value of education in raising consciousness and comprehension of zoonotic illnesses and hazards associated to cattle. When compared to respondents with little to no formal education, we discovered that respondents with higher education (secondary and tertiary) knew more about animal diseases. The lack of interest in

moving beyond traditional farming may be the cause of the low degree of awareness of animal diseases among respondents with lower levels of education. Compared to those in joint households, those in nuclear families were more likely to have a positive outlook. This might be because these family arrangements differ in how decisions are made and how information is shared.

Practice was significantly related with cattle rearing and disease training. The value of education in this situation is highlighted by the fact that those with training were more likely to have a positive effect. Similar to cattle rearing training, cow disease training increased the likelihood of a positive outlook in participants. Participants that took part in cattle rearing training scored higher in practice. This demonstrates the value of training programs in enhancing participants' practice toward zoonotic diseases. In line with the present findings, people's adoption of health-protective activities is mostly determined by their level of education and awareness (Rosenstock, 1974). Practice and knowledge were correlated with the number of employed individuals in the family. This can mean that families with more earning members have better access to resources and knowledge. There was a lack of training in the handling of sick cattle isolation. It's interesting to note that the majority of participants said they would sell the cattle if the condition of the animals did not improve after treatment (Adam, 2021).

Practice was significantly related with yearly income from cow. Comparatively to those with greater incomes, those earning less than 200,000 Bangladeshi takas were less likely to have a positive outlook. When compared to cattle handlers with monthly salaries of 10,000 taka, individuals with incomes between 10,000 and 20,000 takas were substantially (OR: 0.36, 95% CI: 0.14-0.92) less likely to possess adequate expertise (Islam et al., 2021). The findings of this study have important ramifications for public health intervention and policy.

64.6% of respondents said there is enough separation between human living areas and animal housing, while 35.4% said there isn't enough. According to Adam,2021;(82.0%) of the participants indicated that they live close to their cattle, while (18.0%) also indicated that they do not, which is inconsistent with our study.

Over 97.7% of cattle farmers in the survey had favorable behaviors and positive practice toward handwashing following interaction with an animal, which was one of the preventive measures for zoonotic infections. Only 2.3% of respondents, nevertheless, acknowledged

skipping this important step. 36.8% of people admitted to inconsistently using soap when washing their hands, despite 63.2% claiming to do so. It is notable that 93.7% of participants gave affirmative answers to the question on the significance of hand washing when handling animals, with only 6.3% giving negative answers. According to our study, 9.6% of respondents take preventative action by using protective equipment before approaching animals. However, a huge majority of 90.4% decided opposed using this preventative strategy. These findings did not line up with other recent studies that have persisted in advocating the use of personal protective equipment (PPE) for livestock producers who are frequently exposed to zoonotic infections (Odo et al., 2015). Nearly half (47.7%) of the respondents thought that action should be taken against animals to stop such outbreaks, while the remainder 52.3% disagreed. With varying viewpoints among the responders, the importance of biosecurity for controlling diseases also became a crucial consideration. We discovered that 77.5% of respondents indicated confidence in their own animal care procedures. However, 22.5% of respondents admitted to being unsure about the strategies they were employing. According to Voss (2019) the majority of outbreaks around the world are caused by these types of farmers' unsatisfactory treatment of illnesses and animal husbandry practices. In order to effectively control the spread of disease during outbreaks, immediate management and treatment of disease is essential. In our survey, an amazing 87.4% of farmers pledged to respond quickly when communicable diseases arise. 12.6% of the population admitted to responding slowly, which is substantial. Due to the absence of zoonoses like brucellosis and leptospirosis in the procedures for differential diagnosis and testing in human health facilities, the diseases may not be properly diagnosed or treated (John et al., 2008). Additionally, cattle ranchers often handled zoonosis-related cases poorly. Few people sought the help of veterinary officials to cure their sick cattle; instead, the majority of popular procedures for dealing with zoonotic diseases that affect cattle used self-medication.

Strength and Limitations

The strength of this study is that gathering a comprehensive amount of data while encompassing Karnaphuli Upazila, which is the second largest dairy region in Bangladesh, and possessing sufficient understanding and communication about zoonotic diseases. It used a well-structured survey to gather data from diverse cow owners, revealing knowledge gaps and misconceptions. The study bridged the gap between knowledge and behavior, emphasizing the need for improved public health policies and communication strategies. It produced actionable findings for educational programs and raised awareness about zoonotic diseases. Additionally, the research highlighted the role of human- animal interaction in disease transmission and supported effective preventative measures. The study's framework aids interventions for positive behavior change among cow owners, reducing zoonotic risks and enhancing disease prevention.

The study's limitations include potential sampling bias from non-randomized sampling, the risk of social desirability bias among cattle farmers' responses, challenges posed by language barriers and low literacy levels, and the narrow focus solely on cattle farmers without involving other important stakeholders in the zoonotic disease transmission ecosystem. Also as this approach focuses on specific areas in Bangladesh, it might not precisely represent the diverse knowledge and perspectives present across the entire country.

Chapter 5. Conclusion and Recommendations

Conclusion

The practice or preventative behaviors of respondents were found to be highly influenced by socioeconomic characteristics such education, income, and profession. Higher levels of education, participation in training for cattle rearing, and experience in disease management and cattle rearing were all linked to higher knowledge, more positive behaviors and better practices. These findings highlight the value of focused educational activities and training programs to advance and encourage positive behaviors. The correlations between sociodemographic and cattle-related variables with practices were further clarified by the study's logistic regression analysis. These studies indicated important correlations, supporting the notion that respondents' conduct is significantly influenced by their education, training, and experience. The findings showed that responders had usually good habits, like cleaning their hands after handling livestock. The adoption of other biosecurity measures, however, varied, demonstrating the need for more extensive awareness efforts.

In summary, the study offers insightful information about the zoonotic disease knowledge, attitudes, and practices of Bangladeshi cattle owners. It highlights the need for focused interventions that close information gaps, develop optimistic attitudes, and support practical preventive measures. Policymakers and public health professionals can develop more effective strategies to lower the risks associated with zoonotic diseases, improve livestock health, and safeguard public health in the context of agricultural communities by understanding the factors that influence cattle owners' behaviors.

Recommendations

The identified risk factors and demographic trends offer valuable insights into areas needing specific attention. To narrow information gaps between diverse age groups and educational backgrounds, awareness campaigns should utilize various communication platforms, including digital channels, to share details about zoonotic disease risks and preventive measures. Recognizing gender-related attitude differences, it's crucial to employ communication strategies sensitive to gender. Public health initiatives should customize their messaging to accommodate various family structures, such as nuclear and blended households. effectively addressing their unique challenges. The study underscores the pivotal role of education and training in molding public perceptions. Improving training programs related to cattle care and disease management can distinctly alter people's viewpoints and attitudes. Interventions targeted toward communities residing near cowsheds should cater to their specific concerns and underscore effective mitigation techniques. This study accentuates the intricate interplay between zoonotic diseases, cattle, demographics, attitudes, and risk factors in Bangladesh. The findings provide a roadmap for precise interventions to bridge information gaps, enhance awareness of risks, and eventually contribute to enhanced public health outcomes. These insights bear substantial significance for policymakers and practitioners in the realm of public health

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