

Research Article

Knowledge, Attitude and Practices of Veterinarians on Anti-Biotics Use and Resistance and its Containments in Central Gondar Zone, Ethiopia

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Introduction

Antibiotics are widely used in the animal husbandry sector for therapeutics and non-therapeutic purposes. In food animal production, treating individual animal is practically impossible, rather rendering treatment to the entire livestock by medicating them with low dose of antimicrobials through feed, water, or parenteral routes [1]. The therapeutic benefits of antibiotics to humans, livestock and companion animals are well recognized also in livestock, antibiotics are essential in the therapeutic treatment of bacterial diseases that impact livestock health, production and welfare. Antibiotics are also used for prophylaxis and meta phylaxis, to maintain animal health and increase productivity [2].

Abstract

Inappropriate use of antibiotics in the veterinary sector has contributed to Antibiotic Resistance (ABR), which negatively impacts animal health and welfare. Understanding the Knowledge, Attitudes, and Practices (KAP) on antibiotic use, ABR, and its containment amongst veterinarians is critical to optimizing antibiotic use and containing resistance. Thus, this study aimed to assess the knowledge, attitude, and practices of veterinarian on antibiotic use and resistance and its containment in central Gondar zone, Ethiopia. A cross-sectional study was conducted from December 2022 to July 2023 on 36 purposively selected central Gondar zones using self-administered structured questionnaires. The descriptive and chi-square tests were used to analyze the data. The response rate was one hundred percent. Approximately 86.11% of respondents were men, Almost 77.78%, 80.56% and 41.67% of respondents were 0-10 years of experience, 20-40 years of old and educational level respectively. Furthermore, 88.88%, 94.44%, and 77.78% of respondents, respectively, had high knowledge, positive attitude, and good practice about antibiotic use, resistance, and its containment. The chi-square analysis revealed a significant ($p < 0.05$) between knowledge and educational level, and sex with p -values of 0.022 and 0.027, respectively. The respondent's attitude levels were also significantly associated ($p < 0.05$) with their educational level with p value is 0.005. Respondents' practice levels were not significantly associated ($p < 0.05$) with their socio-demographic or independent variables. The study not found a significant relationship between respondents' knowledge and practice ($\chi^2 = 0.0201$, $p = 0.887$), practice and attitude ($\chi^2 = 0.9454$, $p = 0.331$). And that of attitude and knowledge also had not significantly associated ($\chi^2 = 0.2647$, $p = 0.607$). Therefore, this study found that study participants with educational level have a positive effect on the occurrence rate of antibiotic resistance level.

Keywords: Antibiotic use; Attitude; Knowledge; Practice; Resistance

laxis and meta phylaxis, to maintain animal health and increase productivity [2]. The antibiotic was coined from the word, "antibiosis" which literally means, "against life". In the past, antibiotics were considered to be organic compounds produced by one microorganism which are toxic to other microorganisms [3]. The veterinary use of antibiotics includes the use on pets, farm animals, and animals raised in aquaculture. In companion animals, antibiotic are essential for therapeutic treatment of skin, wound, respiratory and urinary tract infections, as well as for reducing the frequency of sepsis and surgical site infection.

tions for farm animals to increase growth and feed efficiencies it's also play major role for main infectious diseases treated are enteric and pulmonary infections, skin and organ abscesses and mastitis. Antibiotics used in veterinary medicine are: penicillin, cephalosporin, tetracycline, chloramphenicol, aminoglycosides, spectinomycin, lincosamide, macrolides, sulphonamides and trimethoprim [4].

Antibiotic Resistance (AR) is a burning health-care issue influencing both humans and domestic animals across the globe. Antibiotic resistance is accelerated by the overuse and misuse of antibiotics (WHO 2008). The use of antibiotics exerts selection pressure on microbes, allowing resistant pathogens to proliferate and leading to the emergence of Antimicrobial Resistance (AMR). The emergence of AMR in humans has been linked with AMR in animals and the environment. Inappropriate antibiotic prescribing and increased antibiotic consumption in animals have contributed to Antibiotic Resistance (ABR) [5].

This anti-microbial have been widely used in animals for disease control, prevention and treatment and have played a vital role as growth promoters in animals. Use of antimicrobial drugs has become widespread over several decades, and these drugs have been extensively misused in both humans and food-producing animals in ways that favor the selection and spread of resistant microbes [6]. This widespread application of antibiotics in different food animal populations imposes strong selection pressure, which contributes to the emergence, spread, and persistence of resistant pathogens to other animals, humans, and the environment [7].

Misuse and overuse of various antimicrobial agents in the health care setting and the agricultural industry are regarded as major contributors to the emergence of antimicrobial resistance. Besides that, spontaneous evolution, pathogen mutation, and the transmission of resistant genes via horizontal gene transfer are significant contributors to antimicrobial resistance. More than half of all medicines are prescribed, dispensed, or sold improperly and do not follow the principle of rational drug use, and more than half of patients fail to take them correctly [8]. This inappropriate dose results in increasing antimicrobial resistance. Despite continuous efforts to improve antimicrobial prescribing and address issues such as self-prescribing, unnecessary use for viral infections, dosing errors, and excessive treatment durations, rates of antimicrobial resistant infections continue to rise globally [9].

Antimicrobial Resistance (AMR) in these present times has become a big challenge to public health worldwide, because of the emergence of superbugs "which are strains of bacteria that have become resistant to antibiotic drugs" hence resulting in higher mortality and economic hardships. Sub-Saharan African countries are also faced with the challenges arising from AMR. This global health problem is facing both medical and veterinary healthcare professionals, hence it requires a 'One-Health' approach to provide effective response. The Global Action Plan (GAP) on Antimicrobial Resistance (AMR) was adopted by the World Health Assembly in 2015 [10].

However, it has not been determined well to what extent knowledge, attitude, and practices of animal antibiotic usage and resistance in the central Gondar zone. Thus, the investigation of animal antibiotic usage and resistance in the study area contributes by identifying the factors that contribute to low levels of knowledge, attitude, and practices which allow veterinarians to be aware of the condition and apply possible interven-

tion measures to decrease the risk. Therefore, this study was designed with the following objectives.

General Objective

To assess the knowledge, attitude, and practice of veterinarians on antibiotic use, resistance and its containment in central Gondar zone, Ethiopia.

Specific Objectives

- To assess veterinarians' knowledge, attitude, and practice toward usage of antibiotics
- To assess veterinarians' knowledge, attitude, and practice and toward antibiotic resistances
- To identify the antibiotic resistance containment in central Gondar

Materials and Methods

Study Area

A study was conducted among veterinarian professionals working in central Gondar zone from December 2022 to July 2023. Gondar is found in Northern Ethiopia in Amhara regional state, located at 725 km from Addis Ababa, the capital city of federal government of Ethiopia, 175 km from Bahir Dar, the capital city of Amhara National Regional State. Gondar is the historical capital of the Ethiopia and it is a famed tourist destination place that stands at an elevation of 2,133 meters above sea level. The city of Gondar is situated in North-western parts of Gondar and It is at 120 3' N latitude and 370 28'E. In the area there were different organizations that providing services for animal health, which includes private, pharmacy, governmental clinics and governmental pharmacy [11].

Study Design and Sampling Technique

A cross sectional study design was carried out to assess knowledge, attitude and practices of veterinarians on antibiotics use, resistance and its containment in central Gondar zone, Ethiopia. The sampling method was a purposive sampling technique.

Study Population

The sources of population were all veterinary professionals working in central Gondar zone. The study population was veterinary professionals working in five selected areas of the population, such as Azezo, Maksegnite, the University of Gondar veterinary clinic and academic, chohit, and aberjah.

Inclusion and Exclusion Criteria

Inclusion criteria: the study included all veterinarians who was working in central Gondar zone at different position such as private pharmacy, academic/lectures/, government clinics and others had basic knowledge regarding veterinary information. Veterinarians who was voluntary during data collection was includes in the study.

Exclusion Criteria: The professional who was not willing to participate during data collection was excluding in the study.

Variables of the Study

Dependent variables: Knowledge, attitude and Practice of veterinarian respondents about antibiotics use, resistance and its containment.

Independent variables: Socio demographic profiles of respondents such as district, sex, age, educational level, year of experience, field of practice.

Data Collection Methods

Data Collection

Data were collected through self-administered structured questionnaires, which were prepared in English. The questionnaire comprised four parts with most of the questions being close-ended. The questionnaire items were internally reviewed for content validity by two experts in the field of epidemiology and public health. Modifications of questionnaire items were made based on expert feedback and recommendations to suit the local population. Moreover, before data collection participants in this study were provided to inform by questionnaire the purpose of the study, that participation is entirely voluntary, they were free to fill the questionnaire at any time and all data will be kept securely.

Measurement Tools

Socio-demographic data: There were six (6) questions in this part. The questions include district, sex, age, year of experience, educational level, and field of experience.

Knowledge on antibiotic usage and resistance: There were seven (7) questions which were asked to know the knowledge level of the veterinarians on antibiotics use and resistance and its containment. A correct answer for each close ended question was given 3 score for correct answer, 2 disagree and 1 uncertain score for a wrong answer. The score varied from 6-21 points and was classified into 3 levels according to the Blooms' (1956) cut off point, 60-80% as follows:

High level (80-100%) 16-21 scores

Moderate level (60-79%) 13-16 scores

Low level (less than 60%) 6-10 scores

Attitude on antibiotics usage and resistance: This part includes the attitude veterinarians who work in central Gondar zone towards antibiotics usage and its resistances and its containment. There was a total of eight questions, six positive and two negative statements with Likert scale options of choice ranging from agree to disagree. The rating scale was measured as knowledge scale. The scores varied from 8 to 24 and all individual answers were summed up for total and calculated for means. The scores were classified into 3 levels (Positive Attitude, Neutral Attitude and Negative Attitude).

Positive Attitude 19-24 scores (80%-100%)

Neutral Attitude 15-18 scores (60%-79%)

Negative Attitude 8-14 scores (Less than 60%)

Practice on antibiotics usage and resistance: Seven (7) questions have been included in this part. Of which all seven questions were close ended the rating scale for the responses was measured as previous one. The scores in measuring the practice of antibiotics usage and resistance were varied from 8 to 21, and were classified into 3 levels according to the Bloom's cut off point, 60-80% (Bloom 1956). The levels of practice were:

Good (80-100%) 16-21 scores; Fair (60-79%) 13-16 scores; Poor (Less than 60%) 8-14 scores

Data Management and Analysis

The data obtained was classified and coded using Microsoft Excel® 2019. Then, the data was exported to STATA version 16 (Stata Corp. Texas, USA). Descriptive statistics such as mean \pm standard deviation or percentage as appropriate was used to show socio-demographic characteristics of the study participants. The test for association on knowledge, attitude and practice was done by using Chi square (χ^2) to identify the most contributing demographic factor. The data was interpreted as significant when p-value is less than 0.05.

Result

Respondent Socio-Demographic Characteristics

There were a total of 36 participants in this study. Of these, 86.11% were male and 13.89%. The highest percentage of the study participants were 20-40 years (n=29), +40 years or age 19.44%, and regarding to educational level highest percent of 15 were DVM, 7 were DVM, Msc, 1 were BVSc, MSc, 6 were BVSc and respondents n=4 was diploma (Table 1). Relating to year of experience, most participants were 0-10 years of experiences that is 77.78%, 5.56% of 11-20 years of experience, and 16.67% of +20 year of experience were participated in the study (Table 1).

Respondent Knowledge Regarding Antibiotics Uses and Resistance and its Containment

Respondents answered a total of seven close-ended, multiple-choice questions regarding antibiotics resistance and use. Each correct response was given three marks and 1 mark for wrong answers, with a total of eighteen marks. As shown in Table 2 below, the mean knowledge score for the respondents was 18.611 out of possible 18 points (SD=.993605). (Table 2).

Table 1: Socio demographic characteristics of study participants.

Variable	Category	Number (n=36)	Percentage (100%)
District	Rural	11	30.56
	Urban	25	69.44
Sex	Male	31	86.11
	Female	5	13.89
Age	20-40	29	80.56
	40	7	19.44
	0-10	28	77.78
Year of experience	20-Nov	2	5.56
	20	6	16.67
	20-Nov	2	5.56
Educational level	Diploma	4	11.11
	BSC pharmacy	1	2.78
	BSC,VLT	1	2.78
	VLT Msc	1	2.78
	BVSC	6	16.67
	BVSc,MSc	1	2.78
	DVM	15	41.67
Field of practice	DVM, MSc	7	19.44
	Government	22	61.11
	Academic	7	19.44
	Private	7	19.44

Overall KAP mean score of respondents was found 85.75%.

Table 2: Distribution of veterinarian's knowledge on antibiotics use and resistance.

Level	Frequency	Percentage	
High	32	88.88%	
Medium	4	22.22%	
Total	36	100	
Minimum = 17	Maximum = 20	Mean= 18.611	Stand. Dev. =0.9936305

On the other hand, the result indicated in table 3 shows the respondent knowledge on antibiotic usage and resistance. Thirty-one (86.11%) of the thirty-six respondents were agreed that of restricting usage is necessary to reduce antibiotics resistance. Similarly, most of the respondents 88.89% were agree that antimicrobial is differ from antibiotics 11.11% of respondents disagree that that antimicrobial is differ from antibiotics (Table 3).

Attitude of Veterinarians in Central Gondar Zone Towards Antibiotics Usage and Resistance

Attitude to a given drug usage by the veterinary is known to influence the course and outcome of a given therapeutic regimen. To evaluate this, respondents were asked to answer a total of eight Likert-scale questions with a total score of 24. Distribution of respondents' attitude towards antibiotics usage and resistance is shown in Table 4. As it indicated in the table, more than half 94.44% of the veterinarians are found to have a "positive attitude" and 5.56% of them had "neutral attitude" towards ABU and ABR. The mean attitude score for all respondents were 21.361 out of a possible 24 points (SD=0.9305). The minimum and maximum range of attitude score was 19 and 22, respectively (Table 4).

Most of the professionals/veterinarians who participated in the study had positive attitude toward antibiotics resistance. Statements The data shown on table below shows that 91.6 % of the professionals agreed that "it is necessary to establish a law on rational use of antibiotics". Thirty-one (86.11%) of respondents were agreed for restricting usage is necessary to reduce antibiotics resistance (Table 5).

Table 3: Knowledge about antibiotics use and resistance.

Knowledge question	Agree	Uncertain	Disagree	Total	Mean ± SD
Do you think antimicrobials different from antibiotics?	32		4	36	2.88±0.318
	88.89		11.11	100	
Do you think antibiotics resistance is an issue of concern in Ethiopia?	31		5	36	2.86±.35
	86.11		13.89	100	
Do you think antimicrobials are effective against viruses?	3	31	2	36	1.97±.37
	8.33	86.11	5.56	100	
Do you think there is risk association with irrational use of antibiotics?	35		1	36	2.97±.16
	97.22		2.78	100	
Do you think restricting usage is necessary to reduce antibiotics resistance?	31	1	4	36	2.83±.44
	86.11	2.78	11.11	100	
Do you believe that missing dose of antibiotics agents contribute to antibiotics resistance?	36	0		36	3±0
	100			100	
Do you think the possibilities that news classes of antibiotics will develop in next 5 to 10 years?	16	13	7	36	2.08±.90
	44.44	36.11	19.44	100	

Over all mean score of knowledge of respondents=85.58%

Practice of Respondents Regarding To ABU and ABR

The overall score of respondents on antibiotics was good with 77.78% good practice with a mean and standard deviation of 17.3611+1.376388 and a minimum and maximum range of 14 to 20 respectively were examined as shown below in the table (Table 6).

With regard to ABU and ABR the practice level among central Gondar zone veterinarians who participated in this questioner appeared good More than half 88.89% of veterinary profession were not administer antibiotics to animals without determining their body weight properly. However, 11.11% participants were

Table 4: The level of veterinarian attitude on antimicrobial usage and resistance.

Level of attitude	Frequency	Percentage
Positive	34	94.44
Neutral	2	5.56
Total	36	100
Minimum=19	Mean=21.3611	Std. dev.= 930523
Maximum=22		

Table 5: Attitude towards antibiotics use and resistance.

Attitude question	Agree	Uncertain	Disagree	Total	Mean ± SD
Do you think all antibiotics drug heal any disease?	3	0	33	36	1.91±.28
	8.33	0	91.67	100	
Do you think in your opinion only veterinarians are eligible to prescribe drugs?	31	0	5	36	2.86±.35
	86.11	0	13.89	100	
Do you think it is necessary to establish a law on rational use of antibiotics?	33	1	2	36	2.88±.39
	91.67	2.78	5.58	100	
Do you think it is important to add antibiotics with feed or water as growth promoters in livestock?	8	3	25	36	1.86±.54
	22.22	8.33	69.44	100	
Do you think improper use of antibiotics can cause antibiotics drug resistance?	36	0	0	36	3±0
	100	0	0	100	
Do you think using same antibiotics drug for long period of time can lead to antibiotic drug resistance?	36	0	0	36	3±.0
	100	0		100	
Do you think antibiotics drug resistance in animal also important issue to public health?	35	1	0	36	2.94±.33
	97.22	2.78	0	100	
Do you think in appropriate use or half course antibiotics leads to antibiotics resistance?	34	2	0	36	2.88±.46
	94.44	5.56	0	100	

Over all mean score of attitudes of respondents=89%

Table 6: Distribution of level of veterinarians practices on antibiotics usage and resistance.

Level of practice	Frequency	Percentage
Good	28	77.78
Fair	8	22.22
Total	36	100
Minimum=14 maximum=20	Mean=17.3611	Std.dev.=1.376388

Table 7: Veterinarian’s response for each practice questions regarding to antibiotics use and resistance.

Practice question	Always	Sometimes	Never	Total	Mean ± SD
Do you prescribe antibiotics without examining animals over phone?	3	11	22	36	2.52±.65
	8.33	30.56	61.11	100	
Do you have facility in your area to test antibiotics sensitivity?	0	6	30	36	2.83±.37
	0	16.67	83.33	100	
Do mention withdrawal period in prescription?	15	17	4	36	2.3±.66
	41.67	47.22	11.11	100	
Do you prefer combine antibiotics to ensure therapeutic success?	10	24	2	36	2.22±.54
	27.78	66.67	5.56	100	
Do you administer antibiotic to the animals without determining their body weight?	0	4	32	36	2.88
	0	11.11	88.89	100	±.31
Do you consider whether an infection is self-limiting before prescribing antibiotics?	9	22	5	36	2.11±.62
	25	61.11	13.89	100	
Do you consult with other veterinarian or other educational resource/Para veterinarian?	18	17	1	36	2.47±.55
	50	47.22	2.78	100	

Overall mean score of respondent s= 82.68% administering without determining their body weight of animal. Majority 13.89% of respondents consider whether an infection is self-limiting before prescribing antibiotics but 61.11% of participant were never consider self-limiting infection. For the question said Do mention withdrawal period in prescription? 41.67% and 47.22% respondents were prescribing antibiotic always and sometimes respectively while 11.11% were never prescribe antibiotic. Majority 50.00% of participants answer correctly(always) for the statement “Do you consult with other veterinarian or other educational resource/Para veterinarian” and 47.22% were sometimes, 2.78% of consult with other veterinarian or other educational resource/Para veterinarian, Do you prescribe antibiotics without examining animals over phone? Out of participants in the study 8.33% were always and 30.56% sometimes while 61.11% never prescribe antibiotics without examining animals over phone. (Table 7).

Association Between Socio-Demographic Variables and ABU & ABR Knowledge, Attitude and Practice

Socio-demographic variables of the respondents; district, sex, age, educational level, field of experience were tested to see the association they might have with the knowledge, attitude and practice of the respondent towards ABU and ABR (Table 8 to 10).

Table 8: Association of knowledge with socio demographic characteristics.

Variable	No of respondents	Knowledge			χ ²	P – value
		High (%)	Medium (%)	Low (%)		
District	Rural	11	9	2	0.80	0.371
	Urban	25	23	2	18	
Sex	Male	31	29	2	4.90	0.027
	Female	5	3	2	65	
Age	20-40	29	25	7	1.08	0.297
	+40	7	4	0	62	
Year of experience	0-10	28	24	4	1.28	0.526
	11-20	2	2	0	57	
	+20	6	6	0		
Educational level	Diploma	4	2	4	16.4	0.022
	BSC pharmacy	1	1	0	25	
	BSC,VLT	1	1	0		
	VLT, Msc	1	0	0		
	BVS	6	6	0		
	BVS, Msc	1	1	0		
	DVM	15	14	0		
DVM, Msc	7	7	0			
Field of experience	Government	22	19	3	1.08	0.580
	Academic	7	6	1	85	
	Private	7	7	0		

Furthermore, the knowledge level showed a significant association between knowledge vs. sex and knowledge vs. educational level with p values 0.027 and 0.022 respectively. But the study does not find significant association between knowledge vs. age, knowledge vs. year of experiences, knowledge vs. district, and knowledge vs. field of practice with p values (p=0.297,0.526, 0.371, and 0.580) respectively (Table 8).

In addition, the attitude of respondents was significantly associated with educational level of respondents with p value of 0.005, but it showed no significant association between attitude vs. district, sex, age, year of experience, field of practice with their p values (p=0.538,0.129,0.261,0.4190.479) respectively, because their p values are greater than 0.05. (Table 9). Also, the practice level of the study participant was not significantly associated with district 2=(1.58) (p=0.209), sex 2=(0.016) (p=0.898), age 2=(2.14) (p=0.14), year of experience χ²=(3.55) (p=0.169), educational level χ²=(3.65) (p=0.081) and field of practice χ²=(0.42) (p=0.81) (Table 10).

Association Between Veterinarians Knowledge, Attitude and Practice on ABU and ABR

From the results of chi square test of association between knowledge, attitude and practice veterinarians towards ABU and ABR, statistically significant difference (χ²=0.2647, p=0.607) was

Table 9: Association of attitude with demographic characteristics.

Variable	Category	No of respondents	Attitude			χ ²	P – value
			Positive (%)	Neutral (%)	Negative (%)		
District	Rural	11	10.4	0.61	0	0.377	0.538
	Urban	25	23.61	1.38	0		
Sex	Male	31	29.3	1.72	0	2.308	0.129
	Female	5	4.72	0.27	0		
Age	20-40	29	27.38	1.61	0	1.262	0.261
	+40	7	6.61	0.38	0		
Year of experience	0-10	28	26.44	1.55	0	1.739	0.419
	11-20	2	1.88	0.11	0		
	+20	6	5.66	0.33	0		
Educational level	Diploma	4	3.77	0.22	0	20.11	0.005
	BSC pharmacy	1	0.94	0.05	0		
	BSC,VLT	1	0.94	0.05	0		
	VLT, Msc	1	0.94	0.05	0		
	BVS	6	5.66	0.33	0		
	BVS, Msc	1	0.94	0.05	0		
	DVM	15	14.16	0.83	0		
DVM, Msc	7	6.61	0.38	0			
Field of practice	Government	21	19.83	1.16	0	1.471	0.479
	Academic	7	6.61	0.38	0		
	Private	7	6.61	0.38	0		
	Total=				0		

Table 10: Association of practice with socio-demographic characteristics.

Variable	Category	No of respondents	Practice			χ ²	P – value
			Good (%)	Fair (%)	Poor (%)		
District	Rural	11	8.55	2.44		1.58	0.209*
	Urban	25	19.44	5.55			
Sex	Male	31	24.11	6.88		0.016	0.898
	Female	5	3.88	1.11			
Age	20-40	29	22.55	6.44		2.14	0.14
	+40	7	5.44	1.55			
Year of experience	0-10	28	21.77	6.22		3.55	0.169
	11-20	2	1.55	0.44			
	+20	6	4.66	1.33			
Educational level	Diploma	4	3.11	0.88		3.65	0.81
	BSC pharmacy	1	0.77	0.22			
	BSC,VLT	1	0.77	0.22			
	VLT, Msc	1	0.77	0.22			
	BVS	6	4.66	1.33			
	BVS, Msc	1	0.77	0.22			
	DVM	15	11.66	3.33			
DVM, Msc	7	5.44	1.55				
Field of practice	Government	7	5.44	1.55		0.42	0.81
	Academic	21	16.33	4.66			
	Private	7	5.44	1.55			

Table 11: Association between knowledge and attitude level.

Attitude	Knowledge					χ ²	p-value
	Level	High	Medium	Low	Total		
Positive	30	4	0	0	34	0.2647	0.607*
Neutral	2	0	0	0	2		
Total	32	4	0	0	36		

Table 12: Association between knowledge and practice level.

Practice	Knowledge					χ ²	p-value
	Level	High	Medium	Low	Total		
Good	25	3	0	0	28	0.0201	0.887*
Fair	7	1	0	0	8		
Total	32	4	0	0	36		

Table 13: Association between attitude and practice level.

Practice	Attitude					χ ²	p-value
	Level	Positive	Neutral	Negative	Total		
Good	27	1	0	0	28	0.9454	0.331
Fair	7	1	0	0	8		
Total	34	2	0	0	36		

found between knowledge and attitude, (χ²=0.0201, p=0.887) was found between knowledge and practice, and (χ²=0.9454, p=0.331) was found between attitude and practice of the respondents. Table 11 to 13 provides details of these tests.

The result described in Table 11 showed that, knowledge

had no significant association with level of attitude towards ABR and ABU among the respondents ($p=0.607$). (Table 11).

The statistic ($\chi^2=0.0201$, $p=0.887$) in Table 12 indicated that no significant association was found between knowledge and practice of the respondents in the study area (Table 12).

The result described in Table 13 indicated that, while the level of the attitude the level of good practice regards to ABU and ABR increases, it was statistically not significantly association at the test result ($\chi^2=0.9454$, $p=0.331$) (Table 13).

Discussion

A structured questionnaire-based self administered survey was conducted among veterinarians in central Gondar zone, Ethiopia. Average knowledge scores on antibiotic use, antibiotic resistance, and its containment in animal health in central Gondar were good. The veterinary training the respondents received appeared to equip the vast majority of respondents with adequate knowledge on the rational use of antibiotics. There was a high degree of concern about antibiotic-resistant infections. The veterinarians sometimes consulted other Para veterinarian for appropriate use of antibiotics and prefer combine antibiotics to ensure therapeutic success were the most preferred antibiotic class [12].

Inappropriate ABU and associated risk of ABR is an increasing public health problem globally. The misuse and abuse of antibiotic in agriculture, veterinary and human medicine have been described as major contributing factors for the emergence of AMR globally. The development and spread of antimicrobial resistant pathogens impede both preventative and therapeutic uses of antibiotics. This problem is becoming increasingly important in low-income African countries [9].

Having believe that missing dose of antibiotics agents contribute to antibiotics resistance. Antibiotic stewardship refers to approaches that encompass correct antibiotic usage, dosage, and duration whilst preventing ABR. It involves the use of guidelines for appropriate use of antibiotics, culture and sensitivity testing before antibiotic usage, surveillance and monitoring of antibiotic usage, client education, and the implementation of effective infection prevention and control programmer [13].

The result of the current study showed that Overall KAP mean score of respondents was found good (85.75%). This result was higher than that of the study done in hawasa city which was 40.28%. In this study overall mean knowledge score of respondents was found 85.58%, this was higher than from the result found in hawassa city which was 36.05%. The overall mean attitude score of respondents was 89%, this was higher than that of the study done in hawassa city which was 39.61%. The overall mean practice score of respondents was found good (82.68%), which was higher than that of the study done in hawasa city which was 45.19% [14]. Another study done in India among veterinarians was found 49.21% overall KAP mean score of respondents, in which it was much lower than that of my study. Mean knowledge, attitude and practice score respondents in the study done in India was found 67.27%, 38.1%, and 42.25% respectively. These results found in Indian veterinarians were lower than of that of my study [7].

In this study 8.33% of respondents agreed that they think antimicrobials are effective against viruses, this result was less than that of the study done in Gondar community in which it had 28% of respondents agreed that they think antimicrobials

are effective against viruses [8]. The result of this study was also lower than the study done in Sidama region related question (antibiotics can kill viruses) in which it was disagreed (correctly answered) by 10.1% of the respondents [15]. The result of this study was also lower than the study done in Romania which had 32.88% of the respondents disagreed to the question of antibiotics can kill viruses [16].

In my study, from the knowledge questions all respondents 100% had good knowledge about missing dose of antibiotics agents contribute to antibiotics resistance followed by thinking there is risk association with irrational use of antibiotics.

In my study, from the attitude questions all respondents 100% had positive attitude about improper use of antibiotics can cause antibiotics drug resistance followed by antibiotics drug resistance in animal also important issue to public health and in this study from practice questions respondents 88.89% had good practice about administer antibiotic to the animals without determining their body weight followed by which had fair practice about consult with other veterinarian or other educational resource/Para veterinarian.

The result of this study showed significant association between knowledge level and educational level with p value 0.022. The same result was found in the study done in Romania in which knowledge level was significantly associated with educational level.

This study shows that a high level of education is associated with a better level of knowledge. My study showed no significant association between knowledge vs. age, this was in contrast to the result in the study done in Romania, in which significant association was found knowledge vs. age [16].

Another study from India also revealed that there was significant association between knowledge vs. age [7]. This study also showed that no significant association between district and knowledge level, knowledge vs. age, but shows significant association between knowledge and sex, knowledge vs. educational level This differs from the study done in sidama in which there was association knowledge vs. district, knowledge vs. age, knowledge vs. sex, knowledge vs. educational level [15].

Chi square test was employed to determine an association between independent variables (Socio-demographic characteristics) and dependent variables (knowledge, attitude and practice) ($p<0.05$). The knowledge level showed a significant association across socio-demographic characteristics such as education level, and sex which is the p values (0,022 and 0.027), respectively, in addition, the practice level of respondents was not significantly associated with across socio demographic. Also, the attitude of the study participant was significantly associated with educational level which is the p values was 0.005.

Conclusion and Recommendations

The result my study showed that overall positive attitude and high knowledge level with a good practice level with a percentage of (89%, 85.58% and, 82.67%) respectively. the study also showed that there were association between. The knowledge level showed a significant association across socio-demographic characteristics such as education level, and sex which is the p values (0,022 and 0.027), respectively, in addition, the practice level of respondents was not significantly associated with across socio demographic. Also, the attitude of the study participant was significantly associated with educational level

which is the p values was 0.005. I recommend there must be need to increase (update) or give awareness about antibiotic use and resistance at urban and need collaboration with rural as campaign or giving training about antibiotic resistance.

Author Statements

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