

## Original Research Article

# A CROSS-SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS ANTIMICROBIAL RESISTANCE AMONG MEDICAL DOCTORS AND VETERINARIANS: A ONE HEALTH APPROACH

Kolli Leela Nandini<sup>1</sup>, Yallamelli. Neelima<sup>2</sup>, Monica paparao cherukupalli<sup>3</sup>

<sup>1</sup>Post graduate Department of Community Medicine, Government Medical College, Srikakulam, Andhra Pradesh, India.

<sup>2</sup>Assistant Professor, Department of Community Medicine, Government Medical College, Srikakulam, Andhra Pradesh, India.

<sup>3</sup>Post graduate Department of Community Medicine, Government Medical College, Srikakulam, Andhra Pradesh, India.

Received : 20/04/2026  
Received in revised form : 01/06/2026  
Accepted : 16/06/2026

## Corresponding Author:

**Dr. Kolli Leela Nandini**

Post graduate Department of  
Community Medicine, Government  
Medical College, Srikakulam, Andhra  
Pradesh, India..

Email: nandhunandhu791@gmail.com

DOI: 10.70034/ijmedph.2026.2.708

Source of Support: Nil,

Conflict of Interest: None declared

**Int J Med Pub Health**

2026; 16 (2); 4299-4306

## ABSTRACT

**Background:** Antimicrobial resistance has now emerged as a global public health challenge affecting humans, animals and the environment. In India, antibiotics are widely accessible without prescription weak regulatory control contributes to the growing challenge of Antimicrobial Resistance. Irrational antimicrobial use has contributed to the amplification and spread of antimicrobial resistance (AMR). The study assesses knowledge, attitudes, and practices regarding antimicrobial resistance and proper usage among healthcare professionals and veterinarians. The objective is to assess the Knowledge, Attitude, and Practice towards antimicrobial resistance among medical doctors and veterinarians. 2. To provide evidence-based recommendations for coordinated action across human and animal sectors, from a One Health perspective.

**Materials and Methods:** A descriptive cross-sectional study was conducted within 3months from December 2025 to February 2026 using purposive sampling. Data was collected through Google Forms. The data were entered into MS Excel and analyzed using Epi Info 7.0 software. Chi -square test was used.  $P < 0.05^*$ , considered significant.

**Results:** A total of 125 participants, 75 medical doctors and 50 veterinarians, participated in this study to assess the knowledge, attitude, and practices regarding antimicrobial resistance. Overall, both groups had good knowledge levels about antimicrobial resistance (AMR), with 98.6% of medical doctors and (100%) veterinarians recognizing it as a major public health concern. Awareness of the role of inappropriate antibiotic use in developing AMR was high in both medical doctors (93.3%) and veterinarians (100%). A positive attitude towards AMR prevention was reported by most participants. Among medical doctors, 89.3% supported one health approach, while 90% of veterinarians recognized their responsibility in ensuring rational antibiotic use. In terms of practice, 97.3% of medical doctors reported educating patients about appropriate antibiotic use, where as 90% of veterinarians avoided unnecessary empirical antibiotic therapy. Among veterinarians shows statistically significant association between the predominant age group and years of professional experience have good knowledge ( $X^2=7.46$ ,  $p=0.024$ ), while no statistically significant associations were found among medical doctors.

**Conclusion:** Strengthening antimicrobial stewardship and promoting the One Health approach are essential to the growing burden of antimicrobial resistance. scaling up an integrated one health surveillance system that captures resistance trends across hospital farms, waste waters, and wildlife is critical.

**Keywords:** Antimicrobial resistance, medical doctors, One health, veterinarians.

## INTRODUCTION

Antimicrobials are one of the most important discoveries in modern medicine; they play a major role in both human and veterinary healthcare for the treatment and prevention of infectious diseases. However, their indiscriminate and excessive use may lead to the development of antimicrobial resistance (AMR), posing a growing threat to the effective management of infections.<sup>[1]</sup>

Antimicrobial resistance has now emerged as a global public health challenge affecting humans, animals and the environment.<sup>[2]</sup>

According to the World Health Organisation (WHO), antimicrobial resistance (AMR) refers to the ability of microorganisms (bacteria, viruses, and certain parasites to resist the effects of antimicrobial agents such as antibiotics, antivirals, and antimalarials, rendering these medicines ineffective against them.<sup>[3]</sup>

Antibiotic usage sharply rise 67% from 2010 to 2030 worldwide due to improper use in healthcare, animals and agricultural sectors, increasing threats of AMR. If effective measures are not implemented, drug-resistant infections may cause more than 10 million deaths annually and lead to economic losses of nearly US\$100 trillion by 2050, with low- and middle-income countries like India.<sup>[4]</sup>

In India, antibiotics are widely accessible without prescription weak regulatory control contributes to the growing challenge of Antimicrobial Resistance.<sup>[5]</sup> The one health approach emphasises the relationship between human, animal, and environment. It encourages teamwork among doctors, veterinarians, environmental experts and public health professionals to manage major health problems like antimicrobial resistance (AMR) diseases spread from animals to humans and food safety issues. The excessive and inappropriate use of antibiotics in humans and animals has greatly increased the spread of AMR worldwide.

One Health approaches play a major role in improving antimicrobial stewardship and protecting global public health to strengthen the policies and coordinate action necessary to control antimicrobial resistance.<sup>[6-10]</sup>

## MATERIALS AND METHODS

A Descriptive cross-sectional study was conducted among medical doctors of the Government General Hospital, Srikakulam and among veterinarians of the veterinary polyclinic, Srikakulam, from December 2025 to February 2026, over a period of 3-months. A total of 125 participants were recruited for the study. Among them are 75 medical doctors and 50 veterinarians.

### Inclusion Criteria

Medical doctors and veterinarians who prescribe antibiotics and who gave informed consent for the study were included in the study.

### Exclusion Criteria

Medical doctors and veterinarians who did not complete the Google Forms and those who are not involved in active prescription of antibiotics (like radiologists, anaesthetists, administrators, etc.) were excluded from the study

The sample size was calculated to be 125, by using 4pq/12 among medical doctors and veterinarians.

Medical doctors 75, (78%prevalence, 10% allowable error,5% non-response rate.)<sup>[3]</sup>

Veterinarians50, (69.5%prevalence, 12% allowable error,5%non-rate).<sup>[2]</sup>

By using the purposive sampling technique, 75 medical doctors and 50 veterinarians were selected. Informed consent and ethical approval were obtained before starting the study. Data was collected through Google Forms, which included questions on socio-demographic factors and knowledge, attitude, practice towards antimicrobial resistance among medical doctors and veterinarians.

The knowledge, attitude and practicing behaviour of the medical doctors and veterinarians regarding antimicrobial use and awareness of antimicrobial resistance data were collected through Google Forms and assessed based on the 28 questions. They were categorised into four sections. Section-I (4-questions) based on the sociodemographic characteristics of respondents. Section-II (7-questions) is based on the knowledge of antimicrobial resistance, Section-III (7 questions) is about the attitude of clinicians and veterinarians on antimicrobial resistance, and lastly, Section-IV (10-questions) is about practice questions on antimicrobial resistance. The response rate to the study was based on Likert scale questions like agree, disagree, and uncertain.

**Statistical Analysis:** The collected data were entered into Microsoft Excel and analyzed using Epi Info software version 7.0. Descriptive statistics are represented as frequency and percentage. Chi-square test was used for association between categorical variables ( $p < 0.05$  considered as statistically significant).

## RESULTS

A total of 125 participants were included in the study. Out of 125, 75 were medical doctors, and 50 were veterinarians who participated in the study, respectively.

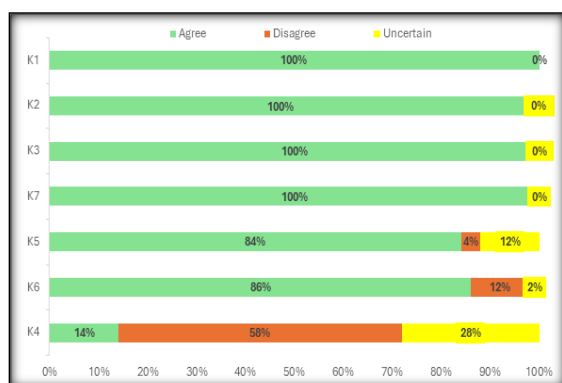
A total of 50 veterinarians were included in the study. Thirty-eight (76%) of the participants' predominant age group were 25–40 years, followed by the 41–55 years age group, 8(16%) and the more than 55 years age group, 4(8%). The majority were male, 38(76%) while 12 (24%) were female of the study population. In terms of years of professional experience, 31 (62%) had more than 10 years of experience, 12(24%) had 5–10 years, and 7(14%) had less than 5 years of experience. About 25(50%) of veterinarians had received formal training on antimicrobial resistance,

whereas the remaining 25(50%) had not received formal training on antimicrobial resistance [Table 1].

**Table 1: Distribution of socio-demographic profile among veterinarians (n=50)**

| Variable                        | Frequency(n) | Percentage (%) |
|---------------------------------|--------------|----------------|
| Age (in years)                  |              |                |
| 25-40                           | 38           | 76%            |
| 41-55                           | 8            | 16%            |
| >55                             | 4            | 8%             |
| Years of experience             |              |                |
| <5                              | 7            | 14%            |
| 5-10                            | 12           | 24%            |
| >10                             | 31           | 62%            |
| Gender                          |              |                |
| Male                            | 38           | 76%            |
| Female                          | 12           | 24%            |
| Received formal training on AMR |              |                |
| Yes                             | 25           | 50%            |
| No                              | 25           | 50%            |

The knowledge assessment among veterinarians, 50(100%), agreed that AMR (antimicrobial resistance) is a serious public health issue and indiscriminate and injudicious use of antibiotics leads to antimicrobial resistance. About 42 (84%) agreed use of antibiotics affects human health, while 43(86%) agreed broad spectrum antibiotics use increases AMR risk. However, 7(14%) agreed that antibiotics are effective against viral infection. [Figure 1]

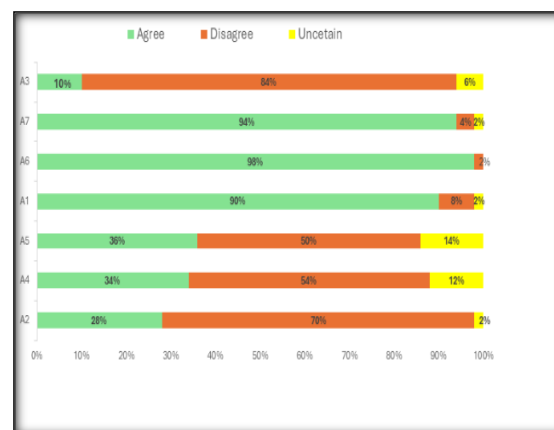


**Figure 1: Distribution of responses to knowledge-based questions in descending order of mean scores (M.S) among veterinarians (n= 50)**

K1 AMR is an important and serious public health issue (M.S=3)  
 k2 Indiscriminate and injudicious use of antibiotics lead to emergence of bacterial resistance (M. S=3)  
 K3 AMR means microorganisms become resistance to drugs (M. S=3)  
 K7 culture and sensitivity testing helps to prevent AMR (M. S=3)  
 K5 Use of antibiotics in animals can affect human health (M. S=2.8)  
 K6 Broad spectrum antibiotics increase AMR risk (M. S=2.72)  
 k4 Antibiotics are effective against viral infections (M. S=1.56)

The attitude assessment among veterinarians, most of the participants 45(90%) agreed that veterinarians play a key role in ensuring rational antibiotic use,

while 47(94%) recognized that health professionals have an important responsibility in preventing AMR. Nearly all participants 49(98%) need a thorough examination of animals before prescribing antibiotics, reflecting a strong inclination toward appropriate clinical practices. While 42(84%) disagreed with the statement that AMR is only a hospital problem, indicating awareness of its broader One Health implications. However, certain misconceptions were still evident. About 14(28%) of participants believed that antibiotics are generally safe and can be commonly used, and 17(34%) agreed that antibiotics should be prescribed for any infectious condition. [Figure 2]



**Figure 2: Distribution of responses to Attitude based questions in descending order of mean scores (M.S) Among veterinarians (n=50)**

A3. AMR is mainly a hospital problem not a veterinary problem (M. S=3.2)  
 A7 Health professionals play a key role in preventing AMR (M.S=3)  
 A6 Thorough examination of animals is required before prescribing or administration of antibiotic (M. S=2.96)  
 A1 veterinarians play a major role to play in ensuring proper antibiotic use (M. S=2.62)  
 A5 Irrational antibiotic use is common in veterinarians (M. S=1.86)

A4 Prescribe antibiotics for any infectious case (M. S=1.8)

A2 Antibiotics are safe drugs hence they can be commonly used (M. S=1.58)

The practice assessment among veterinarians revealed both appropriate and inappropriate behaviours related to Antimicrobial Resistance. A majority of 45(90%) reported avoiding unnecessary empirical antibiotic therapy. However, 32(64%) repeated the same antibiotic in herds, and 23(46%) prescribed critical human antibiotics for animal use. Inappropriate practices such as 10(20%) using antibiotics for prophylaxis, 4(8%) prescribing for viral infections or due to owner pressure, and 17(34%) ignoring withdrawal periods were also observed, indicating gaps in antimicrobial stewardship. [Figure 3].



**Figure 3: Distribution of responses to practice based questions in descending order of mean scores (M.S) Among veterinarians (n=50)**

P9 To avoid unnecessary empirical antibiotic therapy(M.S=3.44)

P2 Have you repeat same antibiotic dose in a herd if worked previously (M. S=2.44)

P1 Do you prescribe human critical antibiotics in animals when needed (M. S=2.02)

P10.Do you record adverse reactions to antimicrobial drugs (M. S=1.82)

P6 Ignore withdrawal periods when low doses are prescribed (M.S=1.78)

P8 prescribe antibiotics for prophylactic purposes (M. S=1.48)

P7 Are antibiotic used for growth promotion (M. S=1.24)

P4 prescribe antibiotics for suspected viral infections (M. S=1.18)

P3 Do you prescribe antibiotic due to owner pressure (M. S=1.16)

P5 prescribe broad spectrum antibiotics as first line treatment in animals(M.S=1.8)

Among veterinarians, there is a statistically significant association of knowledge levels ( $\chi^2=7.45$ ,  $p=0.024$ ) with age and years of experience. suggested that more professional experience and being older are associated with better knowledge about antimicrobial resistance. However, no statistically significant association was observed with age and years of experience towards attitude ( $\chi^2=4.3057$ ,  $P=0.116$ ) and practice ( $0.1285$ ,  $P=0.93$ ) related to AMR. These findings indicate professional experience may improve knowledge, but it does not necessarily lead to changes in attitude and routine practices. [Table 2]

**Table 2: Association of knowledge, attitude and practice levels with predominant age group (25–40 years) and years of professional experience (>10 years) among Veterinarians (n=50)**

| Variable  | Predominant Age Group 25-40 Years | Predominant years of experience >10years | CHI -Square (X2) | P-Value |
|-----------|-----------------------------------|------------------------------------------|------------------|---------|
| Knowledge |                                   |                                          | 7.4596           | 0.024   |
| Good      | 31                                | 26                                       |                  |         |
| Fair      | 7                                 | 5                                        |                  |         |
| Poor      | 0                                 | 0                                        |                  |         |
| Attitude  |                                   |                                          | 4.3057           | 0.116   |
| Good      | 18                                | 22                                       |                  |         |
| Fair      | 19                                | 9                                        |                  |         |
| Poor      | 1                                 | 0                                        |                  |         |
| Practice  |                                   |                                          |                  |         |
| Good      | 11                                | 8                                        | 0.1285           | 0.93    |
| Fair      | 24                                | 20                                       |                  |         |
| Poor      | 3                                 | 3                                        |                  |         |

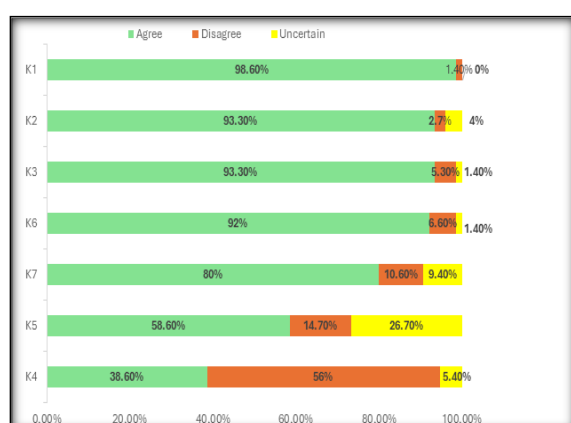
A total of 75 medical doctors participated in this study. Fifty-five (73.3%) of these participants' predominant age group was 25-40 years, followed by 41–55 years, 18(24%) and more than 55 years, 2(6%). While Gender distribution was nearly equal 37(49.4%) males, 38(50.6%) females. About

32(42.6%) had less than 5 years of experience, while 15 (20%) had more than 10 years. Only 34(45.3%) were receiving formal training on AMR, and the remaining 41 (54.6%) were not receiving formal training on AMR. [Table 3]

**Table 3: Distribution of socio demographic profile among medical doctors (n=75)**

| Variable                        | Frequency(n) | Percentage (%) |
|---------------------------------|--------------|----------------|
| Age (in years)                  |              |                |
| 25-40                           | 55           | 73.3%          |
| 41-55                           | 18           | 24%            |
| >55                             | 2            | 2.6%           |
| Years of experience             |              |                |
| <5                              | 32           | 42.6%          |
| 5_10                            | 28           | 37.3%          |
| >10                             | 15           | 20%            |
| Gender                          |              |                |
| Male                            | 37           | 49.4%          |
| Female                          | 38           | 50.6%          |
| Received formal training on AMR |              |                |
| Yes                             | 34           | 45.3%          |
| No                              | 41           | 54.6%          |

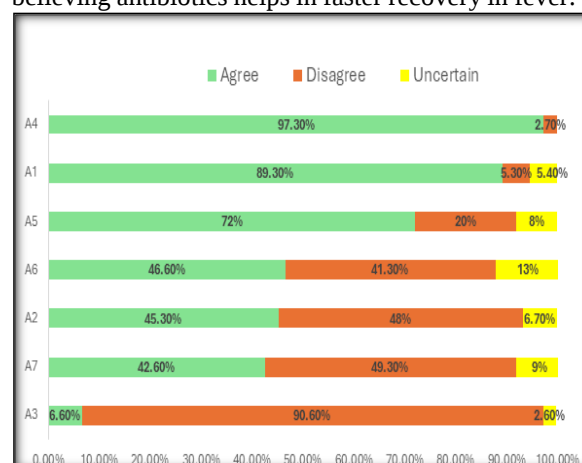
The knowledge assessment among medical doctors regarding AMR. Nearly all 74(98.6%) agreed that antimicrobial resistance is a serious public health problem, and 70(93.3%) recognised that indiscriminate antibiotic use leads to resistance. Additionally, 69(92%) acknowledged the role of culture and sensitivity testing in preventing AMR, while 60(80%) were aware that broad-spectrum antibiotics increase resistance risk. However, misconceptions persisted, as 29 (38.6%) incorrectly believed that antibiotics are effective against viral infections. [Figure 4]



**Figure4: Distribution of responses to knowledge-based question in descending order of mean scores (M.S) Among Medical doctors (n=75)**

K1 Antibiotic resistance is an important and serious public health issue(M.S=3.05)  
k2 Indiscriminate and injudicious use of antibiotics may lead to emergence of bacterial resistance(M.S=2.90)  
K3 AMR means microorganisms become resistance to drugs(M.S=2.88)  
K6. Culture and sensitivity testing helps prevent AMR(M.S=2.85)  
K7. Broad -spectrum antibiotics increase AMR risk (M. S=2.69)  
k5. Use of antibiotics in animals can affect human health (M. S=2.44)  
K4. Antibiotics are effective against viral infections (M. S=1.32)

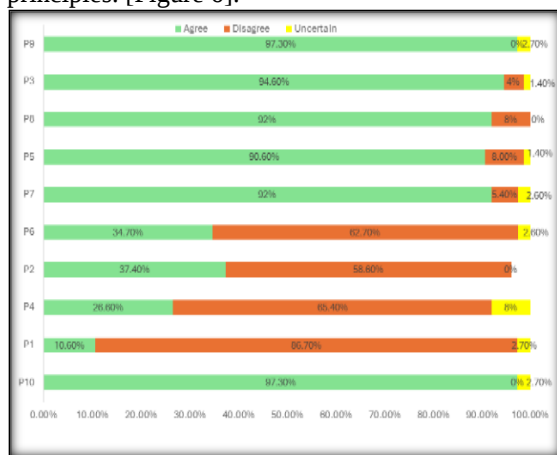
The attitude assessment among medical doctors' respondents, a majority 73(97.3%) agreed that misuse of antibiotics contributes to resistance, and 67(89.3%) supported the importance of a One Health approach. However, 54(72%) reported that antibiotics are available over-the-counter, indicating concern about regulatory practices. Misconceptions were noted, with around 34(45.3%) perceiving antibiotics as generally safe drugs, and 43(42.6%) believing antibiotics helps in faster recovery in fever.



**Figure 5: Distribution of responses to Attitude based questions in descending order of mean score (M.S) Among Medical doctors (n=75)**

A4. misuse of antibiotics may contribute to develop of antibiotic resistance(M.S=2.94)  
A1. One health approach is important in addressing antimicrobial resistance(M.S=2.84)  
A5 Antibiotics available as over the counter medicine (OTC)(M.S=2.52)  
A6. skipping one or two doses of antibiotics, does not contribute to development of antibiotic resistance (M. S=2.5)  
A2. Antibiotics are safe drugs hence they can be commonly used (M. S=1.97)  
A7. When you have fever, antibiotics help you to get more quickly(M.S=1.93)  
A3. When you have common cold, you should take an antibiotic to prevent more serious illness(M.S=1.16)

The practice assessment among medical doctors' respondents, nearly 73 (97.3%) of doctors reported explaining to patients when antibiotics are not required, and 94.6% advised completion of the antibiotic course. Additionally, 92% discouraged self-medication, and 90.6% checked expiry dates before prescribing. However, gaps in practice were evident: 26.6% prescribed antibiotics due to patient pressure, 37.4% preferred broad-spectrum antibiotics as first-line therapy, and 34.7% reported self-prescribing antibiotics for themselves or family members. Nearly all 97.3% reported reviewing ongoing antibiotic therapy within 48–72 hours, indicating variability in adherence to stewardship principles. [Figure 6].



**Figure 6: Distribution of responses to practice based questions in descending orders of mean score (M.S) Among Medical doctors (n=75)**

P9. explain the patients when antibiotics are not required(M.S=2.94)  
P3. Advise completing antibiotic course(M.S=2.90)  
p8. Discourage patients from self-medication with antibiotics(M.S=2.7)  
P5. Important to check the expiry date of the antibiotic before using it? (M.S=2.69)  
P7. Follow standard treatment guidelines while prescribing antibiotics (M. S=2.15)  
P6. prescribe antibiotics for your family or yourself without consultation (M. S=1.72)  
p2. Broad spectrum antibiotics are you were first choice in most infections(M.S=1.62)  
P4. Have you prescribed antibiotics due to patient pressure (M. S=1.61)  
P1. prescribe antibiotics for viral infections9M.S=1.24  
P10.Do you review ongoing therapy after 48-72 hours (M. S=1.10)  
In the present study, among medical doctors, no statistically significant association was found with knowledge levels ( $\chi^2 = 0.8428$ ,  $p = 0.6561$ ), predominant age group (25-40 years) and years of professional experience (<5 years). similarly Attitude levels ( $\chi^2 = 0.7862$ ,  $P = 0.675$ ) and practice ( $\chi^2 = 0.0043$ ,  $P = 0.99$ ) not statistically significant respectively. These findings suggest knowledge, attitude, and practice regarding antimicrobial resistance were not significantly influenced by age group or years of professional experience among medical doctors. (Table4)

**Table 4: Association of knowledge, attitude and practice levels with predominant age group (25–40 years) and years of professional experience (<5 years) among medical doctors. (n=75)**

| Variable  | Predominant age group (25-40 years) | Predominant years of experience <5years | Chi-sqaure (x2) | P-value |
|-----------|-------------------------------------|-----------------------------------------|-----------------|---------|
| Knowledge |                                     |                                         | 0.8428          | 0.65    |
| Good      | 36                                  | 23                                      |                 |         |
| Fair      | 18                                  | 9                                       |                 |         |
| Poor      | 1                                   | 0                                       |                 |         |
| Attitude  |                                     |                                         | 0.7862          | 0.67    |
| Good      | 21                                  | 14                                      |                 |         |
| Fair      | 33                                  | 18                                      |                 |         |
| Poor      | 1                                   | 0                                       |                 |         |
| Practice  |                                     |                                         | 0.0043          | 0.99    |
| Good      | 45                                  | 26                                      |                 |         |
| Fair      | 10                                  | 6                                       |                 |         |
| Poor      | 0                                   | 0                                       |                 |         |

## DISCUSSION

The present study assessed knowledge, attitude, and practices regarding antimicrobial resistance (AMR) among 75 medical doctors and 50 veterinarians using a one health approach. The findings revealed that both groups had good knowledge levels regarding antimicrobial resistance; however, certain gaps were present in prescribing practices.

In the present study, sociodemographic characteristics of the participants majority of medical doctors belonged to the 25-40(73.3%) years age group, which means the majority of participants were

young professionals who actively participate in prescribing antibiotics. Similar findings were seen in Patil et al. (2021), where healthcare professionals who participated were below 40 years of age.

In our study, the knowledge assessment among medical doctors, the majority of doctors agreed that antimicrobial resistance (AMR) is an important public health issue (98.6%). Similar findings found that Teja et al. 88% of medical practitioners had adequate knowledge regarding AMR, 93.3% agreed indiscriminate use contributes to AMR. Similar findings were found in Nisha et al 84% where

inappropriate antibiotic use developed antimicrobial resistance.

The present study regarding attitude, most of the medical doctors showed towards antimicrobial resistance prevention. Nearly 97.3% agreed that the misuse of antibiotics develops antimicrobial resistance. Similar findings were found in Patil JP et al. and Murthy et al. studies.

The present study regarding practice, about 92% a discourage self-medication and 97.3% explained that when antibiotics were not required. These findings show higher than in Nishat S et al., where 78% advised completion of antibiotic use and 72% discouraged self-medication. Similar study by Teja et al, found that 75% of medical doctors routinely educated patients regarding appropriate antibiotic use. The higher practice scores observed in the present study may reflect improved awareness of antimicrobial stewardship among medical doctors.

In the present study, no statistically significant association was observed between the predominant age group and years of professional experience towards knowledge, attitude, practice, which shows a p-value greater than 0.05 similar finding is present in Patil JP et al., who indicate medical doctors demonstrated an equal level of knowledge, attitude, practices regarding antimicrobial resistance.

The present study showed most of the veterinarians had good knowledge regarding AMR, with 100% recognized AMR as a serious public health issue. And 96% of veterinarians agreed that cultural and sensitivity test helps prevent AMR. Similar findings in Vijay D et al. found out that 89.3% of veterinarians were aware of AMR and its effects on public health.

In the present study, veterinarians had a positive attitude towards antimicrobial resistance. Although certain gaps are present towards AMR. 90% of participants agreed that veterinarians play a crucial role in ensuring proper antibiotic use, 84% supported the one health. 98% believed that animals should be thoroughly examined before prescribing antibiotics similar finding to that of Vijay D et al., while 87% of veterinarians had a positive attitude towards antibiotic use. Similar finding Kotekar SU and Vyas N. found that 80% Of veterinary professionals supported antimicrobial stewardship measures and recognised their responsibility in preventing antimicrobial resistance. These findings suggest that veterinarians have played their role in protecting both animal and human health.

Regarding practices, the present study showed 64% repeated the same antibiotic in herds and 46% reported prescribing critically important human antibiotics in animals when necessary. Similar findings were found in Vijay et al.

The present study showed a statistically significant association between years of experience and predominant age group about knowledge towards antimicrobial resistance among veterinarians ( $\chi^2 = 7.45$ ,  $p = 0.024$ ), which indicates that veterinarians who had more experience had good knowledge compare few years of experience. Similar findings by

Kotekar and Vyas found that professional experience positively influenced AMR preparedness and awareness among veterinary professionals.

**Limitations:** The present study was conducted among a limited number of medical doctors and veterinarians from selected institutions, which may limit generalizability. Since the study design was cross-sectional, causal relationships could not be established. Data were collected self-reported through Google Forms and may show response bias or overestimation of good practices. In addition, environmental and microbiological aspects of the One-Health approach were not included.

## CONCLUSION

Strengthening antimicrobial stewardship and promoting the One Health approach are essential to the growing burden of antimicrobial resistance. scaling up an integrated one health surveillance system that captures resistance trends across hospital farms, waste waters, and wildlife is critical.

## RECOMMENDATIONS

- Regular training programs and continuing medical education about antimicrobial resistance are conducted for medical doctors and veterinarians.
- Public awareness programs should be conducted to reduce self-medication and inappropriate antibiotic use.
- Collaboration between human and animal health sectors through the One Health approach is essential to control antibiotic resistance effectively

## ACKNOWLEDGEMENT

We would like to thank all medical doctors and veterinarians who participated in this study.

## REFERENCES

1. World Health Organisation. Antimicrobial resistance. Geneva: WHO; 2023.
2. Vijay D, Bedi JS, et al. Knowledge, attitude, and practices (KAP) survey among veterinarians and risk factors relating to antimicrobial use and treatment failure in dairy herds of India. *Antibiotics*. 2021;10(2):216.
3. K. NT, Hazra P, Padma L. A cross-sectional observational study on knowledge, attitude and practices about indiscriminate use of antibiotics and antibiotic resistance among medical doctors at Sathagiri Hospital, Bangalore. *International Journal of Basic & Clinical Pharmacology*. 2019 Nov 25;8(12):2609.
4. Srajana Uttam Kotekar, Vyas N. Assessment of preparedness for antimicrobial resistance in the veterinary department of a district in South India. *International Journal of One Health*. 2024 Nov 1;242–52.
5. Murthy N, Arun, Kumar N. Knowledge, attitudes, and practices toward antibiotic use and resistance among medical students: a cross-sectional study. *International Journal of Basic & Clinical Pharmacology*. 2025 Aug 22;14(5):760–4.
6. Food and Agriculture Organization. FAO Action Plan on Antimicrobial Resistance 2021–2025.
7. World Organisation for Animal Health. Annual Report on Antimicrobial Agents Intended for Use in Animals. Paris: WOAH.

8. Patil JP, Baig MS, Kulkarni VA. Knowledge, attitude, and perception of prescribers about antimicrobial stewardship in a tertiary care hospital International Journal of Research in Medical Sciences. 2023;11(9):3357–3364.
9. Dhayal VS, Bilal Ur Rehman, Krishnan A, Vijay Pal Singh. Accessing the behavior and awareness of veterinary professionals towards antimicrobials use and antimicrobial resistance in Indian district. Frontiers in Veterinary Science. 2024 Mar 11;11.
10. Dhayal VS, Bilal Ur Rehman, Krishnan A, Vijay Pal Singh. Accessing the behavior and awareness of veterinary professionals towards antimicrobials use and antimicrobial resistance in Indian district. Frontiers in Veterinary Science. 2024 Mar 11;11.