



Research Article

## Knowledge, Attitude and Practice of Healthcare Professionals Regarding Antimicrobial Stewardship in a Tertiary Care Hospital: A Cross-Sectional Study

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### ABSTRACT

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**Background:** Antimicrobial resistance (AMR) poses a major threat to global public health. Antimicrobial stewardship (AMS) programs aim to optimize antimicrobial use and improve patient outcomes while limiting the emergence of resistance. Healthcare professionals play a central role in the success of antimicrobial stewardship programs; however, gaps in knowledge, attitude, and clinical practices may compromise effective implementation.

**Methods:** A hospital-based cross-sectional observational study was conducted at a tertiary care teaching hospital in South India. A validated, structured questionnaire assessing knowledge, attitude, and practice (KAP) regarding antimicrobial stewardship was administered to healthcare professionals, including medical students, residents, consultants, nursing staff, and faculty members. The questionnaire consisted of 15 items with 58 sub-sections evaluated using a 5-point Likert scale. Data were analyzed using SPSS software. Descriptive statistics were used to summarize responses, and Pearson's Chi-square test was applied to determine associations between categorical variables. A p-value <0.001 was considered statistically significant.

**Results:** Overall, 62% of participants demonstrated good knowledge of antimicrobial stewardship principles, while 71% exhibited a positive attitude toward antimicrobial stewardship programs. However, only 48% showed good antimicrobial prescribing practices. Consultants and senior residents demonstrated significantly better knowledge and practice compared to junior clinicians and nursing staff. Case-based scenarios revealed inappropriate antibiotic use in self-limiting conditions such as acute bronchitis, uncomplicated diarrhea, and asymptomatic bacteriuria. A significant association was observed between higher knowledge scores and appropriate antimicrobial practices ( $\chi^2 = 12.4, p = 0.001$ ).

**Conclusions:** Although knowledge and attitudes toward antimicrobial stewardship were generally favorable, a substantial gap was observed in clinical practice. Strengthening antimicrobial stewardship programs through continuous education, multidisciplinary collaboration, and institutional support is essential to improve antimicrobial use and combat antimicrobial resistance.

**Keywords:** Antimicrobial stewardship, Antimicrobial resistance, Knowledge attitude practice, Healthcare professionals, Antibiotic prescribing..

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## INTRODUCTION

Antimicrobial stewardship (AMS) is a critical component of healthcare systems aimed at ensuring the rational use of antimicrobial agents. Along with infection prevention and control and patient safety, AMS forms one of the three pillars of healthcare quality improvement. Despite the availability of effective antimicrobials, inappropriate prescribing practices have contributed to the rapid emergence of antimicrobial resistance (AMR), resulting in increased morbidity, mortality, and healthcare costs worldwide<sup>1,2,3</sup>.

Studies from India and other low- and middle-income countries have reported inappropriate antimicrobial prescribing driven by diagnostic uncertainty, patient expectations, and lack of awareness of stewardship principles. Understanding healthcare professionals' knowledge, attitudes, and practices toward antimicrobial stewardship is essential for designing effective interventions<sup>4,5</sup>. This study aimed to assess the KAP of healthcare professionals regarding antimicrobial stewardship in a tertiary care hospital.

## METHODS

### Study Design and Setting

This was a hospital-based cross-sectional observational study conducted at Kamineni Hospital, Kamineni Academy of Medical Sciences and Research Centre (KAMSRC), LB Nagar, Hyderabad, India.

### Study Participants

The study included final-year medical students, junior residents, senior residents, consultants, nursing staff, and faculty members involved in patient care.

### Study Tool

A validated questionnaire comprising 15 questions with 58 sub-sections was used to assess knowledge (29 items), attitude (5 items), and practice (24 items) related to antimicrobial stewardship. Responses were recorded on a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5).

### Scoring and Data Analysis

Scores were categorized as good ( $\geq 75\%$ ), average (50–74%), or poor ( $< 50\%$ ). Data were analyzed using SPSS software. Descriptive statistics were presented as frequencies and percentages. Pearson's Chi-square test was used to assess associations, with statistical significance set at  $p < 0.05$ .

## RESULTS

### Overall KAP Performance

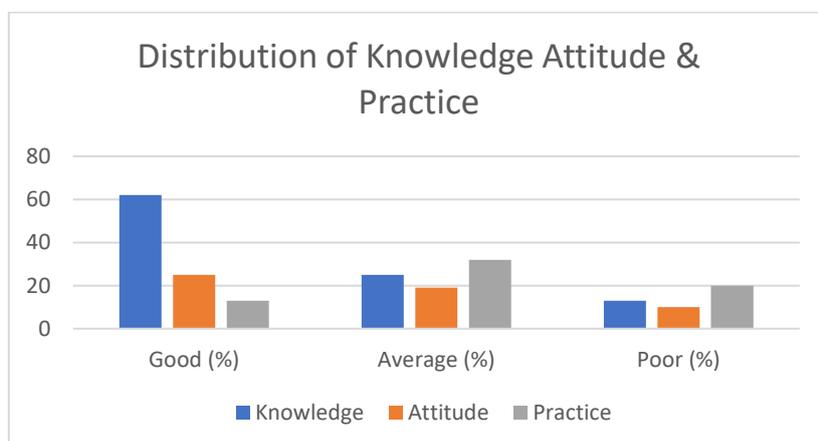
Good knowledge of antimicrobial stewardship principles was observed in 62% of participants, while 71% demonstrated a positive attitude toward antimicrobial stewardship programs. In contrast, only 48% of respondents exhibited good antimicrobial prescribing practices.

### Profession-wise Analysis

Consultants and senior residents had significantly higher knowledge and practice scores compared to medical students, junior residents, and nursing staff. Practice gaps were particularly evident in routine antimicrobial review, de-escalation, and multidisciplinary consultation<sup>8,9</sup>.

**Table 1: Distribution of Knowledge, Attitude and Practice Levels**

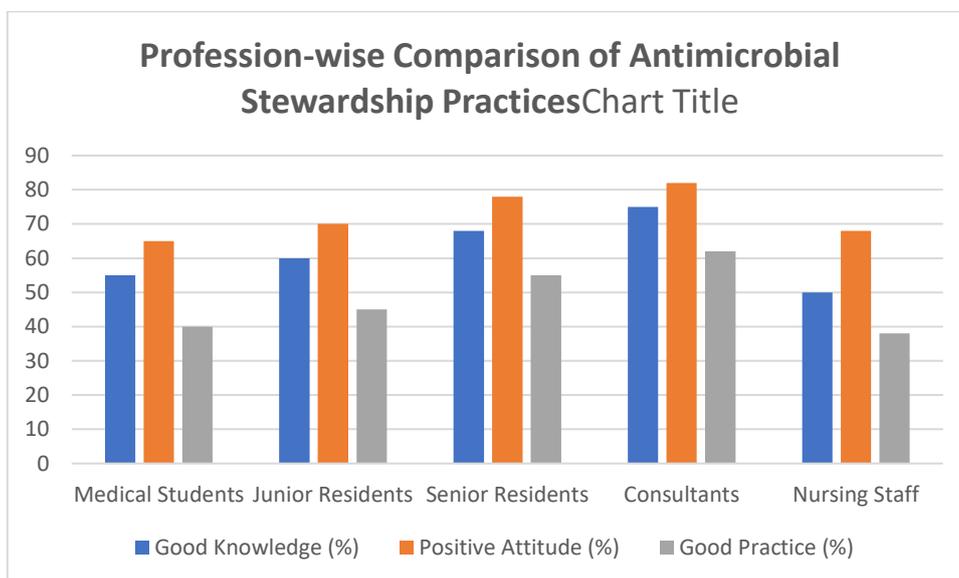
Domain	Good (%)	Average (%)	Poor (%)
Knowledge	62	25	13
Attitude	25	19	10
Practice	13	32	20



**Figure 1: Distribution of Knowledge, Attitude, and Practice Levels**

**Table 2. Profession-wise Distribution of Knowledge, Attitude, and Practice Scores**

Profession	Good Knowledge (%)	Positive Attitude (%)	Good Practice (%)
Medical Students	55	65	40
Junior Residents	60	70	45
Senior Residents	68	78	55
Consultants	75	82	62
Nursing Staff	50	68	38

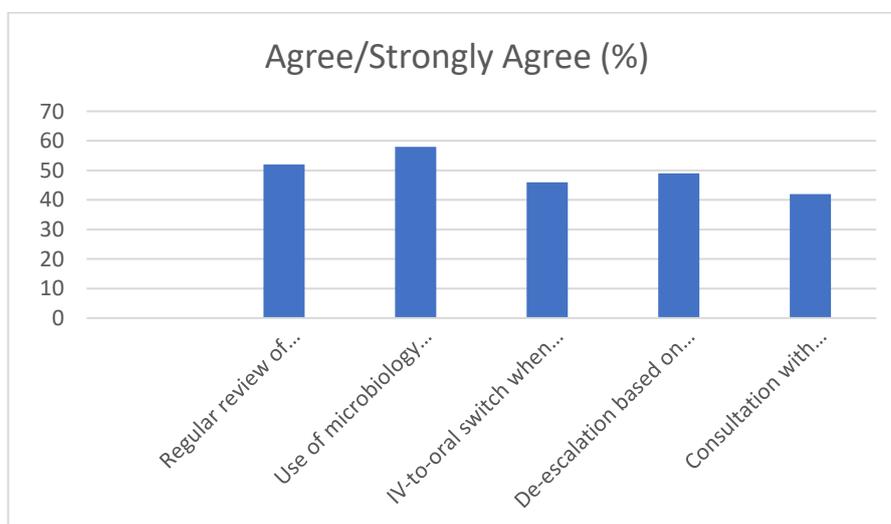


**Figure 2. Profession-wise Comparison of Antimicrobial Stewardship Practices**

Despite adequate knowledge across professional categories, antimicrobial stewardship practices were suboptimal among junior clinicians and nursing staff.

**Table 3. Responses to Key Antimicrobial Prescribing Practices**

Practice Statement	Agree/Strongly Agree (%)
Regular review of antimicrobial therapy	52
Use of microbiology reports before modification of therapy	58
IV-to-oral switch when clinically appropriate	46
De-escalation based on culture sensitivity	49
Consultation with microbiologist/pharmacologist	42

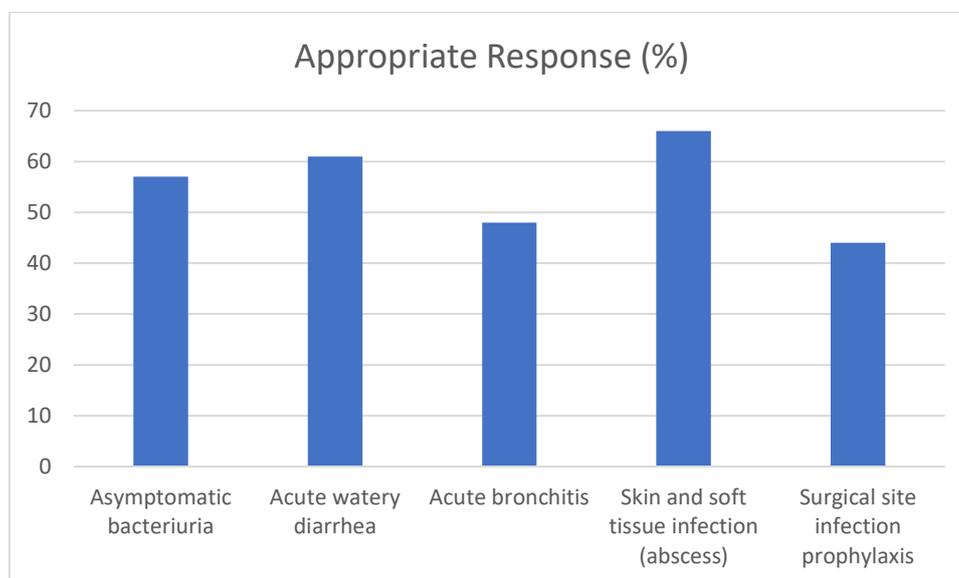


**Figure 2. The lowest compliance was seen in consultation-based prescribing and IV-to-oral switch strategies.**

**Table 4. Case Scenario–Based Practice Responses**

Clinical Scenario	Appropriate Response (%)
Asymptomatic bacteriuria	57
Acute watery diarrhea	61
Acute bronchitis	48
Skin and soft tissue infection (abscess)	66
Surgical site infection prophylaxis	44

Overuse of antibiotics was common in self-limiting conditions such as acute bronchitis and postoperative prophylaxis.



**Figure 4. Correct Antimicrobial Decision-Making in Case Scenarios**

Clinical decision-making varied widely, with notable misuse of antibiotics in respiratory and surgical settings.

**Table 5. Association Between Knowledge and Practice**

Knowledge Level	Good Practice (%)	Poor Practice (%)	$\chi^2$ value	p-value
Good	64	36	12.4	0.001*
Average/Poor	39	61	-	-

\*Statistically significant p-value 0.001\*

Higher knowledge scores were significantly associated with better antimicrobial prescribing practice

#### Case-Based Practice Assessment

Inappropriate antimicrobial use was commonly observed in self-limiting conditions such as acute bronchitis and uncomplicated diarrhea. Overuse of antibiotics for surgical prophylaxis was also reported.

#### Association Between Knowledge and Practice

A statistically significant association was found between higher knowledge scores and appropriate antimicrobial prescribing practices ( $\chi^2 = 12.4$ ;  $p = 0.001$ ).

#### DISCUSSION

This study demonstrates that although healthcare professionals possess adequate knowledge and favorable attitudes toward antimicrobial stewardship, these do not consistently translate into optimal clinical practices. Similar findings have been reported in previous studies from India and other countries, highlighting a persistent gap between knowledge and practice<sup>10,11,12</sup>.

The lower practice scores among junior clinicians and nursing staff emphasize the need for targeted educational interventions<sup>14,15</sup>. Limited multidisciplinary involvement and reliance on empirical prescribing further highlight structural barriers to effective stewardship implementation. Strengthening antimicrobial stewardship programs through continuous training, audit and feedback, and real-time microbiology support is essential.

## CONCLUSIONS

Healthcare professionals demonstrated good awareness and positive attitudes toward antimicrobial stewardship; however, antimicrobial prescribing practices remain suboptimal. Institutional strengthening of antimicrobial stewardship programs, continuous professional education, and multidisciplinary collaboration are critical to improving antimicrobial use and combating antimicrobial resistance.

## DECLARATIONS

### Ethics approval and consent to participate

The study protocol was approved by the Institutional Ethics Committee of Kamineni Hospital, Kamineni Academy of Medical Sciences and Research Centre (KAMSRC), LB Nagar, Hyderabad, India. Informed consent was obtained from all participants.

**Funding:** Nil

**Conflicts of interests:** Nil

## REFERENCES

1. Simardeep Kaur et al. *American Journal of Infectious Diseases* 2022; 18 (1): 9.20.
2. Chatterjee D, Sen S, Begum SA et al. A questionnaire-based survey to ascertain the views of clinicians regarding rational use of antibiotics in teaching hospitals of Kolkata. *Indian J Pharmacol* 2015; 47 (1): 105
3. Khajuria K, Kaur S, Sadiq S. KAP on antibiotic usage and resistance among second professional medical students.
4. Banerjee K, Dwivedi LK. The burden of infectious and cardiovascular diseases in India from 2004 to 2014. *Epidemiol Health* 2016; 38.
5. World Health Organization. Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries: a WHO practical toolkit. Geneva: WHO; 2019.
6. Dyar OJ, Huttner B, Schouten J, Pulcini C. What is antimicrobial stewardship? *Clin Microbiol Infect.* 2017;23(11):793–798.
7. Davey P, Marwick CA, Scott CL, et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. *Cochrane Database Syst Rev.* 2017;2:CD003543.
8. Laxminarayan R, Duse A, Wattal C, et al. Antibiotic resistance—the need for global solutions. *Lancet Infect Dis.* 2013;13(12):1057–1098.
9. Pulcini C, Wencker F, Frimodt-Møller N, et al. European survey on principles of prudent antibiotic prescribing teaching. *Clin Microbiol Infect.* 2015;21(4):354–361.
10. Charani E, Holmes A. Antimicrobial stewardship programmes: the need for wider engagement. *BMJ Qual Saf.* 2013;22(11):885–887.
11. Mendelson M, Matsoso MP. The World Health Organization global action plan for antimicrobial resistance. *S Afr Med J.* 2015;105(5):325.
12. Sharma S, Saini V, Kaur J, et al. Knowledge, attitude, and practices of medical professionals regarding antimicrobial stewardship. *J Glob Antimicrob Resist.* 2020;22:370–376.
13. Abbo LM, Cosgrove SE, Pottinger PS, et al. Medical students' perceptions and knowledge about antimicrobial stewardship. *Clin Infect Dis.* 2013;57(5):631–638.
14. Malhotra S, Sharma S, Hans C. Awareness of antimicrobial resistance and stewardship among health professionals in India. *Indian J Med Res.* 2018;147(6):555–560.
15. Nathwani D, Varghese D, Stephens J, et al. Value of hospital antimicrobial stewardship programs. *Clin Microbiol Infect.* 2019;25(3):293–300.