



KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING ANTIBIOTIC RESISTANCE AMONG PRACTICING DOCTORS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Antibiotic resistance is an escalating global health challenge driven largely by inappropriate antibiotic use. Practicing doctors play a critical role in promoting rational prescribing. This cross-sectional study assessed the knowledge, attitude, and practices regarding antibiotic resistance among practicing doctors in a tertiary care setting in India using a structured questionnaire. The findings indicate that while most participants had adequate knowledge and a positive attitude, certain gaps in prescribing practices persist, underscoring the need for continuous medical education and strengthened antibiotic stewardship strategies.

KEYWORDS : Antibiotic Resistance; Knowledge; Attitude; Practice; Prescribing Doctors

INTRODUCTION

Antimicrobial resistance (AMR) has progressively become a defining concern of modern medicine, threatening the foundations of infection treatment across healthcare settings worldwide. Its consequences extend beyond individual patient outcomes to encompass systemic strain on healthcare infrastructure and escalating economic costs. Its impact is reflected in increased morbidity, extended hospital admissions, higher treatment costs, and, in severe cases, mortality attributable to organisms that no longer respond to standard therapies. The World Health Organization (WHO) has consistently ranked AMR among the foremost global health priorities, noting a sustained rise in resistance profiles across diverse pathogen and antibiotic combinations worldwide.⁽⁴⁾

The development and propagation of AMR are closely tied to patterns of antibiotic use. Overuse, non-prescription dispensing, and inappropriate discontinuation of treatment courses are well-established contributors. These challenges are well documented in the Indian context, where structural factors including unrestricted OTC availability of antibiotics, weak regulatory enforcement, and variable guideline adherence continue to drive resistance⁽⁴⁾. These factors have collectively driven the emergence of clinically significant resistance in organisms such as *Escherichia coli* and *Staphylococcus aureus* in tertiary care environments, highlighting the urgency of the problem.⁽⁴⁾

Prescribing physicians occupy a central and decisive position in the effort to contain AMR, since their clinical decisions directly determine antibiotic exposure at the individual and population level. While published literature indicates that healthcare professionals typically possess adequate theoretical knowledge of AMR, Despite measurable levels of theoretical awareness, prescribing behavior among clinicians frequently diverges from evidence-based recommendations - a gap that stewardship interventions specifically aim to narrow through institutional support and structured oversight.⁽³⁾

Against this background, the present study was designed to evaluate the knowledge, attitude, and practices regarding antibiotic resistance among practicing doctors at a tertiary care facility, with the objective of identifying actionable gaps that can inform targeted educational and institutional interventions.

A cross-sectional questionnaire-based study was conducted for among practicing doctors in tertiary care hospital in Navi Mumbai. The target population included PG Resident doctors, Consultants and excluding professionals not authorized to prescribe antibiotics.

Sample Size and Sampling Technique

Assuming a 50% prevalence of adequate knowledge, with a 10% margin of error and a 95% confidence interval, the minimum sample size was calculated to be 96. Considering feasibility and ease of data collection, the final sample size was rounded to 100. A convenience sampling technique was used to recruit practicing doctors from tertiary care hospitals and private clinics, ensuring inclusion of participants with varied clinical experience and specialties.

Data Collection Tool

A pre-tested, structured questionnaire was developed, comprising four sections:

1. Demographics: Educational qualification, years of clinical practice, and practice setting.
2. Knowledge: 5 multiple-choice questions assessing facts of antibiotic pharmacology and resistance mechanisms
3. Attitude: 5 statements evaluated on a three-point Likert scale (Agree/Neutral/Disagree).
4. Practices: 5 questions assessing related to antibiotic prescribing behavior

The questionnaire was adapted from validated tools used in previous studies^(1,2)

Data Collection Procedure

The questionnaire was administered using a Google Forms link shared with practicing doctors. Participation was voluntary, and informed consent was obtained electronically prior to participation. Anonymity and confidentiality of responses were maintained throughout the study.

Data Analysis

Data were collected through Google Forms, compiled in Microsoft Excel, and analyzed using SPSS version 25. Descriptive statistics such as frequencies, percentages, and mean $\pm$ standard deviation were used to summarize demographic characteristics and KAP scores. Associations between demographic variables and KAP levels were assessed using the Chi-square test. A p-value of <0.05 was considered statistically significant

MATERIALS AND METHODS

Study Design and Participants

RESULTS

Table 1: Demographic Characteristics of Participants (N=100)

Variable	Frequency, (%)
Educational Qualification	
• PG Resident Doctors	38 (38%)
• Consultants / Specialists	62 (62%)
Years of Clinical Practice	
• 1–5 years	40 (40%)
• 6–10 years	34 (34%)
• >10 years	26 (26%)

Knowledge Assessment

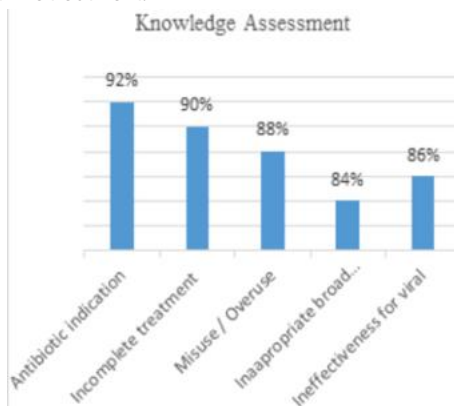
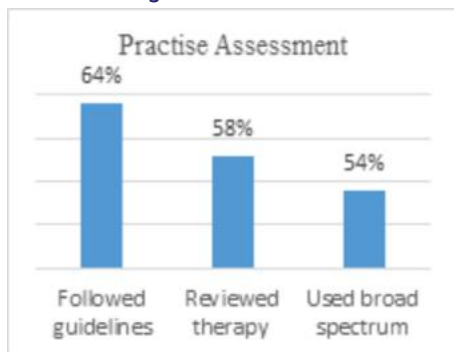
The mean knowledge score was 4.3 ± 0.8 out of 5, indicating high awareness. Correct responses were observed across all 5 questions of knowledge: antibiotic use against bacteria (92%), incomplete treatment courses as contribution to resistance (90%), misuse as primary driver to resistance (88%), inappropriate broad-spectrum use (84%), and the ineffectiveness of antibiotics for viral infections (86%).

Attitude Assessment

The mean attitude score was 4.4 ± 0.7 out of 5, indicating a overall positive attitude towards antibiotic stewardship. A large majority of participants agreed that antibiotic resistance is a serious concern (94%), expressed support for stewardship programs (93%), acknowledged the importance of guideline adherence (91%), recognized over-prescription as significant problem (89%), and noted that patient's expectation influence prescribing decisions. (72%).

Practice Assessment

The mean practice score was 3.6 ± 1.0 out of 5, indicating moderate adherence to optimal prescribing behavior. Empirical prescribing was reported always by 28% and sometimes by 60% of participants; 64% consistently followed clinical guidelines, 70% routinely educated patients on antibiotic use, 58% reviewed therapy after culture reports, and 54% reported occasionally using broad-spectrum antibiotics as first-line treatment.

**Graph No: 1 Knowledge Assessment.****Graph No 2. Practice Assessment****DISCUSSION**

The present study evaluated the knowledge, attitude, and practices regarding antibiotic resistance among practicing doctors, with the majority being postgraduate residents and specialists. The findings demonstrated a high level of knowledge (86%), which is consistent with findings from Thakolkaran et al. (2017), where physicians in South Indian teaching hospitals demonstrated comparable levels of awareness regarding antibiotic resistance and its determinants⁽²⁾.

A substantial proportion of participants identified misuse and overuse of antibiotics as the primary cause of resistance (88%), aligning with evidence from the systematic review by Jahromi et al. (2025), which reported that most healthcare workers are aware of the key contributors to antimicrobial resistance⁽⁶⁾. Similarly, knowledge regarding the ineffectiveness of antibiotics against viral infections was high (86–92%), reflecting improved awareness and training.

The attitude assessment revealed predominantly positive perceptions, with more than 90% of respondents recognizing antibiotic resistance as a serious public health issue and supporting stewardship programs. These findings are comparable to those reported in the study by Thakolkaran et al (2017), where clinicians expressed strong agreement toward rational antibiotic use and policy implementation⁽²⁾.

Despite good knowledge and attitude, gaps in practice were evident. A significant proportion of participants reported empirical antibiotic prescribing (88% always/sometimes), possibly reflecting the practical realities of busy clinical environments, where awaiting confirmatory diagnostic results may delay treatment initiation beyond acceptable risk thresholds. Similar discrepancies between knowledge and practice were observed in the study by Murthy et al. (2025)⁽⁵⁾.

Furthermore, only 58% consistently reviewed antibiotic therapy after culture reports, highlighting an important area for improvement. Additionally, 54% of participants reported occasional use of broad-spectrum antibiotics as first-line therapy, which, while not universal, signals a pattern that warrants attention from a stewardship perspective.

Patient expectations also played a notable role, with 72% of doctors acknowledging its influence on prescribing behavior, which is consistent with findings from the study by Wester et al. (2002), where physician prescribing was influenced by external factors including patient demand⁽¹⁾.

The findings demonstrate that although knowledge and attitude levels are high among practicing doctors, there remains a notable gap in translating this knowledge into optimal clinical practice, particularly in areas such as empirical prescribing and the use of broad-spectrum antibiotics.

CONCLUSION

This study provides evidence that practicing doctors in a tertiary care setting demonstrate adequate knowledge and a positive attitude toward antibiotic resistance. However, important gaps persist in prescribing practices, particularly in empirical antibiotic use and preference for broad-spectrum agents. These findings point to a persistent gap in which theoretical competence has not yet been fully operationalized into consistent bedside decision-making. Addressing this gap will require coordinated institutional efforts that integrate regular continuing medical education (CME), strengthened diagnostic support to enable culture-guided prescribing decisions, and well-structured antimicrobial stewardship programs. These measures are essential to encourage rational antibiotic use and contribute to a more coordinated and evidence-informed response to the expanding burden of antimicrobial resistance in India.

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