

A Cross-Sectional Study on Knowledge, Attitudes & Practices Among Medical Students Regarding Antimicrobial Resistance (AMR) & Healthcare-Associated Infections (HAIs)

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ABSTRACT:

Introduction: Antimicrobial resistance (AMR) and healthcare-associated infections (HAIs) pose significant global health challenges. Medical students and trainees frequently interact with patients, making their knowledge and adherence to infection prevention practices crucial. This study aimed to evaluate the Knowledge, Attitudes, and Practices (KAP) regarding AMR and HAI prevention among medical trainees in a tertiary care teaching hospital. **Methods:** A descriptive cross-sectional study was conducted among 600 medical trainees at K.H. Patil Institute of Medical Sciences, Gadag. A structured WHO/CDC-based questionnaire assessing AMR knowledge, attitudes toward stewardship, and infection prevention practices was administered via Google Forms. Knowledge scores were calculated and categorized using tertiles. Descriptive statistics and chi-square tests were applied, with a p-value ≤ 0.05 considered significant. **Results:** Knowledge levels were low, with a mean score of 0.37/2; 62.9% scored 0, and none scored full marks. While 97% agreed that inappropriate prescribing is a serious problem, 52.4% remained unsure whether stewardship programs were being implemented. Practice indicators were suboptimal: only 34.2% consistently used PPE appropriately, and 17.7% always followed the hospital antibiogram. Chi-square analysis revealed a significant association ($p \leq 0.05$) between level of training and both knowledge and practice categories, whereas gender showed no significant association with any KAP domain. **Conclusion:** Despite positive attitudes toward AMR and HAI prevention, substantial gaps in knowledge and practical adherence persist. Strengthening institutional stewardship programs, expanding curricular training, and reinforcing IPC practices through supervision and monitoring are essential to improve competency among future healthcare professionals.

Keywords: Antimicrobial resistance, Healthcare-associated infections, Knowledge, attitudes, and practices, Medical students, Antibiotic stewardship, Infection prevention and control, Cross-sectional study

INTRODUCTION:

Antimicrobial resistance (AMR) and healthcare-associated infections (HAIs) are major threats to patient safety and global health. Rising resistance patterns, inappropriate antibiotic use, and inconsistent infection prevention practices contribute significantly to hospital morbidity. Medical students, interns, and postgraduates actively participate in patient care during their clinical postings, making their understanding of AMR and IPC crucial to reducing transmission risk. Evaluating their Knowledge, Attitudes, and Practices (KAP) helps identify learning gaps, strengthen training, and optimize institutional stewardship strategies essential for preventing AMR-related complications.

OBJECTIVES:

1. To assess the knowledge level of medical trainees regarding AMR, mechanisms of resistance, and infection prevention strategies.
2. To evaluate their attitudes toward antibiotic stewardship, rational antimicrobial use, and institutional IPC responsibilities.
3. To analyze self-reported hand hygiene, PPE usage, and adherence to antibiotic policies/antibiograms.
4. To identify significant gaps requiring targeted interventions and enhanced training modules.

MATERIALS & METHODS:

A descriptive cross-sectional study was conducted among 600 undergraduates (except 1st year MBBS students), interns and postgraduates at K.H. Patil Institute of Medical Sciences, Gadag. Universal sampling was used. Data was collected through a validated, structured questionnaire based on WHO and CDC AMR/IPC guidelines. The tool included five sections: demographics, AMR knowledge, HAI awareness, attitudes, and practices. Reliability was assessed through pilot testing in postgraduates. Data were collected via Google Forms. Knowledge scores were computed and categorized into tertiles. Descriptive statistics were used, and chi-square tests were performed to determine associations between demographic variables and KAP categories. A p-value ≤ 0.05 was considered statistically significant.

RESULTS:

A total of 737 responses were analyzed.

Knowledge:

Knowledge scores were low, with a mean of 0.37/2:

- Score 0: 377 (62.9%)
- Score 1: 222 (37.1%)
- Score 2: 0 participants

Attitudes:

- AMR is a problem in the hospital: Yes 35.4%, No 28.2%, Unsure 36.4%
- Inappropriate prescribing is serious: 97% agreed/strongly agreed
- Regular AMR/HAI training is necessary: **98.8% Yes**
- Unsure whether stewardship is implemented: **52.4%**

Practices:

- Hand hygiene satisfactory: Yes 37.6%, No 44.7%
- Following antibiogram: Always 17.7%, Sometimes 43.4%, Unsure 35.6%
- PPE usage appropriate: Sometimes 56.3%, Always 34.2%, Rarely/Never 9.4%

Statistical significance:

Chi-square test showed a **significant association ($p \leq 0.05$)** between level of training (UG/Intern/PG) and knowledge as well as practice categories, indicating improvement with increased clinical exposure. **No significant association** was found between gender and any KAP variable.

DISCUSSION:

The study highlights a substantial disparity between awareness and implementation of recommended infection control practices. Although postgraduates

expressed positive attitudes—nearly universal support for AMR/HAI training and strong recognition of inappropriate prescribing as a problem—knowledge deficiencies were pronounced, and practical compliance remained inconsistent. The significant association between training level and KAP outcomes suggests that clinical exposure improves competence; however, gaps persist even among postgraduates. High uncertainty regarding stewardship implementation reflects inadequate institutional visibility of existing programs. These findings underscore the need for structured, recurrent IPC & AMR training modules, regular CMEs, increased supervision, accessible antibiograms, and audit-feedback mechanisms to reinforce accountability and sustain best practices.

CONCLUSION:

Postgraduates demonstrate positive attitudes but inadequate knowledge and inconsistent IPC practices. Strengthening AMR and HAI education through structured curricular integration, enhanced supervision, and visible stewardship programs is essential. Institutional commitment to routine monitoring and continuous reinforcement can bridge the awareness–practice gap and improve patient safety.

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