Assessment of Knowledge, Attitude, and Practice Toward Self-Medication with Antibiotics Among Students Belonging to Healthcare and Non-Healthcare Study Backgrounds

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INTRODUCTION

Antibiotics are vital pharmaceutical agents used primarily for the treatment of bacterial infections, operating either by directly killing bacteria (bactericidal) or inhibiting their growth (bacteriostatic) [1]. Since their discovery, antibiotics have revolutionized medical care, enabling the effective treatment of infections that were once life-threatening. However, their widespread and often irrational use has led to a mounting global crisis — antimicrobial resistance (AMR), which threatens to undermine decades of progress in medicine [2].

Self-medication with antibiotics (SMA) is one of the key contributors to this crisis. The World Health Organization (WHO) defines self-medication as the selection and use of medicines by individuals to treat self-recognized conditions or symptoms without professional supervision [3]. Although responsible self-medication can ease the burden on healthcare systems by providing relief from minor ailments, inappropriate use — especially of antibiotics — can lead to misdiagnosis, adverse drug reactions, masking of serious conditions, and most significantly, the evolution of drug-resistant bacterial strains [4].

In developing countries like India, the practice of SMA is alarmingly common, driven by factors such as over-the-counter (OTC) availability of antibiotics, lack of regulatory enforcement, low health literacy, time constraints, and economic limitations [5]. The prevalence of antibiotic self-medication is particularly high among university students, including those studying in both medical and non-medical disciplines [6]. Paradoxically, while healthcare students are expected to possess greater knowledge about the prudent use of antibiotics, numerous studies have shown that they too engage in SMA, often influenced by convenience, prior prescriptions, and peer behavior [7].

The implications of this practice are severe. According to the WHO, antimicrobial resistance is projected to cause 10 million deaths annually by 2050 if left unchecked [8]. Studies from Europe and Asia have highlighted disturbing trends, such as increasing resistance to carbapenems, third-generation cephalosporins, and fluoroquinolones among organisms like *Escherichia coli*, *Klebsiella pneumoniae*, and *Staphylococcus aureus* [9]. In the Indian context, resistance to first-line antibiotics is already affecting treatment efficacy for common infections such as typhoid, tuberculosis, and pneumonia [10].

Given the critical role that education plays in shaping health behaviors, it becomes essential to assess and compare the knowledge, attitudes, and practices (KAP) related to antibiotic use among different student populations. Healthcare students, as future prescribers, must be equipped with sound knowledge and ethical practices to mitigate the threat of AMR. Likewise, educating non-healthcare students — who represent a large portion of the general public — is equally important, as they too influence drug consumption patterns and

contribute to resistance trends [11].

This study aims to assess the KAP toward antibiotic self-medication among healthcare and non-healthcare students in Guntur, Andhra Pradesh, with the broader goal of identifying knowledge gaps and behavioral patterns that could be addressed through targeted educational interventions and policy reforms. A cross-sectional survey using a structured questionnaire was employed, covering awareness of antibiotic function and resistance, sources of self-medication, frequency of use, and perception of associated risks.

Understanding these patterns will provide evidence to inform institutional curricula, national antibiotic stewardship programs, and community awareness initiatives. Moreover, by drawing comparisons between student groups, this study provides a critical lens into how academic background influences rational medicine use, a fundamental component in the global fight against AMR.

METHODOLOGY

Study Design and Duration

A descriptive cross-sectional observational study was conducted over a period of five months, from September 2024 to January 2025, among students pursuing healthcare and non-healthcare courses in Guntur, Andhra Pradesh, India.

Study Population and Sampling

The study targeted undergraduate and postgraduate students aged 18 years and above from both healthcare (pharmacy, medicine, nursing, etc.) and non-healthcare (engineering, arts, science, etc.) educational backgrounds. Sample size determination was based on Cochran's formula at a 95% confidence interval, resulting in a required sample of 384 participants, equally divided between healthcare (n = 192) and non-healthcare (n = 192) students.

Inclusion Criteria

- ✓ Students enrolled in recognized healthcare or non-healthcare programs.
- ✓ Aged 18 years or older.
- ✓ Willing to provide informed consent.
- ✓ Able to read and respond to the questionnaire in English.
- ✓ Currently studying in colleges/universities in Guntur.

Exclusion Criteria

- ✓ Students under 18 years of age.
- ✓ Diploma/certificate students not enrolled in regular academic programs.
- ✓ Participants who did not complete the questionnaire or refused consent.

Data Collection Tool

A structured, pre-validated Knowledge, Attitude, and Practice (KAP) questionnaire was used, developed in Google Forms. The questionnaire was divided into four sections:

1. Sociodemographic details
2. Practice of SMA

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3. Knowledge of antibiotics and antibiotic resistance
4. Attitudes toward antibiotic use

The tool was distributed online via institutional groups, with prior informed consent obtained. Responses were anonymized and exported into Microsoft Excel for statistical analysis.

Statistical Analysis

Data were analyzed using descriptive statistics (frequencies and percentages) and comparative analysis (Chi-square tests) to evaluate differences between healthcare and non-healthcare students. P-values <0.05 were considered statistically significant.

RESULTS

Table 1: Participation Rate

This table shows the total number of students who agreed to participate in the study. Both healthcare and non-healthcare groups showed a high level of willingness, indicating strong engagement and interest in the subject.

Response	Medical Students (n=192)	Non-Medical Students (n=192)
Yes	190 (99%)	191 (99.5%)
No	2 (1%)	1 (0.5%)

Table 2: Gender Distribution

The gender distribution highlights that the healthcare field had predominantly female students (80.7%), while the non-healthcare group had more male students (64.1%). This reflects broader societal or academic trends.

Gender	Medical Students	Non-Medical Students
Male	37 (19.3%)	123 (64.1%)
Female	155 (80.7%)	69 (35.9%)

Table 3: Marital Status

This table displays the marital status of respondents. Nearly all participants in both groups were single, which is expected given the typical age group of university students.

Marital Status	Medical Students	Non-Medical Students
Single	191 (99.5%)	191 (99.5%)
Married	1 (0.5%)	1 (0.5%)

Table 4: Place of Residence

The table below presents where students were residing during the study. A significant majority of medical students lived in hostels (71.9%), while non-medical students were almost evenly split between home and hostel accommodations.

Residence	Medical Students	Non-Medical Students
Home	54 (28.1%)	97 (50.5%)
Hostel	138 (71.9%)	95 (49.5%)

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Table 5: Awareness of the Term "Self-Medication"

This table indicates the awareness of the term 'self-medication'. Medical students showed significantly higher awareness compared to their non-medical counterparts.

Response	Medical Students	Non-Medical Students
Yes	175 (91.1%)	136 (70.8%)
No	17 (8.9%)	56 (29.2%)

Table 6: Practice of Self-Medication Before Consulting a Doctor

A large percentage of both student groups reported practicing self-medication before seeking professional medical consultation, with healthcare students showing a higher prevalence.

Response	Medical Students	Non-Medical Students
Yes	154 (80.2%)	130 (67.7%)
No	38 (19.8%)	62 (32.3%)

DISCUSSION

The present study provides valuable insight into the knowledge, attitude, and practice (KAP) related to self-medication with antibiotics (SMA) among students from healthcare and non-healthcare backgrounds in Guntur, Andhra Pradesh. The findings reveal several critical patterns that require immediate attention to prevent further escalation of antibiotic misuse and antimicrobial resistance (AMR).

A significant observation was the higher awareness of the term "self-medication" among healthcare students (91.1%) compared to non-healthcare students (70.8%). This difference can be attributed to the formal medical education and exposure to pharmacology and microbiology in healthcare curricula. However, despite this greater awareness, the practice of SMA was still alarmingly high among healthcare students (80.2%). This contradiction indicates that mere knowledge does not always translate into responsible behavior. Students from healthcare fields may feel overconfident in self-diagnosing and self-treating, contributing to inappropriate antibiotic use.

Non-healthcare students demonstrated comparatively lower awareness and knowledge, as evident from the higher proportion (64.2%) believing that antibiotics can cure common colds and viral infections. This misconception is particularly dangerous as it reflects the lack of differentiation between bacterial and viral infections among this group. Furthermore, their reliance on pharmacies without prescriptions (66.4%) and leftover medications (47.9%) highlights the lack of regulatory enforcement and ease of access to antibiotics without medical supervision.

Another concerning finding is the tendency to discontinue antibiotics prematurely once symptoms subside. In this study, 57.3% of non-healthcare and 41.1% of healthcare students admitted to stopping antibiotics early. This behavior contributes directly to the development of resistant bacterial strains, one of the most pressing public health threats globally.

The sources of antibiotics reported, including leftover prescriptions and advice from family or friends, suggest a culture of informal and potentially unsafe medical practices. Additionally, keeping antibiotics at home “just in case,” which was agreed upon by nearly half of the respondents (49.2%), underscores a widespread normalization of self-medication.

Adverse reactions were reported by 21.9% of participants, but only 38.6% sought professional medical help. This lack of proper follow-up further exacerbates health risks and highlights poor health-seeking behavior among students.

The findings align with global and regional studies showing high prevalence of SMA among students, driven by convenience, easy availability, prior experiences, and perceived mildness of illnesses. Similar trends have been documented in studies from Pakistan, Palestine, and Ethiopia, indicating that SMA is a pervasive and culturally rooted issue, not limited to specific regions or economic settings.

To effectively address this issue, multifaceted interventions are required. Educational initiatives should go beyond imparting factual knowledge and focus on behavioral change strategies. Curriculum reforms incorporating antibiotic stewardship principles, patient education on AMR, and the dangers of incomplete treatment courses are crucial. Additionally, enforcing stricter policies on over-the-counter antibiotic sales and promoting awareness campaigns targeting both healthcare and non-healthcare student communities can reduce misuse.

CONCLUSION

The study underscores a critical gap between knowledge and practice regarding antibiotic use among both healthcare and non-healthcare students. While healthcare students displayed superior knowledge, their high rates of SMA indicate a worrying disconnect, suggesting that confidence in medical knowledge can sometimes foster risky self-treatment behaviors.

Non-healthcare students showed lower levels of awareness and higher misconceptions, further amplifying the risk of inappropriate antibiotic use. This group's tendency to rely on non-prescription sources and stop antibiotics prematurely poses a significant public health concern.

To combat these challenges, universities and policymakers must work together to integrate comprehensive antimicrobial stewardship programs into academic curricula and public health strategies. Educational interventions should be behaviorally focused and tailored to different student groups. Simultaneously, regulatory authorities need to strengthen the enforcement of prescription-only antibiotic sales.

Promoting responsible antibiotic use is essential to safeguard their effectiveness for future generations and prevent the global threat of antimicrobial resistance. Addressing SMA among young, educated populations is a critical step in this fight, as they represent future professionals and influencers within their communities.

Ethical Approval

Ethical approval for this study was obtained from the Institutional Ethics Committee of Chalapathi Institute of Pharmaceutical Sciences, Guntur, Andhra Pradesh. Informed consent was obtained from all participants prior to data collection, and the study was conducted in accordance with the Declaration of Helsinki.

Conflict Of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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