

MYTHS AND MISCONCEPTIONS ON ANTIBIOTIC USE AMONG MEDICAL AND NON-MEDICAL UNDERGRADUATE STUDENTS: A CROSS-SECTIONAL SURVEY IN SOUTH INDIAPOOJITHA KP*^{ORCID}, TRISHA EDULA^{ORCID}, SINDHURA N^{ORCID}, TULASI MADHURI T^{ORCID}

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Received: 20 January 2026, Revised and Accepted: 04 March 2026

ABSTRACT**Objectives:** To compare myths, attitudes, and selected practices related to antibiotic use among medical and non-medical undergraduate students.**Methods:** A cross-sectional questionnaire survey was conducted among 300 students (medical: n=155; non-medical: n=145) in South India. Items assessed misconceptions (antibiotics for viral infections), recent antibiotic use, prescription-seeking, course completion, storage of leftovers, and attitudes on rational use using Likert responses. Data were summarized as frequencies/percentages and compared using Chi-square tests ($p < 0.05$).**Results:** The misconception that antibiotics treat viral infections was higher among non-medical students (117/145, 80.7%) than medical students (52/155, 33.5%) ($p < 0.001$). Antibiotic use in the past 6 months was frequent (medical: 110/155, 71.0%; non-medical: 91/145, 62.8%). The course completion was better in medical students (112/155, 72.3% vs. 82/145, 56.6%; $p = 0.004$), as was reporting improvement after use (127/155, 82.0% vs. 104/145, 71.7%; $p = 0.041$). Leftover antibiotics were stored for future use by 97/155 (62.6%) medical and 64/145 (44.1%) non-medical students. Agreement that antibiotics can treat fever was lower among medical students (32/155, 20.6%) than non-medical students (67/145, 46.3%) ($p < 0.001$). Disagreement with stopping antibiotics when symptoms improve was higher in medical students (79.4% vs. 32.4%; $p < 0.001$). Most of the respondents supported patient education to reduce resistance (medical: 95.4% agreement; non-medical: 91.0%) and endorsed consulting a physician before starting antibiotics (91.6% vs. 78.0%).**Conclusion:** Among undergraduate students in this university-based survey, misconceptions and unsafe self-reported antibiotic-related practices remained common, particularly in the non-medical group. Targeted stewardship education should be strengthened across disciplines, with foundational messages for non-medical students and stronger emphasis among medical students on translating knowledge into safe, real-world practice, especially avoiding storage and reuse of leftover antibiotics.**Keywords:** Antibiotics, Antimicrobial resistance, Myths, Self-medication, Stewardship, University students.© 2026 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2026v19i4.58202>. Journal homepage: <https://innovareacademics.in/journals/index.php/ajpcr>**INTRODUCTION**

Antimicrobial resistance (AMR) has emerged as a major threat to population health, with the global burden of bacterial AMR in 2019 estimated to contribute to millions of deaths and substantial disability worldwide [1]. A key driver is avoidable antibiotic exposure arising from inappropriate initiation, unnecessary broad-spectrum selection, suboptimal dosing, and premature discontinuation. Across settings, public misunderstanding about antibiotic indications and expectations from prescribers perpetuates demand for antibiotics even when they offer no benefit [2]. Antimicrobial stewardship promotes coordinated interventions that optimize antibiotic use and slow resistance, but its success depends on informed users as well as trained prescribers [3].

Misconceptions are particularly important in young adults, where self-directed medicine use, peer influence, and online advice can shape antibiotic-related behavior. Reviews describing the antibiotic resistance crisis and strategies to reduce misuse repeatedly emphasize that behavior change and education are essential complements to regulatory control and diagnostic improvements [4,5]. Non-prescription antimicrobial use remains common in many regions, and systematic evidence indicates that community access and perceived convenience contribute to self-medication [6]. University students represent a high-priority group because they frequently make independent health decisions and, in the case of medical trainees, they are future prescribers. The post-pandemic period has also intensified attention to irrational antibiotic consumption.

Several surveys have documented persistent “myths” among students, including believing that antibiotics treat viral infections, taking antibiotics for fever or common colds, and retaining leftovers for later use. In a multinational student survey, misconceptions coexisted with partial awareness of AMR, suggesting that knowledge alone may not translate into safe practice [7]. Comparative data between medical and non-medical cohorts are valuable because they identify gaps that can be addressed through tailored antimicrobial stewardship education beyond health-science curricula.

The present study was designed to evaluate and compare misconceptions, attitudes, and selected antibiotic-use practices among medical and non-medical undergraduate students. By mapping differences in key domains, viral-bacterial differentiation, adherence to prescribed courses, storage of leftovers, and attitudes toward rational use, this work aims to inform practical, discipline-specific educational interventions to reduce inappropriate antibiotic use and mitigate AMR.

METHODS**Study design and setting**

A descriptive, cross-sectional survey was conducted during a 2-month study (October–November 2025) among undergraduate students of GITAM (Deemed to be University), Visakhapatnam, Andhra Pradesh, India. Both medical (MBBS) and non-medical streams were included to enable an internal comparison within the same academic environment.

Participants and sampling

Students aged ≥18 years who provided electronic consent were eligible. A convenience sampling approach was adopted because data collection was performed through an online form distributed to accessible student groups during the study. A total of 300 completed responses were included for analysis (medical: n=155; non-medical: n=145). Submissions were reviewed for completeness before inclusion.

Study tool (questionnaire)

A structured questionnaire was used to assess antibiotic-related knowledge, misconceptions, recent exposure, practices, and attitudes. The questionnaire was adapted from previously published survey instruments on antibiotic use and AMR and was revised to fit the objectives and context of the present study. The final tool included items on: (1) Knowledge and myths, including misconceptions such as antibiotic use for viral infections; (2) self-reported antibiotic use in the preceding 6 months; (3) prescription and adherence-related practices, including course completion and stopping treatment after symptom relief; (4) storage of leftover antibiotics; and (5) attitudes toward rational antibiotic use using Likert-scale responses. Minor wording modifications were made to improve clarity and contextual relevance before circulation. A structured questionnaire was used to capture antibiotic-related knowledge, misconceptions, recent exposure, practices, and attitudes.

Data collection procedure

The questionnaire was circulated electronically and completed anonymously. Participation was voluntary, and consent was obtained before proceeding to the survey items. Responses were downloaded from the online platform, screened for completeness and internal consistency, and then coded for statistical analysis. Data were handled as group-level information without linking responses to identifiable individuals.

Study variables and outcome measures

Primary outcomes included:

- Prevalence of myths and misconceptions regarding antibiotics
- Self-reported antibiotic exposure in the preceding 6 months
- Practice indicators reflecting adherence (e.g., completion of the full course) and potentially unsafe behaviors (e.g., storing leftover antibiotics)

Table 1: Gender distribution of study participants

Characteristic	Medical students (n=155) (%)	Non-medical students (n=145) (%)
Male	42 (27.1)	95 (65.5)
Female	113 (72.9)	50 (34.5)
Total	155 (100)	145 (100)

p-value for gender distribution (Chi-square): <0.001

Table 2: Knowledge myth regarding antibiotic use for viral infections

Knowledge item	Medical students (n=155) (%)	Non-medical students (n=145) (%)	p-value
Belief that antibiotics treat bacterial infections and also treat viral infections (Yes response indicates myth)	52 (33.5)	117 (80.7)	<0.001

Table 3: Recent antibiotic exposure and adherence-related practices

Practice item (yes)	Medical students (n=155)	Non-medical students (n=145)	p-value
Used antibiotics in the past 6 months	110 (71.0)	91 (62.8)	0.131
Antibiotics taken were prescribed by a doctor	109 (70.3)	91 (62.8)	0.165
Completed the full antibiotic course	112 (72.3)	82 (56.6)	0.004
Felt better after taking antibiotics	127 (81.9)	104 (71.7)	0.036

- Attitudinal support for rational antibiotic use derived from Likert responses
- The key analytical comparison was between medical and non-medical student groups.

Statistical analysis

Categorical variables were summarized as frequencies and percentages. Differences between medical and non-medical groups were assessed using Pearson’s Chi-square test. A two-sided p<0.05 was considered statistically significant. Where required, Likert responses were presented as category-wise distributions; when interpretation needed simplification, responses were also grouped into broader categories (agreement/neutral/disagreement) without altering the original response options.

Ethical considerations

Ethical approval was obtained from the Institutional Ethics Committee of GITAM Institute of Medical Sciences and Research (GIMSR)(Approval No. GIMSR/Admn./Ethics/approval/IEC-404/2024; dated April 04, 2025). Electronic informed consent was obtained before questionnaire completion. No personal identifiers were collected, participation was voluntary, and confidentiality was maintained. Data were analyzed and reported in aggregate to protect participant privacy.

RESULTS

A total of 300 undergraduate students participated (medical: n=155; non-medical: n=145). Female students predominated in the medical cohort, whereas males predominated in the non-medical cohort (p<0.001) (Table 1).

A key misconception was observed regarding antibiotic indications. The belief that antibiotics treat viral infections was significantly higher among non-medical students compared with medical students (p<0.001) (Table 2).

Recent antibiotic exposure and selected practices are summarized in Table 3. Antibiotic use in the previous 6 months was common in both groups. Medical students reported higher course completion than non-medical students (p=0.004).

Storage of leftover antibiotics for future use was frequently reported, particularly among medical students (Table 4), and the distribution differed between groups (p=0.001).

Attitudinal items showed clear contrasts. Agreement that fever can be treated with antibiotics was higher among non-medical students, whereas medical students were more likely to disagree with stopping antibiotics when symptoms improve (Table 5). Support for patient education and consulting a physician before starting antibiotics was high in both groups (Table 6).

DISCUSSION

This study demonstrates that antibiotic-related myths remain frequent among undergraduates, with a marked disparity between medical and non-medical students. The most prominent misconception, endorsing antibiotics for viral infections, was substantially higher in the non-medical cohort. Similar gaps between awareness and correct indication have been described among medical students in multi-country settings, where partial AMR knowledge did not reliably prevent inappropriate beliefs or behaviors [8]. Pharmacy and other health-professional trainees may also show heterogeneous understanding, underscoring the need for competency-based antimicrobial stewardship training rather than passive exposure to pharmacology content [9].

Medical students were more likely to report adherence-related practices, including completion of the full antibiotic course and disagreement with stopping antibiotics once symptoms improved; however, these findings should be interpreted cautiously because the practices were self-reported and may have been influenced by recall error or social desirability bias. Comparable patterns have been observed in surveys among healthcare students in Nigeria, where stronger training exposure was associated with more appropriate attitudes toward course completion and resistance prevention [10]. Nevertheless, the finding that nearly two-thirds of medical students reported storing leftover antibiotics indicates that even medically trained cohorts may normalize unsafe practices that facilitate future self-medication and selection pressure.

Self-medication and easy access to antibiotics remain critical contextual factors. Studies among medical students in Nepal and undergraduates in India have identified symptom-based self-treatment, time constraints, and prior experience as drivers of antibiotic self-medication, with incomplete adherence and sharing of medicines frequently reported [11,12]. Our results align with this broader pattern, suggesting that interventions must address

both knowledge and the practical “decision points” that lead to antibiotic use.

Attitude profiles further support targeted education. Non-medical students were more likely to agree that fever warrants antibiotics and more likely to endorse stopping antibiotics early, indicating that symptom-based heuristics may dominate over etiologic reasoning. Structured educational modules emphasizing viral-bacterial differentiation, risks of partial treatment, and the harms of leftover storage could be integrated into general university health programs. Such efforts are timely, as pandemic-era prescribing analyses have shown that antibiotics were frequently used despite low rates of bacterial co-infection, illustrating how uncertainty can amplify antibiotic exposure at scale [13-16].

Overall, the data support a dual approach: reinforce stewardship competencies in medical curricula while delivering simplified, action-oriented messages to non-medical students. Peer-led campaigns, campus health services, and digital microlearning may be suitable channels. Future studies should evaluate whether these approaches reduce misconceptions and measurable antibiotic consumption over time [17-19].

Limitations

This study has several limitations. First, a convenience sampling approach was used, and the questionnaire was distributed through accessible student groups; therefore, the respondents may not be representative of the entire medical and non-medical student population at the university. This sampling strategy introduces potential selection bias, as students who chose to respond may have had greater interest in health-related topics, greater prior exposure to antibiotics, or stronger views regarding antibiotic use than non-responders, which could have either overestimated or underestimated the observed knowledge gaps and self-reported practices. Second, the survey was conducted in a single university setting, which limits external generalizability, and the findings should therefore be interpreted as specific to this cohort rather than to all students in South India. Third, the study relied on self-reported responses, which are subject to recall bias and social desirability bias. Fourth, only selected domains of antibiotic-related knowledge, attitudes, and practices were assessed, and some responses reflected perceptions rather than objectively verified behaviors. Finally, the cross-sectional design precludes causal inference, and unmeasured confounding may have influenced the observed group differences. Despite these limitations, the study identifies important educational targets for antibiotic stewardship in university settings.

Table 4: Practice of storing leftover antibiotics for future use

Response	Medical students (n=155) (%)	Non-medical students (n=145) (%)
Yes	97 (62.6)	64 (44.1)
No	54 (34.8)	66 (45.5)
Don't know	4 (2.6)	15 (10.3)

Overall group difference (Chi-square, 2x3): <0.001

Table 5: Attitudes on antibiotic use (agree/neutral/disagree)

Attitude statement	Medical: agree (%)	Medical: neutral (%)	Medical: disagree (%)	Non-medical: Agree (%)	Non-medical: Neutral (%)	Non-medical: Disagree (%)	p-value*
High fever can be treated with antibiotics	32 (20.6)	57 (36.8)	66 (42.6)	67 (46.2)	59 (40.7)	19 (13.1)	<0.001
Healthcare professionals overprescribe antibiotics	76 (49.0)	58 (37.4)	21 (13.5)	83 (57.2)	49 (33.8)	13 (9.0)	0.155
I can stop taking antibiotics when I start feeling better	17 (11.0)	15 (9.7)	123 (79.4)	52 (35.9)	46 (31.7)	47 (32.4)	<0.001

Agree=strongly agree+agree, Disagree=disagree+strongly disagree

Table 6: Support for stewardship-oriented attitudes (agree vs. not agree)

Attitude statement	Medical: agree (%)	Medical: not agree (%)	Non-medical: Agree (%)	Non-medical: Not agree (%)	p-value*
Educating patients about appropriate antibiotic use can reduce antibiotic resistance	148 (95.5)	7 (4.5)	132 (91.0)	13 (9.0)	0.123
When I fall ill, I should consult a physician before starting antibiotics	142 (91.6)	13 (8.4)	113 (77.9)	32 (22.1)	<0.001

CONCLUSION

In this cross-sectional survey, myths and unsafe practices related to antibiotic use were common among undergraduates, with consistently poorer responses among non-medical students. Misbelief in antibiotics for viral illnesses, symptom-driven initiation for fever, and early discontinuation when feeling better remained key gaps. Compared with non-medical students, medical students were more likely to report favorable adherence-related behaviors, although these findings are based on self-reported survey responses and should not be interpreted as objectively verified practice. However, leftover antibiotic storage remained frequent in both groups, indicating persistence of risky behavior despite better reported adherence in the medical cohort. Universities should implement stewardship-oriented education across disciplines, using clear messages on viral-bacterial differences, completing prescribed courses, and avoiding sharing or saving antibiotics. Strengthening campus health guidance may contribute to AMR containment.

ACKNOWLEDGMENT

The authors gratefully acknowledge all community participants who completed the survey and shared their views on medicine storage and disposal. Their cooperation and time were essential for data collection and for generating evidence to guide safer disposal practices and public awareness initiatives.

AUTHORS' CONTRIBUTION

K P Poojitha: Study concept, protocol design, supervision, data analysis, interpretation, and manuscript revision. Trisha Edula: Data collection, questionnaire administration, literature review, data entry, and manuscript drafting. N. Sindhura: Study design, supervision, data analysis, interpretation, and manuscript editing. T. Tulasi Madhuri: Conceptualization, supervision, critical manuscript review, and final approval.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

FUNDING

None.

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