



Original Article



Perceptions of Medical Students on Antibiotic Use and Antimicrobial Resistance: An Internet Based Public Survey

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ABSTRACT

Background: Rational antibiotic prescribing is a behaviour embedded with sound knowledge and a positive attitude. The baseline assessment of medical students' knowledge, attitude, and practice serves as a road map for incorporating educational interventions that could translate the competency of antimicrobial stewardship into the competence of future prescribers. The objective of this study was to describe medical students' perceptions of antibiotic use and antimicrobial resistance.

Methods: This was a cross-sectional internet-based survey conducted amongst the Phase 2 MBBS students at a Government Medical College in Central Kerala during World Antimicrobial Awareness Week. Experts prepared and validated a questionnaire with items related to medical students' knowledge, attitudes, and practices regarding antibiotic use and antimicrobial resistance. Participants were requested to fill out an online questionnaire using Google Forms. The data were analyzed using the Licensed version of SPSS 16 (licensed one).

Results: Of the 175 medical undergraduates, 164 responded with a response rate of 93.7%. All the participants had heard about antibiotics and except 2 all others knew that it was used for bacterial infections. Thirty-one (18.9%) thought that the antibiotics could treat viral infections as well. All the participants had heard of antimicrobial resistance (AMR) and knew that it was a serious public health issue that is relevant globally. The majority 160(97.6%) knew that AMR emerges from the indiscriminate use of antimicrobials, thus rendering them ineffective for future use. Forty-one (25%) thought that newer and costly drugs had better efficacy than the older ones. The majority vouched that prescriptions are a must for getting antibiotics from pharmacies. Except for two, all the participants had consumed antibiotics, and 9.8% had consumed them without prescriptions.

Conclusions: Medical students understood the gravity of the AMR problem and proper antibiotic use; however, a large number of them had a negative attitude and practiced poorly. Based on the insights gained from learning the students' perceptions, a student-centric module should be developed.

KEYWORDS: Antimicrobial resistance; Rational antibiotic use; MBBS students; Medical education; Antimicrobial stewardship; Questionnaire-based study

INTRODUCTION

Antimicrobial Resistance (AMR) is increasing alarmingly and is now a public health problem worldwide.¹ A seminal article in the Lancet stated that 4.95 million deaths were associated with bacterial AMR

in 2019 of which 1.27 million deaths were linked directly to it.² The common infections are turning fatal because of multidrug resistance and we are heading towards an era where antibiotics are increasingly becoming ineffective.³ The main drivers of antibiotic resistance are of course misuse and overuse in humans

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as well as the rampant use in animals, horticulture and fisheries as growth promoters and prophylactics.^{1,4} AMR has adversely affected the economy, causing a surge in healthcare costs attributed to hospital admissions and drug use.⁴ India has been referred to as 'the AMR capital of the world' and has one of the highest burdens of bacterial infections.⁵ There has been a rapid increase in resistance to newer antibiotics like carbapenems in addition to the older drug classes. Under the National Action Plan on AMR (NAP-AMR) six priorities have been identified, the first priority being – improving awareness and understanding of AMR through effective communication, education and training.⁶ The Government of Kerala has adopted measures under the State Action Plan on AMR to create awareness about AMR containment among the faculty and students of Government Medical Colleges.¹ There needs to be awareness among the budding doctors so that this peril can be tackled from the prescriber's side at the earliest. This study was conducted to describe the knowledge, attitude and practices of MBBS undergraduates on antibiotics use as well as antimicrobial resistance.

METHODOLOGY

This was a cross-sectional questionnaire-based study done in the Department of Pharmacology of a Government Medical College in Central Kerala among the second phase medical undergraduates as a part of Antimicrobial Awareness Week from 18-24 November. Since the sensitisation talks on antimicrobial stewardship programmes were attended by Phase 2 students, purposive sampling was done and 175 phase two medical students formed the sample population. The questionnaire was prepared by the investigators, and it was validated for content and time. The questionnaire was piloted among 10 students and Cronbach's alpha was found to be 0.81. It consisted of 55 questions divided into five parts - Demography, assessment of the knowledge, perceptions, practice, and suggestions on proper use of antibiotics. The knowledge questions were true or false, while the Likert scale was used to find out the perceptions and practices related to proper use of antibiotics, while suggestions were solicited as an open-ended question. The questionnaire was administered as a Google Form shared via WhatsApp, and two reminders were sent within a one-week gap to encourage participants to submit the form. Since it was an internet-based survey aiming at public practices rather than a public study, the Institutional Review Board Clearance was not obtained. The participation was voluntary, informed consent was obtained digitally and data privacy was

ensured by maintaining anonymity. Only those participants who provided consent proceeded to fill the questionnaire. The data were analysed using SPSS for Windows, Version 16 (licensed one).

RESULTS

Out of the 175 second year medical undergraduates who were invited to participate in this study 164 returned the Google Fill Out form with a response rate of 93.7%. The mean age was 21.27 ± 1.38 years with minimum 19 and maximum 31 years. There were 107 (65.2%) females and 57 (34.8%) males.

All the participants had heard about antibiotics and except two, all knew that they were used for treating bacterial infections. Thirty-One (18.9%) thought that the antibiotics could treat the viral infections as well. All the participants had heard of antimicrobial resistance (AMR) and knew that it is a serious public health issue that is relevant globally. Majority 160 (97.6%) knew that AMR emerges from indiscriminate use of antimicrobials, thus rendering them ineffective for future use. Out of the 5 drugs kept for identification, only three were antibiotics and 112 (68.3%) identified them correctly, while others identified only one or two of the antibiotics or mistakenly selected the non-antimicrobials as well. Only 15 (9.1%) participants could identify all the given choices (gonorrhoea, urinary tract infections, skin and wound infections, diarrhoea, respiratory infections) where the antibiotics could be used while others only identified some of the conditions or wrongly identified acquired immunodeficiency syndrome, fever, measles, bodyaches as diseases to be treated by antibiotics. Only 115 (70.1%) identified the statement "Antibiotic resistance occurs when your body becomes resistant to antibiotics, and they no longer work as well" as false. The statements many infections are becoming increasingly resistant to treatment by antibiotics; if bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause; antibiotic resistance is an issue in other countries but not here; Antibiotic resistance is only a problem for people who take antibiotics regularly and bacteria which are resistant to antibiotics can be spread from person to person were marked as true or false appropriately by 158 (96.3%), 150 (91.5%), 151 (92.1%), 119 (72.6%) and 137 (89.5%) respectively. The attitude of the participants regarding use of antibiotics is summarized in Table 1. Forty-one (25%) thought that newer and costly drugs had better efficacy than the older ones. One hundred and thirty-two (80.5%) believed that antibiotics were widely used in agriculture and livestock.

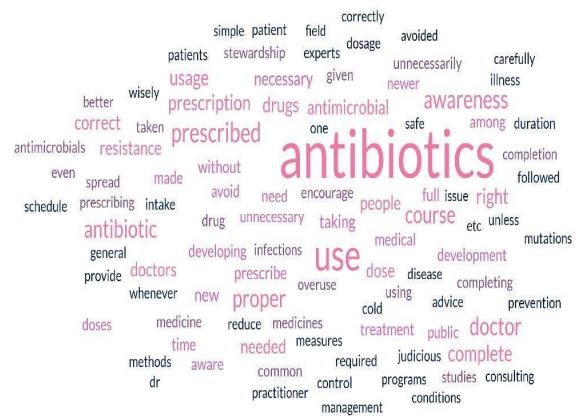
Table 1: Attitude of participants on antibiotic use and istance.

Statement	Totally Disagree	Disagree	Uncertain	Agree	Totally Agree
Antibiotics are safe drugs; hence they are medications that can be commonly used	24(14.6)	49(29.9)	38(23.2)	45(27.4)	8(4.9)
Whenever I take an antibiotic, I contribute to the development of antibiotic resistance.	5(3)	19(11.6)	33(20.1)	85(51.5)	22(13.4)
Skipping one or two doses does not contribute to the development of antibiotic resistance	32(19.5)	60(36.6)	41(25)	20(12.2)	11(6.7)
Multiple antimicrobial use shortens the duration of illness	20(12.2)	54(32.9)	37(22.6)	46(28)	7(4.3)
When I get fever, antibiotics help me to get better more quickly	4(2.4)	32(19.5)	41(25)	81(49.4)	6(3.7)
There is abuse of antibiotics at present	2(1.2)	6(3.7)	28(17.1)	66(40.2)	62(37.8)
Antibiotic resistance affects me and my family's health	2(1.2)	14(8.5)	14(8.5)	78(47.6)	56(34.1)
It is necessary to carry out large-scale 'antibiotics awareness campaign'	2(1.2)	1(0.6)	3(1.8)	58(38.4)	100(61)
When I use antibiotics, I am worried about side effects	1(0.6)	10(6.1)	13(7.9)	110(6.7)	30(18.3)
If I experience side effects while using antibiotics, I will consult a doctor	1(0.6)	2(1.2)	10(6.1)	77(47)	74(45.1)
People should use antibiotics only when they are prescribed by a doctor	0	7(4.3)	5(3)	51(31.1)	101(61.6)
Farmers should give fewer antibiotics to food producing animals	4(2.4)	5(3)	28(17.1)	69(42.1)	58(35.4)
People should not keep antibiotics and use them later for other illnesses	1(0.6)	15(9.1)	18(11)	51(31.1)	79(48.2)
Parents should make sure all their children's vaccinations are up to date	0	2(1.2)	5(3)	23(14)	134(81.7)
People should wash their hands regularly to prevent infections	0	3(1.8)	8(4.9)	32(19.5)	121(73.8)
Doctors should only prescribe the antibiotics when they are needed	0	1(0.6)	2(1.2)	39(23.8)	122(74.4)
Government should reward the development of new antibiotics	1(0.6)	1(0.6)	9(5.5)	66(40.2)	87(53)
Pharmaceutical companies should develop new antibiotics	2(1.2)	2(1.2)	16(9.8)	73(44.5)	71(43.3)
Antibiotic resistance is one of the biggest problems the world faces	2(1.2)	0	15(9.1)	64(39)	83(50.6)
Medical experts will solve the problem of antibiotic resistance before it becomes too serious	3(1.8)	4(2.4)	92(56.1)	51(31.1)	14(8.5)
Everyone needs to take responsibility for using antibiotics responsibly	1(0.6)	1(0.6)	7(4.3)	77(47)	78(47.6)
There is not much that people like me can do to stop antibiotic resistance	20(12.2)	65(39.6)	34(20.7)	37(22.6)	8(4.9)
I am not at risk of getting an antibiotic-resistant infection, if I take my antibiotics correctly	20(12.2)	55(33.5)	44(26.8)	35(21.3)	10(6.1)

While two (1.8%) claimed that they had never taken an antibiotic, 69(42.1%) had taken it in the last month, 54(32.9%) had taken it in the last six months while others had taken in the past year 16(9.8) or before that

11(6.7) or couldn't remember 12(7.3). Of the 162 participants who had taken antibiotics 144(88.8%) took it with prescription from the doctor and they received advice on when to take the antibiotic, for how many

Figure 1: Word Cloud of Suggestions to Prevent Emergence of Antimicrobial Resistance.



Question	Never	Sometimes	Usually	Always
Do you stop taking the antibiotic if you start feeling better after 2-3 doses	80(48.8)	48(29.3)	26(15.9)	10(6.1)
Do you save the remaining antibiotics for the next time you get sick	89(54.3)	38(23.2)	33(20.1)	4(2.4)
Do you discard the remaining, leftover medication?	29(17.7)	61(37.2)	45(27.4)	29(17.7)
Do you give the leftover antibiotics to your friend/roommate if they get sick?	81(49.4)	48(29.3)	26(15.9)	9(5.5)
Do you complete the full course of treatment?	0	27(16.5)	59(36)	78(47.5)
Do you consult a doctor before starting antibiotics	1(0.6)	21(12.8)	49(29.9)	93(56.7)
Do you check the expiry date of the antibiotic before using it?	7(4.3)	15(9.1)	22(13.4)	120(73.2)
Do you take an antibiotic when you have cough and sore throat?	31(18.9)	71(43.3)	46(28)	16(9.8)
Will you ask the doctor to prescribe antibiotics for you when you catch a common cold?	106(64.6)	41(25)	13(7.9)	4(2.4)

This was a cross-sectional study done by the department of Pharmacology on antibiotic use and antimicrobial resistance among second Phase MBBS students during the World Antimicrobial Awareness Week (WAAW). The Government of Kerala released the Kerala Antimicrobial Resistance Strategic Action Plan (KARSAP) in 2018 and stressed the importance of creating awareness about AMR and developing skills for its containment amongst the cross sectoral stakeholders. During WAAW, as well as longitudinally, awareness classes have been held at all government medical colleges in Kerala for faculty and students.¹ Through these classes, the focus to prevent AMR is emphasized by promoting rational antibiotic use, infection control practices and implementation of

institutional antibiotic policy.¹ Abbo et al found that there is difference between medical schools in the use of educational resources, perceived preparedness as well as knowledge about antimicrobial use.⁷ Incorporation of curriculum about proper behavior with respect to antimicrobial use and prescribing practices would translate in the future to patient care. They are undertaken to ensure that our future doctors are well educated in the principles and practices of appropriate use of antibiotics and antimicrobial stewardship.⁷ The National Medical commission (NMC) has taken a humongous step by developing and releasing the curriculum for prescribers and non-prescribers to improve the awareness and understanding of AMR through training and education.⁷ The NMC has announced that two other modules would be released subsequent to the release of the prescribers module to create awareness among the undergraduates and allied health sciences.⁷ In order to combat AMR, Indian Council of Medical Research (ICMR) has initiated Antimicrobial Stewardship Programme (AMSP) activities by developing the AMSP curriculum, conducting workshops and developing AMSP research projects⁸

Majority of the participants in this study had a good knowledge regarding basic statements like the antibiotics are used for bacterial infections while one third of the participants thought that it may be used for viral infections as well. All the participants knew that AMR is a serious public threat. Hagiya et al akin to our study found that 30% of all medical undergraduates believed that antibiotics could treat viral infections, while 46.4% considered antibiotics as treatment for the common cold.⁹

Around one fourth participants in this study perceived that newer and more costly drugs would be more effective than older and cheaper drugs. Around one-third of the participants perceived the concept about AMR development wrongly and thought that it develops when the body becomes resistant to antibiotics. One fourth of the participants were of the attitude that AMR develops only in participants who do not take their antibiotics as prescribed. It is a matter of concern that 55.5% of participants agreed or were uncertain about the statement that 'Antibiotics are safe it is okay to use it like any other common drugs. It was disheartening to notice that 43.9% thought that skipping doses didn't contribute to the development of AMR and only 48.8% completed the full course of antibiotics. Use of multiple antimicrobials was advocated by 54.9% and one fourth believed that they would get better quickly if they used antimicrobials when they had fever, and 9.8% participants always took antibiotics when they had

fever or sore throat. Even though the participants vouched for the need for prescriptions for use of antibiotics only 56.7% consulted a doctor before taking an antibiotic. Dyar et al opined the final year medical students thought that too many prescriptions and too much broad-spectrum antibiotic use were the most important contributors to resistance.¹⁰ In a multicentric study Yang et al found that the majority of students self-medicated and had a stock of antibiotics, mostly without a prescription. One in seven had taken antibiotics for treatment of common cold and asked their doctors for antibiotics.¹¹ Assar et al., stated that in their multicentric study, 40% participants believed that antibiotics were effective for common cold and nearly half of them stopped antibiotics when they started to feel well.¹² Similar to this study, most participants elsewhere believed that AMR is a national problem.^{10,13} In contrast to our study Hagiya et al., stated that the awareness about AMR was poor in their participants (6.5%). The participants in a South African study asserted that antibiotics are overused, and they noted a positive correlation of knowledge in those who followed prescribing guidelines.¹³ A great amount of Indian healthcare students were reported to use antibiotics over the counter, one fourth medical students reported self-medication and one third medical students did not finish the course of antibiotics.¹⁴ Emera et al reported that despite having high knowledge scores one third of the medical students who participated in their study believed that antibiotics could treat sore throats and 16.6% of them self-medicated.¹⁵

The participants in this study had a positive attitude about the need for vaccination and infection control to prevent AMR, however one fifth of the participants believed that it was okay to use antimicrobials as growth promoters in the livestock and store antimicrobials for later use. Dyar et al stated that 24% participants believed that poor hand hygiene was not particularly important.¹⁰ Dadgostar et al stated that misuse and overuse of different antibacterial agents in healthcare as well as in agricultural industry are the major reasons behind the emergence of antimicrobial resistance.⁴ Even though majority of the participants wanted the development of newer antibiotics it is a matter of disappointment that more than half the participants were uncertain whether the current scientific community would find a solution to curb this menace and 27.5% thought that they had no role to play in preventing the development of AMR.

Efthymiou et al opined that future medical professionals need to be equipped to face the challenges of antimicrobial use in everyday clinical

practice. Medical education encompasses thorough knowledge in pharmacology, pathology and microbiology of infectious diseases. AMSP, a growing field in medicine with principles of rational use of antibiotics along with antibiotic utilization metrics needs to be intertwined with it.^{10,11} Majumdar et al in a review article raised an urgent call for the integration of antimicrobial stewardship teaching for the undergraduates so as to equip the future prescribers, as proper undergraduate education on rational antibiotics would help them to enter clinical practice with competencies translated into rational prescribing.¹⁶

This is in line with the suggestions of the participants to create more awareness amongst the students, health care professionals and the public. Sharma et al in a similar study done elsewhere, found that most of the students were aware of the antibiotic resistance and its consequences. Despite this their attitude and practices were of huge concern, and they suggested educational interventions to bring about behavioral changes regarding rational antibiotics prescribing.¹⁷ Lago et al in a qualitative study found that factors like the low applicability of knowledge, insecurity, clinical inertia, unawareness of available valid updates on the topic contributed to future prescribing habits of the medical students which were modifiable.¹⁸

The limitations of this study are that it is a single centre study which involves only a batch of medical students. Multicentric studies involving all phases of medical students need to be conducted to generalize the findings.

CONCLUSIONS

Most of the participants had good knowledge about antibiotic use and antimicrobial resistance. The attitude was positive about many aspects of antibiotic use and on antimicrobial resistance in about half of the participants and this is reflected in the practice as well. There needs to be educational interventions and more awareness campaigns to inculcate antimicrobial stewardship practices in one's own life, amongst the future prescribers which would equip them to be competent antibiotic stewards in the future.

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CONFLICTS OF INTEREST STATEMENT

The authors declare no conflict of interest

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None

ETHICS STATEMENT INCLUDING PATIENT CONSENT

Not applicable

AUTHOR'S CONTRIBUTION

ATA: Conceptualization, Data collection, Review of Literature, Manuscript Preparation

DSP: Conceptualization, Data collection, Statistical analysis, Manuscript Preparation

SK: Conceptualization, Manuscript Review

SMB: Data analysis, Manuscript Review

AI DECLARATION

No AI tool was used to generate research data, perform data analysis, interpret findings, formulate scientific conclusions, or make editorial decisions. All AI-assisted content was critically reviewed, verified, and revised by the authors. The authors take full responsibility for the accuracy, originality, integrity, and final content of the manuscript.

REFERENCES

1. Government of Kerala. Kerala Antimicrobial Resistance Strategic Action Plan (KARSAP) 2018 [Accessed December 2, 2024] Available online at <https://ncdc.mohfw.gov.in/wpcontent/uploads/2024/03/35158354141579866436.pdf>.
2. Murray CJL, Ikuta KS, Sharara F, et al. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *The Lancet* 2022;399(10325):629-55. [https://doi.org/10.1016/S0140-6736\(21\)02724-0](https://doi.org/10.1016/S0140-6736(21)02724-0)
3. World Health Organization. Global action plan on antimicrobial resistance [Internet]. Geneva: World Health Organization; 2015 [Accessed December 2, 2024]. 28 p. Available from: <https://iris.who.int/handle/10665/193736>
4. Dadgostar P. Antimicrobial Resistance: Implications and Costs. *Infect Drug Resist.* 2019;12:3903-10; <https://doi.org/10.2147/IDR.S234610>
5. Taneja N, Sharma M. Antimicrobial resistance in the environment: The Indian scenario. *Indian J Med Res.* 2019;149:119-128.; https://doi.org/10.4103/ijmr.IJMR_331_18
6. Directorate General of Health Service. National Policy for Containment of Antimicrobial

- Resistance India 2011. [Accessed December 2, 2024]. Available online at <https://ncdc.mohfw.gov.in/wp-content/uploads/2024/07/National-Policy-for-AMR-Containment-in-India.pdf>
7. National Medical Commission. National Action Plan on Antimicrobial Resistance (NAP-AMR) Module for Prescribers 2024. [Accessed December 2, 2024]. Available online at <https://www.nmc.org.in/wpcontent/uploads/2024/06/AMR%20Module%20for%20Prescribers.pdf>
 8. Indian Council for Medical Research. Antimicrobial Stewardship Programme Guideline 2018. [Accessed December 2, 2024]. Available online at https://www.icmr.gov.in/icmrobject/custom_data/pdf/resource-guidelines/AMSP_0.pdf
 9. Hagiya H, Ino H, Tokumasu K, et al. Antibiotic literacy among Japanese medical students. *J Infect Chemother* 2020;26:1107-9.; <https://doi.org/10.1016/j.jiac.2020.06.021>
 10. Dyar OJ, Pulcini C, Howard P, Nathwani D, ESGAP (ESCMID Study Group for Antibiotic Policies). European medical students: a first multicentre study of knowledge, attitudes and perceptions of antibiotic prescribing and antibiotic resistance. *J Antimicrob Chemother*. 2014;69:842-6; <https://doi.org/10.1093/jac/dkt440>
 11. Hu Y, Wang X, Tucker JD, et al. Knowledge, Attitude, and Practice with Respect to Antibiotic Use among Chinese Medical Students: A Multicentre Cross-Sectional Study. *Int J Environ Res Public Health* 2018;15:1165.; <https://doi.org/10.3390/ijerph15061165>
 12. Assar A, Abdelraoof MI, Abdel-Maboud M, et al. Knowledge, attitudes, and practices of Egypt's future physicians towards antimicrobial resistance (KAP-AMR study): a multicenter cross-sectional study. *Environ Sci Pollut Res Int*. 2020;27:21292-8. <https://doi.org/10.1007/s11356-020-08534-5>
 13. Efthymiou P, Gkentzi D, Dimitriou G. Knowledge, Attitudes and Perceptions of Medical Students on Antimicrobial Stewardship. *Antibiotics* 2020;9:821; <https://doi.org/10.3390/antibiotics9110821>
 14. Virmani S, Nandigam M, Kapoor B, Makhija, P. Antibiotic use among health science students in an Indian university: A cross-sectional study. *Clin Epidemiol Glob Health* 2017;5:176-9; <https://doi.org/10.1016/j.cegh.2017.04.005>
 15. Emera NM, El-Baraky IA, Abbassi MM, Sabry NA. Knowledge, Attitude, and Practice Towards Antibiotics Use Among Medical Sector Final-Year Students in Egypt. *Med Sci Educ* 2024;34:1369-79; <https://doi.org/10.1007/s40670-024-02117-6>
 16. Majumder MAA, Singh K, Hilaire MGS, Rahman S, Sa B, Haque M. Tackling Antimicrobial Resistance by promoting Antimicrobial stewardship in Medical and Allied Health Professional Curricula. *Expert Review of Anti-Infective Therapy* 2020;18:1245-58. <https://doi.org/10.1080/14787210.2020.1796638>
 17. Sharma S, Jayakumar D, Palappallil DS, Kesavan KP. Knowledge, attitude and practices of antibiotic usage and resistance among the second year MBBS Students. *Int J Basic Clin Pharmacol* 2016;5:899-903. <https://doi.org/10.18203/2319-2003.ijbcp20161542>
 18. Vázquez-Lago JM, Montes-Villalba RA, Vázquez-Cancela O, Otero-Santiago M, López-Durán A, Figueiras A. Knowledge, Perceptions, and Perspectives of Medical Students Regarding the Use of Antibiotics and Antibiotic Resistance: A Qualitative Research in Galicia, Spain. *Antibiotics* 2023;12:558; <https://doi.org/10.3390/antibiotics12030558>