

A Study of Knowledge and Attitude and Practice of Antimicrobials and Antimicrobial Resistance among Medical Students.**Harsh Yadav¹, Shubhdeep Kaur², Shailesh Kawle³, Gopal Jhalani⁴**¹Associate Professor, Department of Pharmacology, GMC, Alwar²Associate Professor, Department of Microbiology, Maharishi Markandeshwar College of Medical Sciences and Research Sadopur, Ambala, Harayana³Professor, Department of PSM, GMC, Bharatpur⁴Assistant Professor, Department of Pharmacology, GMC, Kota

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Abstract:

Antibiotics are one of the most commonly prescribed drugs and often misused and this inappropriate use of antibiotics leading to resistance. Rate of self-medication is considerably high among undergraduate medical and paramedical students in India.

Total 148 students were assessed regarding their knowledge, attitude and practice of antibiotic usage (response rate was 59.43). All 148 students (100%) know about the antibiotics 58 (39.2%) responded that Antibiotics are indicated to reduce any kind of pain and inflammation. while 145 (98%) agreed that Cefixime is an antibiotic. 22 (14.9%) reported that self-medication is safe and 136 (91.9%) and 142 (95.9%) responded that Antibiotic usage disturbs the gut flora, causes diarrhea and Antibiotics can cause allergic reactions.

This study highlights the prevalence of self-medication among medical students of GMC, Bharatpur. The knowledge and awareness about the increasing incidence of antibiotic resistance is the need of the hour. We suggest more studies in this field, especially in a larger sample of population to get more accurate results. Theoretical knowledge should be correlated clinically by the implementation of competency-based medical education. More of interdepartmental lectures should be arranged in the Medical Colleges to increase the knowledge of the students and reduce the difference between the knowledge and attitude.

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Introduction

Antibiotics are one of the most commonly prescribed drugs and often misused and this inappropriate use of antibiotics leading to resistance. [1]

Rate of self-medication is considerably high among undergraduate medical and paramedical students in India. [1,2]

Medical students and doctors are more prone to self-medication because of their familiarity with medicines and it is also expected that their practice of self-medication will also increase as their knowledge and familiarity with medicines increases. [3]

Self-medication practice is said to be done when medicines are consumed by self or on the consultation of others but without the guidance of a physician [4]

There is a correlation between the usage of antibiotics and resistance where populations who use lower amount of antibiotics develop lower amount of resistance toward bacteria. [5]

Despite this recognition, unnecessary antibiotic prescribing remains common even in developed countries such as the United States and Britain where more than a fifth of all antibiotic prescriptions for children and adults are written for upper respiratory tract infection [5,6]

Knowledge of antibiotic resistance and its prevention is the need of the hour.

One of the main drawbacks of self-medication is that, once the symptoms are resolved after taking self-medication, the users usually discontinue the drugs due to a lack of knowledge, which is responsible for antibiotic resistance. [4,7]

Moreover, self-medication is one of the major causes of antibiotic resistance. [4] Hence, we conducted this study to sensitized the students' knowledge and awareness about self-medication and the increasing incidences of antibiotic resistance.

Antimicrobial resistance (AMR) is a global pandemic of astounding magnitude. AMR is one of the

greatest threats to mankind. It also makes an impact on the economy of the country. Therefore, Antimicrobial resistance is an urgent and serious global health problem demanding considerable attention from healthcare professionals all over the world. Rational use of antibiotics has to be emphasized. [8].

Objectives of the Study:

1. To assess knowledge regarding antibiotics, antibiotic resistance as well as Antimicrobial Stewardship among second- and third-year medical students
2. To assess attitude of second- and third-year medical students about antibiotics, antibiotic resistance as well as Antimicrobial Stewardship
3. To assess practice of proper antimicrobial use among second- and third-year medical students.

Material and Method

This was a descriptive type of cross-sectional questionnaire-based study conducted among Second and Pre final MBBS students of Government Medical College (SJPMC) Bharatpur during Dec 2021 - Jan 2022. It was done to assess the knowledge, attitude and practice regarding antibiotic use and resistance in the medical students. As sample size was decided by purposeful sampling, total 249 students in Second and Pre final MBBS were selected out of which 148 students give consent and attended the questionnaire.

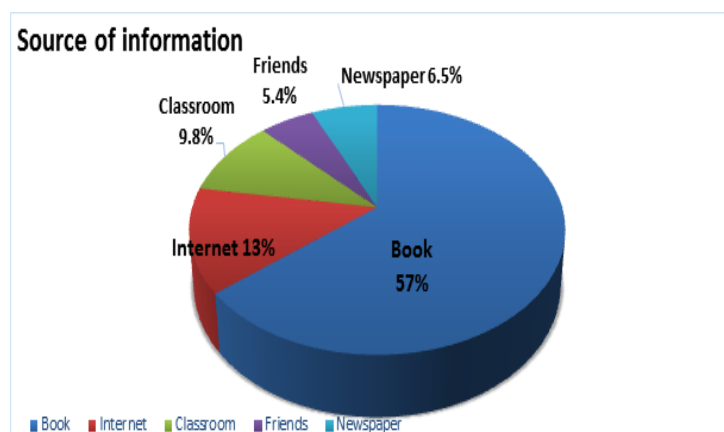
A pre-validated questionnaire prepared after a review of similar studies which comprised both open-ended and closed-ended questions which were scrutinized by subject experts (Department of Microbiology, Pharmacology and PSM). After val-

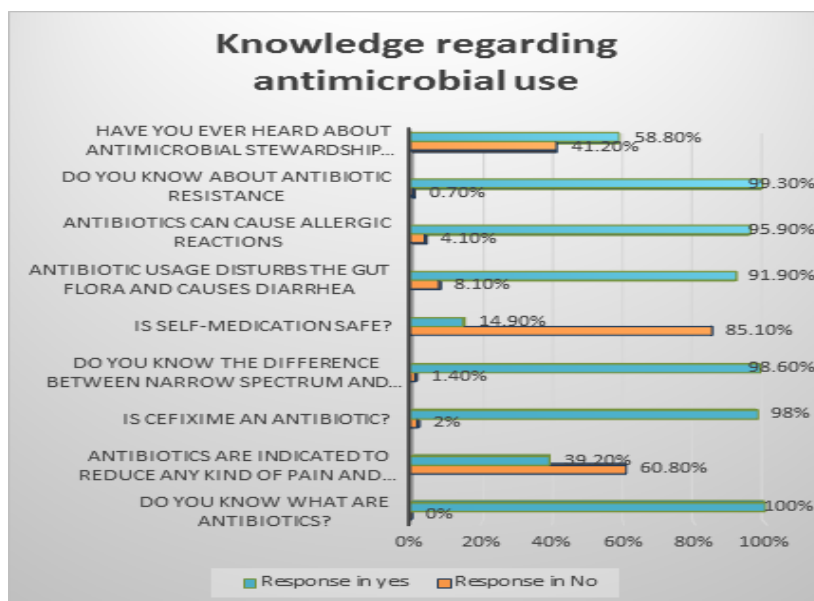
idation, the final questionnaire was approved for the study Participation in the study was voluntary, and confidentiality of data was maintained. The students were informed about the study design, and the importance of participation in the study during the lecture class and their consent was also taken and recorded. It consists of 25 questions divided into three parts: first- Knowledge about antibiotic use and AMR consist of 10 questions; second- attitude on antibiotic use and AMR 6 questions; third- self reported practices with regard to their antibiotic usage consist of 9 questions. Google form containing consent details, and 25 pre-validated questions divided in three parts was sent to all students. Data received was then entered in Microsoft excel sheet and analyzed by using Epi Info software version 7.2 and Results were expressed in frequency and percentage.

Results

Total 148 students were assessed regarding their knowledge, attitude and practice of antibiotic usage (response rate was 59.43). All 148 students (100%) know about the antibiotics 58 (39.2%) responded that Antibiotics are indicated to reduce any kind of pain and inflammation. while 145 (98%) agreed that Cefixime is an antibiotic. 22 (14.9%) reported that self-medication is safe and 136 (91.9%) and 142 (95.9%) responded that Antibiotic usage disturbs the gut flora, causes diarrhea and Antibiotics can cause allergic reactions.

146 (98.6%) know the difference between narrow spectrum and broad-spectrum antibiotics. 147 (99.3%) students know about antibiotic resistance but 87 (58.8%) Heard about Antimicrobial stewardship program and Book 57(62%) followed by Internet 12 (13%) were means by which they heard about Antimicrobial stewardship program.





108 (73%) think Broad spectrum antibiotics are better than narrow spectrum. 147 (99.3) think Resistance against antimicrobials are increasing and inappropriate use of antibiotics is one the leading cause of antibiotic resistance 143 (93.6) and over-use of antimicrobials in Animals also contributing to increased drug resistance in microorganisms 135 (91.2).

33 (22.3) think is it better to prescribe antibiotic in every prescription and in opinion of 144 (97.3%), guidelines regarding proper use of antibiotics should be implemented in every Hospital.

Majority of students 121 (81.8) taken antibiotic during their last illness, Azithromycin (76) followed by Amoxicillin/Penicillin (34) were common antibiotic preferred by them during illness. 50 (33.8) students take antibiotic for cold or sore throat / fever every time and, 85(57.4) stop taking antibiotic when start feeling better. 110 (74.3) complete the full course of antibiotic.

64 (43.2) bought antibiotics without a medical prescription, 104 (70.3) Kept leftovers antibiotics for future uses, 98 (66.2) give the leftover antibiotics to their friend/roommate if they get sick and 28 (18.9) advise their friends/ relatives for using antibiotics in every medical condition.

consumed by students was Azithromycin (50%) followed by amoxicillin (23%) which is contrary to the study done by Sharma et al. [4] their most

common antibiotic consumed by students were amoxicillin (35.8%). On the contrary, metronidazole and ciprofloxacin were the most common antibiotics used as documented by a study done among nonmedical students. [11] While it was metronidazole as the most common antibiotic used in another documented study. [12]

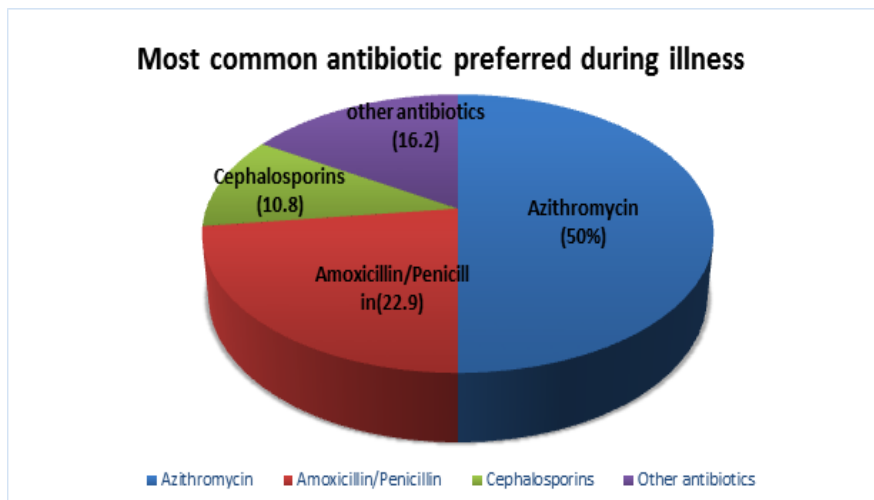
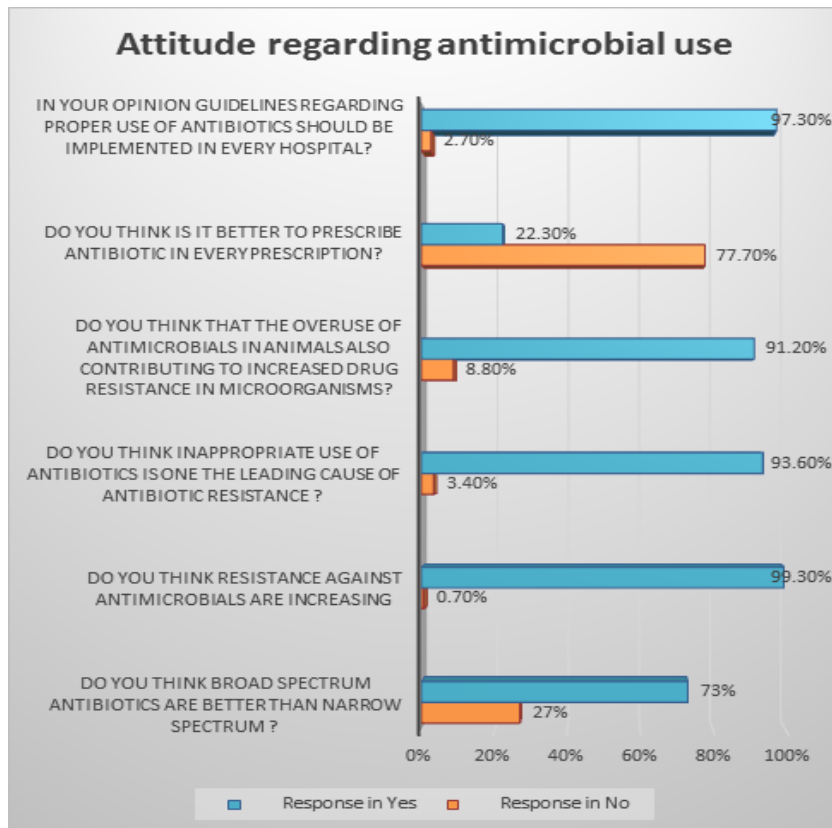
A satisfactory response was obtained regarding antibiotic resistance in our study, as most of the respondents (99.3) knew about antibiotic resistance which is also reported same by the Sharma et al. [4]. An outstanding knowledge of antibiotic usage and awareness of antibiotic resistance among respondents was reported by a recently published study. [13]

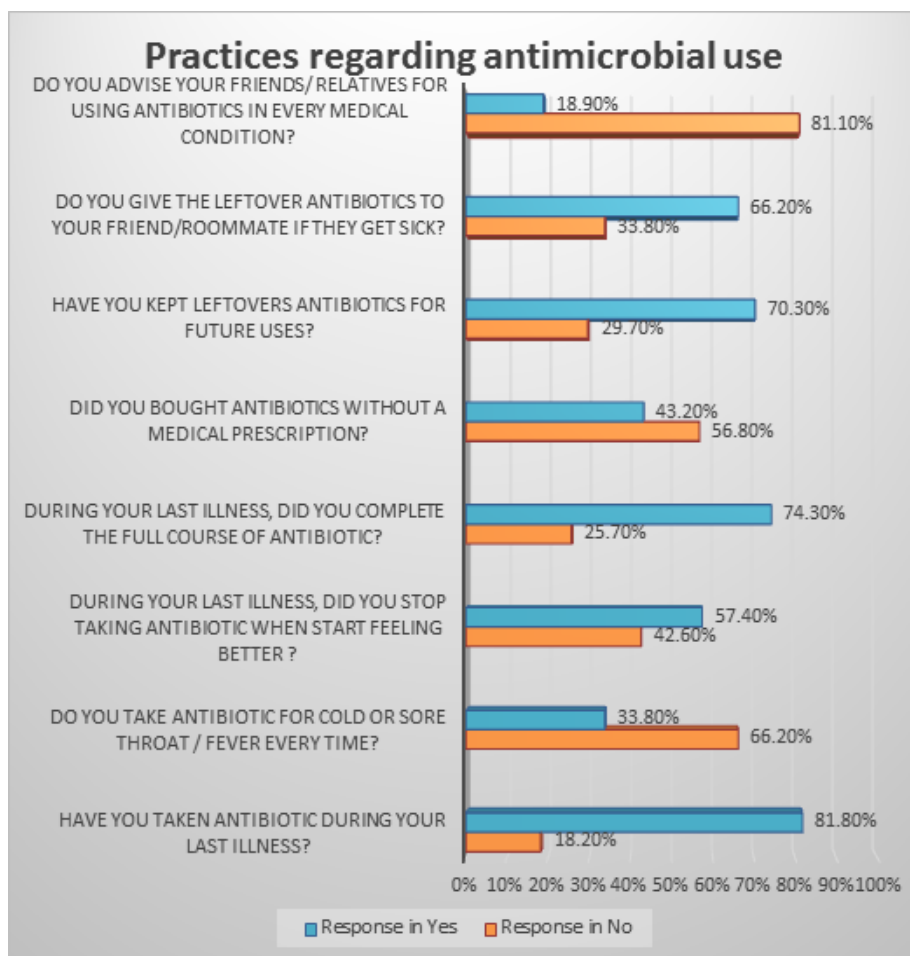
A statistically significant difference in the Knowledge, attitude, and practice of antibiotic use among medical and nonmedical students is reported recently. [14]

Limitations of the Study

Following limitations were found in our study:

1. The study was limited to second and Pre final medical students at Government Medical College Bharatpur only.
2. The study was limited to students who were willing to participate in this study
3. The study was limited to students who were available on the day of data collection.





Parameters	Statement/Question	Response n (%)	
		Yes	No
Knowledge	1. Do you know what antibiotics are?	148 (100)	0 (0)
	2. Antibiotics are indicated to reduce any kind of pain and inflammation	58 (39.2)	90 (60.8)
	3. Is Cefixime an antibiotic?	145 (98%)	3 (2)
	4. Do you know the difference between narrow spectrum and broad-spectrum antibiotics	146 (98.6)	2 (1.4)
	5. Is self-medication safe?	22 (14.9)	126 (85.1)
	6. Antibiotic usage disturbs the gut flora and causes diarrhea	136 (91.9)	12 (8.1)
	7. Antibiotics can cause allergic reactions	142 (95.9)	6 (4.1)
	8. Do you know about antibiotic resistance	147 (99.3)	1 (0.7)
	9. Have you ever Heard about Antimicrobial stewardship program	87 (58.8)	61 (41.2)
	10. If your answer is yes in Q.9 then, By which means you heard about Antimicrobial stewardship program	Book 57(62) Internet 12 (13) Classroom 9 (9.8) Friends 5 (5.4) Newspaper 6 (6.5)	
Attitude	1. Do you think Broad spectrum antibiotics are better than nar-	108 (73%)	40 (27)

	row spectrum?		
	2. Do you think Resistance against antimicrobials are increasing	147 (99.3)	1 (0.7)
	3. Do you think inappropriate use of antibiotics is one the leading cause of antibiotic resistance?	143 (93.6)	5 (3.4)
	4. Do you think that the overuse of antimicrobials in Animals also contributing to increased drug resistance in microorganisms?	135 (91.2)	13 (8.8)
	5. Do you think is it better to prescribe antibiotic in every prescription?	33 (22.3)	115(77.7)
	6. In your opinion guidelines regarding proper use of Antibiotics should be implemented in every Hospital?	144 (97.3)	4 (2.7)
Practice	1. Have you taken antibiotic during your last illness?	121 (81.8)	27 (18.2)
	2. Most common antibiotic preferred by you during illness	Azithromycin 74(50%) Amoxicillin/Penicillin 34(22.9) Cephalosporins 16 (10.8) + other antibiotics 24 (16.2)	
	3. Do you take antibiotic for cold or sore throat / fever every time?	50 (33.8)	98 (66.2)
	4. During your last illness, did you stop taking antibiotic when start feeling better?	85 (57.4)	63 (42.6)
	5. During your last illness, did you complete the full course of antibiotic?	110 (74.3)	38 (25.7)
	6. Did you bought antibiotics without a medical prescription?	64 (43.2)	84 (56.8)
	7. Have you Kept leftovers antibiotics for future uses?	104 (70.3)	44(29.7)
	8. Do you give the leftover antibiotics to your friend/roommate if they get sick?	98 (66.2)	50 (33.8)
	9. Do you advise your friends/relatives for using antibiotics in every medical condition?	28 (18.9)	120 (81.1)

Discussion

The response rate in our study is 59.4%, which is less than study done by Sharma et al. [4] who reported a response rate of 83.3% and also less than a study done by Gillani et al [11] who reported a response rate of 97%, in another study Ghaieth et al. [9] have reported a response rate of 55%.

In this study 43.2% medical students were self-medicator which is less than the study done by Sharma et al. [4] who reported self-medicator

students 63.2%, but this is slightly higher than a study done by Ghaieth et al. who reported that medical students were more self-medicated (43%) as compared to their peer group from the nonmedical fields. [9]

On the contrary to this, a very low prevalence of self-medication was seen in a study among Saudi medical students (26%). [10]

As our study was restricted to self-medication of antibiotics only, the most common antibiotic

Conclusion

This study highlights the prevalence of self-medication among medical students of GMC Bharatpur. The knowledge and awareness about the increasing incidence of antibiotic resistance is the need of the hour. We suggest more studies in this field, especially in a larger sample of population to get more accurate results. Theoretical knowledge should be correlated clinically by the implementation of competency-based medical education. More of interdepartmental lectures should be arranged in the Medical Colleges to increase the knowledge of the students and reduce the difference between the knowledge and attitude.

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Ethical conduct of research: Institutional review board exemption was granted as this was an observational study, and no intervention was needed. Required permission from the Head of the Pharmacology Department and Medical Education Unit at Government Medical College, Bharatpur, Rajasthan, was sought before the commencement of the study. The authors utilized applicable EQUATOR (<https://www.Equator-network.Org/>) reporting guidelines.

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