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Research Article

EVALUATION OF CONCEPT OF ANTIMICROBIAL STEWARDSHIP AMONG UG MEDICAL STUDENTS FOR BETTER UNDERSTANDING OF USE OF ANTIMICROBIAL AGENTS AND MINIMIZING ANTIMICROBIAL RESISTANCE

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ABSTRACT

Objectives: The objective of this study is to assess interns perception and knowledge about antibiotic stewardship and their preparedness for appropriate use of antimicrobials and to prescribe antimicrobials.

Methods: The 164 medical interns of BLDE (DU)'s Shri B.M. Patil Medical College who provided consent to participate in the study were included in this cross-sectional web-based online survey. The study was carried out using a validated questionnaire. The data were analyzed using the statistical tool for the social sciences (Version 20).

Results: Out of the 164 interns, 133 (83.1%) completed the entire survey. The term "antimicrobial stewardship" was familiar to 51% (n=68). 50% (n=66) agreed that antibiotics are inappropriately used at the hospital. Approximately 88% (n=104) and 85% (n=113) of the interns thought that insufficient infection control practices and the use of wide spectrum antibiotics were the main causes of resistance development, respectively. About 90% (n=119) thought that lecture series and grand round discussions on the responsible use of antibiotics were good educational tools. About 37% (n=49), 41% (n=54), and 24% (n=32) of the interns understood the proper antibiotic selection for treating simple cases of urinary tract infections, could de-escalate antibiotic therapy, understand an anti-biogram, and could match a different combination of antimicrobials and microorganisms, respectively.

Conclusion: The major findings of our study were, despite students having good perception, the knowledge component was inadequate, that is, they lacked their preparedness and confidence to prescribe antibiotics which emphasizes that the students are aware of the antimicrobial stewardship but their knowledge domain needs to be improved for better application in their clinical practice.

Keywords: Medical interns, Antimicrobial resistance, Antibiotic stewardship, Perception, Knowledge.

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INTRODUCTION

Antimicrobial resistance (AMR) is one of the major threats to global health, primarily due to improper prescription practices by medical professionals. It makes it more difficult to treat the infection effectively, increasing the risk of complications, long-term illness, and even death of the patients. Since health professionals often prescribe antibiotics as part of their clinical practice, it plays a critical role in fighting against antibiotic resistance. They encourage patients to follow their treatment plan and abstain from self-medication through health education [1]. However, incorrect prescribing of antibiotics by doctors has always been an issue [2]. Inadequate infection control procedures, subpar drugs, easy availability to over-the-counter antibiotics, patient self-medication, deficiency of quick diagnostic testing, lack of knowledge about AMR, and its effects among the general public and health-care professionals are the other important factors that have led to the emergence of AMR [3]. One of the nations with a serious "antimicrobial resistance" issue is India. In the nation, even strong antibiotics are available without the necessary prescriptions. While some studies indicate that health-care professionals and students are adequately aware of this issue, many other studies reveal abuse, a casual attitude, and a lack of awareness regarding this issue, highlighting the urgent need for improved perception [4]. Certain studies suggest that even in hospitals as well, 30–50% of cases may involve errors in the basic indication for treating patients with antibiotics (administration or not), agent choice (selection of antibiotics), or dosage (posology, interval between administrations, and length of therapy). In addition, in 30–60% of cases, the antibiotics that are given in intensive care units are either unnecessary, unsuitable, or not the best option [4]. Compared to patients with non-resistant infections, patients with resistant infections need more intensive care, longer hospital stays, and more expensive treatment. AMR will cause hospital stays to increase, which will be disastrous for the country's health-care system, which is already having difficulty keeping up with the rising cost of healthcare [5]. One crucial intervention for enhancing prescribing practices at the facility and individual levels is antibiotic stewardship program (ASP) [6,7]. It is essential to give basic knowledge about antibiotics and AMR, make the right diagnosis, manage infections, and prescribe medications appropriately [5]. AMR is the loss of efficacy of drugs used to treat infections, including anti-parasitic, antiviral, antibacterial and antifungal drugs [8].

The ASPs, which should have a chemist who is a drug specialist and is in charge of promoting the use of antibiotics, are recommended by the centers for disease control and prevention (CDC) for all hospitals [9]. The use of over-the-counter antibiotics has also been observed to be rising [10], which may be connected to each country's inadequate regulatory structure. The World Health Organization has highlighted the significance of providing medical students with adequate and efficient education regarding the proper usage of antibiotics. It is imperative

that medical students receive instruction on topics pertaining to the responsible use of antibiotics in their chosen specialties, as well as education about the issues raised by AMR [11].

Reducing the alarming risk of AMR requires educating students about AMR and the accurate usage of antibiotics. Medical students are the ones who will prescribe antibiotics in the future, so it is imperative that the initiative to rationalize their proper use begin at their level. To establish successful training strategies and accomplish the goal of curtailing AMR, it is imperative to evaluate their existing level of expertise in this area [3]. Several studies on the knowledge, attitude, and practice of physicians and medical students on AMR have shown [12,13] that although students were aware of the need of having knowledge when prescribing antibiotics, they lacked confidence and needed further training [14,15].

Despite the inclusion of microbiology and pharmacology in the curriculum, there appears to be a deficiency in the application of acquired knowledge to clinical settings [16]. This research on the perception and knowledge of medical students (interns) on antibiotic stewardship was carried out to ascertain the extent of the gap and the steps that should be taken to bridge it. This is because there is a gap between the knowledge that has been acquired and its translation into clinical practice [17].

Objectives

The objectives of the study are as follows:

1. To assess medical interns' perception and knowledge about antibiotic stewardship
2. To assess medical interns' preparedness for appropriate use of antimicrobials and to prescribe antimicrobials.

METHODS

This study is a web-based, cross-sectional survey of medical interns. The study included 164 medical interns from BLDE (DU)'s Shri B.M. Patil Medical College Hospital and Research Centre, Out of 164 interns, 133 (83.1%) provided their consent to take part in the study and finished the entire survey. Twenty of the remaining 31 interns declined to respond, and eleven were not accessible when the information was gathered. The study was carried out using a validated questionnaire with some modifications used by Abbo *et al*. [15]. Perception among interns about antimicrobials was assessed using the following questionnaire on Likart's scale.

The questions used are as follows:

Are the antimicrobials inappropriately used at the hospital, AMR has been found to be a major problem in the treatment of infectious diseases nationally. The incidence of infections caused by resistant organisms can be reduced with the appropriate use of antimicrobials, sound knowledge of antimicrobials is crucial in the medical career, I would like to acquire more knowledge about AMR, more knowledge has to be acquired on rational use of antimicrobials, development of new antimicrobials in near future will solve the problem of resistance, use of broad-spectrum antimicrobials instead of available equally or more effective antimicrobials is more likely to increase AMR, poor infection control practices by health-care providers has been responsible for development of resistance, Inappropriate use of antimicrobials not only results in AMR but also creates problems for patients.

Interns opinion regarding the usefulness of various options for learning about antimicrobial prescribing and resistance (how helpful were the following teaching methods) like grand round discussions on rational use of antimicrobials, lecture series on antimicrobial use and development of resistance for medical students, interactive patient-based problem-solving modules online, interactive patient oriented problem-solving modules on e-learning/moodle, small group discussion of medical students, and residents or faculty on antibiotic resistance related problem-based sessions was taken using Likart's scale.

Interns views regarding the usefulness of various sources to learn about the usage of antimicrobials and AMR such as infectious disease specialist, non-infectious diseases physician, internal guidelines from infectious diseases society, hospital incharge pharmacists, representatives of pharmaceutical companies, medical journals related to antimicrobial use, Smart phone or iPhone apps, Wikipedia, text books or study manuals, and senior students was obtained.

Student's perception on medical curriculum regarding their preparedness for antimicrobial prescribing and resistance whether the medical curriculum clearly teaches the concept of basic mechanism involved in the development of antibiotic resistance, whether the medical curriculum makes the students well worsed with various aspects of antimicrobial use like when to start the antimicrobial therapy, how to select appropriate antimicrobial for a specific infection, enables students to describe correct spectrum of antimicrobial activity of different antimicrobials, makes students well worsed with the rational use of antimicrobials and how to interpret antimicrobial susceptibility testing and how and when to change from intravenous (IV) to oral administration of antimicrobials was assessed.

The knowledge component was assessed using clinical case based scenario on appropriate choice of antibiotics and duration of therapy for acute uncomplicated urinary tract infection (UTI), appropriate selection of antibiotics not effective against anaerobes, interpretation of antibiogram and deescalation of antibiotic treatment, diagnose a case of viral respiratory infection, recognize the risks associated/not associated with the surgical prophylactic antibiotic use in an elective orthopedic surgery. Recognize clostridium difficile infection secondary to the use of antimicrobials, match the most likely mechanism of AMR with different combination of antimicrobials/micro-organisms, selection of appropriate empirical antimicrobial therapy for extended spectrum beta lactamase (ESBL) positive *Escherichia coli* bacteremia, and knowledge regarding the guidelines for IV vancomycin use by the CDC. The institutional ethics committee clearance was obtained from BLDE (DU)'s Shri B.M. Patil medical college before conducting the study.

RESULTS AND DISCUSSION

Out of total 164 medical interns, 133 (83.1%) finished the entire survey. Twenty of the remaining 31 interns declined to respond, and 11 were not accessible when the information was gathered. The participant's average age was 25 years, and 53% participants were female. Only 13% of the students had experience in conducting research or had studied antibiotics in pharmacology class before starting results medical school; the other 87% did not. In medical school, about 90% of the students had clinical experience to infectious disorders, whereas the remaining 10% did not. The official lectures on when to begin taking antibiotics (84%, n=111), the rational use of antibiotics in general (86%, n=114), how to choose the appropriate dosage (74%, n=99), and how to choose a suitable duration of treatment for particular illnesses (76%, n=101) were attended by the majority of students. About 80% of interns felt that their learning about the proper use of antibiotics was beneficial and 41% of them proposed introducing additional teaching on the prudent usage of antibiotics in the 2nd year (Figs. 1-3).

Antimicrobials: Perception among interns

The term "antimicrobial stewardship" was familiar to 51% (n=68) of the interns. About 62% (n=82) of the students agreed that antimicrobials are used for inappropriate indications while 27% (n=36) chose the neutral option for this question. Around 62% (n=82) of the students stated that antimicrobials are employed for inappropriate indications, while 27% (n=36) opted the neutral opinion regarding this issue. AMR has been identified as a significant issue in the treatment of infectious diseases nationally, according to 94% (n=125) of the students. 95% (n=126) of respondents agreed that appropriate use of antibiotics will decrease the incidence of infections caused by resistant organisms. According to 94% (n=125) of interns sound, knowledge of antimicrobials and AMR is essential in medical career. About 96%

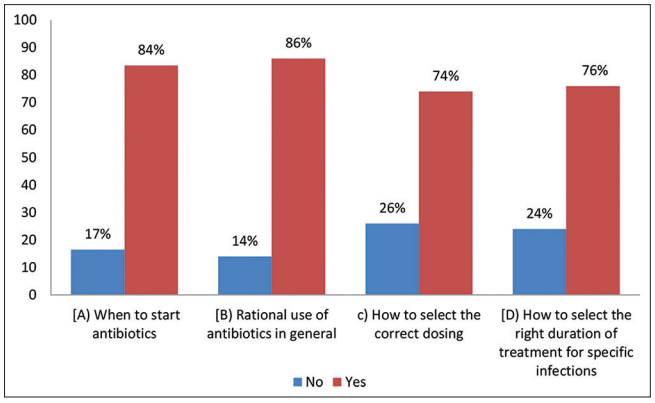

Fig. 1: Formal lectures attended by interns in medical school that address the following topics

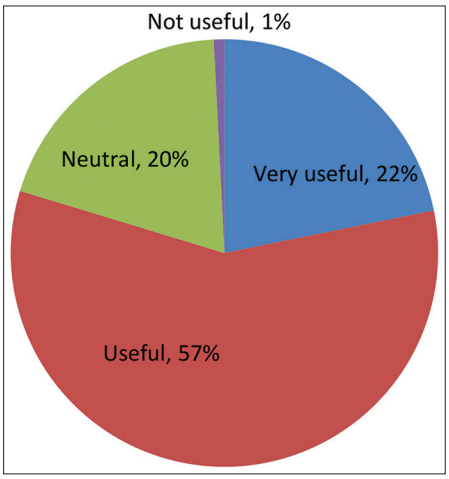

Fig. 2: Rating by interns about their learning relating to the appropriate use of antimicrobials so far

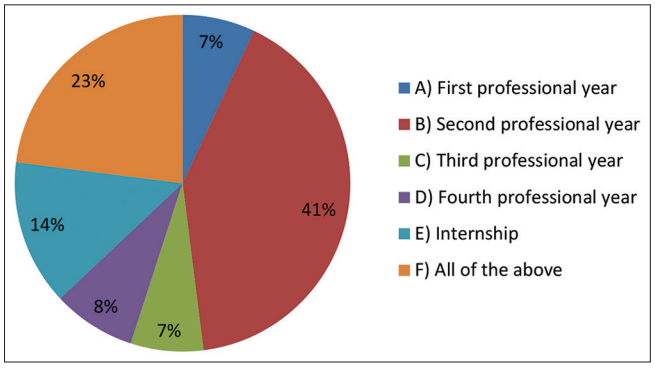

Fig. 3: Assessment of intern's perception regarding inclusion of additional teaching about the rational use of antimicrobials

(n=127) of them claimed that more knowledge should be acquired on rational use of antimicrobials. Nearly 80% (n=106) of interns think that introduction of new antibiotics in near future will tackle the issue of resistance. About 85% (n=113) and 78% (n=104) of the interns were of the opinion that use of broad spectrum antimicrobials instead of available equally or more effective antimicrobials is more likely to increase AMR and poor infection control practices by health-care providers has been responsible for development of resistance, respectively. About 92% (n=123) of students agreed that inappropriate use of antimicrobials not only results in AMR but also creates problems for the patients (Table 1).

Respondent's opinion regarding the usefulness of various options for educating about antimicrobial prescribing and resistance.

Majority of the respondents 90% (n=119) rated grand round discussions on the rational use of antibiotics and lecture series as the excellent educational methods being useful. Interactive patient-oriented problem solving modules e-learning/moodle, interactive patient-based problem solving modules on the internet, and small-group discussions of medical students, residents, or faculties on antibiotic resistance related problem-based sessions were ranked as useful learning options by more than 85% (n=114) of the respondents (Table 2).

Views regarding the use of various sources to learn about the usage of antimicrobials and antimicrobial resistance.

The majority of interns 57% (n=76) opted study manuals or textbooks, medical journals, Smart phones or iPhone apps 46% (n=61) related to antimicrobial use as the beneficial sources to gain knowledge about usage of antimicrobials and resistance. The majority of students believed that the following sources could occasionally be useful as sources to learn about the use of antimicrobials and resistance to antibiotics they are Wikipedia (44%), senior students (51%), hospital in charge chemists (48%), international guidelines from the infectious diseases society (47%), and additional guidelines developed by health-care professionals (48%) (Fig. 4).

Student's perception on medical curriculum regarding their preparedness for antimicrobial prescribing and resistance:

About 87% of the students agreed that the medical curriculum clearly teaches the concept of basic mechanism involved in the development of antibiotic resistance. About 83% of the students were well worsed with the selection of appropriate antimicrobial for a specific infection. About 80% of them were knowledgeable about the appropriate time to initiate antimicrobial therapy, could explain the correct spectrum of antibacterial activity exhibited by various antimicrobials, were knowledgeable regarding rational use of antimicrobial agents and could interpret antimicrobial susceptibility tests. Approximately 73% of the students claimed that their medical curriculum has prepared them regarding how to convince patients who insist antimicrobial treatment even if it is not required, 70% of students knew when to switch over from IV to oral administration of antimicrobials (Fig. 5).

Knowledge (Table 3).

About 37% (n=49) of students were knowledgeable about appropriate selection of antibiotic for managing a case of uncomplicated UTI.

Only 17% (n=22) of the students correctly selected an antibiotic that is ineffective against anaerobes.

About 41% (n=54) of the interns were able to de-escalate antibiotic therapy and interpret an antibiogram.

About 71% (n=95) of the interns were able to make the diagnosis of viral respiratory tract infection and 23% (n=31) were aware of the further steps to be followed to manage the case.

Only about 13% (n=17) of the interns were able to identify the risks associated or not associated with the surgical prophylactic antibiotic use in an elective orthopedic surgery.

Only 21% (n=28) of the students were able to identify an infection caused by clostridium difficile that resulted from the use of antibiotics.

About 24% (n=32) of the interns were able to match a different combination of antimicrobials and microorganisms with the most likely mechanism of AMR.

For cases of ESBL-positive *E. coli* bacteraemia, 25% (n=33) of interns were able to select appropriate empirical antimicrobial therapy.

Table 1: Perception of interns about antimicrobials

Interns perception about antimicrobials	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
A. Antimicrobials are inappropriately used at the hospital	16 (12)	66 (50)	36 (27)	11 (8)	4 (3)
B .Antimicrobial resistance has been found to be a major problem in the treatment of infectious diseases nationally	57 (43)	68 (51)	7 (5)	1 (1)	0 (0)
C. The incidence of infections caused by resistant organisms can be reduced with the appropriate use of antimicrobials	78 (59)	48 (36)	5 (4)	2 (2)	0 (0)
D. Sound knowledge of antimicrobials is crucial in the medical career	86 (65)	39 (29)	7 (5)	1 (1)	0 (0)
E. I would like to acquire more knowledge about antimicrobial resistance	74 (56)	51 (38)	6 (5)	1 (1)	1 (1)
F. More knowledge has to be acquired on rational use of antimicrobials	73 (55)	54 (41)	6 (5)	0 (0)	0 (0)
G. Development of new antimicrobials in near future will solve the problem of resistance	54 (41)	52 (39)	22 (17)	5 (4)	0 (0)
H. Use of broad-spectrum antimicrobials instead of available equally or more effective antimicrobials is more likely to increase antimicrobial resistance	52 (39)	61 (46)	17 (13)	3 (2)	0 (0)
I. Poor infection control practices by health care providers has been responsible for development of resistance	37 (28)	67 (50)	26 (20)	2 (2)	1 (1)
J. Inappropriate use of antimicrobials not only results in antimicrobial resistance but also creates problems for patients	68 (51)	55 (41)	9 (7)	0 (0)	1 (1)

Table 2: Respondent's opinion regarding the usefulness of various options for educating about antimicrobial prescribing and resistance

If provided, how helpful do you think each of the following resources for learning about antibiotic prescription and resistance?	Very useful (%)	Useful (%)	Neutral (%)	Not at all useful (%)	N/A (%)
A. Grand round discussions on rational use of antimicrobials	56 (42)	65 (49)	11 (8)	1 (1)	0 (0)
B. Lecture series on antimicrobialuse and development of resistance for medical students	46 (35)	73 (55)	14 (11)	0 (0)	0 (0)
C. Interactive patient–based problem-solving modules online	63 (47)	51 (38)	17 (13)	1 (1)	1 (1)
D. Interactive patient oriented problem-solving modules on e-learning/moodle	58 (44)	56 (42)	18 (14)	0 (0)	1 (1)
E. Small group discussion of medical students and residents or faculty on antibiotic resistance related problem-based sessions	53 (40)	63 (47)	17 (13)	0 (0)	0 (0)

The CDC guidelines for the IV use of vancomycin were known to 38% (n=50) of interns.

The present questionnaire-based study was conducted in a tertiary care medical college in Karnataka state in the southern part of India. We aimed to evaluate the concept of antimicrobial stewardship among medical interns for clear understanding of use of antimicrobial agents so as to minimize AMR.

Of the 83.1% of participants, Only 13% of the students had experience in conducting research or had studied antibiotics in pharmacology class before starting medical school and around 90% students had clinical exposure in infectious diseases during medical school and majority gained knowledge through the formal lectures that addressed start of antibiotics, its rational use in general, how to choose the appropriate dose and how long to treat a particular infection. Similarly a study done by Abbo *et al*. showed 8% respondents had prior knowledge of antimicrobials before joining medical school [15].

About the perception of antimicrobials, more than 50% were aware of the term antimicrobial stewardship and around 60% were aware of inappropriate usage and more than 90% also knew that AMR is being a major issue globally, 95% agreed that appropriate treatment reduces the incidence of infectious diseases; hence, sound knowledge about rational use of antimicrobial usage to prevent AMR is essential in medical career. Around 80% of interns were also aware that drugs to prevent resistance were also one of the future areas of research in drug development. About 85% and 78% of the interns were of the opinion that use of broad-spectrum antimicrobials instead of available equally or more effective antimicrobials is more likely to increase AMR and poor infection control practices by health care providers has been responsible for development of resistance, respectively. Furthermore, 92% of students agreed that inappropriate use of antimicrobials not only results in AMR but also creates problems for patients. In a similar study by Hayat *et al*. conducted in Pakistan, 72.3% of interns felt that AMR is not only a global issue but also a significant public health issue. About 60% claimed that antibiotics are overused, and unjudicial antibiotic usage is unethical and can lead to resistance. Similarly in a study done by Hayat *et al*. students stated that developing new antibiotics and providing proper education were essential in reducing the AMR problem [18]. A different study found that while all students understood the concept of antibiotic resistance, only 94.12% were aware that inappropriate use of antimicrobial agents might be the cause for the development of antibiotic resistance. About 85.09% of the students knew about programs for antibiotic stewardship [19].

Perceptions regarding the usefulness of various options for learning about the prescription of antibiotics and resistance: Lecture series and grand round discussions on the rational use of antibiotics were the useful learning options opted by most respondents. Moreover, interactive patient-oriented problem-solving modules on e-learning/moodle, small-group discussions of medical students, residents, or faculty on antibiotic resistance-related problem-based sessions, and interactive patient-based problem-solving modules online were rated as helpful learning resources about antimicrobial prescribing and resistance by over 85% of the respondents. According to a related study, "interactive patient-oriented problem-solving modules on compact disc read-only memory" and "problem-solving sessions attended by small groups" were found to be effective teaching and understanding tools [20].

Regarding the perception on use of different sources in learning about the prescription of antibiotics and resistance, majority of the interns opted textbooks or study manuals, medical journals, Smart phone, or iPhone apps related to antimicrobial use as the useful sources. Other sources included following physicians instructions, senior students, international guidelines of infectious diseases society and guidelines of health-care professionals, hospital in charge pharmacist, Wikipedia, and the representatives of pharmaceutical companies. iPhone and smartphone apps, peers, medical apps such as UpToDate, infectious

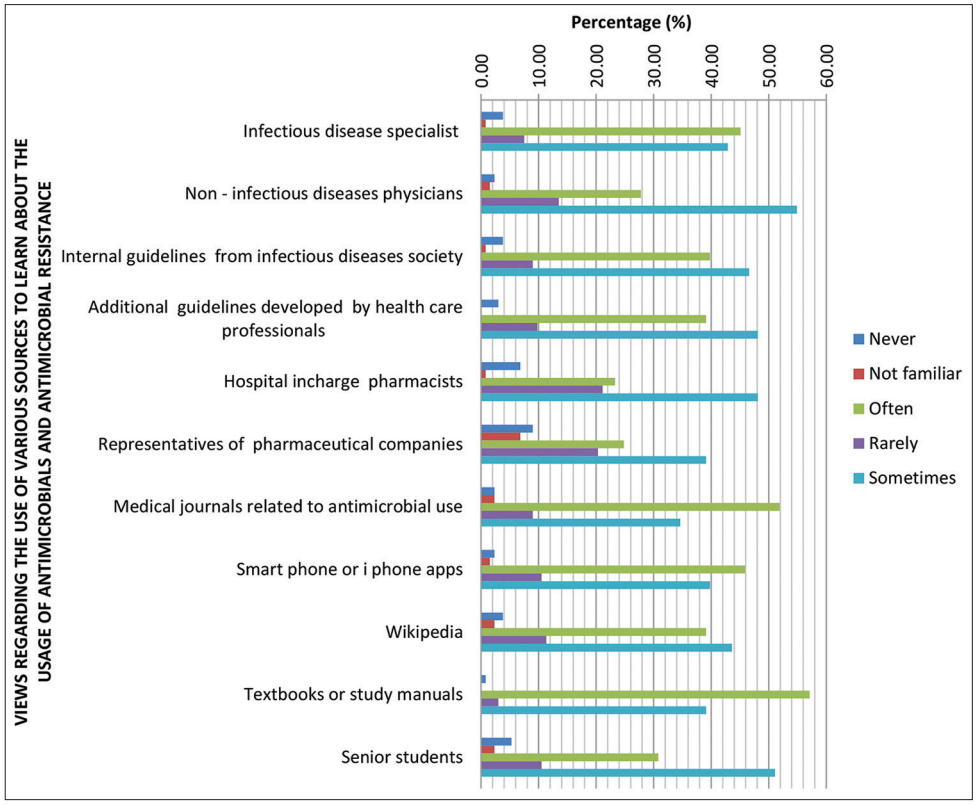

Fig. 4: Views regarding the use of various sources to learn about the usage of antimicrobials and antimicrobial resistance

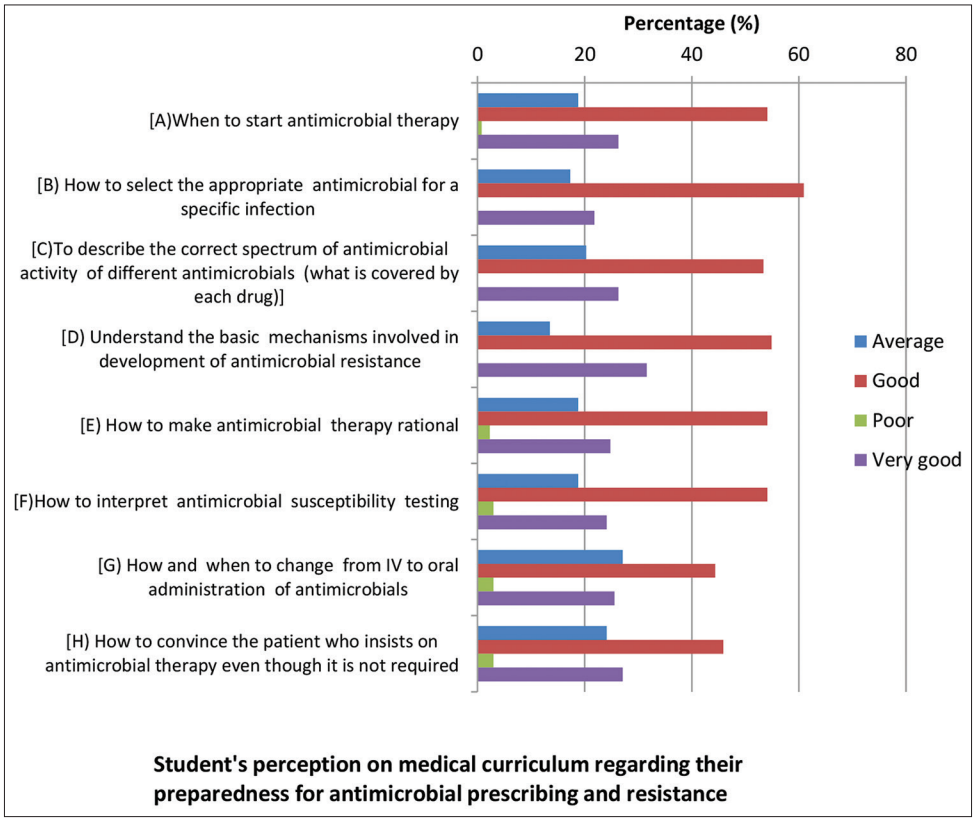

Fig. 5: Student's perception on medical curriculum regarding their preparedness for antimicrobial prescribing and resistance

disease experts, journals, American guidelines, pharmaceutical representatives, and hospital pharmacists were all mentioned as useful sources in another study [18].

Perception of students on medical curriculum regarding their preparedness about antimicrobial prescribing and resistance: Around 90% of the students agreed that the concept of basic mechanisms

Table 3: Percentage of correct responses by interns on knowledge vignettes

S. No	Competency assessed in clinical vignette	Percentage of correct responses
1	Acute uncomplicated urinary tract infection: Appropriate choice of antibiotics and duration of therapy	37
2	Appropriate selection of antibiotics not effective against anaerobes	17
3	Interpretation of antibiogram and deescalation of antibiotic treatment	41
4	Diagnose a case of viral respiratory infection	71
5	Further steps to be followed in the management of viral respiratory infection	23
6	Recognize the risks associated/not associated with the surgical prophylactic antibiotic use in an elective orthopedic surgery	13
7	Recognize clostridiumdifficile infection secondary to the use of antimicrobials	21
8	Match the most likely mechanism of antimicrobial resistance with different combination of antimicrobials/micro-organisms	24
9	Selection of appropriate empirical antimicrobial therapy for Extended spectrum Beta lactamase positive *Escherichia coli* bacteraemia	25
10	Knowledge regarding the guidelines for intravenous vancomycin use by the centers for disease control and prevention	38

involved in development of AMR was clearly taught in the medical curriculum and also 83% of students were well worsed with the selection of appropriate antibiotic for a given infection and also knew when to begin antimicrobial therapy. The students were also able to describe the correct antimicrobial spectrum of various antimicrobial agents, had knowledge regarding rational use of antimicrobial agents and knew how to interpret antimicrobial susceptibility pattern and when to de-escalate. In contrast according to another study only 65% students were well prepared for accurately diagnosing infections, knowing when to start antibiotic therapy, de-escalation, interpretation of antibiograms. Approximately 90% of students correctly chose antibiotics but only 20% were aware about the spectrum of antibiotics [18].

However when we tested their knowledge regarding selection and their use of appropriate antimicrobial agents using a case scenario for few common conditions, performance was very poor. Only few knew which antibiotic is indicated in an uncomplicated UTI, correct selection of antimicrobial which is not effective against anaerobes, interpretation of antibiogram and de-escalation of antibiotic treatment, recognize the risks associated/not associated with the surgical prophylactic antibiotic and secondary infection like clostridium difficile and appropriate selection of empirical antimicrobial therapy for ESBL bacteraemia and only few were aware of the CDC guidelines for IV vancomycin use.

Overall, only 27.37% of medical interns provided correct answers in the knowledge section of the study, while 72.63% of interns provided incorrect answers [19].

A study found that 85.49% of medical interns were aware that using narrow-spectrum antibiotics rather than broad-spectrum could reduce the likelihood of resistance and adverse effects. Of medical students, 63.14% did not know about the red line campaign. About 47.45% were unaware of the usage of antibiotics in the treatment of viral infections [19]. In another study, the students responses were as follows: 11.8% said that antibiotics are beneficial for treating viral infections, 11.6% said that they are used to treat the flu or the common cold, 12.2% said that stopping antibiotics should be done as soon as symptoms go away, 8% said that antibiotics are the first treatment of choice when a cough or sore throat is present, and 28.5% acknowledged that AMR is a complex problem but did not take action because doing so would have little effect on its own [21].

CONCLUSION

The results of the present study state that despite students having good perception, the knowledge component was inadequate, that is, they lacked their preparedness and confidence to prescribe antibiotics which emphasizes that the students are aware of the antimicrobial stewardship but their knowledge domain needs to be improved for better application in their clinical practice. The students had inadequate knowledge of basic antibiotic prescribing practices and majority of the students had shown their desire to improve their knowledge in this area and have proposed introducing additional teaching on the prudent use of antibiotics in the 2nd year. Lecture series and grand round discussions on the rational use of antibiotics were the useful learning options opted by the majority of respondents. More studies are needed to recognize areas and effective educational interventions like campaigns and the provision of guidelines to encourage the rational use of antibiotics at the beginning of the medical course to improve antibiotic prescribing practices among medical interns.

ETHICAL APPROVAL

Taken and enclosed.

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Nil.

AUTHOR'S CONTRIBUTION

Jyoti S Patil: Conceived and designed the study along with review of literature, validation of the questionnaire used in the study, and final correction of the manuscript. Priya P Vishwakarma: Collection of data. Anand M Ingale: Monitored data collection and performed data analysis. Rashmi M Karigoudar: Contributed to the interpretation of results and in writing the manuscript.

CONFLICT OF INTEREST STATEMENT

No.

SOURCE(S) OF SUPPORT AND FUNDING

Nil.

CONSENT TO PARTICIPATE

Consent from participants (medical interns) taken in the Google form.

PRESENTATION(S) OR AWARDS AT A MEETING

Nil.

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