



PERCEPTION OF ANTIMICROBIAL RESISTANCE AND SELF-MEDICATION PRACTICES AMONG COLLEGE STUDENTS IN INDIA

Healthcare

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ABSTRACT

Objectives: Antimicrobial resistance (AMR) is a global issue and measures to halt this is the need of the hour. Thus our study aims at identifying awareness as well as knowledge, attitude, perception and practice regarding antimicrobial resistance and antibiotic use among college students, to get insight and take appropriate actions to enhance their knowledge that will help in reducing antimicrobial resistance as they are the future prescribers. **Methods:** A descriptive cross-sectional study was conducted among 483 undergraduate engineering college students of an engineering college, in Chennai, Tamil Nadu. A pretested, semi-structured questionnaire was designed to collect data from participants regarding sociodemographic profile, and behaviour of the participants regarding antibiotic use which comprises: attitude, perceptions and practice. SPSS IBM version 22.0 was used for data analysis. **Results:** The majority of study participants have heard about antimicrobial resistance before (27%) of which most of them got information about antibiotic resistance from the web/ internet (35%). The majority of study participants were aware (>90%) of the phenomenon of antibiotic resistance, 98.9% of them were correctly able to identify Amoxicillin and Penicillin as antibiotics, and most of them had correct knowledge about the role of antibiotics. A majority (83.6%) of participants take antibiotics only after the prescription of the doctor, 78.9% of them reported use of antibiotics in the last year. **Conclusions:** A fair good amount of awareness, knowledge, attitude, perception & practice regarding antimicrobial resistance and its use was found among study participants. Still, there is a scope for improvement in it that can be addressed by giving more emphasis on this in the undergraduate teaching curriculum.

KEYWORDS

Antimicrobial resistance, knowledge, attitude, practice and awareness

INTRODUCTION

One of the most important medical discoveries of the 20th century was the discovery of antibiotics. Millions of lives have been saved by antibiotics, which have also made critical medical procedures like surgery and cancer chemotherapy possible¹. While measles, AIDS, malaria, tuberculosis, and other infectious diseases cause more than 85% of infection-related deaths worldwide, irrational antibiotic use has increased dramatically in recent years, contributing to the rise of antimicrobial resistance (AMR).²

According to WHO, antimicrobial resistance happens when bacteria, viruses, fungi, and parasites evolve and stop responding to medications, making infections more difficult to treat and raising the risk of disease transmission, serious illness, and death.³

Resistance drives up treatment costs by reducing the earlier drug and necessitating the switch to a newer, more expensive drug or treatment, which harms lives and livelihoods and poses a threat to the viability of health care delivery initiatives.³ The development of new antimicrobials to combat the widespread issues of drug resistance is also weakly encouraged, and the pipeline of new medications is drying up. As a result, the World Health Assembly (WHA) Resolution of 1998 urged the Member States to create measures for the appropriate use of antibiotics and to enact strict laws that would make it illegal to dispense antibiotics without a prescription from a qualified healthcare professional. World Health Day 2011's theme was "Antibiotic Resistance: No Action Today, No Cure Tomorrow," and since 2015, the WHO has held an annual World Antimicrobial Awareness Week with the theme "Antibiotics: Handle with Care." However, in 2020, the slogan will change to "Antimicrobials: Handle with Care" to better reflect the growing prevalence of drug-resistant infections.⁴ Numerous studies have demonstrated that even college students who are educated adults are not fully trained to prescribe safer antibiotics and are not well-informed about antibiotic resistance.⁵ The study's objective was to assess college students' awareness of antimicrobial resistance and antibiotic use as well as their knowledge, attitudes, perceptions, and practices in these areas.

METHODS

The study was a prospective cross-sectional study conducted among undergraduate engineering college students of all branches of an Engineering College, in Chennai of Tamil Nadu. The study was conducted from February 2022 to May 2022. A total of 483 students from all the years from all branches such as electronic and communication, Information technology, electrical and electronics, mechanical, civil and automobile branch. The study tool consisted of a questionnaire containing questions related to the socio-demographic profile, and behaviour of the participants regarding antibiotic resistance and its use perception and current practice adopted from the previous studies⁵⁶. A 5-point Likert scale was used to assess these parameters. After getting the college authorities, the students were invited to participate in the study using the google questionnaire. The nature of the study and its consequences along with free voluntariness to participate were explained before the start of the questions. The ethical clearance was obtained from Institutional Ethics Committee, Chettinad Hospital & Research Institute. The data were analysed with SPSS IBM version 22.0.

RESULTS

Most study participants are familiar with antimicrobial resistance (27 percent). Only 8.2 percent of study participants learned about antibiotic resistance from television, compared to 57.3 percent who learned about it from the internet (34.5 percent). Most of the study's participants knew (>90%) that "antibiotic resistance is a phenomenon where a bacterium loses its sensitivity to an antibiotic," (>90%) that "misuse of antibiotics can lead to a loss of sensitivity of an antibiotic to a specific pathogen," (>80%) and that "one should take the full course of antibiotics even if symptoms improved." (Table 1)

Amoxicillin and penicillin were correctly identified as antibiotics by the majority of study participants (98.9%), but aspirin and paracetamol were incorrectly identified as antibiotics by 5.4 percent and 9.1 percent of participants, respectively. (Table 2) The majority of study participants were aware that "antibiotics are useful for bacterial infections" (>95%), "antibiotics can cause allergic reactions" (>90%), and "antibiotics can kill "good bacteria" present in our body" (>80%), and "antibiotics are not useful for viral infections and antibiotics can cause secondary infections after killing good bacteria present in our

organism," according to the study. (Table 3) It's clear that the majority of participants (83.6%) only take antibiotics on a doctor's prescription, only 21.7% believe in taking leftover antibiotics at home without consulting a doctor, and 80.7% don't take antibiotics for fever or stop taking them when they feel better. A sufficient number of participants (64.6%) simply refuse antibiotic therapy following a brief doctor visit and had no formal physical examination. (Table 4)

The majority of study participants (78.9%) reported using antibiotics in the previous year, though approximately two-thirds of them (65.6%) only used them once or twice, 23.9 percent used them three to five times, and 10.5 percent used them more than five times.

DISCUSSION

Our study offers pertinent data on college students' knowledge, attitudes, practices, and awareness of antibiotic resistance and usage that can be used to design effective educational interventions aimed at enhancing the prescription and use of antibiotics.

In our study, the prevalence of self-medication practices among engineering students was 21.7% which is lesser than the previous study 85.4% by Poornima .T. Common morbidities for which people seeking self-medication practice were 19.1% for upper respiratory and 19.3% for pyrexia of unknown origin, which is very much higher in the previous study by Poornima T⁷ Various other reasons for seeking self-medication practice from previous studies were headache (86.2%), pain abdomen(38.1%), vomiting(7.1%).⁷

The source information on antibiotics and antibiotic resistance was obtained from internet sources by 34.5% of students, 8.2% from mass media communication and 57.3% from other sources. In comparison to a previous study by Chowdhury H et al⁸ showed 54% from mass media communication, 27% from internet sources and the remaining 19% from other sources. Overall, the participants in our study had relatively fair knowledge about antibiotic resistance.

Study participants using antibiotics without doctors' prescription was 21.7% and the most identified antibiotic was amoxicillin (98.9%) and which is comparatively higher than the previous study by Tuyishimire J et al⁹ which was 12.2% and also the most identified antibiotic is amoxicillin (59.42%) and also the major reason for self-medication of antibiotics was illness not serious to have a doctor consultation (50.72%).

The majority of our participants, 91.4% were well aware of the adverse reactions following antibiotic usage and 94.3% knew about antibiotic resistance which was higher than the previous study by Jawadshah S et al¹⁰ 77.3% and 19.9% respectively. Also, 19% of participants reports that self-medication was practised to save money. The prevalence of self-medication practice with antibiotics was quite high among non-medical university students when compared to medical college students.

Our study showed the frequency of antibiotic usage in self-medication practice in the previous year was up to 2 times in 65.6%, more than 3 times in 23.9% and 10.5% for more than 5 times. Which is quite higher when compared to the previous study by Nunez et al¹¹ which were 29.82%, 49.6% and 20.4% for more than 2, 3 and 5 times respectively in the last year. Respiratory tract infections are the most common health condition treated by antibiotic self-medication.

CONCLUSION

Our study sheds light on college students' knowledge, attitudes, behaviors, and awareness of antibiotic resistance in Chennai. The study's participants showed a fair amount of awareness, knowledge, attitude, perception, and practice regarding the use of antibiotic resistance. Even so, there is room for improvement, which can be addressed by placing more emphasis on this as a health warning in the media and newspapers.

Competing interests-

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Table 1. Knowledge of the study population on antimicrobials resistance (n=483)

Knowledge	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
Antibiotic resistance is a mechanism in which a bacterium loses its sensitivity to an antibiotic.	282 (58.3)	172(36)	19 (3.9)	7 (1.4)	3 (0.6)
Misuse of antibiotics can lead to a loss of effectiveness of an antibiotic.	264 (54.6)	186 (38.5)	27 (5.5)	06 (1.2)	00
We can stop using the antibiotics, and symptoms improve before the course completed	08 (1.6)	37 (7.6)	47 (9.7)	178 (36.8)	213 (44)

Table 2. Knowledge of antibiotics identification of study participants (n=483)

Knowledge	Yes (%)	No (%)	Don't Know (%)
Paracetamol is an antibiotic	44 (9.1)	427 (88.4)	12 (2.4)
Aspirin is an antibiotic	26 (5.4)	434 (89.8)	23 (4.76)
Penicillin or Amoxicillin are antibiotics	478 (98.9)	1 (0.2)	4 (.82)

Table 3. Knowledge of study participants on antibiotics role and side effects (n=483)

Knowledge	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
Antibiotics are useful in infections due to bacteria	311 (64.3)	154 (31.8)	9 (1.86)	7 (1.44)	2 (0.41)
Antibiotics are useful in viral infections	28 (5.79)	44 (0.91)	48 (9.93)	148 (30.6)	215 (44.5)
Antibiotics can reduce any kind of pain and inflammation.	16 (3.31)	97 (20.08)	93 (19.3)	155 (32.09)	122 (25.3)
Antibiotics can kill "good bacteria" present in our body	161 (33.3)	252 (52.1)	44 (9.1)	21 (4.34)	05 (1.03)
Antibiotics can cause subsequent infections after killing good bacteria	129 (26.7)	231 (47.8)	79 (16.3)	38 (7.86)	06 (1.24)
Antibiotics use may cause allergic reactions.	163 (33.7)	279 (57.7)	37 (7.6)	02 (0.41)	02 (0.41)

Table 4. Perception and practice of antibiotics usage among study participants (n=483)

Perception and practice	Yes (%)	No (%)
Do you usually take antibiotics for common cold or cough	97 (19.1)	386 (79.9)
Do you take the antibiotic for high temperature/fever?	93 (19.3)	390 (80.7)
Do you usually stop taking antibiotics when you start feeling better	156 (32.2)	327 (67.8)
Do you take antibiotics only after prescribed by the doctor?	404 (83.6)	79 (16.4)
Do you keep leftover antibiotics at home assuming they might be useful in future situations?	265 (54.8)	218 (45.2)
Do you use such leftover antibiotics when you have a cold, sore throat or cough without having consulted your doctor?	105 (21.7)	378 (78.3)
Can you buy antibiotics without a medical prescription?	163 (33.7)	320 (66.3)
Have you ever started antibiotic therapy after a simple doctor call over the phone, without a proper medical examination?	171(35.4)	312 (64.6)

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