

## RESEARCH ARTICLE

### Patterns, perception, and practice of self-medication with antibiotics among medical undergraduate students

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#### ABSTRACT

**Background:** Self-medication with antibiotics (SMA) has turned out to be a common practice worldwide and is widespread in developing nations like India. Self-medication in medical students is different when compared to general population, as they have a good knowledge about diseases and drugs, obtained from textbooks, colleagues, drug indices, etc., and being a medical student, drugs can be acquired easily. There are various studies conducted on nursing, medical, and university students, but there are very few studies conducted in this region. **Aims and Objectives:** The present study was conducted to know patterns, perception and practice of SMA in medical students. **Materials and Methods:** The present study was a questionnaire-based, cross-sectional study. The study was conducted in April 2017 at a Medical College in South India. The information was collected on demographic characteristics, reasons for SMA, indications for the use of antibiotics, drug/drug group of antibiotics used, reasons for not consulting a health-care professional, and sources of information about antibiotics. The results are described using frequency and percentage. **Results:** In the present study, 81.6% of the students had taken an antibiotic in the past 1 year. Most common conditions for which students used SMA were for upper respiratory tract infections (62.1%), fever (60.5%), and gastrointestinal infections (51.3%). The most common self-medicated antibiotics were ampicillin (57.2%) ciprofloxacin (49.7%) and metronidazole (46.4%). Most common reasons of SMA were, students considered SMA as less expensive when compared to doctor prescription (55.6%), illness not considered serious (49.7%) and lack of time to visit the hospital (47%). The most common source of information of antibiotic was from a previous prescription (49.7%) and the drug store (pharmacist) (36.7%). **Conclusion:** The present study found a high prevalence of SMA among medical undergraduate students. Special emphasis should be given in teaching medical students about the disadvantages of irrational self-medication particularly in relation to the emergence of drug resistance. Pharmacists should not dispense antibiotics without a valid prescription. At the policy-making and regulatory level, there is a need for strict legislation and enforcement of law so as to restrict access to an antibiotic, along with vigorous monitoring system will help in promoting rational antibiotic usage.

**KEY WORDS:** Antibiotics; Drug resistance; Rational use; Self-medication

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#### INTRODUCTION

Self-medication has been defined as the use of medication for self-treatment without consulting a physician either for diagnosis, prescription or surveillance of treatment.<sup>[1,2]</sup> Among drug groups, antibiotics are one of the regularly prescribed drugs worldwide.<sup>[3]</sup> Self-medication with

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antibiotics (SMA) can be defined as the procurement of antibiotics and consuming them with the intention of treating a supposed infection.<sup>[4]</sup> SMA has turned out to be a common practice worldwide and is widespread in developing nations like India.<sup>[4]</sup> Self-medication pattern varies among different populations and is influenced by many factors such as age, gender, self-care orientation, medical knowledge, educational level and nature of illnesses.<sup>[5,6]</sup>

Although SMA has some advantages such as shortening the duration of illness, decrease the extent of symptoms, and period of infectivity, irrational use of SMA can lead to consequences such as the development of resistant microorganisms, prolonged hospitalization, treatment failures, increase in treatment cost, and morbidity.<sup>[7,8]</sup> SMA assumes a special importance in medical students as they will be future prescribers and specialists, and play an important role in counseling both the general population and the patients about the merits and de-merits of self-medication.

Self-medication in medical students is different when compared to general population, as they have a good knowledge about diseases and drugs, obtained from textbooks, colleagues, drug indices, etc., and being a medical student drugs can be acquired easily when compared to general population.<sup>[9]</sup> There are various studies conducted on nursing, medical, and university students, but there are very few studies conducted in this region; hence, the present study was conducted to know patterns, perception and practice of SMA in medical students.

## MATERIALS AND METHODS

This present study was a questionnaire-based, cross-sectional study. The study was conducted in April 2017 at a medical college in South India. The questionnaire was pre-tested and comprised open- and close-ended questions. The questionnaire was pre-examined in 10 interns and was suitably modified. Students included were those who have completed 2<sup>nd</sup> year pharmacology (V term completed). Ethics committee approval was taken from the Institutional Human Ethics Committee and only those students were included in the study who provided informed consent.

The inclusion criteria were that students should have self-medicated in the past 1 year with an antibiotic. Multiple answers were allowed for some of the questions and space was provided for additional information. The information collected includes demographic information, reasons for self-prescribing of antibiotics, indications for the use of antibiotics, drug/drug group of antibiotics used, reason for not consulting a health-care professional and sources of information about antibiotics. The statistical analysis was performed using Microsoft Excel (2016 version) and descriptive statistics were used in the present study. The results are described using frequency and percentage.

## RESULTS

A total of 198 participants were included in the study, out of which 185 completed the questionnaire. The response rate was 93.43%. The demographic variables are shown in Table 1. Male students constituted 51.3% of the respondents and rest were female students. Age group in the present study was between 19 and 21 years. The prevalence of SMA was 81.6% in the past 1 year. The common conditions for which antibiotics were used are shown in Table 2. Most common condition for which antibiotic used was for the upper respiratory tract infections (URTI), fever and GIT infections. Some students used antibiotics for more than one condition. The commonly used antibiotics are shown in Table 3. Some students used more than one antibiotic in the past 1 year. The most common self-medicated antibiotics were ampicillin (57.2%) followed by ciprofloxacin (49.7%) and metronidazole (46.4%).

The various reasons for which self-medication was practiced are shown in Table 4. Some of the students gave more than one reason for using an antibiotic. Most common reason for which students self-medicated was, they considered self-medication as less expensive when compared to prescription by a doctor (55.6%), illness not considered serious (49.7%), and lack of time to visit doctor clinic (47%). The various sources used for obtaining the antibiotics are shown in Table 5. Some students mentioned multiple sources of information about

**Table 1: Demographic characteristics of the participants**

Variable	n (%)
Gender	
Male	95 (51.3)
Female	90 (48.6)
Age	
19–21 years	185 (100)
SMA in past 6 months	
Yes	151 (81.7)
No	34 (18.3)

SMA: Self-medication with antibiotics

**Table 2: Conditions for which antibiotics were used**

Condition	n (%)
URTI	115 (62.1)
GIT infections	95 (51.3)
Skin infections	40 (21.6)
Fever	112 (60.5)
Cold/cough	86 (46.4)
Toothache	25 (13.5)
Others*	31 (16.7)

\*Other conditions include pimples, rashes, generalized body pain, and burning micturition. URTI: Upper respiratory tract infections, GIT: Gastrointestinal tract

the antibiotics used. The most common source of information was from a previous prescription (49.7%) and the drug store (pharmacist 36.7%).

## DISCUSSION

SMA has emerged as an important aspect of health care and a major concern with SMA is the emergence of antibiotic resistance. SMA is often associated with unreasonable practices such as inadequate dosing and taking antibiotics only till the symptoms subside and irrational choice of antibiotics have contributed to the emergence of drug resistance.<sup>[10,11]</sup> The emergence of multidrug resistance to a different group of antibiotics is a major concern globally and this multidrug resistance may lead to consequences such as prolonged illnesses, frequent hospital visits, extended hospital stays, need for more expensive and higher antimicrobials, and sometimes death.

In the present study, 81.6% of the students had taken an antibiotic in the past 6 months. Male students constituted 51.3% of the respondents and rest were female students. Age group in the present study was between 19 and 21 years. Other studies conducted on SMA in medical students have also reported higher prevalence ranging from 57% to 92%.<sup>[12-15]</sup> The prevalence in developed countries such as in Europe is very low ranging from 1% to 4%. The reasons for variation in prevalence of SMA may be due to differences in the demographic profile of participants, methodology of the study, sample population, recall bias and strict regulation of over the sale of antibiotics especially in developed countries.<sup>[16,17]</sup>

In the present study, URTI (62.1%), fever (60.5%), GIT infections (51.3%) and cold/cough (46.4%) were the most common conditions for the use of antibiotics. Other studies have also reported the same conditions for which antibiotics were used such as fever, cold/cough, sore throat, indigestion, and gastrointestinal infections.<sup>[12,14,18,19,20]</sup> The most common self-medicated antibiotics were ampicillin (57.2%), followed by ciprofloxacin (49.7%) and metronidazole (46.4%). Other studies have reported a different group of antibiotics. Some have reported azithromycin (a macrolide), amoxicillin (penicillin) and ofloxacin (fluoroquinolone) as the most common antibiotics used.<sup>[19,21]</sup> While other studies have reported penicillin group as the most common antibiotic used.<sup>[12,22]</sup> A review article has reported that fluoroquinolones, amoxicillin, and macrolides as the most commonly used antibiotics in the Southeast Asia region.<sup>[17]</sup>

In the present study, most common reasons for which self-medication used were students considered self-medication as less expensive when compared to prescription by a doctor (55.6%), illness not considered serious (49.7%) and lack of time to visit doctor clinic (47%). Other studies have reported slightly different findings. Some authors have reported that students self-medicated due to the available previous prescription (46.6%), convenience of not visiting a physician

**Table 3: Commonly antibiotics used for self-medication**

Condition	n (%)
Amoxicillin	106 (57.2)
Amoxicillin/Clavulanic acid	47 (25.4)
Ciprofloxacin	92 (49.7)
Metronidazole	86 (46.4)
Co-trimoxazole	74 (40)
Cefixime	29 (15.6)
Azithromycin	56 (30.2)
Clindamycin	22 (11.8)

**Table 4: Reasons for self-medication**

Reason	n (%)
Less expensive	103 (55.6)
Good knowledge of antibiotics	47 (25.4)
Lack of time to visit doctors	87 (47)
Quick-relief	68 (36.7)
Illness considered not serious	92 (49.7)
Prior experience of use	77 (41.6)

**Table 5: Source of information about antibiotics**

Source	n (%)
Previous prescription	92 (49.7)
Advertisements	52 (28.1)
Internet	61 (32.9)
Textbooks	74 (40)
Pharmacists	68 (36.7)

(21.7%), and decent knowledge of antibiotics (11.3%).<sup>[19]</sup> In other studies illness considered not as serious as the most common reason.<sup>[12,14]</sup> The common source of information about antibiotics was obtained from a previous prescription (49.7%) and the drug store (pharmacist 36.7%). Other studies have reported pharmacies and previous prescription as the most common sources of information.<sup>[14,18,19,23]</sup>

## Limitations of the Study

The study was conducted in medical students only. There was no comparison with other students such as nursing or dental students, and the sample size was small. The present study was based on self-reported data; hence, recall bias cannot be ruled out as the information of SMA was from the past one year. Future studies should be multicentric and include a large sample size.

## CONCLUSION

The present study found a high prevalence of SMA among medical undergraduate students. Steps have to be taken at various levels to stop irrational self-medication. Educational

interventions for the students and pharmacists are of utmost importance. Special emphasis should be given in teaching medical students about the disadvantages of irrational self-medication particularly in relation to the emergence of drug resistance. Pharmacists should not dispense antibiotics without a valid prescription. At the policy-making and regulatory level, there is a need to legislate and enforce laws so as to restrict access to antibiotics, along with vigorous monitoring system will help in promoting rational antibiotic usage.

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