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# KNOWLEDGE, ATTITUDE AND PRACTICES RELATED TO ANTIBIOTIC USE AMONG PHARMACY STUDENTS IN SOUTH INDIA

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## ABSTRACT

Antibiotics have been a crucial development in the evolution of medical treatment, effectively reducing the morbidity and mortality from bacterial diseases that were previously left untreated. However, antibiotic misuse is widespread and contributes to antibiotic resistance, especially in less regulated health systems such as India. The aim of this study was to assess the knowledge, attitude and practice of Pharmacy students about usage and resistance of antibiotics in South India. A cross-sectional questionnaire-based study was performed among pharmacy students. The study showed good knowledge, attitude and practice (KAP) of pharmacy students regarding antibiotic usage. Even though majority of the students had good knowledge related to antibiotic use, still there exist a controversy among students about antibiotics effectiveness in common cold, viral diseases and its association with emergence of resistance. 23.5% of students believed that antibiotics could cure cold, 34.1% assumed that antibiotics are effective against viral infections and 16.3% were unaware that unnecessary use of antibiotics could lead to antibacterial resistance.

Students had good attitude towards antibiotic use as 67.4% of the students disagreed to preserve antibiotics for future use. But still 17% of students preferred to stock antibiotics and 26% of students had shared antibiotics with others. Also 33.3% discontinued antibiotics if symptoms do not improve. Even though students had good KAP towards antibiotic treatment, there exists a need for conducting awareness among pharmacy students to fill the gap, as they are the future health care professionals easily accessible and responsible to public health care.

**KEYWORDS:** Antibiotics, Pharmacy students, KAP, Questionnaire.

## INTRODUCTION

Increased antibiotic resistance has been reported by World Health Organization (WHO) worldwide.[1] Antibiotic resistance may increase hospital stay, costs, morbidity, and mortality.[2] Antibiotic resistance crisis is difficult in developing countries because of high burden of infectious diseases, irrational practice of antibiotics, availability of antibiotics without prescription and lack of laboratories for antibiotics susceptibility testing.[3]

Antibiotics have been a crucial development in the evolution of medical treatment, effectively reducing the morbidity and mortality from bacterial diseases that were previously left untreated.[4] However, antibiotic misuse is widespread and contributes to antibiotic resistance, especially in less regulated health systems such as India. Overusing antibiotics or using them irrationally can easily result not only in the emergence of resistant bacterial strains but also in adverse reactions and can also result in an economic burden on the national health system.[5]

Pharmacists are an important member in the healthcare team and have a major role in medicine use and the provision of advice regarding appropriate medicines use and health care.[6] Pharmacist education and training have the potential to influence the behaviour of other health professionals and consumers to ensure the quality use of medicines.[7] Inadequate education and inappropriate training of pharmacist in developing countries can contribute to substandard professional practices which may lead to pharmacists having a tendency to inappropriate use, recommend and supply antibiotics including the non-prescription sales of antibiotics in community pharmacies.[8] Comprehensive and relevant education and training on the use of antibiotics and antimicrobial resistance is essential for pharmacists to take a leading role in changing behaviours around antibiotic consumption and the appropriate use of antimicrobial agents in the community.[9] Currently, little is known about how pharmacy

students in developing countries such as India perceive antibiotic usage and antimicrobial resistance. An essential aspect of this research is the focus on understanding antibiotic use among young adults with an educational background in health science.

## OBJECTIVE

The study aims to investigate the KAP related to antibiotic use among pharmacy students in South India.

## METHODOLOGY

This study was conducted over a period of 3 months. A Cross sectional observational study was conducted among 250 pharmacy students in Thiruvananthapuram, Kerala, India. A self-designed questionnaire was prepared to collect data which includes demographics, knowledge, attitude and practice related to antibiotic use. The questionnaire was prepared using data and systematic review from the literature survey and factors used in previous research works. This KAP questionnaire consists of a total of twenty seven questions which includes three questions on demographic details, eight questions related to basic knowledge, seven questions related to attitude and nine questions related to practice regarding antibiotic use. Data analysis was carried out using SPSS software version 20.

## RESULTS

### Demographics of the participants

A total of 246 students participated in this study. The results showed good knowledge of antibiotic use among pharmacy students. 81.3% of them were females (Table I) in age group between17-27 pursuing B Pharm degree.

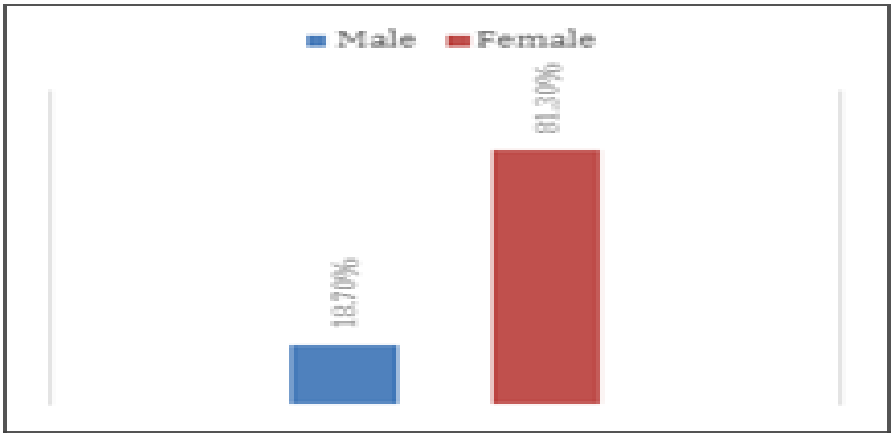


**Fig. 1: Gender distribution.**

**Table I: Demographics of the participants.**

| Age | Mean age | 22 |
|---|---|---|
| Gender | Female (81.3%) | Male (18.7%) |
| Education | B Pharm (61%)<br>D Pharm (1.6%)<br>M Pharm (0.8%)<br>Pharm D (36.6%) | |

**Knowledge related to antibiotic use**

The knowledge of pharmacy students was remarkably high for most of the questions. Majority (95.9%) of the students agreed that different antibiotics are needed to cure different diseases and 96.7 were aware that antibiotics are effective against bacteria. Most of the participants (69.9%) disagreed that antibiotics could relieve cold and 60.2% believed that antibiotics are ineffective in viral infections (Figure 2).

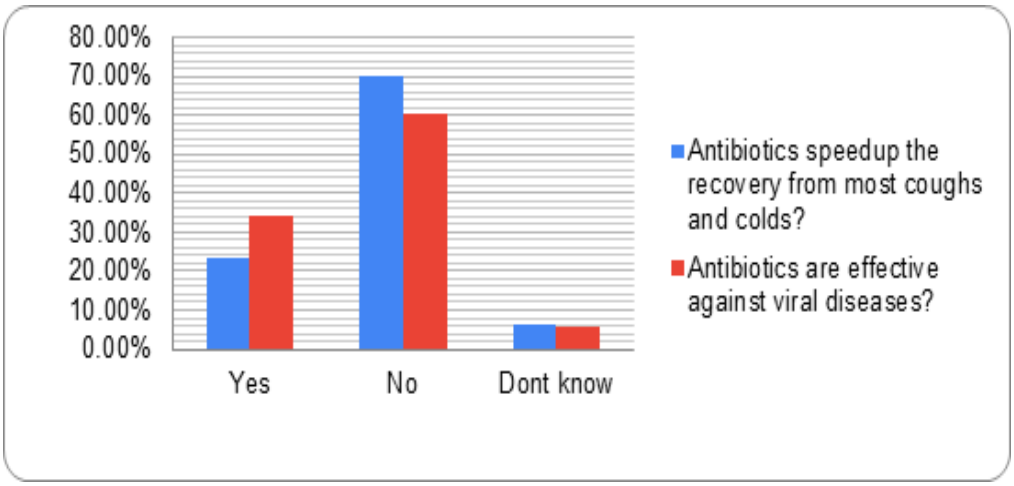


**Fig. 2: Knowledge related questions.**

Similarly 81.3% correctly identified that if side effects occur during antibiotic course, there is a need to immediately discontinue therapy (Table II). Similarly 80.5% students reported that antibiotic that causes allergy should not be used again. 78% agreed that unnecessary use of antibiotics could increase antibacterial resistance and 84.6% mentioned it as a serious public health issue worldwide. Even though majority of the students had good knowledge related to antibiotic use, still there exist a controversy among students about antibiotics effectiveness in common cold, viral diseases and its association to emergence of resistance. 23.5% of students believed that antibiotics could cure cold, 34.1% thought that antibiotics are effective against viral infections and 16.3% were unaware that unnecessary use of antibiotics could lead to antibacterial resistance.

**Table II: Knowledge regarding antibiotic use (n=246).**

| Knowledge related questions | Yes | No | Don't know |
|---|---|---|---|
| Different antibiotics are needed to cure different disease? | 95.9% | 3.3% | 0.8% |
| Antibiotics are effective against bacteria? | 96.7% | 3.3% | --- |
| Antibiotics speedup the recovery from most coughs and colds? | 23.5% | 69.9% | 6.5% |
| Antibiotics are effective against viral diseases? | 34.1% | 60.2% | 5.7% |
| If you get side effects during antibiotic therapy, you should discontinue antibiotic as soon as possible. | 81.3% | 16.3% | 2.4% |
| If you get allergic reaction from antibiotic use, you should not use that antibiotic again. | 80.5% | 14.6% | 4.9% |
| Unnecessary antibiotic use can lead to antibacterial resistance? | 78% | 16.3% | 5.7% |
| Resistance to antibiotic is a worldwide problem? | 84.6% | 5.7% | 9.8% |

**Attitude related to antibiotic use**

The overall attitude of pharmacy student was good. 66.7% of students used to take complete course of antibiotic even when the symptoms were relieved. (Fig 2).

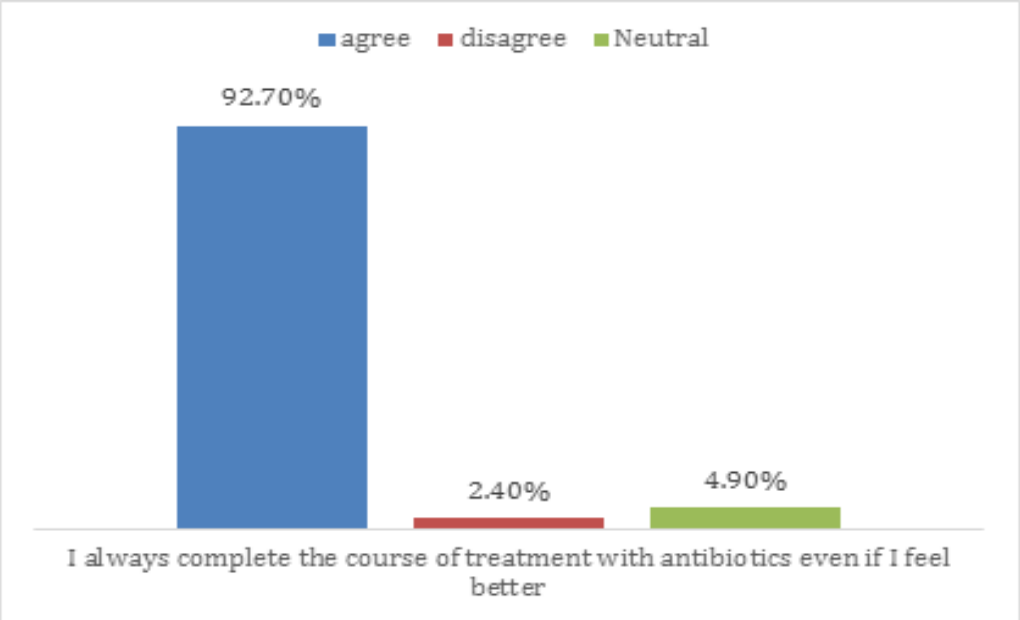


**Fig. 3: Attitude related question.**

Majority of the students (67.4%) disagreed to preserve antibiotics for future use. 95.2% disagreed to seek friends or relatives for antibiotics similarly 92.7% of students disagreed to buy antibiotics from pharmacy without valid prescription. Majority preferred to use antibiotics if the cough persist for more than a week and have sore throat.

**Table III: Students attitude towards antibiotic use (n=246%).**

| Attitude related questions | Strongly agree | Agree | Strongly disagree | Disagree | Neutral |
|---|---|---|---|---|---|
| I always complete the course of treatment with antibiotics even if I feel better | 66.7% | 26% | | 2.4% | 4.9% |
| If I feel better after few days, I sometimes stop taking my antibiotics before completing the course of treatment. | 3.3% | 9.8% | 48.8% | 29.3% | 8.9% |
| I prefer to keep antibiotics at home in case there may be a need for them later. | 1.6% | 15.4% | 34.1% | 33.3% | 15.4% |
| It is good to take antibiotics from friends or relatives without doctor's prescription. | 0.8% | | 72.4% | 22.8% | 4.1% |
| I prefer to buy antibiotics from pharmacy without a prescription. | 0.8% | 0.8% | 68.3% | 24.4% | 5.7% |
| I prefer to use antibiotics if I have a cough for more than a week. | 4.9% | 33.3% | 21.1% | 21.1% | 19.5% |
| When I have a sore throat, I prefer to use an antibiotic. | 3.3 | 17.9% | 26% | 28.5% | 24.4% |

**Practices related to antibiotic use**

73.2% of students had never shared antibiotics with others but still 26% had shared, similarly 86.2% did not use leftover prescription for further use (Fig. 4).

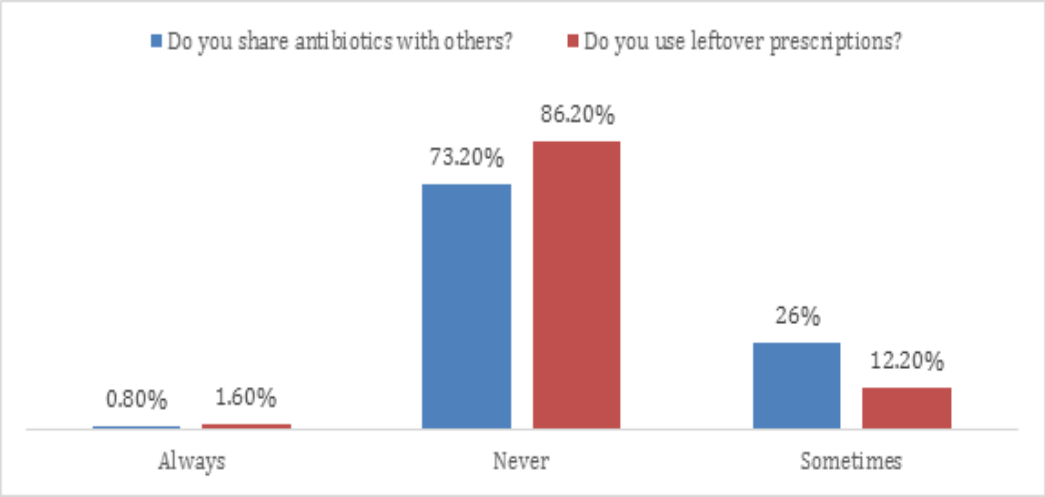


**Fig. 4: Practice related questions.**

80.5% of students always completed their antibiotic course. 66.7% students continued to take antibiotics even though they feel that symptoms didn't improve but the rest (33.3%)

discontinued their medication. Most (87%) of students believed in their consulting physician, for not prescribing an antibiotic. Majority of the population would consult a physician, pharmacist, self-treatment and few seek relatives when they turn sick.

**Table IV: Practice related questions (n=246).**

| Practice related questions | Always | Never | Sometimes |
|---|---|---|---|
| Do you share antibiotics with others? | 0.8% | 73.2% | 26% |
| Do you use leftover prescriptions? | 1.6% | 86.2% | 12.2% |
| Do you complete the full treatment course? | 80.5% | | 19.5% |
| If the symptoms do not improve after taking antibiotic, do you stop taking it by yourself? | 2.4% | 66.7% | 30.9% |
| Have you changed your doctor when he did not prescribe antibiotic? | --- | 87% | 13% |
| First thing you do when you are sick is to see a doctor? | 4.4% | 44.3% | 51.2% |
| First thing you do when you are sick, ask a pharmacist? | 2.4% | 47.2% | 50.4% |
| First thing you do when you are sick, ask relatives? | 1.3% | 80.9% | 17.9% |
| First thing you do when you are sick, treat yourself? | 0.8% | 52.8% | 46.3% |

## DISCUSSION

The study examined the KAP of antibiotic use among pharmacy students in South India. The results suggested that the knowledge of pharmacy students regarding antibiotic use was sufficient. This finding is in line with other published studies which also reported good understanding of antibiotics among healthcare students.[10,11] Our results were also similar to another study which reported good knowledge of medical students with respect to antibiotic use.[12,13,14] Although, 78% participants believed that irrational use of antibiotic can lead to ineffective treatment, it is also important to mention that only 69.9% students correctly answered when asked whether antibiotics are required in common cold and viral infections.[15] This result is relatively poor in accordance to other study in which 95% students correctly answered the question.[16]

The findings of the current study showed a positive attitude of pharmacy students towards antibiotic use. Majority of pharmacy students in this study rarely used non prescribed antibiotics. The results are in line with other published study which also reported the same.[16] Even though majority of the students (67.4%) disagreed to preserve antibiotics for future use, 17% of students preferred to stock antibiotics which is malpractice that require immediate attention. Cough, cold, and flu were the major problems for which antibiotics were used commonly by the students. The results are in accordance to a study where common cold was the major cause of antibiotics self-practices.[16] In contrast, the results were more

discouraging when a study reported that 60% of their participants recommended antibiotics for viral infections. Outcome based education could be an effective approach to bridge the gap between knowledge to practice.

Self-antibiotics practice among the participated students was good as majority of the students were aware of the antibiotic resistance. Most students did not opt for self-treatment, they were willing to see a doctor when they get cold or flu, and results were in accordance with the findings obtained from a study conducted in Greece.[16] Pharmacy students, having adequate knowledge on antibiotic resistance did not share their antibiotics with others or use leftover prescription. 66.7% students continued to take antibiotics even though they feel that symptoms didn't improve but the rest (33.3%) discontinued their medication. Overall the students had good practice towards antibiotic treatment, but there also exists an alarming need for conducting awareness among students on antibiotic use and resistance, to improve their skills, as they are the future health care professionals easily accessible and responsible to public health care.

## CONCLUSION

The study showed good knowledge, attitude and practice of pharmacy students regarding antibiotic usage. The study recommends future studies to be conducted with interventional design to further improve KAP of pharmacy students about antibiotic use and resistance as pharmacists are an important member in the healthcare team and have a major role in medicine use and the provision of advice regarding appropriate medicines use and health care. This implies that the education that pharmacy students rely upon is not sufficient and that better education is required on the appropriate use of antibiotics to improve their practice towards antibiotics and their use.

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