



## KNOWLEDGE, PRACTICE AND ATTITUDE OF ANTIBIOTIC USAGE : A QUESTIONNAIRE BASED STUDY AMONG MEDICAL STUDENTS

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**ABSTRACT** The overuse and misuse of antibiotics leads to antibiotic resistance . This has become a serious global issue because people who have multi drug resistant infections have the worst clinical outcome. The undergraduate medical students as future medical practitioners should be aware of the rapidly intensifying problem of antibiotic resistance and should be guided towards appropriate prescribing of antibiotics. Aim and objective of this study is to analyze the knowledge , attitude and practice of antibiotic usage among medical students. The study pattern was cross sectional , questionnaire based study . The data collected was entered in Excel sheet and analyzed using SPCC software from which frequency and percentages were obtained . Out of 450 students , 300 (66.66%) students from each semester participated in the survey . Out of those , 204(68%) medical students agreed that frequent use of antibiotics will decrease the efficacy of treatment on using the antibiotic again, 83 (27.66%)students agreed that skipping one or two doses of antibiotics will not contribute to development of antibiotic resistance, 232 (77.3%)medical students completed the course of antibiotic prescribed to them even when they felt better. The survey done provides useful information about the knowledge, attitude and practice of antibiotic usage among medical students hence proves that the present medical curriculum and clinical rotations provide sufficient information for medical students on appropriate usage of antibiotics.

**KEYWORDS** : Antibiotics ; Antibiotic resistance ; Medical students ; Medical curriculum; Inappropriate Usage ; Efficacy

### INTRODUCTION

The word Antibiotic was first used as a noun in 1941 by Selman Waksman. Antibiotics are medications that are used to prevent or treat bacterial infections. Antibiotic resistance is when the bacteria will resist the effect of the antibiotic , hence causing reduction or total elimination in the action of the antibiotic . When antibiotics were discovered 70 years ago , they were a breakthrough in the treatment of infectious diseases , but now in the last decade antibiotic resistance has been threatening our efficiency to treat these infectious diseases as there are a lot of drug resistant infections emerging . In 2011 , WHO in 2012 set the theme of World Health Day as ' Combat Antimicrobial Resistance'™ No action today, No cure tomorrow close' to address this global crisis. It is termed as a serious global public health care crisis as it will produce worse clinical outcomes and tend to increase the risk of complications .patients who have multi drug resistant infections will require more healthcare resources, longer hospital stays , expensive medicines , intensive treatment and additional tests. Restricting the use of antibiotics has been the top priority to slow down the development of antibiotic resistance.

The public play an important role in the misuse of antibiotics. Many researchers are focusing on social aspect of antibiotic usage to help combat antibiotic resistance . The problem of antibiotic resistance is going out of control because of developing countries like India and China as they have a high burden of infectious diseases and antibiotics are the drugs which are most commonly and widely drugs used to treat them thus increasing the risk of developing antibiotic resistance. There persists incorrect prescription of antibiotics by clinicians, antibiotics are dispersed even without a prescription by the pharmacist over-the-counter for human and animal consumption, lack of knowledge about antibiotic resistance and factors that tend to worsen the current problem .The situation needs to be interrupted or reversed safeguarding people's health but also for reducing healthcare costs .

The WHO in 2012 voiced out about the importance of rational prescribing of antibiotics to be included in the medical curriculum . At present in India medical profession is a five years consisting of ninesemesters course students doing class work till the third semester and then can go for clinical rotations in the remaining five semesters . The medical curriculum give some introduction of infectious diseases and antibiotics but does not deal with antibiotics usage and resistance as a separate entity. Medical undergraduates as the future medical practitioners should possess the awareness about the intensifying problem of antibiotic resistance which will indefinitely have a great impact in the containment of antibiotic resistance . They should possess proper training on antibiotic prescription Therefore the present study was undertaken to analyse the existing knowledge attitude and practice of antibiotic usage among the various semesters of MBBS undergraduates.

### MATERIALS AND METHODS

This was a questionnaire-based cross sectional study conducted among 300 medical undergraduates at Saveetha medical College , Thandalam, Chennai during June 2018 to August 2019 following

approval from the Institutional Ethics Committee . A questionnaire was designed with the objectives of assessing the knowledge attitude and practice of antibiotic usage among the medical undergraduate students.

After briefing about the study the questionnaire was distributed to the medical undergraduate students and informed consent was obtained from the students to utilise the data for research purposes .Quality control was maintained as per the standard protocol and confidentiality of the information was also maintained .

Third semester , fifth semester and seventh semester students who are present on the day of data collection willing to participate in the study were included , those who were absent or not willing to participate or did not return the questionnaire within the stipulated time were excluded .The questionnaire contained 20 questions, out of which 10 questions relating to knowledge, four questions relating to attitude and remaining six questions relating to the practice of Antibiotic usage of the students. Questions relating to knowledge and attitude , the response was a yes or no and for the questions relating to the practice of antibiotic usage the response was a always /usually/ sometimes or never. Questionnaire was considered valid only if all the questions were answered

Students were asked whether antibiotics affect the gut flora, do large doses of antibiotics provide quick relief , does skipping one or more doses contribute to antibiotic resistance, are broad spectrum antibiotics better, are newer and costlier antibiotics more efficient to get an insight about their knowledge on antibiotic usage . Students were asked if they complete the course of antibiotic treatment, if they have bought antibiotics without a prescription, if they prefer to use more than one antibiotic for treatment, if they take an antibiotic when they have a flu, if they check the expiry date of antibiotic before using it if they have any leftover antibiotics in their home to get an insight about their attitude and practice of antibiotic usage.

Data collection was the biggest part of the study. The data was collected was entered in an excel sheet and was analysed using capital SPCC software and the frequencies and percentage were obtained.

### RESULTS AND DISCUSSION

**Table 1 : Knowledge about antibiotic usage , their efficiency , their effect on gut flora and antibiotic resistance across various semesters of medical undergraduates**

S.No	QUESTION	2nd semester		5th semester		7th semester	
		YES	NO	YES	NO	YES	NO
1	Antibiotics cure viral infections	37%	63%	18%	82%	13%	87%
2	Use of antibiotics will speed up the recovery of cold or cough	32%	68%	21%	79%	15%	85%
3	Frequent use of antibiotics will decrease efficacy of treatment when using the antibiotic again	59%	41%	80%	20%	83%	17%
4	Once the symptoms are relieved one should stop using antibiotics	33%	67%	19%	81%	18%	82%
5	Efficacy is better if the antibiotics are newer and more costlier	56%	44%	32%	68%	24%	76%
6	Broad Spectrum antibiotics are better than narrow spectrum antibiotics	61%	39%	77%	23%	79%	21%
7	Antibiotic usage disturbs the gut flora and cause diarrhea	31%	69%	26%	74%	15%	85%
8	Large doses of antibiotics are better to use for quick action	36%	64%	25%	75%	22%	78%
9	Skipping one or more doses does not contribute to developing antibiotic resistance	32%	68%	16%	84%	20%	80%
10	Samples for bacterial culture should be sent only after initiating antibiotic therapy	34%	66%	25%	75%	23%	77%

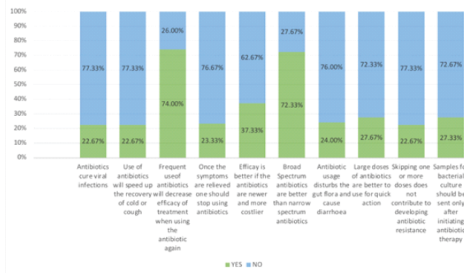
**Table 2 :The attitude of various semesters of medical students towards antibiotic usage.**

S.No	QUESTION	Questions regarding Attitude					
		3rd semester		5th semester		7th semester	
		YES	NO	YES	NO	YES	NO
11	I always complete the course of antibiotic treatment even if I feel better	77%	23%	79%	21%	76%	24%
12	I prefer to buy antibiotics without a prescription	27%	73%	19%	81%	23%	77%
13	I prefer to use more than one antibiotic for speed recovery	17%	83%	13%	87%	15%	85%
14	Antibiotics are safe drugs and can be commonly used to prevent infections	70%	30%	74%	26%	69%	31%

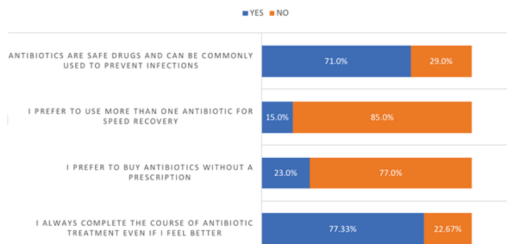
**Table 3 : Antibiotics usage among the various semesters of medical students**

S.No	DETAILS	Questions regarding practice							
		3rd semester		5th semester		7th semester			
		Always	Usually	Sometimes	Never	Always	Usually	Sometimes	Never
15	Do you consult a doctor before starting off antibiotics?	50%	25%	16%	9%	48%	27%	13%	8%
16	Do you prefer to take an antibiotic when you have flu?	2%	28%	37%	33%	7%	28%	33%	30%
17	Do you complete the full course of antibiotic treatment as prescribed?	39%	26%	29%	6%	37%	27%	29%	7%
18	Do you check the expiry date of antibiotic before using it?	56%	22%	18%	4%	49%	35%	16%	0%
19	Are there any left over antibiotics at your home?	44%	29%	13%	10%	45%	32%	14%	9%
20	Did you insist on antibiotics when your clinician did not prescribe them?	2%	3%	38%	57%	1%	3%	42%	54%

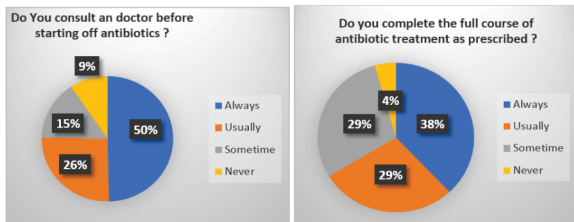
**Figure 4 : Questions testing knowledge of antibiotic usage**



**Figure 5 : Questions testing the attitude of antibiotic usage of students**



**Figure 6 : Questions regarding practice of antibiotic usage of students**



Out of 450 medical students 300 students participated in the survey. The participation rate was 66.6 percentage. Out of these 300 , there were 100 students from third semester , fifth semester and seventh semester each respectively. The third semester only have classwork curriculum whereas the fourth and fifth semester have clinical rotations where they would have been exposed about antibiotic usage and antibiotic knowledge correlating to the fact that they have more knowledge about antibiotic usage and antibiotic resistance. The students who have Clinical rotations are allowed to look through patients prescriptions and their case history when is providing them more knowledge about antibiotic usage as they look into the drugs prescribed to various patients .

The response which reflected the attitude and the practice of antibiotic usage among the students showed that they do not understand as much as they should have understood as future clinicians about the intensity of antibiotic resistance . antibiotic usage which indirectly reflects the how antibiotics are highly vulnerable to misuse .

**Knowledge of antibiotic usage :**

From table 1 , the third semester had very little knowledge about antibiotic usage. Around 37% Of Students think that antibiotics will

cure viral infections. Only half of the third semester students were aware that frequent use of antibiotics will decrease its efficiency on subsequent treatment. Approximately 30% of the third semester students were unaware that the course of antibiotic therapy should be completed and even one dose of antibiotic when missed can give rise to development of antibiotic resistance. Large doses of antibiotics can increase your risk of developing toxicity and complications. The third semester students comparatively lack the knowledge about antibiotic usage and antibiotic resistance. The lack of exposure to how antibiotics should be used and antibiotic resistance development among students might be a reason for their lack of knowledge about antibiotics. Antibiotics should be treated as a separate entity in the medical curriculum and given more importance right from preclinical years rather to prevent irrational use of antibiotics. The medical students should be provided with the intensity of the problem using special workshops and seminars apart from regular curriculum to develop the right attitude towards antibiotic usage.

A minority of them responded that they have inappropriate practices of antibiotics , proving the lack of interactive learning sessions between microbiology and pharmacology as these to deal with antibiotics and the pathogenic organisms correlating these two subjects provide the students with a better insight on antibiotics should be used , resistant organisms and how to prevent antibiotic resistance. They can be provided with mock clinical scenarios and exercises which will allow them to limit the present and future consequences of antibiotic resistance and guide them towards the appropriate usage of antibiotics both on personal and clinical level. Almost 1/3 of the fifth semester and seven semester still lacked knowledge about how antibiotics should be used . This is due to lack of understanding of the intensity of the future healthcare threatening problem of antibiotic resistance . There were no strict guidelines for antibiotic prescription among clinicians, By enforcing such guidelines we have tried to prevent the irrational prescription of antibiotics to an extent. We have encountered a failure in implementing policies and programmes in preventing resistant infection as well as the failure to follow the current antibiotic usage guidelines strictly. These protocols need to be enforced and taught to even preclinical students. Present protocols should be evaluated again as the problem of antibiotic resistance is constantly on the rise. The medical graduates should be made aware of the complications that can occur in a patient when they prescribe antibiotics inappropriately . The questionnaire was distributed to the students for a very short amount of time of nearly 15 to 20 minutes this might have influenced their response to the knowledge based questions.

**Attitude of antibiotic usage:**

The attitude of medical students to words antibiotic usage was not serious and they seem to neglect the proper use of antibiotics as only approximately 75% of the students where completing the entire course of antibiotics even if they felt better. This will tend to set a bad example for the general public population. Approximately 15% of the students have used more than one antibiotic to feel better this clearly reflects mis use of antibiotics. The knowledge about antibiotics will clearly influence the attitude towards antibiotic usage establishing a clear connection between the two factors . The lack of knowledge is ultimately leading to Casual attitude towards antibiotic usage.

**Practice of antibiotic usage :**

Roughly around 10% of the students bought antibiotics without a prescription. They could be bought over-the-counter which reflects the easy accessibility to antibiotics and hence making them vulnerable to abuse. Only 70% of the students founded that antibiotics are safe drugs and can be used to prevent common infections tens worsening the above situation of Easy accessibility to antibiotics . The pharmacists also so contribute to words the development of antibiotic assistance , if strict rules were enforced for the pharmaceuticals regarding antibiotic distribution it will limit the current situation of antibiotic resistance.

Only half of the students consulted a doctor before taking antibiotics hence suggesting that they could have been self medication which is also a serious issue leading to drug interactions ,masking an underlying disease and development of microbial resistance. The above-mentioned factors can be observed more in the please see the students due to the lack of exposure to antibiotics usage. Awareness sessions should be conducted among medical students about not to self medicate themselves . Nearly half of the students always check the expiry date of the antibiotics . Expired antibiotics can have decreased potency. 2 % of the students demanded antibiotics from their clinicians which clearly shows that could have been a lack of

communication between the two which could be improved to prevent inappropriate use of antibiotics. The responses towards the practice of antibiotic usage reflects a clear negligence on the issue of antibiotic resistance also proving that the knowledge about antibiotic resistance does not always reflect on the practice of antibiotic usage.

#### Limitations:

Limitations of the study are that it included only a small sample size from a private tertiary care hospital that was exclusion of the interns in the fourth year students who will probably have better knowledge when compared to the juniors as they have more clinical exposure. The study questionnaire doesn't not cover the complications of antibiotic resistance

#### CONCLUSION

Undergraduate medical students should possess inevitably a clear understanding of antibiotics usage and antibiotic resistance . Medical curriculum should lay stress on the appropriate usage of antibiotics right from the pre clinical years where the students lack exposure on the subject . A study provides insight on knowledge, attitude and practice Olof antibiotic usage of undergraduate students and this can be considered for drafting an more effective under graduate curriculum which will guide towards rational antibiotic usage in the future. Future research can be undertaken to compare and assess the knowledge of postgraduate medical students medical officers and general practitioners on antibiotics.

#### ACKNOWLEDGEMENTS

All the participants contributed equally to the research. There were no funding sources.

The study was approved by the Institutional Ethics Committee.

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