



A RAY OF HOPE: KNOWLEDGE, ATTITUDE AND PRACTICE OF ANTIMICROBIAL USE AMONG MEDICAL STUDENTS

Microbiology

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ABSTRACT

Introduction: Antimicrobial resistance is a global concern. Sound knowledge and proper use of antimicrobials, among medical students are crucial to combat it. Hence this study was undertaken to reflect the understanding of medical students on antimicrobial use. **Methods:** This cross sectional study was carried out among 100 second MBBS students. **Results:** The mean scores in knowledge, attitude and practice (KAP) were 89.42%, 91.12% and 90.39% respectively. Totally 29 out of 100 participants scored 100% in antimicrobial use part. Ninety four students scored more than 11 out of 15 (73.33%). There were no significant differences noted ($p > 0.05$) between KAP status, the participants' gender, age and parents' education. **Conclusion:** Satisfactory knowledge score ($\geq 60\%$) of present study respondents is 99%. All of the respondents are aware of proper anti microbial use owing to their curriculum.

KEYWORDS

knowledge, attitude, practice, antimicrobials, medical students

INTRODUCTION:

Antimicrobials are life saving magic bullets in modern medicine which contribute to an extended lifespan of human beings⁽¹⁾. However, their effect is compromised by the rapid emergence and alarming escalation of antimicrobial resistance. Antimicrobial resistance (AMR) is a condition when bacteria change against antimicrobials which are actually meant to cure the infections⁽²⁾. It is a global health concern affecting low and middle income countries. The cardinal driving factor of antimicrobial resistance is irrational use of them. According to World Health Organization (WHO) definition, medicines are used rationally when patients receive appropriate medicines, for appropriate indications, in doses that meet their own individual requirements, for an adequate period of time, at the lowest cost both to them and the society and with appropriate information⁽³⁾.

In India, about 7 lakhs people lose the battle of antimicrobial resistant infections per year. Death due to AMR is higher than that of road accidents and cancer⁽⁴⁾. Modification of patient-practitioner expectations, behaviours and creation of patient awareness on rational drug use are the biggest challenges in elimination of injudicious use of antimicrobials. Medical students, the torch bearers of future global health can play a crucial role in reducing the irrational use of antibiotics. Hence this study was undertaken to determine Knowledge, Attitude and Practice concerning antimicrobials use among medical students. This can re-emphasize the necessity of establishing certain guidelines and action plans for education of medical students regarding antimicrobial prescriptions.

Methodology:

This cross-sectional, descriptive study was done at the Department of Microbiology in a teaching hospital, during September & October 2021.

Inclusion criteria:

100 medical students studying second year MBBS willing to participate in the study who gave proper written informed consent.

Exclusion criteria:

M.B.B.S, students of first, third, final year and trainees (CRRIs). Institutional Ethical Committee approval was obtained.

Preparation of study questionnaire:

The study questionnaire contained 4 components namely demographic part, knowledge, attitude and practice of antimicrobial use assessment parts. It was designed as a semi structured one in English containing total of 20 questions (knowledge 7; attitude 8; practice 5).

Data collection:

The study participants were explained about the objectives of the study. They were instructed to answer promptly to the best of their knowledge and experience. They were given 20 minutes to mark the response in the questionnaire. The questionnaire covered concepts of drug susceptibility testing, rational use of antimicrobials, prescription medication, frequency of antibiotic use in cold and flu, self antibiotic use and demanding antibiotic prescription.

Data analysis:

The response for knowledge based questions was either yes or no. Attitude component was assessed in terms of agree/disagree. The score for correct, incorrect response was 1 and 0 respectively for above 2 components. Practice of antibiotic use was assessed as always/frequent/ never and the scores were 1, 2 and 3 respectively.

All the data were entered in MS Excel worksheet and proportions were calculated. The statistical analysis of variables (responses to questions on knowledge, attitude and practice) was done using simple statistics. Utilizing SPSS, ANOVA test was done to compare mean scores of the students of different groups.

RESULTS:

Of the 100 participants, 80 (80%) were females and the rest were males. Their age ranged from 19 to 24 years. Among them, 38% were 20 years old and 37% were 21 years. The mean age of the participants was 20.44 years. Mothers of 10% of participants and fathers of 6% were working in health related fields. Twenty percent of students had their fathers in professional job whereas 12% of the same had mothers in professional job. Considering the total score obtained by the participants, 30/30 (100% correct responses) was scored by 4% of the participants (Table 1). The mean total knowledge, attitude and practice (KAP) score was 90.53%. The correlation of mean KAP score with gender, age, paternal and maternal education categories was done by ANOVA test. But there were no statistically significant differences noted ($p > 0.05$).

Table 1: Total score obtained by the participants N = 100 Total marks 30

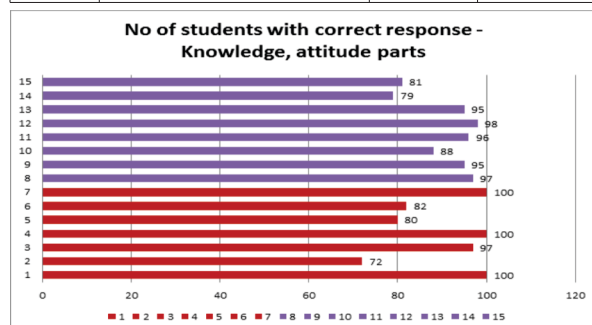
Total score	30 (100 %)	29 (96.66 %)	28 (93.33 %)	27 (90 %)	26 (86.66 %)	25 (83.33 %)	24 (80 %)	23 (76.6 %)	21 (70 %)
Frequency (%)	4 (4%)	23 (23%)	23 (23%)	17 (17 %)	17 (17%)	07 (07%)	06 (06 %)	01 (01%)	02 (02 %)

Knowledge component:

Highest score was 7 out of 7. Forty five percent of the participants scored 100% in this part. Ninety nine respondents scored more than 4 out of 7(57.14%). Only one student got score of 4/7. The mean score in knowledge was 89.42%. Ninety seven percent students were aware of the hazards of antibiotics use during pregnancy (Table 2, Figure 1)

Table 2: Knowledge and attitude of antimicrobials use among the study participants N = 100

S. no.	Question on antimicrobials (correct response)	Number of correct responses	Percentage of correct responses
	Knowledge component		
1	Human skin & oral cavity contains commensal bacteria (yes)	100	100%
2	Antimicrobial prescription requires antimicrobial sensitivity tests (yes)	72	72%
3	All antimicrobials are safe during pregnancy (no)	97	97%
4	Proper duration & dosage – a must for antimicrobial therapy (yes)	100	100%
5	Acne is a bacterial infection (yes)	80	80%
6	Bacteria cause common cold and flu (no)	82	82%
7	Probiotics are derived from microbes (yes)	100	100%
	Attitude component		
8	Doctors' prescription is essential for antimicrobial therapy (agree)	97	97%
9	Unprescribed antimicrobials are available in Indian pharmacies (agree)	95	95%
10	Proper legislation of drug sale will eliminate over the counter antimicrobial sale (agree)	88	88%
11	Proper dosage and duration of antimicrobials leads to resistance (disagree)	96	96%
12	Abuse of antimicrobials leads to antimicrobial resistance (agree)	98	98%
13	Missing antimicrobial dose affects efficacy (agree)	95	95%
14	Newer and expensive antimicrobials are more effective (disagree)	79	79%
15	After initiation of antimicrobials, asymptomatic state is an indication for stoppage (disagree)	81	81%

**Figure 1: Correct response distribution of knowledge and attitude on antimicrobials among the study participants****Attitude component:**

Highest score was 8 out of 8. Forty nine percent of the participants scored 100% and 39% scored 87.5% in this part. Ten students scored

between 50% and 62.5%. Ninety eight respondents scored more than 50%. Only 2 students got score of 4 out of 8 (50%). The mean score in attitude was 91.12%.

Antimicrobial use practice:

Highest score desirable was 15. Totally 29 out of 100 participants scored 100%. Ninety four of them scored more than 11 out of 15 (73.33%). Only 4% of students got 11/15 marks and one each scored 9/15 and 7/15 in the practice component. The mean score in practice was 90.39%.(Table 3)

Table 3: Practice of antimicrobial use among the study participants N = 100

S.no.	Question on practice of antimicrobial use	Number of participants responded as ALWAYS (%)	Number of participants responded as FREQUENT (%)	Number of participants responded as NEVER (%)
1	How often have you suffered from infectious diseases in the past one year?	03 (03%)	56 (56%)	41 (41%)
2	How often you take antibiotics at the earliest stage for sneezing and cold?	05 (05%)	25 (25%)	70 (70%)
3	How often you had self medication with antibiotics in recent time?	02 (02%)	26 (26%)	72 (72%)
4	How often you had side effects from broad spectrum antibiotic use?	00	08 (08%)	92 (92%)
5	How often you request your consultant to prescribe antimicrobials when it is actually not needed?	02 (02%)	04 (04%)	94 (94%)

DISCUSSION:

This study surveyed 100 second year MBBS students of a tertiary care setting and assessed their knowledge, attitude and practice of antimicrobial use. Majority (75%) of the respondents were in age group 20 - 21 years. Only 16% of the study respondents' parents were in health related jobs. This is comparable to the finding observed by Gupta et al, who reported that 32.3% of participants' parents and relatives worked in health related field⁽⁵⁾. This could possibly be explained by the variations in affordability to higher education and socio economic background of study subjects' parents.

The mean Knowledge, Attitude and Practice Total (KAP) score of this study is 90.53% which is higher than the same observation as 74.4% by Hemant Kumar Dutt et al⁽⁶⁾. This could possibly be explained by the differences in factors that influence learning, morals, behaviour and self medication among the study population.

Overall knowledge on antimicrobials and anti microbial resistance is good to excellent in this study. The mean score in knowledge component is 89.42% in the present study whereas the same was found as 70%, 65% and 55% by Jha et al, Jairoun et al and Gupta et al, respectively^(7,1,3). The variations could possibly be explained by variations in the process of admission to medical colleges, geographical settings, sample size and medical curricula.

In this observation, 82% students are aware that bacteria do not cause common cold and flu. The same rate was reported as 94%, 77.3%, 77.14% and 71.01% by Rekha et al, Khan et al, Shanmukananda et al and Padmanabha et al respectively^(8,9,10,11).

The present study finds that the mean score in attitude is 91.12% among the respondents and 98% scored $\geq 62.5\%$. This is in agreement with the finding by Sharma et al, and Zulu et al who reported that 98% and 96.9% of the medical students had positive attitude towards anti microbial susceptibility and regulated antibiotic use^(12,13) respectively.

This study reveals that 88% of respondents believe that proper legislation of antimicrobial sale will eliminate over the counter (OTC) antimicrobials. This is in congruence with the report of Higuaita-Gutierrez et al, (91.9%)⁽¹⁴⁾. This could possibly be explained by the degree of exposure and sensitization of the respondents towards the topic of drug sale regularization, legislation and restriction by law.

Practice of antimicrobial use:

In this observation, 70% respondents do not practise self intake of antimicrobials at the earliest stage of flu and cold. Self antibiotic medication among the students is only 28% which reflects good behaviour and low antibiotic dependency of students in this setting when compared to others (Table 4).

Table 4: Summary of practice of antimicrobial use in literature compared to the present study

No self intake of antibiotics at the earliest stage for flu and cold		Self antibiotic therapy for any illness in recent time		No demand of antimicrobials from the consultant when not needed	
Present study	70%	28%		94%	
Kumar et al(15)	41.3 %	Gupta et al(5)	25%	Asha Rani et al(17)	91.8%
Sharma et al(12)	42.9 %	Hemant Kumar Dutt et al(6)	26.31 %	Mukharjee et al(16)	84.6%
Zulu et al(13)	52.7 %	Mukharje et al(16)	28%		
Khan et al(9)	61.9 %	Asha Rani et al(17)	30.5%	Kanneppady et al(20)	54%
Mukharjee et al(16)	79%	Patil et al(18)	34%		
Hemant Kumar Dutt et al(6)	<50%	Kumar et al(15)	39.3%	Zulu et al(13)	50.4%
		Sandhu et al(19)	46%		

CONCLUSION:

This research elucidates that the students of this setting have better knowledge, attitude and practice towards antimicrobials which could be attributed to the guidance from faculty and learning associated with AETCOM training.

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