

www.jmscr.igmpublication.org

Impact Factor (SJIF): 6.379

Index Copernicus Value: 79.54

ISSN (e)-2347-176x ISSN (p) 2455-0450

crossrefDOI: <https://dx.doi.org/10.18535/jmscr/v6i8.32>



Journal Of Medical Science And Clinical Research

IGM Publication

An Official Publication Of IGM Publication

Original Research Article

Knowledge, Attitude and Practice of Antibiotic Use and Resistance among Second Year Medical Students in a Teaching Hospital

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Abstract

Awareness on the seriousness of antibiotic resistance is the first step towards curtailing its progress. Instructional and educational campaigns among medical students regarding this can help in particular as they are the future health care providers. ^[1] This study was done to assess the knowledge, attitude and practice of antibiotic use and resistance among undergraduate medical students so that teaching methods can be modified to inculcate and promote safe clinical practice culture in them, thereby enhancing patient safety. 173 second year medical students of a teaching hospital in South Kerala were given a modified 20 item pretested questionnaire to assess the knowledge, attitude and practice of antibiotic use and resistance after getting their informed consent. Each correct response was given a score of 1 and responses were graded. Data collected was statistically analysed using Microsoft Excel 2010 and results were expressed in proportions. Age ranged from 19 to 23 years. 58.3% were females. Knowledge scores were high in 96.5%. Good attitude was seen in 58% and the practice scores were excellent in 42.1%. Good knowledge, Positive attitude and good practices were noticed among undergraduate Medical students towards antibiotic use and resistance. However, more training programs and educational interventions should be done to further improve their knowledge, attitude and practice regarding this topic so as to ensure rational drug use in their future clinical practice.

Keywords: Antibiotic resistance, Antibiotic Use, Knowledge, Attitude, Practice.

Introduction

Antimicrobial resistance is a global health security threat that requires concerted cross sectional action by the Government and society as a whole ^[2]. It is commonly due to over use, misuse and indiscriminate use of antimicrobials by those

working in the medical field and also due to noncompliance and self-medication by patients. About 70-80 % of antibiotic prescriptions are unnecessarily prescribed by the health professionals^[3]. The threat of antimicrobial resistance is rapidly progressing and intensifying

.The awareness on its seriousness and significance is the first step towards curtailing its progress. Various approaches have been taken worldwide to meet the challenges. One of the approaches commonly suggested is to conduct instructional and educational campaigns on “the correct use and prescription of antimicrobial drugs” to the general population and health care professionals [4-6]. In particular it is desirable to focus on the new generation health care professionals, as they are the future health care providers. [1] This study was therefore planned to assess the knowledge, attitude and practice of antibiotic use and resistance among undergraduate medical students so as to modify the teaching methods to inculcate and promote rational and safe clinical practice culture in them, thereby enhancing patient safety.

Methods

A cross sectional study was carried out among 173 second year medical students of a Teaching hospital in South Kerala to assess the Knowledge, attitude and practice of antibiotic use and resistance among them. Institutional Human Ethics Committee approval was obtained prior to the study. A Pretested, modified 20 item structured questionnaire^[7-12] with dichotomous options prepared from published studies, was used to collect the data from students after obtaining their consent. The students were requested to spare half an hour after their classes. After explaining the details of the study, they were asked to fill in the response to each item according to the response format in the questionnaire, without disclosing their identity in any form. Filled up questionnaires were collected for statistical analysis.

Knowledge on antibiotic use and resistance was assessed by 7 specific questions as follows: (Q1) Antibiotics are powerful medicines that kill all microbes. (Q2) Super infection is an adverse effect of antibiotic use. (Q3) Antibiotic resistance is a phenomenon by which bacteria loses its sensitivity to an antibiotic. (Q4) Indiscriminate use of antibiotics leads to emergence of antibiotic

resistance. (Q5) Antibiotic should be taken for all cases of common cold and cough. (Q6) The effectiveness of a treatment is reduced if full course of antibiotic is not completed. (Q7) Antibiotic treatment can be stopped once the symptoms are improved. Each correct response was given a score of 1. The maximum total score was 7. Responses were graded as follows:

- Score 0 -- Knowledge Nil
- 1-3 --- Poor Knowledge,
- 4-6 --- Good Knowledge,
- 7 --- Excellent Knowledge,

Attitude towards antibiotic use and resistance

It was assessed by 6 specific questions as follows: (Q1) Do you think antibiotics should be prescribed for all cases of fever? (Q2) Do you think skipping one or two doses of antibiotics leads to antibacterial resistance? (Q3) Do you think antibiotics should be prescribed only after culture and sensitivity report? (Q4) Do you think all antibiotics should be given as injection irrespective of severity of illness? (Q5) Do you think adverse effects can be reduced by using more than two antibiotic at a time? (Q6) Do you think more expensive medicines will be more effective? A score of 1 was given for each correct response. The maximum total score was 6. Responses were graded as follows:

- Score 0---Attitude nil.
- 1-2--- Poor Attitude
- 3 -4--- Good Attitude
- 5--6 -- Excellent Attitude

Practice of antibiotic use and resistance: It was assessed by 7 specific questions. (Q1) Do you consult a doctor before starting antibiotics? (Q2) Do you take the full course of antibiotics prescribed by the doctor? (Q3) Do you stop taking antibiotics when you start feeling better? (Q4) Do you check the expiry date of antibiotics? (Q5) Have you ever prescribed antibiotics to your relatives? (Q6) Do you buy antibiotics without a prescription from the doctor? (Q7) Do you keep

left over medicine for future use? Correct response was given a score of 1. The maximum total score was 7. Responses were graded as follows:

- Score 0--Practice Nil.
- 1--3--- Poor Practice
- 4---6 ---Good Practice
- 7 -- Excellent Practice

Data collected was analysed using Microsoft Excel 2010 and results were expressed in proportion.

Results

173 questionnaires were analysed. The age group of the study population ranged from 19 to 23 years. 58.3% were females. 27.1% students had a wrong impression that antibiotics were powerful medicines that can kill all microbes. 83.8% were aware that super infection is an adverse effect of antibiotic use. 90.1% knew that antibiotic resistance is a phenomenon by which bacteria loses its sensitivity to that antibiotic. 95.9% were aware that indiscriminate use of antibiotics leads to emergence of antibiotic resistance. 91.9% knew that antibiotics should not be taken for all cases of common cold and cough. 93.6% knew that the effectiveness of a treatment is reduced if full course of antibiotic is not completed. 89% felt that antibiotic treatment should not be stopped once the symptoms are improved. 94.2% were aware that antibiotics are not mandatory for all cases of fever. The fact that skipping one or two doses of antibiotics can lead to antibacterial resistance was known to 42.7% students only. 41.6% students were of the opinion that antibiotics should be prescribed only after getting the culture and sensitivity report. 6.3 % had a wrong impression that all antibiotics should be given as injection irrespective of severity of illness. 47.3% were of the opinion that adverse effects can be reduced by using more than two antibiotics at a time. 90.7% knew that effectiveness of a medicine was not based on its cost and that more expensive medicines were not more effective. 91.9% admitted that they always consulted a doctor

before starting antibiotics and 84.9% agreed that they used to take the full course of antibiotics prescribed by the doctor. 76.3% admitted that they did not stop taking antibiotics when they felt better. 91.9% checked the expiry date of antibiotics before they used it. 25.4 % admitted to having prescribed antibiotics to their relatives. 67.6% agreed that they bought antibiotics only with a prescription from the doctor. 31.7% admitted that they kept left over medicine for future use. (Table 1).

Table 1: Frequency and proportion of study population showing the correct response to the questionnaire

Qns	Correct response	Frequency (%)
Questions on Knowledge		
Q1	False	126 (72.8)
Q2	True	145 (83.8)
Q3	True	156 (90.1)
Q4	True	166 (95.9)
Q5	False	159 (91.9)
Q6	True	162 (93.6)
Q7	False	154 (89)
Questions on Attitude		
Q1	No	163 (94.2)
Q2	Yes	74 (42.7)
Q3	Yes	72 (41.6)
Q4	No	162 (93.6)
Q5	Yes	82 (47.3)
Q6	No	157 (90.7)
Questions on Practice		
Q1	Yes	159 (91.9)
Q2	Yes	147 (84.9)
Q3	No	132 (76.3)
Q4	Yes	159 (91.9)
Q5	No	129 (74.5)
Q6	No	117 (67.6)
Q7	No	118 (68.2)

{Q-- Question (All questions as mentioned in Methods)}

Figure 1 depicts the knowledge scores among the study population. 96.5% had knowledge scores ranging from good to excellent regarding antibiotic use and resistance. 58% of the students had good attitude towards use of antibiotics and resistance as shown in figure 2. The attitude in 37% students were excellent. However 8 students showed poor attitude (Figure 2). The practice

scores ranged from good to excellent in 42.7% and 42.1% respectively and it was absolutely nil in 2 students as shown in figure 3.

Figure 1: Knowledge score among the study population

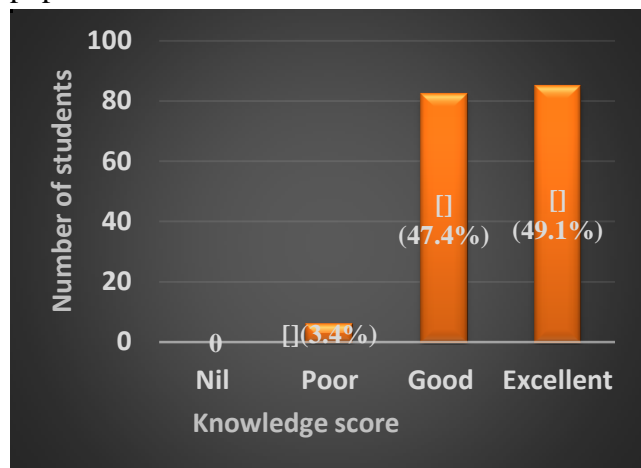


Figure 2: Percentage distribution of study population based on attitude score

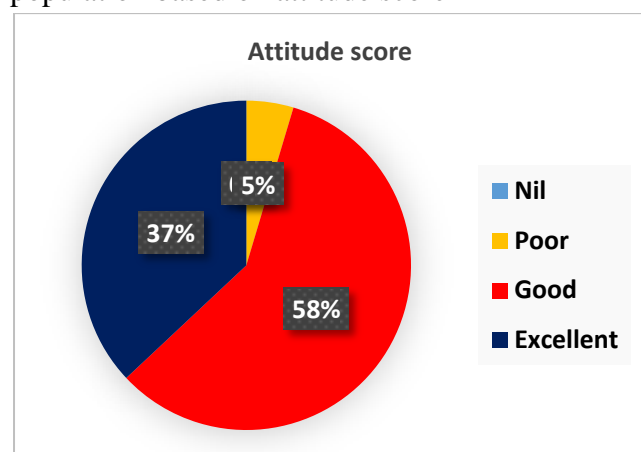
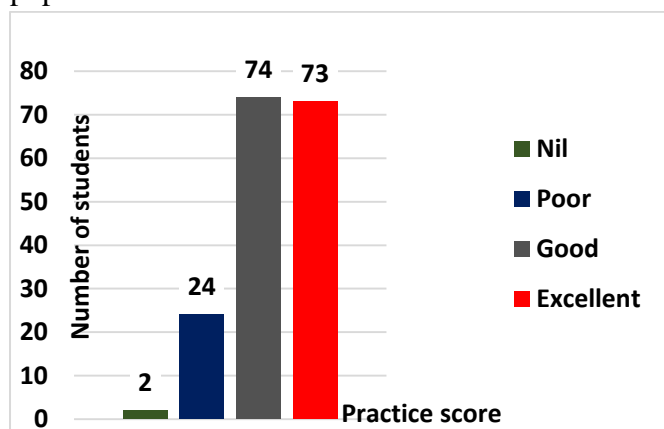


Figure 3: Frequency distribution of study population based on Practice scores



Discussion

Antibiotics are one of the common medications used in clinical practice. Unfortunately, they are often misused too. Injudicious use of these drugs have led on to antimicrobial resistance, [7, 13] which is now emerging as one of the greatest health care challenges globally. Antimicrobial resistance can result in prolonged morbidity, increase hospital stay and increase mortality^[8,14] All these can lead to increased hospital costs and financial burden to families and society^[8,15] Awareness regarding seriousness and significance of antimicrobial resistance is essential to initiate curtailing measures against it and also to promote rational drug use. Educational campaigns highlighting rational prescribing practices and proper usage of antibiotics should be targeted towards medical and non medical personnel on a regular basis to reduce the incidence of antimicrobial resistance. Undergraduate and post graduate medical students should be particularly trained on such rational prescribing practices as they are the future torchbearers^[9] in rendering safe clinical practices to society. To enhance the strength of such training programs, an idea about their knowledge, attitude and practices towards antibiotic use and resistance is essential. Hence, this study was undertaken among the second year medical students of a teaching hospital in South Kerala.

In this study, 173 questionnaires obtained from second year medical students between the ages of 19-23 years were analysed. 58.3% were females. Out of the 7 questions which assessed knowledge, negative response was taken as the correct option for question numbers 1, 5 and 7. 27.1% students had a wrong impression that antibiotics were powerful medicines that can kill all microbes. In a similar study conducted by Tajuddin Shaik and Bikash Ranjan Meher^[9] at Bhubhaneswar among dental students, only 18.75% students (second year) knew that Superinfection was an adverse effect of antibiotic use. In our study, 83.8% were aware of this. More than 90% of the students in our study knew that indiscriminate use of

antibiotics leads to emergence of antibiotic resistance and the effectiveness of a treatment is reduced if full course of antibiotic is not completed. They also knew that antibiotics should not be stopped once the symptoms are improved and antibiotics are not needed for all cases of common cold and cough. These findings were consistent with the findings in the study by Apoorva et al^[7]. In the present study, only about 40% knew that skipping few doses of antibiotics can lead to antibacterial resistance. This was in accordance with the study done by Afzal Khan AK et al^[10] whereas 71.87% and 68.61% were aware in the studies by Apoorva et al^[7] and Manali Mahajan et al^[11]. Majority knew that effectiveness of an antimicrobial agent was not directly proportional to its cost. In accordance with other studies^[7, 10-12], in this study also, students agreed that they took antibiotics only after consulting a doctor and completed the full course also as prescribed. 25.4% admitted that they prescribed antibiotics to their relatives in this study as against 12.5% in the study by Apoorva et al^[7]. This is not ethical as they are not qualified and are not supposed to do so. More training programs may be conducted to increase the awareness regarding this among students. 31.7% admitted that they kept left over medicines for future use as against other studies^[7, 11] where it was 7.29% and 24.41% respectively. Overall, Knowledge, attitude and practice regarding antibiotic resistance and use among second year medical students in this study was good.

Conclusion

This study has shown that there is good knowledge, positive attitude and good practice among undergraduate Medical students towards antibiotic use and resistance. However, steps must be taken to modify curriculum and implement related training programs to enhance rational drug use.

Acknowledgement: We are thankful to all the Medical students who have voluntarily participated in the study.

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