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RESEARCH ARTICLE

Attitude and perceptions of fifth term medical students of Gulbarga Institute of Medical Sciences, Kalaburagi, regarding teaching methods and their learning in pharmacology

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ABSTRACT

Background: Pharmacology, like any other branch of medicine, is progressing by leaps and bounds. Consequently, reforms in undergraduate teaching are the need of the hour. **Aims and Objectives:** To determine the medical students' perception and receive feedback on teaching and learning of pharmacology in our institution. **Materials and Methods:** This was a cross-sectional study based on the questionnaire. A pre-validated and pre-designed questionnaire containing 14 points was administered to fifth term medical students. The 2nd year students were enrolled for the study at their end of the fifth term before university examinations. **Results:** About 78% wanted the faculty members to make more use of audio-visual aids for effective learning. Only 25% participants felt rabbit eye experiments were appropriate and relevant to the present days of practical pharmacology reflecting a need for reforms. 30% of the students were willing to consider pharmacology as one of the subjects for postgraduation. 70% of the students agreed that calculation of pharmacokinetic parameters (e.g. Vd, t1/2, clearance) was relevant and helped in better understanding of general pharmacology. **Conclusion:** The results of our study revealed a positive feedback from students which will help in making the teaching program in pharmacology more interesting and relevant.

KEY WORDS: Questionnaire; Pharmacology; Feedback; Teaching; Learning; Perception

INTRODUCTION

Pharmacology is one of the most important subjects in medical curriculum, which is ever expanding. The primary goal of teaching Pharmacology subject is to impart knowledge about drugs to the medical students so that they will be in position to take right therapeutic decisions in their future clinical practice. However, this main objective is neglected and the prevailing curriculum lacks its importance.[1] Students' perceptions comprise an assortment of effective methodologies for improvement on teaching basic sciences related to clinical professions such as pharmacology in health education.[2,3] Teaching and learning in pharmacology is in a constant stage of reformation, being driven by various pressures like pressure from within the discipline itself, from professional bodies, students, as well as due to changes in teaching style.[4] Pharmacology subject, although crucial for physicians, is perceived as dry and volatile by medical students.[5] Due to content overload, students often find it difficult to remember and recall the pharmacological terms, concepts, and drug names in the subject.[6] Students' feedback would probably reveal whether the so-called reforms are acceptable to them and their opinion for the betterment of teaching/learning pharmacology subject.[7]

Pharmacology is a medical science that forms a backbone of the medical profession as drugs form the cornerstone

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of therapy in human diseases. Therefore, it is of utmost importance to describe the pharmacological basis of therapeutics to maximize the benefits and minimize the risks of drugs to the recipients.[8] The primary objective of teaching pharmacology is to enable undergraduate students to take rational therapeutic decisions in clinical practice.[9] Pharmacology is a crucial discipline for medical students who are going to be future doctors. It is important that medical students appreciate pharmacological principles and are able to apply them in the practice of medicine.[10] There is a growing awareness that learner's views of their educational experiences are valuable in assessing the effectiveness of courses and teaching methods.[11] Furthermore, reviewing the teaching program at regular intervals and modifications in the methodologies of imparting knowledge is a must. Hence, to assess the strength of the pharmacology curriculum and students' learning experience, collection of the students' feedback is important so that necessary reforms can be implemented for the betterment of teaching/learning of the subject. Teaching methods in medical education evolved rapidly in the past three decades. Many reforms are being made in pharmacology curricula and teaching-learning methodologies to best suit medical students' learning. There is a shift from mere didactic lectures to the usage of audio-visual aid-based lectures and computer-based learning.

The relevance of conventional pharmacology practical exercises such as dispensing pharmacy and experimental pharmacology was always questioned and criticized.[12] Regulations by the Medical Council of India resulted in more emphasis being laid on clinical aspects which led to incorporation of clinical pharmacology exercises, problem-based learning, case-based learning, integrated teaching, microteaching, student seminars, and pharmaceutical industry visits into the curriculum.[13]

There is growing awareness that students' views and opinions are most valuable in assessing the effectiveness of teaching methods.[11] Feedback from students serves as an effective tool in designing and developing teaching methodologies and evaluation methods. Implementation of suggestions obtained from students in the form of feedback results in improvement of their academic performance.[14] The present study is a step to obtain feedback from students about teaching-learning methodologies and evaluation methods so that necessary modifications can be done for better outcomes in students and to make teaching more effective and enable students to learn better.

Questionnaires offer an objective means of collecting information about people's knowledge, beliefs, attitudes, and behavior.[15,16] Howitt and Cramer[17] stated that questionnaires should be validated, reliable, and should be standardized. A standardized questionnaire is one that is written and administered, so all participants are asked the precisely same questions in an identical format and responses recorded in a uniform manner.[18] The present study questionnaire is obtained from the minor modifications. The questionnaire was designed after the minor modifications of the questionnaires gathered from previous similar studies.[19] The questionnaire was analyzed and validated by experienced faculties. The study protocol was examined and validated by conducting pilot study for its readability, aspects of understanding, reliability, and comprehensiveness. The revised curriculum places a strong emphasis on self-directed learning. Understanding current perceptions held by future medical practitioners regarding pharmacology and its role in both research and clinical practice may be helpful for improving teaching on this subject and introducing appropriate changes into the curricula where and when necessary. In view of this, the present study was conducted to determine the perception and feedback of teaching/learning pharmacology using a pre-validated questionnaire.

MATERIALS AND METHODS

This was a questionnaire-based study assessing the attitude, perceptions of the students. The study was conducted at the Department of Pharmacology at Gulbarga Institute of Medical Sciences, Kalaburagi. The 2nd year students were enrolled for the study at their end of the fifth term before university examinations. Prior permission was obtained from the Institutional Ethics Committee. A questionnaire containing 14 questions was given to each student, and they were asked to mark to the best of their knowledge. The questionnaire was based on previous studies undertaken on the evaluation of perception and feedback of teaching/learning in pharmacology, and it was suitably modified for our fifth term medical students. The completed questionnaire was collected and data were analyzed. Totally, 115 students were participated in the study. Hence, we have analyzed the responses of 115 participants.

Statistical Analyses

Data were analyzed and presented as counts and percentages.

RESULTS

In our study, 84% of the students were of the opinion that lectures were more helpful in acquiring the knowledge. Majority of the students (78%) wanted the faculty members to make more use of audio-visual aids for effective learning [Table 1]. They particularly stressed on the use of video clips for better understanding of the mechanism of action of different drugs.

In Table 2, it is seen that majority of the subjects (70%) felt that calculation of pharmacokinetic parameters (e.g., volume of distribution, half-life) in the practicals was relevant and helped

them in better understanding of general pharmacology system. From Table 2, it is clear that 67% of the students were of the opinion that rabbit eye experiment charts have enabled them to analyze given condition and know the drugs causing it.

From Table 3, it is observed that 68% of the students were of the opinion that participation in group discussions will enhance their subject understanding. 90% of the students believed that spotters exercise has stimulated their interest in the learning of pharmacology.

DISCUSSION

In our present study, 84% of the students opined that lectures were more helpful in acquiring the knowledge. About 78% of the students inferred that making more use of audio-visual aids will enhance their learning. Majority of 80% of the students opined that interactive learning like asking questions during pharmacology classes boosts their level of understanding. Only 25% of our students found rabbit eye experiments to be appropriate and relevant to the present days of practical pharmacology. About 80% of students in the current study felt that discussion of graphs has helped us in better understanding of mechanism of action of the drugs. Very few students (30%) wished to consider pharmacology as one of the subjects for postgraduation. 84% of the students were of the opinion that pictures showing the adverse drug reactions and their clinical correlation explained with liquid crystal display projector lectures were more interesting. Majority of 85% of the students agreed that their participation in poster presentation exercise increased their subject knowledge and innovative ideas. In the current study, it was observed that 89% students agreed that pharmacology is more closely integrated with the clinical sciences and real cases from hospitals should be used during stimulated learning problems.

In the present study, 68% of students opined that wanted group discussions to be introduced which was significantly more than the findings of Jai *et al.*[7] who reported only 31%. Majority of students 68% in our study agreed that pharmacology was their favorite subject which is in agreement with 36% reported by Jai *et al.*[7] This is in agreement with the findings from other studies conducted in New Delhi, where 80.46% students and 87.50% were in favor of the bedside teaching of clinical pharmacology.[20] Based on these findings, we feel that students should be taken toward for discussion of treatment protocols of various admitted cases. To make the subject more clinically oriented, we need to introduce more therapeutic problems. It is possible that students' interests are biased toward clinical sciences rather than fundamental sciences. Several reports have pointed out that this may in part be due to students' apathy about the enormous challenge of learning about the majority of drugs. It appears that there is a stigma attached to the study of pharmacology[21] and the students' interests appear more biased toward clinical careers with prospective earnings far better than pharmacology careers.[22] They wanted all the practical exercises to be more clinical oriented and if possible replace the animal experiments with the computer simulation techniques.

The strengths from our study were positive outcomes from the students to participate in poster presentations, quiz competitions, group discussions, and spotters exercise. All the teaching-learning modalities helped them to enhance the understanding of the subject. From our study, additional feedback included that mnemonics should be more frequently used for the classification and adverse reactions of the drugs, for better remembrance. Some of the students also opined that pharmacology teaching should be more closely integrated with other subjects such as microbiology and pathology for better understanding of the subject. The limitations of the present study are that the results obtained may not be applicable to all the medical students because these findings are based on a single center study from Karnataka. More multicentric studies need to be carried out among the medical students to draw more meaningful conclusions. The teaching and learning of

Table 1: Students' perceptions regarding teaching methodologies

Perceptions	Yes (%)	No (%)
Lectures were more helpful in acquiring the knowledge	97 (84)	18 (16)
Making more use of audio-visual aids will enhance our learning	90 (78)	25 (22)
Discussion of subject in tutorial classes has increased our understanding of the subject	75 (65)	40 (35)
Interactive learning like asking questions during pharmacology classes boosts our level of understanding	92 (80)	23 (20)

Table 2: Attitude and perceptions toward pharmacology teaching and learning by the students

Items	Disagree	Neutral	Agree
Rabbit eye experiment charts have enabled us to analyze given condition and know the drugs causing it	69 (60)	17 (15)	29 (25)
Discussion of graphs has helped us in better understanding of mechanism of action of the drugs	12 (10)	12 (10)	92 (80)
Calculation of pharmacokinetic parameters (e.g., Vd, t1/2, clearance) was relevant and helped in better understanding of general pharmacology	9 (08)	25 (22)	81 (70)
Pictures showing the adverse drug reactions and their clinical correlation explained with LCD projector lectures were more interesting	4 (3)	15 (13)	97 (84)

LCD: Liquid crystal display

Table 3: Perceptions and practices toward pharmacology teaching and learning by the students

Perceptions	Yes (%)	No (%)
Participation in group discussions will enhance our subject understanding	78 (68)	37 (32)
Spotters exercise has stimulated our interest in the subject	104 (90)	11 (10)
Our participation in poster presentation exercise increased our subject knowledge and innovative ideas	97 (85)	17 (15)
Participation in quiz will enhance our pharmacology understanding and boosts our subject learning	89 (78)	25 (22)
Pharmacology is my favorite 2nd year subject	71 (62)	43 (38)
I will consider pharmacology as one of my subject for postgraduation	34 (30)	80 (70)

pharmacology can be improved and a closer integration with the clinical disciplines is required. Problem-based learning should be strengthened and real cases from the hospital should be used during the sessions. This study has helped us in knowing the student preferences regarding pharmacology teaching and its outcomes would be helpful in modifying undergraduate pharmacology teaching pattern.

CONCLUSION

The study revealed the perception and feedback of the students regarding learning pharmacology was positive and constructive. The study also revealed the priority areas for improvement. It is important to know what our students need and whether they feel comfortable with the ever-expanding course and limited duration of time. Regular feedbacks may help teachers to plan the curriculum and improve the teaching for undergraduate students.

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