

Original Research Article

# A study on the evaluation of medical students' perception and feedback of teaching-learning of pharmacology in a medical college

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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.

**Objectives:** To determine the medical students' perception and receive feedback on teaching and learning of pharmacology in our institution.

**Material and Methods:** This was a cross-sectional study based on the questionnaire. A pre-validated, predesigned questionnaire containing 23 points was administered to fifth term medical students.

**Results:** 73.43% wanted the faculty members to make more use of Audio-Visual aids for effective learning. 98.43% students wanted to include case based learning in the curriculum and 90.62% students wanted more of the clinical pharmacology to be introduced in the curriculum. 70% participants wished recent advances to be included in the curriculum and almost 80% were in favour of MCQs to be included in assessment of their academic performance. Only 26% participants felt rabbit eye experiments was appropriate and relevant to the present days of practical pharmacology reflecting a need for reforms. Only 10.93% students were willing to consider pharmacology as one of

the subject for post-graduation. About 25% students felt the ideal teaching method for learning pharmacology was didactic lectures and group discussions and 81% thought the ideal teaching/learning media for pharmacology was the combination of LCD projector and blackboard. The most difficult system to understand was Autonomic Nervous System (53%).

**Conclusion:** The study revealed the perception and feedback of the students regarding learning pharmacology were positive and constructive. It also revealed the priority areas for improvement.

## Key words

Medical students, Teaching, Learning, Perception, Pharmacology.

## Introduction

Pharmacology is one of the most important subjects in medical curriculum, which is ever expanding. As a result various teaching-learning methods are used worldwide. Each one has its own advantages and disadvantages [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].

Pharmacology, like any other branch of medicine, is progressing by leaps and bounds. Consequently, reforms in undergraduate teaching are the need of the hour. It is generally agreed that reviewing the teaching program at regular intervals and modifications in the methodologies of imparting basic knowledge about drugs and drug therapies is a must. Many attempts have been made by various colleges all over India and abroad to make the teaching of pharmacology more interesting and relevant. 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].

Questionnaires offer an objective means of collecting information about people's knowledge, beliefs, attitudes and behaviour [8, 9]. Howitt D and Cramer D [10] 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 [11].

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 among 2<sup>nd</sup> M.B.B.S. (fifth term) students by Department of Pharmacology at Basaveshwara Medical College and Hospital, Chitradurga.

## Material and methods

This was a cross-sectional study based on the questionnaire. The study was carried out by the Department of Pharmacology at Basaveshwara Medical College and Hospital, Chitradurga on

15<sup>th</sup> July 2015. Prior permission was obtained from the Institutional Ethics Committee. A questionnaire containing 23 questions were given to each student and they were asked to mark single best suitable option. (**Annexure - 1**) Students were instructed not to reveal their identity in the questionnaire. Thirty minutes was the time allotted for answering the questionnaire. 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 was analyzed.

Totally 69 students participated in the study, out of which 5 questionnaires were incomplete and eliminated while evaluating the results. So, we analyzed the data of 64 participants. All the questionnaires were manually checked for the completeness and then coded for entry in Microsoft Excel sheet. Analysis was done using Statistical Package for Social Sciences (SPSS), version 20. The results were expressed using appropriate statistical variables.

## **Results**

There was 38 female students and 26 male students who participated in the study. Majority of the students were from Karnataka Common Entrance Quota (K-CET) quota i.e. 43.75%. The majority (65%) of the parent(s) of the students were non-medical professionals. (**Table - 1**)

Only 10.93% of the students wanted an increase in the number of lecture classes. Majority of the students (73.43%) wanted the faculty members to make more use of Audio-Visual aids for effective learning. They particularly stressed on the use of video clips for better understanding of mechanism of action of the drugs. 98.43% students wanted to include case based learning in the curriculum and 90.62% students wanted more of the clinical pharmacology to be introduced in our present day curriculum. 82.81% students were in favour of introducing Group Discussions as a teaching-learning method. (**Table - 2**)

About 76.56% students felt our pharmacology lectures interesting and stimulating. Only 28.12% students agreed to pharmacology as their favourite 2<sup>nd</sup> M.B.B.S. subject. 89.06% students wished pharmacology to be more closely integrated with the clinical sciences and wanted real cases in hospital to be used during Problem Based Learning (PBL). About 40.62% subjects felt that Pharmacology had helped them to develop problem solving and logical-reasoning skills. 70% participants wished recent advances to be included in the curriculum and almost 80% were in favour of Multiple Choice Questions (MCQs) to be included in the assessment of their academic performance. Only 26% participants felt rabbit eye experiments was appropriate and relevant to the present days of practical pharmacology reflecting a need for reforms. (**Table - 3**)

Majority of the subjects (67%) felt that calculation of pharmacokinetic parameters (e.g. Volume of distribution, half-life, and therapeutic index) in the practicals was relevant and helped them in better understanding of General pharmacology system. Nearly 95% students felt Pharmacovigilance problems (in practical pharmacology) had helped them in better understanding of ADRs justifying its inclusion in the curriculum. Only 10.93% students were willing to consider pharmacology as one of the subject for post-graduation. (**Table - 3**)

About 25% students felt the ideal teaching method for learning pharmacology was didactic lectures and group discussions. Most students (81%) felt the ideal teaching/learning media for pharmacology was the combination of LCD projector and blackboard. The most difficult system to follow and understand was Autonomic Nervous System (53%) followed by Cardiovascular system (20%). (**Table - 4**)

## **Discussion**

Pharmacology, like any other branch of medicine, is progressing by leaps and bounds. Consequently, reforms in undergraduate teaching

are the need of the hour. It is generally agreed that reviewing the teaching program at regular intervals and modifications in the methodologies of imparting basic knowledge about drugs and drug therapies is a must. In view of this, the present study was conducted to determine the

perception and feedback of teaching/learning pharmacology using a pre-validated questionnaire among 2<sup>nd</sup> M.B.B.S. (fifth term) students by Department of Pharmacology at BMC&H, Chitradurga.

**Table - 1:** Demographic variables of the participants.

Demographic variables	Category	Frequency	Percentage
<b>Gender</b>	Male	26	40.62
	Female	38	59.37
<b>Student quota</b>	#K-CET	28	43.75
	*COMED-K	25	39.06
	MANAGEMENT	11	17.18
<b>Profession of Parent(s)</b>	Medical	12	18.75
	Non-medical	52	81.25

#K-CET – Karnataka Common Entrance Test, \*COMEDK - Consortium of Medical Engineering and Dental Colleges of Karnataka

**Table - 2:** Students' opinion about changes recommended in teaching pharmacology.

Sr. No.	Opinion about changes recommended	Frequency	Percentage
1	Increase the number of lectures	7	10.93
2	Make more use of Audio-Visual aids	47	73.43
3	Introduce student Seminars	34	53.12
4	Introduce Case Based Learning (CBL)	63	98.43
5	Introduce more Clinical Pharmacology	58	90.62
6	Decrease the number of lectures	15	23.43
7	Introduce Group Discussions	53	82.81

In the present study, 98% students wanted Case Based Learning to be introduced into the curriculum against 73% reported by Jai Krishna, et al. [7] in a study done at MSDS medical college, Fatehgarh. About 82% students in the present study wanted group discussions to be introduced which was significantly more than the findings of Jai Krishna, et al. [7] who reported only 31%. 28% students in our study agreed that pharmacology was their favourite subject which is in agreement with 36% reported by Jai Krishna, et al. [7].

closely integrated with the clinical sciences and real cases from hospitals should be used during stimulated learning problems. This is in agreement with the findings from other studies conducted in New Delhi where 80.46% students and 87.50% were in favour of the bedside teaching of clinical pharmacology [12]. Based on these findings we feel that students should be taken to wards for discussion of treatment protocols of various admitted cases. To make the subject more clinically oriented we need to introduce more therapeutic problems.

In the current study it was observed that 89% students agreed that pharmacology is more

In our present study 70% students wished that recent advances to be included in the curriculum

and this is similar to findings by Jai Krishna, et al. [7] who reported 58%. About 80% of our students opined that MCQs be included in the assessment of their academic performance and Jai Krishna, et al. [7] reported that more than half (61%) were in favour of this reform. The reason that majority of the students wished MCQs to be included in the assessment might be because these students were somehow uncomfortable facing long and short essay questions and would rather prefer MCQs over essay questions for their assessment.

**Table - 3:** Perceptions and opinion towards pharmacology teaching and learning by the study subjects.

Sr. No.	Item	Disagree	Neutral	Agree
8	I find Pharmacology lectures interesting and stimulating	0 (0.0%)	15 (23.43%)	49 (76.56%)
9	Pharmacology is my favorite 2 <sup>nd</sup> year subject	10 (15.62%)	36 (56.25%)	18 (28.12%)
10	I would like Pharmacology to be more closely integrated with the clinical sciences and would like real cases in hospital to be used during Problem Based Learning (PBL)	0 (0.0%)	07 (10.93%)	57 (89.06%)
11	The subject has helped me to develop my problem solving and logical-reasoning skills	06 (9.37%)	32 (50%)	26 (40.62%)
12	The subject will help me immensely in choosing drugs rationally in my future clinical practice	02 (3.12%)	06 (9.37%)	56 (87.5%)
13	I wish recent advances be included in Pharmacology curriculum	02 (3.12%)	17 (26.56%)	45 (70.31%)
14	I would like MCQs to be included in the assessment	04 (6.25%)	09 (14.06%)	51 (79.68%)
15	I have come across various dosage forms in clinical postings and has helped me in better understanding of the subject	01 (1.56%)	28 (43.75%)	35 (54.68%)
16	Rabbit eye experiments is appropriate and relevant to the present days of Practical Pharmacology	16 (25%)	31 (48.43%)	17 (26.56%)
17	Discussion charts has helped me in better understanding of mechanism of action of the drugs	0 (0.0%)	14 (21.87)	50 (78.12%)
18	I will consider Pharmacology as one of my subject for post-graduation	25 (39.06%)	32 (50%)	07 (10.93%)
19	Calculation of Pharmacokinetic parameters (e.g. Vd, t <sub>1/2</sub> , therapeutic index) is relevant and helps in better understanding of General Pharmacology	05 (7.81%)	16 (25%)	43 (67.18%)
20	Pharmacovigilance problems (in practical pharmacology) has helped me in better understanding of ADRs and ensures safety of the drugs	01 (1.56%)	02 (3.12%)	61 (95.31%)

**Table - 4: Teaching-learning methods in pharmacology.**

Sr. No.	Item	Frequency	Percentage
21	The ideal teaching method for learning Pharmacology is		
	a. Didactic lecture	16	25.0
	b. Tutorial	06	9.37
	c. Group discussion	16	25.0
	d. Seminar	02	3.12
	e. Demonstration	24	37.5
22	The ideal Teaching Learning media for learning Pharmacology is		
	a. LCD projector	12	18.75
	b. Blackboard	00	0.0
	c. LCD projector + Blackboard	52	81.25
23	The most difficult system to understand in Pharmacology is		
	a. Autonomic Nervous System	34	53.12
	b. General Pharmacology	06	9.37
	c. Cardiovascular System	13	20.31
	d. Endocrine System	06	9.37
	e. Antimicrobials	03	4.68
	f. Drugs acting on Gastrointestinal System	01	1.56
	g. Others – Specify (Central nervous system)	01	1.56

About 78% students in the current study felt that discussion charts had helped them in the better understanding of mechanism of action of the drugs. This emphasizes the importance of flowcharts and diagrams, which when used effectively can help a great deal in making the students understand pharmacodynamics.

Only 26% of our students found rabbit eye experiments to be appropriate and relevant to the present days of practical pharmacology. They wanted all the practical exercises to be more clinical oriented and if possible replace the animal experiments with the computer simulation techniques.

Very few students (10%) wished to consider pharmacology as one of the subject for post-graduation. 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 [13] and the students' interests appear more biased towards clinical careers with prospective earnings far better than pharmacology careers [14].

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 like microbiology and pathology for better understanding of the subject. The results obtained may not be applicable to all the medical students because these findings are based on a single centre study from Karnataka. More multi-centric studies need to be carried out among the medical students to draw more meaningful conclusions.

### **Conclusion**

The study revealed the perception and feedback of the students regarding learning pharmacology

were 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.

### **Acknowledgement**

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**Annexure - I**

**Pharmacology learning -- perception and feedback questionnaire**

Gender – M/F

Parent(s) – Medical/non-medical

CET/COMED-K/MANAGEMENT

**Instructions:** Use tick mark for answering all the questions

Choose **only** single Best opinion

**Part – A: Answer in Yes/No**

<b>Opinion about changes recommended</b>	<b>Yes</b>	<b>No</b>
Increase the number of lectures		
Make more use of audio-visual aids		
Introduce student seminars		
Introduce Case based learning		
Introduce more clinical pharmacology (Pharmacovigilance)		
Decrease the number of lectures		
Introduce group discussions		

**Part - B**

<b>Item</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
I find pharmacology lecturers interesting and stimulating			
Pharmacology is my favourite subject in 2 <sup>nd</sup> year of MBBS			
I would like Pharmacology to be more closely integrated with the clinical sciences and would like real cases in hospital to be used during problems stimulated learning (PSL)			
The subject has helped me to develop my problem solving and logical-reasoning skills			
The subject will help me immensely in choosing drugs rationally in my future clinical practice			
I would like to include recent advances in Pharmacology curriculum			
I would like MCQs to be included in the assessment			
I have come across various dosage forms in clinical postings and has helped me in better understanding of the subject			
Rabbit eye experiments is appropriate and relevant in the present days of practical pharmacology			
Discussion charts help in better understanding of mechanism of action of drugs			
I will consider Pharmacology as one of my subject for post-graduation			
Calculation of pharmacokinetic parameters (e.g. Vd, t <sub>1/2</sub> , Therapeutic index) is relevant and helps in better understanding of General Pharmacology			
Pharmacovigilance problems (in practical pharmacology) has helped in better understanding of ADRs and ensures safety of the drugs			

**Part – C: Choose the single best option**

1. The ideal Teaching learning method for learning Pharmacology is
  - a. Didactic lecture
  - b. Tutorial
  - c. Group discussion
  - d. Seminar
  - e. Demonstration
2. The ideal Teaching learning media for learning Pharmacology is
  - a. LCD projector
  - b. Blackboard
  - c. LCD projector + Blackboard
3. The Most difficult system to understand from Pharmacology is
  - a. Autonomic Nervous System
  - b. General Pharmacology
  - c. Cardiovascular system
  - d. Endocrine
  - e. Antimicrobials
  - f. Drugs acting on Gastrointestinal system
  - g. Others – Specify \_\_\_\_\_

**ANY OTHER FEEDBACK** – (for improving pharmacology teaching and learning)

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