**ABSTRACT**

**Objective:** To determine the opinion of students regarding the teaching of pharmacology, the best way of knowing and retaining the subject and application of the subject in future practice.

**Material and Methods:** A questionnaire was designed and given to Second-year medical students who were due to appear for examination. They were supposed to fill in and make suggestions according to the options given and were also free to express their own opinion at various places.

**Results:** Fifty-one out of sixty-three students (81%) wanted introduction of case studies and therapy as part of regular teaching. They wanted the teachers to make use of audiovisual aids during the lectures. About one third of the students (22/63; 35%) felt that more group discussions should be introduced during teaching sessions. Even fewer (7/63; 11%) opted for finer aspects of clinical pharmacology including drug schedules, dosage calculations, and drugs used in special situations. According to them students’ seminars should be discouraged.

**Conclusion:** Students are interested in learning the subject from a futuristic practical therapeutic point of view.

**KEY WORDS:** Clinical pharmacology, medical undergraduate, teaching reforms

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**Introduction**

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\(^1\) to make the teaching of pharmacology more interesting and relevant. Expertise in teaching develops after years of experience following use of various teaching methods.

Experimental pharmacology and pharmacy are still being taught in many institutions in the country, though such a practice has been abandoned at many centers. Clinical pharmacology is being introduced in many institutions. Didactic lectures have decreased. Teachers make use of audiovisual aids. Students’ seminars, group discussions and practical classes on therapeutic problems are slowly being introduced.

The pattern of the practical examination varies from university to university and from institute to institute. Objective Structured Practical Examination (OSPE) is being increasingly used in many institutions for reasons such as objectivity and reliability.\(^5\) Theory papers include more questions requiring short answers, which are practically more important than long, essay-type questions on a single group of drugs.

Considering this diversity in teaching, we thought of eliciting the opinion of students, to consider their views regarding the subject, the methodology of teaching and their learning strategies. It was felt that the students’ feedback would reveal a) whether the so-called reforms are acceptable to them and b) their opinion for the betterment of teaching/learning the subject.

**Material and Methods**

Fifth semester medical students due to appear for II MBBS examination participated in the study. A questionnaire (see Appendix 1) consisting of 23 questions with 3–8 options was given to each of them and they were asked to tick the option/s which they felt was/were the best. Students were allowed to
offer their own suggestions for certain important items in addition to the available options, e.g. what reforms would you like in lectures? The completed questionnaires were collected by the postgraduate students. Students were instructed not to reveal their identity in the questionnaire.

Results

Sixty-three students participated in the “Students’ Opinion Poll”. It was observed that a few students did not attempt some of the questions, whilst in some cases, as expected, more than one option was ticked (as in questions: Which topics did you find interesting? and Would you like any of the following reforms to be made?)

As many as 65% (41/63) students had a little knowledge about pharmacology before it was introduced to them in the Second year of medicine. About 64% (40) students thought that the subject is very useful, practical, and important. Only 24% (15) students felt it was interesting, but a lot of cramming is required. Most of the students found the cardiovascular system, autonomic nervous system, chemotherapy, and endocrinology interesting. However, most of them agreed that all the topics are useful for future practice. Most of them found lectures and tutorials interesting. Surprisingly, only one student showed interest in students’ seminars, and 35% of them (22) thought they are of no use. About 44% (28) wanted teachers to make use of audiovisual aids and 35% (22) wanted more group discussions to be introduced in the teaching program (Table 1). A whopping 51/63 students wanted introduction of case studies and treatment as part of the regular teaching schedule (Table 1).

As much as 86% (56) reported to take class notes. While preparing for examinations, 41% (26) of them pointed that they refer to lecture notes of certain staff members only, irrespective of the topics taken by them. Not surprisingly, 75% of the students (47) preferred studying pharmacology from both lecture notes and textbooks. About 41% (26) stated that they refer to lecture notes of certain staff members only, irrespective of the topics taken. No student studied the subject exclusively using either the textbook or the lecture notes. Surprisingly, no student prepared his/her own notes after referring to lectures notes, textbooks and seminars. About 33% (21) studied the subject regularly either because of interest in the subject (7/63) or due to tests, viva or tutorials (14/63). Another 52% students (33) said that they read only during tutorials/tests or exams. Sixty-two per cent (39) agreed that their grasping of the subject was good, 29% (18) said that only cramming helps whilst 10% (6) thought they could never learn.

Students differed in their opinion about the quality of the lectures. More than half the class (36/63; 57.14%) said some lectures are interesting and some boring. One-fifth (13/63; 20.6%) said that most were boring and few interesting. For the remaining 22% (14) most of the lectures were interesting and some boring. As many as 81% (51) opined that pharmacology lectures should be more clinically oriented. Most of the students felt that special topics like pediatric pharmacology, geriatric pharmacology, drugs in pregnancy and lactation, drugs in liver/ kidney dysfunction, drugs and sexual dysfunction, various dosage schedules and calculation of doses in young/ special situations should be discussed separately either in lectures or practical classes.

Sixty per cent of the students (38) rated pharmacology above all other subjects in II year, whereas 40% (25) rated it at par with others. As many as 65% (41) rated it as one of the more important subjects for practical use and 16% (10) said it was the most important subject in the entire medical curriculum.

The majority (55/63; 87.3%) of the students were happy with the present pattern of marks distribution, although 13% (8) said that more marks should be assigned to pharmacology. To the question whether the subject should be taught in the final year or after, 64% (40) agreed on a few lectures on drug therapy in the final year. 40% (25) wanted to have an orientation course of a few days during internship and 30% (19) thought that only a few lectures on new drugs should be taken in the final year. Some students opted for more than one option while answering the questions.

The students differed in their views regarding the qualities of a good pharmacology teacher. Most of them (47; 74.60%) opined that the teacher should be clinically oriented, knowledgeable or both. They agreed that many of their teachers have these qualities.

Discussion

The students’ opinion poll was in general as expected, but at places revealed important information. Although, considering the modern trend, many students wanted the use of audiovisual aids and introduction of group discussions, there was no demand for students’ seminars. A proper guideline on part of the teachers is the need of the hour to make seminars more interesting for students.

Not surprisingly, 81% of the students (51) opted for case studies and treatment protocols to be added as a part of regular teaching in pharmacology. A study conducted in New Delhi, India showed that 80.46% students and 87.50% teachers were in favor of bedside teaching of clinical pharmacology. The authors opined that bedside teaching should be started after 6 months of teaching basic pharmacology and should be continued till the completion of the final year. Considering the demand, we also feel that during practical classes, II year stu-
udents should be taken to wards for discussion of treatment protocols of various admitted cases. An alternative approach could be the use of short therapeutic problems and patient-oriented problem-solving strategies. We have made an attempt of including the latter in our own department and students have appreciated the change.

In a study from Surat, India, faculty have authored their experiences with a modified clinically oriented program. They have named it 'CARE'-Based Programme, based on Concepts (pharmacokinetics, pharmodynamics, and therapeutics), Application, Rationale and Essential drugs (or Drug information). Authors opined that students not only found the program interesting but they actively participated by way of discussions. The authors felt that with the help of their program the students can be made familiar with rational drug use and the unnecessary burden of memorizing drug data can be avoided. Clinical pharmacology is thus fast catching up.

Surprisingly, not a single student wrote about Computer-Assisted Learning (CAL) as a potential teaching methodology in the blank space provided. One reason for this could be ignorance regarding the advantages of CAL. In one Indian study on the use of CAL, it was pointed out by the authors that a large number of students expressed the advantages of CAL as reduction in animal use, clear estimation of drug effects, repeated observation of experiments and demonstration of difficult experiments. If properly introduced, CAL can go a long way in teaching pharmacology in the future.

In our poll, 81% students (51) opined that lectures should be clinically oriented. This again proves that the students are now more interested in therapeutic and clinical pharmacology guidance in the classes. A report from the University of Arkansas College of Medicine (USA) outlines changes in students’ attendance from poor to high following changes in the teaching style. These changes included encouraging independent learning, reduced lecture time and increased problem-solving exercises. Students’ interest can be understood from the poll as they demanded the introduction of some special topics like pediatric pharmacology, geriatric pharmacology, drugs in pregnancy, dosage schedules, and calculation of dose in the elderly/young.

The staff of the department of pharmacology and clinical pharmacology, Vellore, India, conducted a comparative study to evaluate the usefulness of the Patient Oriented Problem Solving (POPS) method of teaching pharmacology in comparison with the audiovisual aided lecture methods. It was concluded that audiovisual aided lectures were equally useful and comparable with the POPS method.

It is satisfying to note that most of the students believed pharmacology to be one of the most important subjects in the medical curriculum and 15% claimed it to be the most important. As the subject is taught only in II year, its practical importance perhaps cannot be highlighted to the maximum at that time. It is therefore not altogether surprising that 63% students (40) wished for a few lectures on drug therapy in the final year. We feel that a more clinically oriented innovative teaching program at II year level will allow greater retention of the knowledge of pharmacology when they reach the final year.

To impart knowledge of clinical pharmacology, the teachers themselves should be well versed with the current trends in theory and the new drugs in the market. The students in the poll agreed to this fact and thought that most of the teachers do have this quality. It is just a matter of time before we all put our heads together and set the ball rolling for a revised pattern of teaching pharmacology which is learner-centred and more clinically oriented.

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References


Appendix 1

Questionnaire

1. Did you know about Pharmacology before it was introduced to you in II MBBS?
   a) No  b) Somewhat

2. What opinion did you gather from your seniors regarding Pharmacology?
   a) Useful but boring  d) Interesting but cramming
   b) Useful and interesting  e) Very useful, practical
   c) Useless and cramming  and important

3. What is your opinion now?
   a) Useful but boring  d) Interesting but cramming
   b) Useful and interesting  e) Very useful, practical
   c) Useless and cramming

4. Which topics did you find interesting?
   a) General Pharmacology  f) Respiratory System
   b) Cardiovascular / g) GIT
   Autonomic Nervous system  h) Autacoids
   c) Chemotherapy  i) All
   d) Endocrines  j) Miscellaneous. (Specify): _______
5. Which topics do you think will be useful in future?
   a) General Pharmacology
   b) Cardiovascular
   c) Chemotherapy
   d) Endocrinies
   e) Central Nervous System
   f) Respiratory System
   g) GIT
   h) Autonomic Nervous system
   i) All
   j) Miscellaneous. (Specify):______

6. Which of the following was most interesting?
   a) Lectures
   b) Demonstrations
   c) Tutorials
   d) Clinical Pharmacology
   e) Experimental Pharmacology
   f) Students’ Seminars
   g) Case Studies and Treatment
   h) Any other (specify):______

7. Which of these do you think is of no use?
   a) Lectures
   b) Demonstrations
   c) Tutorials
   d) Clinical Pharmacology
   e) Experimental Pharmacology
   f) Clinical Pharmacology Sessions
   g) Lecture notes of certain topics, irrespective of staff member
   h) Lecture notes of certain staff member
   i) Own notes after referring lecture notes, text books, seniors’ notes, etc.
   j) None of the above (specify):______

8. Would you like any of the following reforms to be made?
   a) Decrease the number of lectures
   b) Increase the number of lectures
   c) Include more Student seminars
   d) Include more Clinical Pharmacology
   e) Introduce Group Discussions
   f) Make use of audiovisual aids
   g) Miscellaneous. (Specify):__________

9. Would you like the following to be added as a part of regular teaching?
   a) Lecture notes only
   b) Text books only as I don’t take down notes
   c) Lecture notes and Text books combined
   d) Text books only as I understand little in the class
   e) Text books only as these are more interesting
   f) Lecture notes of certain staff members only, irrespective of topics taken
   g) Lecture notes of certain topics, irrespective of staff member
   h) Own notes after referring lecture notes, text books, seniors’ notes, etc.
   i) None of the above (specify):______

10. From where did you prefer studying Pharmacology?
    a) Lecture notes only
    b) Text books only as I don’t take down notes
    c) Lecture notes and Text books combined
    d) Text books only as I understand little in the class
    e) Text books only as these are more interesting
    f) Lecture notes of certain staff members only, irrespective of topics taken
    g) Lecture notes of certain topics, irrespective of staff member
    h) Own notes after referring lecture notes, text books, seniors’ notes, etc.

11. What is your pattern of study in Pharmacology?
    a) Regular because of interest in it
    b) Regular because of tests/ viva/ tutorials
    c) Regular for gaining more knowledge
    d) Only during tutorials/ tests / exams
    e) Shall study only for final exams.

12. How is your grasping power?
    a) Good
    b) Only cramming helps
    c) Can never learn.

13. How do you rate Pharmacology lectures?
    a) Always boring
    b) Some interesting, some boring
    c) Always interesting
    d) Most interesting, some boring
    e) Most boring, few interesting.

14. What reforms would you like in lectures?
    a) More clinically oriented
    b) Use of OHP
    c) Only important topics to be covered
    d) Good as they are
    e) Others (specify):__________

15. Do you think the following special topics should be discussed in lectures/ practicals?
    a) Paediatric Pharmacology (Y/N)
    b) Geriatric Pharmacology (Y/N)
    c) Drugs in Pregnancy and Lactation (Y/N)
    d) Drugs in liver/kidney dysfunction (Y/N)
    e) Drugs used in sexual function (Y/N)
    f) Drug schedules (Y/N)
    g) Calculation of doses in pediatric and special situations (Y/N)

16. How do you rate Pharmacology in comparison to other II MBBS subjects?
    a) Useless, not important
    b) At par with others
    c) Above others in all respects

17. How do you rate it overall?
    a) Useless altogether
    b) Only theoretical, less practical subjects for practical use
    c) At par
    d) One of the few most important
    e) Most important, above all subjects

18. Do you think it should carry more weight in examinations?
    a) Yes, more marks than others
    b) No
    c) Less marks than others.

19. Do you think the subject should be taught in or after III MBBS?
    a) Yes, a few lectures on drug therapy in III MBBS
    b) No, enough of Pharmacology
    c) Orientation course of few days during Internship
    d) Yes, the subject should be taught in entire III year
    e) Only a few lectures on new drugs to be taken in III MBBS

20. How do you regard Pharmacology teachers as compared to others knowledge wise?
    a) Below par
    b) Some below par, some others at par
    c) All at par
    d) Some more knowledgeable,
    e) All more knowledgeable
    f) Most average, few good

21. What according to you should be the qualities of a good Pharmacology teacher?_______

22. Do you think your Pharmacology teachers have the above qualities?

23. Do you think Pharmacologists are respected as expert therapeuticians?
    a) No
    b) Yes
    c) Ought to have
    d) Do not know