Original Research Article

Assessment of Effectiveness of Different Teaching Methodologies in Pharmacology for Undergraduates at a Rural Medical College of Bastar Region

Ahmed Tabish[*], Sharma Sanat, Ali Sajid Syed, Sharma Raj and Jaiswal Mahendra

Department of Pharmacology, Late Shree Baliram Kashyap Memorial Government Medical College, Jagdalpur, Chhattisgarh 494001

*Correspondence Info:
Dr. Ahmed Tabish,
Assistant Professor,
Department of Pharmacology,
Late Shree Baliram Kashyap Memorial Government Medical College,
Jagdalpur, Chhattisgarh 494001
E-mail: dr.tabishahmed@gmail.com

Abstract

Background: Pharmacology is one of the most fundamental subjects in the field of medicine and a good grasp of this subject is vital for any clinical practitioner. The teaching of pharmacology in medical and dental colleges of India has evolved from mere didactic lectures to audio-visual aid based lectures and computer based learning.
Aim: To identify strengths and weaknesses in the current teaching-learning and evaluation methodology in pharmacology using feedback from the undergraduates of Late Shree Baliram Kashyap Memorial Government Medical College, Jagdalpur, Chhattisgarh.
Materials and Methods: The present study was carried out in March-April 2015. The tool used was pretested questionnaire. A total of 150 students from II, III, & Final year MBBS participated in study. They were administered a pre-validated questionnaire after explaining them the purpose of the study. Suggestions were also asked regarding the qualities of good pharmacology teachers and modification in pharmacology teaching methods. Descriptive statistics were used and results were expressed as percentage.
Results: The students' opinion revealed important information. Most of the students are aware that pharmacology as one of the most important subjects in the medical curriculum. Many students wanted the use of audiovisual aids and introduction of integrated teaching, also clinical demonstrations on the manikin.
Conclusion: The present study has helped us to elicit the student preference regarding pharmacology teaching and its Outcome would be helpful in modifying undergraduate pharmacology teaching patterns.
Keywords: Assessment, Undergraduates, Pharmacology, teaching methodologies, Bastar region.

1. Introduction

Pharmacology forms the backbone of rational therapeutics, being both a basic and applied science. The primary objective of teaching pharmacology is to enable undergraduate medical students to take rational therapeutic decisions in clinical practice.[1] It is one of the most evolving branches in medical sciences. Traditionally, it has focused more on factual information, with little or no emphasis on clinical and applied aspects. Dispensing pharmacy and experimental pharmacology has remained the cornerstone of conventional pharmacology practical exercises. However, clinical utility and relevance of these practical exercises have always been questioned and criticized.[2] The aim of undergraduate medical teaching is to impart knowledge, attitude and skills to the student. Hence,

choice of teaching strategy plays a major role on these parameters. Various methods for teaching undergraduate Medical students include lectures, tutorials, demonstrations, experimental exercises, case discussions, etc. The Medical Council of India (MCI) has made it clear in its regulations that teaching methods should be student centric and should comprise of small group discussions, case based studies and lectures. Use of modern educational technology while teaching the undergraduate students is also encouraged by the guidelines.[3] However, lecture delivery remains one of the Major methods for undergraduate teaching. It is important for a teacher to ensure effective teaching strategy and Incorporation of innovative approach to teach medical Graduates. Traditionally, chalk and

board method was used for lecture delivery but with innovation in information technology, teachers are now equipped with modern methods such as power point presentations for teaching.[4] Lecture delivery has impact on students understanding and retention of concept.[5]

It is accepted that the feedback from students serves as an effective tool in developing teaching methodology and evaluation methods in undergraduate teaching.[6] The present study is a step towards achieving this tool by assessing the student's attitude, perception and feedback on teaching-learning methodology and evaluation methods in pharmacology.

2. Materials and Methods

The present study was carried out in March-April 2015. The tool used was pretested questionnaire. A total of 150 students from II, III, & Final year MBBS participated in study. The questionnaire was adapted from the previous studies that assessed feedback of second year medical students on teaching–learning methodology and evaluation methods in pharmacology. A few modifications were done in the questionnaire to best fit with reference to university syllabus. The questionnaire included questions on three main categories, i.e., teaching–learning methodology, evaluation methods and general questions. After getting the list, a total of 150 students was administered a pre-validated questionnaire was distributed at the end of class and they were asked to fill it up. Suggestions were also asked regarding the quality of good pharmacology teachers and modification needed in pharmacology teaching methods. The filled questionnaires were collected immediately once they were filled up, on the same day. Simple random sampling method was used. The obtained data was tabulated.
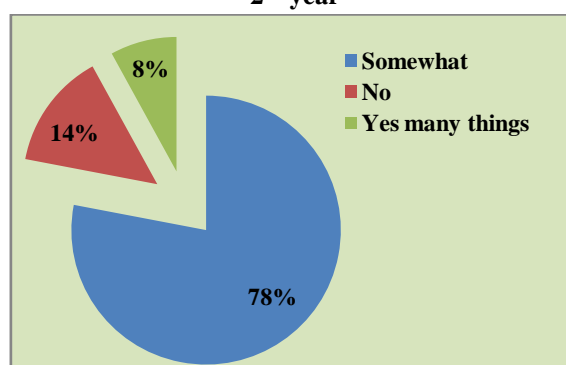
2.1 Statistical Analysis

Descriptive statistics was used for analysis of data and results were expressed as percentage.
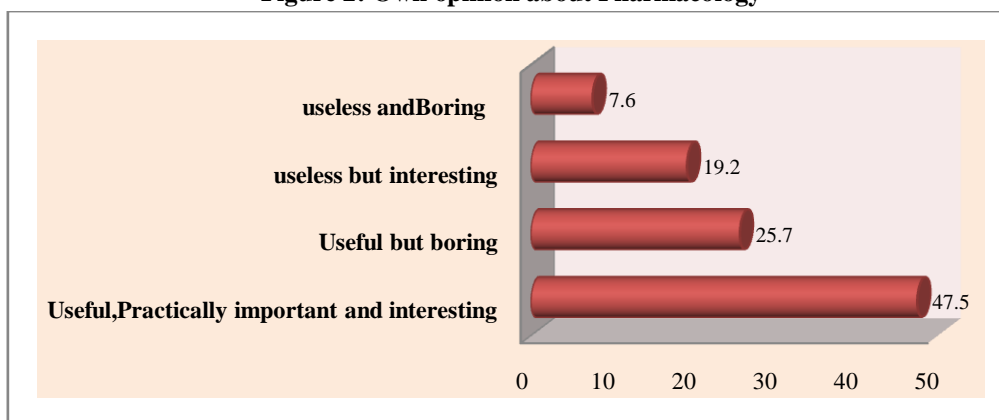
3. Results

78% students said that they know pharmacology somewhat before it was introduced to them in II MBBS 14% of students opined that they do not know about Pharmacology before it was introduced to them in II MBBS, whereas. Remaining 8% opined that they know many things before it was introduced to them in II MBBS (Figure-1).

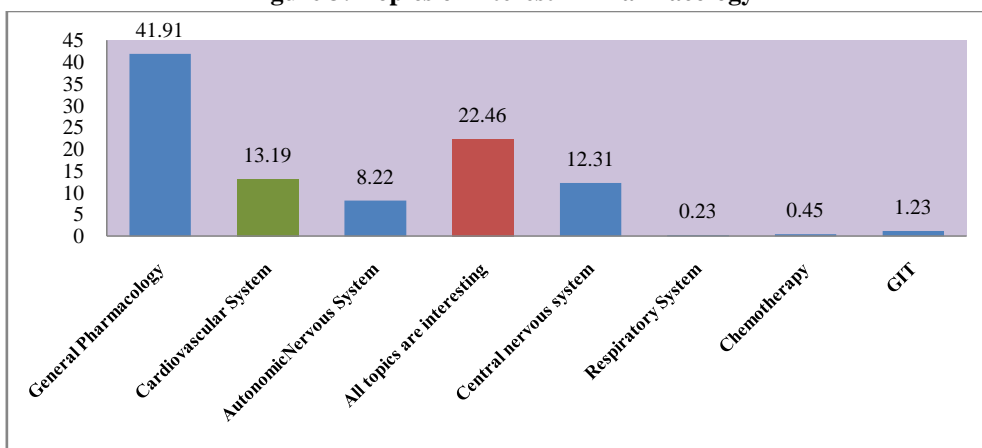**Figure 1: Knowledge about Pharmacology before 2nd year**

Regarding their opinion about Pharmacology 47.50% expressed that the subject is very useful, practically important and interesting and 25.7% of them opined that the subject is useful but boring, but 19.2 % expressed that the subject is useless but interesting, rest 7.6% stated that it is useless and boring (Figure:2).

Figure 2: Own opinion about Pharmacology

Amongst the students the topics of interest in pharmacology were 41.91 % were interested in General Pharmacology, 13.19% students opined that they are interested in cardiovascular system and 8.22% Autonomic Nervous system respectively.

Further 22.46% of them said that all the topics in pharmacology are interesting. Whereas12.31% are interested in Central Nervous System, 0.23% in Respiratory System, 0.45 % in Chemotherapy, 1.23% in GIT as shown in figure-3.
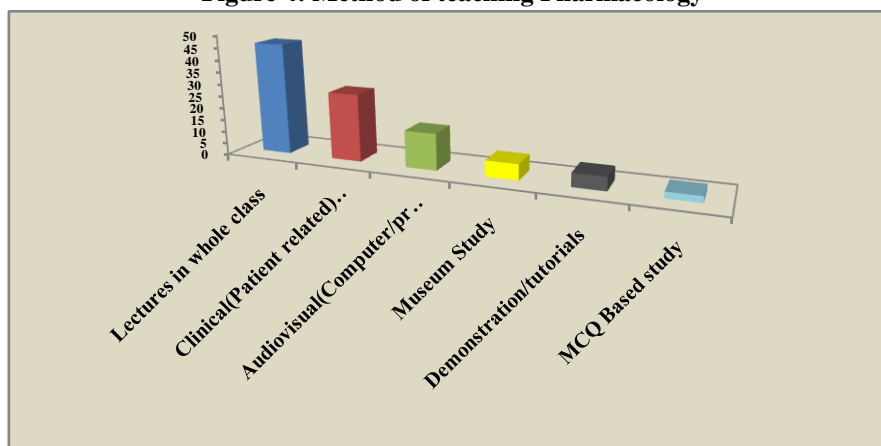
Figure 3: Topics of interest in Pharmacology

Most of the students that is 72.76% expressed that all the topics will be useful in internship; only 12.58% opined that General Pharmacology will be useful in future. Remaining percentage of them opined that Chemotherapy, Endocrines, Central Nervous System, Respiratory System, GIT, Autacoids, topics will be useful in future as shown in Table 1.

Table 1: Topics useful in Internship

Sr. No	Topics	Percentage
01	General Pharmacology	**12.58**
02	ANS	1.03
03	CVS	2.26
04	CNS	3.0
05	GIT	2.01
06	Endocrinology	1.58
07	Chemotherapy	4.08
08	Autacoids	0.70
09	All of the above	**72.76**

Responses to the question that which of the following method they found interesting, 42.71 % students opined that Lectures in the whole class were most interesting. The remaining students 27.67 % and 14.96 % opined that Clinical (patient related) pharmacology and Audiovisual (computer/projector) aided lecture were most interesting. 6.52% were interested in museum study, 5.58% liked demonstration/tutorials, Remaining 2.56% found MCQ based study interesting as shown in Figure 4.

Figure 4: Method of teaching Pharmacology

The students also suggested that certain reforms to be made in the curriculum, 45.42% students opined that integrated teaching should be introduced so as to help them in better understanding the interrelated subjects, 32.19% students suggested that quizzes on specific topics should be held. 22.39 opined that there should be certain clinical demonstrations on manikin so as to obtain clinical skill.

About studying Pharmacology 41.86% of the students prefer reading lecture notes and text books combined together, text books are preferred by 21.24% of students. While 10.62% students prefer own notes after referring lecture notes, text books,
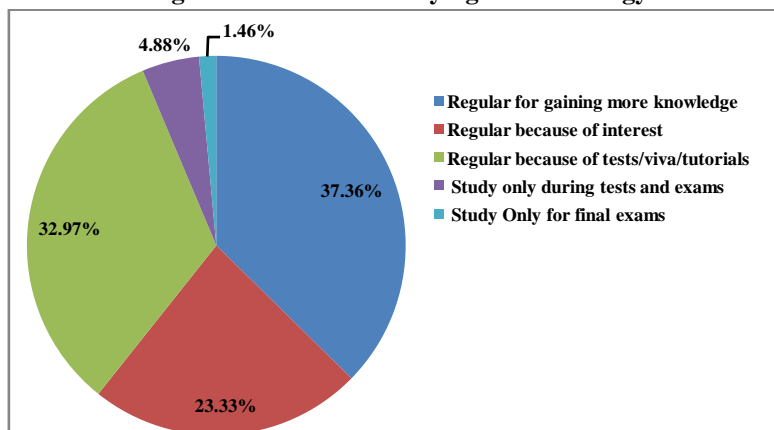
seniors' notes, etc. But most of the students 26.28% prefer lecture notes. (Table 2)

Table 2: Study material to learn pharmacology

Sr. No	Study Material	Percentage
01	Textbooks	21.24
02	Lecture notes	26.28
03	Self Prepared notes	10.62
04	Combinations of all	**41.86**

In regards to study pattern followed by students for learning pharmacology were 37.36 % said that it was regular for gaining more knowledge.1.46% students who study only for final exams. 23.33 % of the students who study Pharmacology regularly as they had interest in the subject. 32.97% read it regularly because of tests/ viva/ tutorials whereas 4.88% read pharmacology only during tests and exams. (Figure 5)

Figure 5: Pattern of studying Pharmacology

The students also favored the discussion of certain special topics like drugs to be avoided in pregnancy and lactation (73%), drugs used in special conditions as liver and kidney dysfunction (9.85%), pediatric pharmacology (2.5%), dose schedule and calculations(6.76%), emergency drugs(3.45%), rationality(0.88%), Geriatric pharmacology(3.56%) as these would be helpful to them in clinical practice.(Table 3)
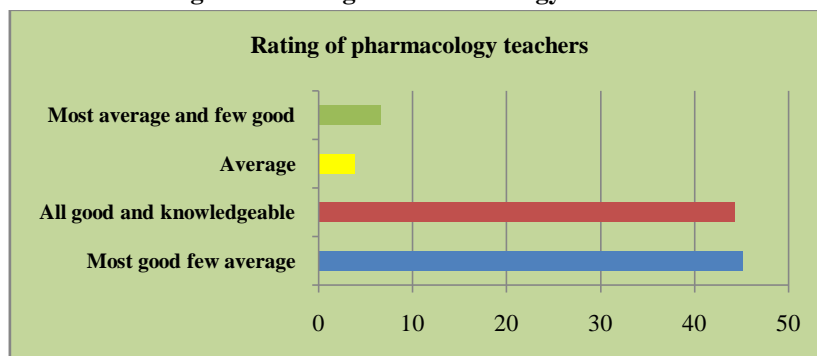
Table 3: Discussion of certain Special topics

Sr. No	Special Topics	Percentage
01	Drugs to be avoided in Pregnancy and Lactation	**73**
02	Drugs used in special conditions as liver and kidney dysfunction	9.85
03	Pediatric Pharmacology	2.5
04	Dose schedule and calculations	6.76
05	Geriatric pharmacology	3.56
06	Rationality	0.88
07	Emergency drugs	3.45

Regarding rating of Pharmacology in comparison to other II MBBS subjects, 72.03% of students opined that Pharmacology is at par with others. About 27.97 % opined that Pharmacology is equivalent to other subjects. None of them mentioned it as useless and unimportant subject.

The students also liked the teachers who taught pharmacology and rated them as most good few average (45.14%), All good and knowledgeable (44.25%), average (3.9%), Most average and few good (6.71%). (Figure 6)

Figure 6: Rating Of Pharmacology Teachers

Regarding respecting pharmacologists as expert therapeuticians, 55.43% of students said yes, whereas 28.60% said they do not know. 10.92% of them opined that they ought to be respected as expert therapeuticians. 5.05 % of them said no.

4. Discussion

It is very important to emphasize the academic need of reviewing the teaching programs from time to time and making adequate modifications, to keep pace with progress in the subject and to cope with the requirements of the beneficiaries. In the present study, many interesting things came into picture and students suggested many ways that could be incorporated in conventional pharmacology teaching so as to make the subject more interesting and understandable. This type of student's feedback represents the primary means used by most programs to assess their methodology [7,8]. Although majority of the entrant students had somewhat knowledge about pharmacology, there was a class of students who were totally unaware of the subject; hence, there is a need to conduct subject orientation programme before the students enter into medical education. Majority of the students found cardiovascular system, central nervous system and general pharmacology as the most interesting topics in pharmacology, whereas autonomic nervous system, gastrointestinal system, autacoids and respiratory system were the less interesting topics. So, these topics need to be emphasized more to draw attention of the students. This could be done by utilizing their suggestions like use of integrated teaching, problem-based learning, patient-related teaching, demonstrations on manikin to obtain clinical skills. Involvement of students improves learning, and thereby their performance in university examinations [9]. This approach towards teaching pharmacology would be appreciated by students than theoretical conventional teaching. The present day pharmacology course in China consists of a combination of lectures; problem based learning sessions, clinic-correlated lectures and Small group discussions [10]. In Malaysia, pharmacology learning is of more clinical reasoning, from laboratory based medicine teaching to more patient oriented approach [11]. The problem based learning curriculum is integrated across organ systems, spanning population and behavior related perspectives, rather than being based on discrete disciplinary areas at the Mc Master University in Canada [12]. The main purpose of teaching pharmacology is that student should develop transferable skills, which would help not only for undergraduate education but to learn throughout the medical career. [13] Animal experiments in undergraduate pharmacology are banned and these are substituted by methods like computer assisted learning, which can teach the receptor pharmacology and demonstrate action of drugs on animal tissues [14, 15]. In our study students' opinion revealed important information. Many students wanted integrated teaching should be implemented, some felt that quizzes should be held regularly, few suggested demonstration of certain clinical skills on manikin would help them a lot. Most of the students are aware that pharmacology, as one of the most important subjects in the medical curriculum. Most of the students felt that all topics in pharmacology are useful in future. They use combined lecture notes and text books for reading pharmacology further 78% of students are aware about many aspects of the subject before 2nd year. They respect pharmacologists as expert therapeuticians.

5. Conclusion

This study revealed us the important information in knowing the student preferences regarding pharmacology teaching which can help in modifying undergraduate pharmacology teaching pattern mostly towards Pharmacotherapeutics and clinical pharmacology. The students' feedback serves as an array of effective methodologies in pharmacology teaching. Also, there is a definite need for modification of undergraduate curriculum so as to make pharmacology more interesting and practicable.

References

[1] Vasundara K, Kanchan P, Pundarikaksha HP, Girish K, Prassana S, Jyothi R. An imperative need to change pharmacology curriculum: A pilot survey. *Indian J Pharmacol.* 2010; 42:420.

[2] Desai M. Changing face of pharmacology practicals for medical undergraduates. *Indian J Pharmacol* 2009; 41:151-2.

[3] Regulations on Graduate Medical Education, 2012, MCI. New Delhi; 2012

[4] Dallmann-Jones, Anthony S. The Expert Educator: A Reference Manual of Teaching Strategies for Quality Education. Fond du Lac, WI: Three Blue Herons Publications; 1994.

[5] Novelli E, Angelica A, Fernandez H. Students' Preferred Teaching Techniques for Biochemistry in Biomedicine and Medicine Courses. *Biochemistry and Molecular Biology Education*. 2007; 35(4):263-6.

[6] Chavda N, Yadav P, Chaudhari M, Kantharia ND. Second year student's feedback on teaching methodology and evaluation methods in Pharmacology. *Natl J Physio Pharm Pharmacol*. 2011; 1:23–31.

[7] Richardson BK, Feedback. *Acad Emerg Med* 2004; 11:e1-5

[8] Victoroff KZ, Hogan S, student's perception of effective learning experiences in Dental school: A qualitative study using a critical incident technique. *Dent Edu* 2006; 70L124-32.

[9] Kaufman M, Mann V. Achievement of students in a conventional and problem based learning (PBL) curriculum. *Adv Health Sci Edu Theory Pract.* 1999; 4:245–60.

[10] Li WD, Zhang Y, Zhang CL, Zhang XM. Pharmacology teaching and its reform in China. *Acta Pharmacological Sin* 2004; 25: 1233-1238

[11] Sim SM. Teaching of pharmacology in University Malaya and the other medical schools in Malaysia: a historical perspective. *Acta Pharmacological Sin* 2004; 25: 1209-1219.

[12] Shankar RP, Jha N, Bajracharya O, Shrestha R, Thapa HS. Teaching pharmacology at a Nepalese medical school: the student perspective. *Australas Med J*. 2010; 1:14–22.

[13] Shankar PR, Mishra P, Shenoy N, Partha P. Importance of transferable skills in pharmacology. *Pharmacy Education* 2003; 3: 97–101.

[14] Kuruvilla A, Ramalingam S, Bose AC, Shastri GV, Bhuvaneshwari K, Amudha G. Use of computer assisted learning as an adjuvant to practical pharmacology teaching: advantages and limitation. *Indian J Pharmacol* 2001; 33: 272-275.

[15] Gitanjali B. New wine in new bottles. *Indian J Pharmacol* 2004; 36:63-4.