

Original article

Second year Medical students perception about pharmacology and teaching methodologies used : A questionnaire based cross sectional study

DR. VIBHA RANI*¹, DR. KRANTI TEKULAPALLY², DR. PADMAVATHI. V³, DR.G.B.SIMPSON⁴

^{1,2}Assistant Professor, Department of Pharmacology, Malla Reddy Medical College for Women, Suraram, Hyderabad-500055

³ Associate Professor, Department of Pharmacology, Malla Reddy Medical College for Women, Suraram, Hyderabad-500055

⁴ Professor and Head, Department of Pharmacology, Malla Reddy Medical College for Women, Suraram, Hyderabad-500055

***Corresponding author:** Dr. Vibha Rani

Abstract

Introduction: To obtain feedback from second MBBS students regarding teaching methodology used and their perception about Pharmacology.

Materials and Methods: A prevalidated questionnaire containing 20 questions with 4-8 options each was administered to 129 second year MBBS students studying at Malla Reddy Medical College for Women, Hyderabad. The data so obtained was entered into Microsoft excel and statistical analysis was done.

Results: 23% of students found Pharmacology of Gastrointestinal tract interesting. Majority (52%) felt that case study and treatment discussion should be incorporated within Pharmacology curriculum. Special topics like drugs used in special conditions like kidney dysfunction, sexual dysfunction and emergency drugs were preferred (26.3%) by students to be discussed during lecture or practical classes of Pharmacology. 25.5% of students thought that recent advances in Pharmacology should be included in Pharmacology lectures. Tutorials (32.7%) was the most favoured evaluation method by the students for preparing towards university examinations. With regarding to practical classes, prescription writing (33.5%) was found most interesting, while experimental graphs was least interesting.

Conclusion: There is need of more clinical orientation to the Pharmacology teaching at undergraduate level to make the subject more understandable and interesting.

Keywords: Pharmacology, Teaching methodologies, Feedback, Curriculum, Perception.

Introduction

Pharmacology, like other branches of medical sciences is an ever changing medical subject. It is an important subject, included in the third, fourth and fifth semesters of the Bachelor of Medicine and Bachelor of Surgery (MBBS) curriculum in India and is horizontally integrated with other second

year subjects like Microbiology, Pathology and Forensic Medicine. Pharmacology is a subject which has to be learnt thoroughly in order to treat patients effectively. It serves as a foundation stone for clinical practice.^[1] In Pharmacology the students are familiarized with drug production and regulation, drug classification, mechanism of action

of drugs, drug interactions, side effects of drugs and medications used in various diseases.^[2] The discipline of Pharmacology embraces both experimental and clinical sciences. Experimental pharmacology is vital to our understanding of drug action in treatment of diseases as well to the pharmaceutical industry for drug discovery and development. Clinical pharmacology is essential for prescribing medicines and underpin pharmacy practicals and therapeutics.^[3]

Graduate medical curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, curative and rehabilitative aspect of medicine.^[4] Acquiring adequate knowledge about drugs is one of the preliminary steps in preparing the medical students for future practice. The teaching and learning process in 2nd professional year is crucial, because this is the time the students are taught about pathophysiological concepts of diseases and their treatment which they can appreciate when they come across variety of patients in the clinics. It is important that the students appreciate the importance of Pharmacology and learn to apply that knowledge appropriately in a given clinical context.^[5] Teaching in Pharmacology is predominantly lecture based. While practical sessions do include problem solving and case scenarios the teaching methodologies are inadequate in empowering the students to handle real life scenarios which require integration of theory and practice, application of knowledge and skills to find a viable solution to a defined problem. Undergraduate Pharmacology teaching should stress the principle of rational evaluation of therapeutic alternatives and developing a personal formulary on the basis of a rational comparison. Such exercises would help students identify various extraneous factors that could affect their ability to

prescribe rationally.^[6] Solving real life scenarios, rather than decontextualized learning activities or problems designed to elicit only recollection of factual knowledge, promotes high level thinking and encourages students to acquire answers from different resources that they may access as professionals. The opportunity to apply knowledge and concepts through problem solving for real world issues offers students contextualized learning and a powerful learner-centered instructional approach.^[7]

Pharmacology subject although crucial for physicians, is perceived as dry and volatile by medical students.^[8] Due to content overload, students often find it difficult to remember and recall the pharmacological terms, concepts and drug names in the subject.^[9] Many attempts have been made by various colleges all over India and abroad to make the teaching of pharmacology more interesting and relevant. There is a growing awareness that learner's view of their educational experiences are valuable in assessing the effectiveness of courses and teaching methods.^[10] Furthermore, reviewing the teaching program at regular intervals and modifications in the methodologies of imparting knowledge is a must. So, in order to assess the strength of our Pharmacology curriculum and students learning experience in this setting, collection of the students feedback through a questionnaire must be done so that necessary reforms can be implemented for the betterment of teaching/ learning the subject.^[11] Feedbacks also enhance learning and provide us with an opportunity to assess the lacunae in our current system and this continuous process of repair and reforms is an essential platform to bring out the changes which would match the need of the hour. Questionnaires offer an objective means of collecting information about people's knowledge, beliefs, attitudes and behaviour.^{[12],[13]} Howitt D and

Cramer D^[14] 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.^[15] Results of the previous studies reported that the maximum percentage of students who found Pharmacology interesting was 72.8%, Cardiovascular system was the most interesting topic in Pharmacology. Lectures using audio visual aids, was the most preferred teaching methodology by the students.^{[16],[17],[18],[19]}

The perception of the students varies with their demographic patterns. There were no previous studies reported from Hyderabad, Telangana region. In view of this, the present study was conducted with the objectives of evaluating students perception about Pharmacology and their view about teaching methodologies used in Pharmacology using a pre-validated questionnaire among 2nd M.B.B.S. (fifth term) students at Malla Reddy Medical College for Women, Hyderabad.

Aims and Objectives

1. To evaluate students perception about Pharmacology
2. To evaluate students view about teaching methodology in Pharmacology

Material and methods

It was a cross sectional, open labelled questionnaire based study conducted in the month of December 2015, at Malla Reddy Medical College for Women (MRMCW), Hyderabad, Telangana. After taking oral consent, the questionnaire was administered to 139, 2nd year MBBS students who were due to appear in the University examinations. The questionnaire consisting of 20 questions having 4-8 options each was based on previous studies undertaken for undergraduate medical students and suitably modified for the present setting. Students

were asked to tick the options whichever they felt was most appropriate. The students were asked to be truthful and unbiased in answering the questions and were told to mark more than one option if they found it necessary. Sufficient time was given to fill the questionnaire. They were asked not to reveal their identities in order to make them express freely. The completed questionnaires were collected. Incomplete questionnaires were excluded and the data of 129 students was entered into Microsoft excel. Descriptive statistics were used for analysis of data. Frequency was expressed as percentage. All the procedures used in the study were approved by Institutional Ethics Committee, MRMCW, Hyderabad.

Observation and Results

Out of 129 students, around 66.9% of students were somewhat aware and 26.1% were having no knowledge about Pharmacology before coming to second year MBBS. Regarding the question about the opinion of their seniors about Pharmacology, only 9.4% of students felt that Pharmacology is very useful, interesting and majority 57.6% of students felt it is useful but boring. When asked about their own opinion with respect to their interest in Pharmacology it was noted that 43% of students found the subject very useful, interesting and practically important and 33% of students felt it was useful but boring. Among all the second year subjects we were happy to note that 36.6% of student found Pharmacology to be interesting. The students were asked to choose which topics they found interesting in Pharmacology, 23% of them found Gastro Intestinal System and 19.6% found Endocrinology interesting. Among the least interesting topics were General Pharmacology (3.8%), Autacoids (2.1%) and Chemotherapy (8.1%). 20.6% of students felt drugs used in Cardiovascular System will be useful in future. As a reply to the question about how they rate

Pharmacology in comparison to other MBBS subjects, 62.7% of them replied it as same as other subjects and 37.2% felt Pharmacology is above all other MBBS subjects. 32.6% of students gave the opinion that they require regular lectures on drug therapy in 3rd MBBS and 32% felt they require few lectures on new drugs and recent advancement in therapy after they finish second year course and few (27.3%) mentioned they require orientation classes during internship.

Regarding teaching methodology in Pharmacology, 29.5% of students found Clinical Pharmacology as an interesting method following it by tutorials (18%) audiovisual aided lecture (14%). The least interesting teaching methods were students seminars (3.5%), lecture in whole class (8%). Majority (52%) felt that incorporating case study and treatment discussion, group discussion (27.1%) and quiz (15.6%) as a part of regular teaching will make Pharmacology more interesting. Most of the students (46.2%) preferred text book to study Pharmacology, some preferred (15.8%) teacher's notes. Most of the students (56.58%) accepted the fact that they study Pharmacology only during tests and exams. When asked about their way of studying the subject, about 41.6% of students clearly told that they learnt Pharmacology only by understanding and not by mugging (8.3%). Special topics such as drugs used in special conditions like kidney dysfunction, sexual dysfunction and emergency drugs were preferred (26.3%) by

students to be included and discussed during lecture or practical classes in Pharmacology. 25.5% of students also requested to include recent advances in Pharmacology.

It was quite interesting to note that 57.8% of students thought that Pharmacologists were respected as clinicians and 12.5% did not agree to that fact. Regarding their opinion about the faculty members in the Department of Pharmacology, 69% gave the opinion that they are good and knowledgeable and only few (1.4%) felt they are below average. Tutorials (32.7%), class tests (25.8%) and Problem based learning (18.2%) were the most favored evaluation methods among the students for preparing towards university examinations. As a reply to the question regarding their interesting classes during practical hours, prescription writing (33.5%), CCRs (27.8%) and clinical problems (26.7%) were preferred by students. The least interesting practical classes were of experimental graphs (5.6%) and spotters (6.25%). 64.3% of students gave the opinion that one and half year is adequate for second professional MBBS teaching, while few 9.3% felt 2 years is required for the same. Majority of students (41.35%) never wished to become pharmacologists in future and only few, 4.2% expressed their wish for the same because they considered it as a noble profession providing them a chance to serve the society.

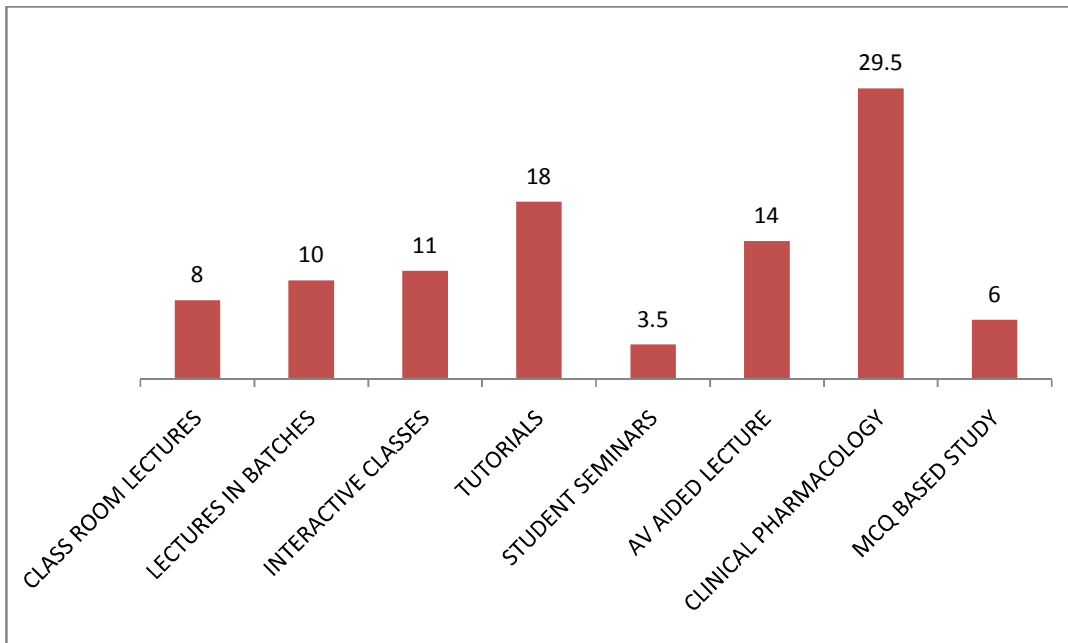


Figure 1. Teaching methods found interesting by students; expressed as percentage

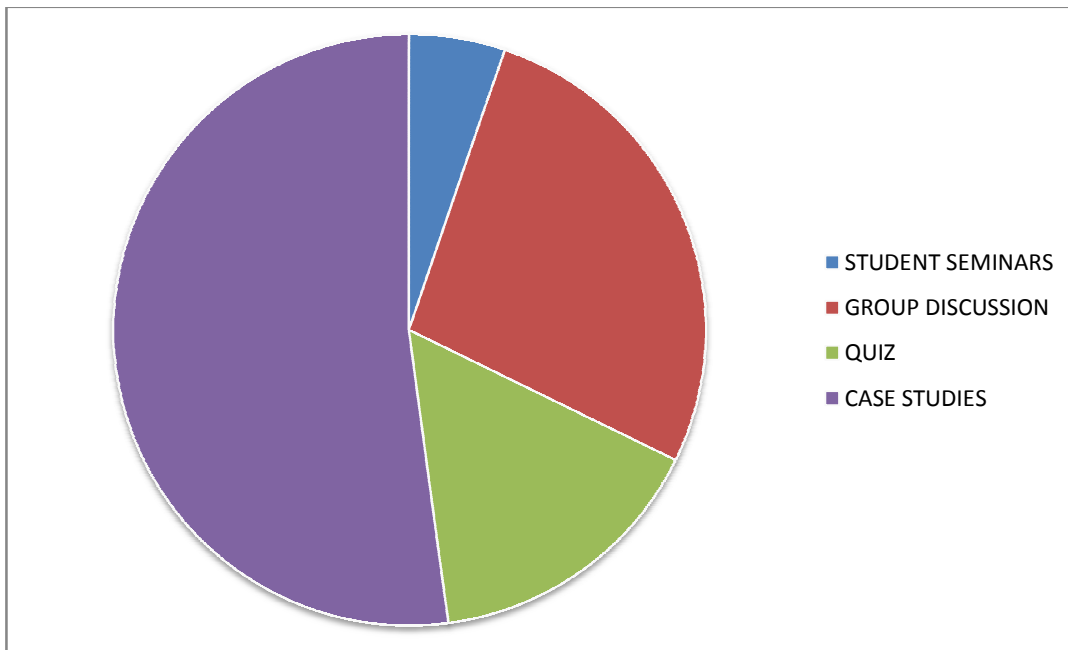


Figure 2. Teaching methods needed to be incorporated into curriculum; expressed as percentages

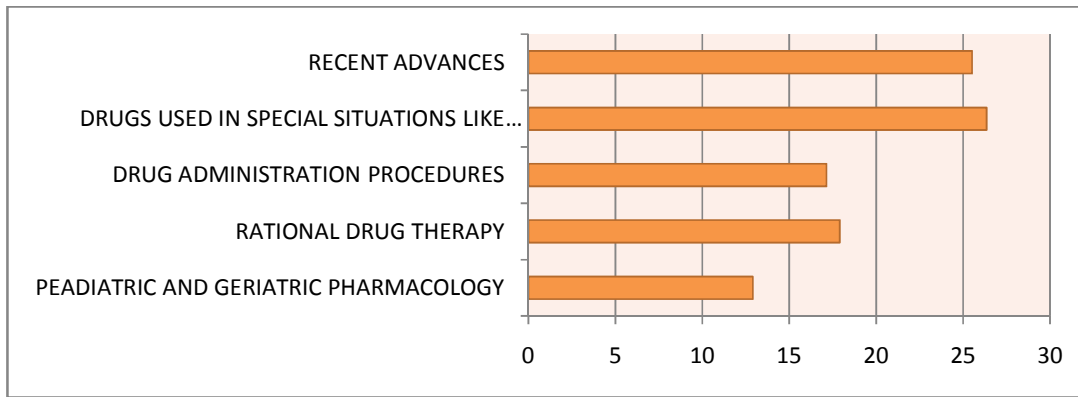


Figure 3. Special topics needed to be discussed in pharmacology teaching; expressed as percentages

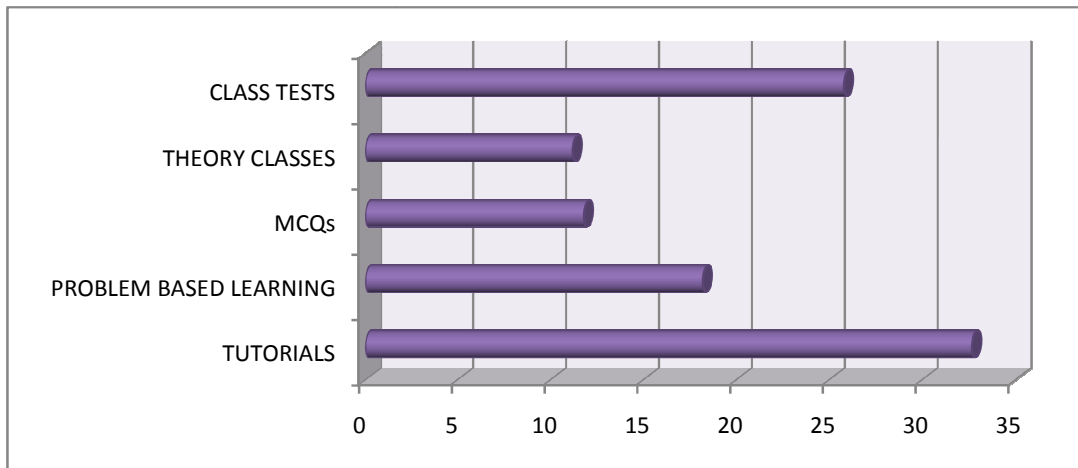


Figure 4. Evaluation methods preferred by students in preparation for their university exams; expressed as percentages

Discussion

Pharmacology is ever-changing, ever expanding applied science and is one amongst the most covetable bundle of knowledge a clinician should attain. Undergraduate pharmacology in the MBBS curriculum is incorporated with the prime intention of sensitizing the students to the wide world of drugs and to equip them to utilize this knowledge in a rational way during their clinical practice. The concepts of teaching methodologies and evaluation methods need to be kept under continuous review.^[20] It is accepted that the feedback from the students serves as an effective tool in developing teaching methodology and evaluation methodology.^{[21],[22]} In our study we found that Gastro intestinal system was the most interesting and useful topic among the various other topics in

Pharmacology. Autonomic nervous system was favoured by 13.4% of students and we found that special emphasis on the ANS topics has to be given to the students during theory classes and practical hours as most of the majority of our practical experiments like frog experiments and rabbit eye are related to ANS. Least interested topics like General Pharmacology and Autocoids can be made more interesting and understandable by taking special efforts. It was noticed that prescription writing was the most useful and interesting practicals in Pharmacology. There are some studies that point out that teaching and learning to prescribe rationally should be an important part of clinical pharmacology training.^{[23],[24]} Majority of students favoured incorporation of Clinical pharmacology and tutorials in regular teaching and

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, 52% of the students opted for case studies and treatment discussion 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 favour of bedside teaching of clinical pharmacology.^[25] The authors opined that bed-side 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, second year students 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.

Students interest can be understood from the poll as they demanded the introduction of some special topics like paediatric pharmacology, geriatric pharmacology and recent updates of new drugs which are available in the market. Their preference for Pharmacology as a subject in post graduation

References

1. Thirunavukkarasu J, Latha K, Sathish BC, Tharani CB. A Study on effectiveness of different teaching methodology in Pharmacology for under graduate students. *Asian J Exp Biol Sci.* 2011;2(3):487-92
2. Tahereh Eteraf-Oskouei, Moslem Najafi. The Effective Teaching Method of Pharmacology for the Students in the Faculty of Health and Nutrition in Tabriz University of Medical Sciences. *Res Dev Med Educ*, 2013, 2(1), 7-11 doi:10.5681/rdme.2013.003 (Accessed on 3 March 2016)
3. Bullock S, Manias E, The education preparation of undergraduate nursing students in Pharmacology: a survey of lectures perception and experiences. *J Adv Nurs* 2002. 40:7-16
4. Medical Council of India. Regulations on graduate medical education, published in part iii, section 4 of the Gazette of India. New Delhi. 1997
5. Rangachari PK. Basic Sciences in an Integrated Medical Curriculum: The Case of Pharmacology. *Adv Health Sci Educ Theory Pract.* 1997;2(2):163- 171
6. Upadhyaya P, Seth V, Sharma M, Ahmed M, Moghe VV, Khan ZY et al. Prescribing knowledge in the light of undergraduate clinical pharmacology and therapeutics teaching in India: views of first-year postgraduate students. *Adv Med Educ Pract.* 2012 Jun 5; 3:47-55
7. Ashwin Kamath, A Review of Use of eLearning in Pharmacology, *Int J Intg Med Sci* 2015, Vol 2(9):157-62. DOI: <http://dx.doi.org/10.16965/ijims.2015.124> (Accessed on 25 March 2016)

was less probably because of inadequate knowledge of the booming career in clinical research in pharmaceutical industries.^[26] It is necessary to enlighten students about various carriers options in Pharmacology like Clinical research, Pharmacovigilance. 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.

Conclusion

Students perceive Pharmacology as an interesting subject which requires to be taught regularly even after second MBBS. There is need of more clinical orientation in Pharmacology teaching at undergraduate level.

Acknowledgements

We acknowledge second year MBBS students of 2013 batch of MRMCW, Hyderabad, for participating in this project.

8. Jalgaonkar SV, Sarkate PV, Tripathi RK. Students' perception about small group teaching techniques: role play method and case based learning in Pharmacology. *Education in Medicine Journal*. 2012; 4(2): 13-18
9. Achike FI, Ogle CW. Information overload in the teaching of pharmacology. *J Clin Pharmacol*. 2000; 40(2): 177-83
10. Dagenais ME, Hawley D, Lund JP. Assessing the effectiveness of a new curriculum: Part I. *J Dent Educ*. 2003;67:47-54
11. Jai K, Abhishek S, Shwetank G, Aakansha G, Priyamvada S, Mirza URB, et al. Students' current perceptions and feedback on teaching and learning Pharmacology from an evolving medical school. *IAIM*. 2015; 2(7): 99-104
12. Oppenheim AN. Questionnaire design, interviewing and attitude measurement. Pinter publications. ST Martins-press. First edition. 1992
13. Petra MB, Trisha Greenhalgh. Selecting, designing and developing your questionnaire. *BMJ*. 2004; 328: 1312-1315. doi: 10.1136/bmj.328.7451.1312
14. Howitt D, Cramer D. First steps in research and statistics, Routledge publishers. First edition. 2000
15. Hughes I. Changes in the technological methods of teaching and learning in undergraduate pharmacology in UK higher education. *BEE-j*. 2003; 1: 1
16. Manoj G, Monika B, Anshu G, Shailesh Y, Perceptions and suggestions of 2nd professional MBBS students about their teaching and learning process. *NJIRM*. 2010; 1(4): Oct-Dec
17. Chavda N, Preeti Y, Mayur C, Kantharia N D. Second year students feedback on teaching methodology and evaluation methods in Pharmacology. *NJPPP*. 2011; 1:23-31
18. Palappallil DS. Attitude of interns and students on teaching and learning methodologies in Pharmacology, *IJP-T*. 2014; 5(1)
19. Uma AB, Radha Y, Gauri EY. Attitude perception and feedback of second year medical students on teaching- learning methodology and evaluation methods in Pharmacology: A questionnaire- based study. *Niger Med J*. 2013; Jan- Feb;5491:33-39
20. Bhosale UA, Yegnanarayan R, Yadav GE. Attitude, perception and feedback of second year medical students on teaching- learning methodology and evaluation methods in pharmacology: A questionnaire-based study. *Niger Med J*. 2013;54:33-9. doi: 10.4103/0300-1652.108891 (Accessed on 15 April 2016)
21. Chavda N, Yadav P, Karan J, Kantharia ND. Second MBBS medical student's feedback on teaching methodology and evaluation methods in Pharmacology. *NJPPP*. 2011;1(1):23-31. doi:10.5455/njppp.2011.1.23-31. (Accessed on 16 April 2016)
22. Jaykaran, Chavda N, Yadav P, Kantharia ND. Intern doctors' feedback on teaching methodologies in pharmacology. *J PharmacolPharmacother*. 2010;1:114-6
23. Han WH, Maxwell SR. Are medical students adequately trained to prescribe at the point of graduation? Views of first year foundation doctors. *Scott Med J*. 2006;51:27-32
24. Heaton A1, Webb DJ, Maxwell SR. Undergraduate preparation for prescribing: the views of 2413 UK medical students and recent graduates. *Br J Clin Pharmacol*. 2008; 66:128-34. doi: 10.1111/j.1365-2125.2008.03197.x
25. Kela AK, Mehta VL. Impact of inclusion of clinical projects in undergraduate teaching. *Indian J Pharmacol*. 1993;25:249-50
26. Debjit Bhowmik, Margret Chandira, Chiranjib.B. Emerging trends of scope and opportunities clinical trials in India. *International journal of Pharmacy and Pharmaceutical Sciences*. Vol 2, Suppl 1, 2010