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Outcome Of Case Based Learning For Teaching Pharmacology At A Tertiary Medical College Of Rural Chhattisgarh, India.

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ABSTRACT

Pharmacology, a very important subject of second MBBS, is a bridge to the clinical subjects like medicine. The application of knowledge of pharmacology is evident in the medicine. The treatment of diseases is incomplete without the thorough knowledge of Pharmacology. Students coming to second Prof need an interesting approach to the subject which is not possible via traditional teaching methods like didactic lectures. Case based learning forms a platform for better teaching and training of the subject. Introduction of CBL as a method of teaching pharmacology and the perceptions of students regarding it were noted. 100 students of second MBBS were enrolled in the study. The students were divided in a group of 2 each with a group leader. Didactic lectures of the relevant topics like hypertension and diabetes were first taught 1 month prior and next month in the tutorials commonly prevalent diseases were formulated into case-based scenarios were given to each group. Effectiveness of the CBL was done on the basis of pretest and posttest. 88% students agreed that CBL was beneficial in improving the learning outcomes. The results of Pretest versus Post test showed remarkable improvement in their performances. Arousal of interest, Critical thinking, self-learning approach with integration of the subject were all the hallmarks of Case based learning approach of Pharmacology.

Keywords: Pharmacology, undergraduate, self-directed learning, CBL

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INTRODUCTION

Pharmacology is a vast and challenging subject, of rapidly changing nature due to fast paced research, drug discoveries and clinical trials. Strong pharmacological concepts are crucial for proper understanding and application of clinical management guidelines.

There can be no single best way of learning in medicine since each method has its advantages and disadvantages. In India, traditionally delivered didactic lectures may not always suffice the students to understand the basic concepts of pharmacology [1].

Most of the knowledge given through didactic lecture is focusing on recall (Lower cognitive domain) rather than comprehension and application (higher cognitive domain). Routine didactic lectures are not having sufficient active participation of students in learning & students find the subject very vast, dry and volatile as well as less interesting and having poor memory retention. Conventional modes of teaching neither encourages the right qualities in students nor imparts a life-long respect for learning because it is unidirectional, teacher-centered and does not focus on analytical skills.

The teaching of pharmacology is a challenging task as it involves teaching of drugs and their kinetics and dynamics. Without any real-world application of this massive knowledge-bank in pharmacology, the undergraduate students are afraid of the subject due to the massive amount of data that have to be crammed and learned by rote memorization. Hence, an element of clinical correlation has to be brought into pharmacology teaching to promote easy comprehension of the subject [2].

The Medical Council of India, recommendations for graduate medical education in 1997, state that maximal efforts have to be made to encourage integrated teaching between various preclinical and clinical disciplines using PBL/CBL [3].

Competency based Medical Education (CBME) adopted by Medical Council Of India (Now replaced by National medical Commission) provides an effective outcome-based strategy where various domains of teaching including teaching learning methods and assessment form the framework of competencies [4].

The medical council of India has also recommended the introduction of Case-based learning (CBL) in basic medical subjects [5, 6].

Case based learning is an innovative method which uses problem as the starting point and hence motivates the students to identify the “conceptual gaps” and formulate learning objectives for themselves.

Case-based learning is centered on a well-designed clinical problem through which students identify their learning requirements, make an enquiry, and correlate the theory and practice. Because of the active participation by students, it enhances the students’ ability to analyze and learn clinical application of the knowledge to treat a patient and can reflect on the educational experience gained through cases/problems [7, 8]. The CBL encourages independent learning and deeper understanding of a particular topic and promotes lifelong learning [9, 10].

In our institute Pharmacology is taught mainly as didactic lectures, tutorials and practical’s which is teacher centered and unidirectional learning. The objective of this study is to find out benefits of CBL as compared to didactic lectures and also to evaluate the perception of students regarding CBL.

Aims and Objectives

- To study effectiveness of CBL over Didactic lectures as teaching learning method in Second MBBS students
- To study perception about CBL in second MBBS students as a teaching learning method in Pharmacology

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MATERIALS AND METHODS

A total of 100 students of second prof were enrolled in the study. The students were divided in two groups along with a group leader. A prior informed consent was obtained for enrolling in the study. The study was conducted for 3 months (February to April 2023).

Inclusion criteria: Students who have attended the class and are willing to participate in the study.

Exclusion criteria: Students not willing to participate in the study

Methodology

After receiving ethical approval by the Institutional ethical committee,100 students of second year were enrolled in the study by random sampling method. Before, commencement of the study a written informed consent was taken from the participants.

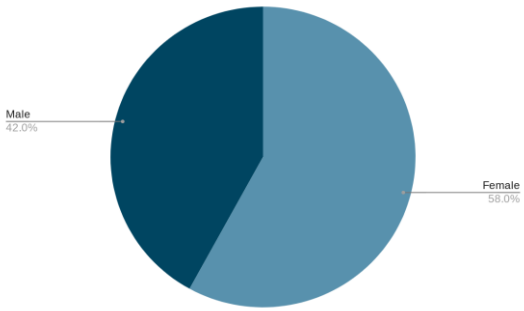
Those students enrolled in the study were labeled group A and Group B.

Group A was given a pretest on the topic of hypertension and posttest after the didactic lecture was delivered. This pattern was applied for 2 weeks similarly group B was given pretest and posttest after being taught the topic of hypertension via CBL. Similarly the topic of diabetes was also dealt in the same way.

RESULTS

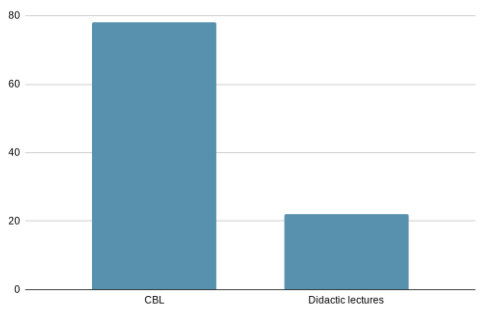
A total of 100 students were enrolled in the study out of which 58% were females and 42% were males.

Figure 1: Male versus Female participation in the study



Attendance in the sessions were compared in which attendance in CBL was 78% as compared to didactic lectures 22%.

Figure-2 Attendance in didactic lectures and CBL



The response of students to the questionnaire about CBL different aspects.

Table 1

Sr. No	Question	Yes	No
1	CBL was useful in understanding the topic	55	45
2	CBL helped me improve my ability to apply the concepts of basic sciences to clinical situations	68	32
3	CBL facilitated self directed learning in pharmacology	77	23
4	My learning of facts,diagnostic and therapeutic skills as well as rational drug therapy knowledge were significantly enhanced by CBL sessions	86	24
5	Didactic lectures were useful in the understanding of the topic	31	69
6	The problems in CBL were related to the topics of the study	88	22
7	By virtue of CBL the drugs could be better related to their basic mechanism	62	38
8	CBL motivated to learn about the topic	55	45
9	CBL should be combined with didactic lectures for better learning pharmacology	94	06
10	CBL helps in preparing better for university exams	99	01

DISCUSSION

The traditional/conventional system (didactic lecture) in pharmacology is teacher centered with very less active participation from the students and the application of knowledge of Pharmacotherapy in actual clinical posting is also minimal [11, 12].

In our study there was a prevalence of female participants (58%) as compared to males (42%). The attendance in CBL sessions was better (78%) as compared to didactic lectures (22%) as similarly found in the study conducted at Punjab by Gurleen Kaur, Jagdeep Rehncy et al. This depicts that the students enjoy CBL sessions more as compared to conventional lecture-based learning sessions [13].

55% opined that CBL was an effective tool in learning pharmacology as pharmacology is a discipline more applicable and closer to clinical science; the design of learning cases and the incorporation of clinical relevance in them should be more obvious and easier to make. Similar outcome was found in the study by Tayem in which CBL was 82% effective tool.

68% stated that CBL improved the ability to apply the concept to basic sciences as compared to the study by Dube et al [15] where only 50% students agreed to this fact.

Also, similar results found in Bihar [14] 77% felt that it improved self-directed learning.

Case based learning promotes active involvement, increases attention and motivation, gives immediate feedback to teacher and student, and enhances the student's learning by increasing the ability to synthesize and integrate the material in comparison with passive learners [14]. Also a study conducted by Adiga and Adiga [15] also clearly demonstrates stronger benefits of CBL in learning, such as an enhancement in academic locus, triggered motivation, achieving strategy, deep approaches, and deep achieving approach to learning for a whole group.

86% opined that CBL did significantly enhance the learning by using facts.

CBL helped in better understanding of drug mechanisms as said by 62% of the participants [16].

31% only opined that didactic lectures were better in learning which clearly states that CBL was better as also found in the similar studies by Gupta et al [17].

99% of them said that it will help them in better performance in exams as also found in the study by Chilawant [18] where 75% said about improvement.

Our faculty agreed that this experience was motivating and had contributed in improving their knowledge about new teaching learning techniques.

The response of students was recognisable in their attendance which was also found in study reported by Klegeris and Hurren [19] and also in study by Smith and Cook [20].

The limitations of the study were that we focused only on short term exams like undergraduate exams whereas the long-term outcome like performance in post graduate entrance exam and internship should also be assessed. The skills about prescription writing should be assessed. More students should also be encouraged to participate in similar studies. Evaluation of students both by CBL and non CBL methods should be done for better outcomes.

CONCLUSION

Case based learning is an effective tool in the teaching learning method and can be incorporated into our medical curriculum along with didactic lectures. The outcome of the combination would be more beneficial to the students as depicted in the responses of the student's feedback because it enhanced their understanding of subject of Pharmacology, improved their self-directed learning, made them interested to read more, also helped in problem solving. It would be really beneficial to the students if it is introduced on regular basis in the basic sciences departments.

REFERENCES

[1] Dubey S, Dubey AK. Promotion of higher order of cognition in undergraduate medical students using case-based approach. J Educ Health Promot 2017;6(1):75.
[2] Lau YT. Problem-based learning in pharmacology: a survey of department heads in Taiwan, China. Acta Pharmacol Sin 2004; 25:1238-1240.
[3] Medical Council Of India. Regulation of Graduate Medical Education, 1997. Notification, Gazette of India, Part III, Sect.4, May 17, 1997 (Amended Upto February 2012).
[4] Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018;1:4.
[5] Medical Council of India. Regulations on Graduate Medical Education, 1997. Notification, Gazette of India, Part III, Sect 4.1997. Amended up to Mar 2018.
[6] Competency based undergraduate curriculum for the Indian Medical Graduate. Alignment and Integration. https://www.mciindia.org/CMS/wp-content/uploads/2020/01/Alignment-and-integration_03.10.2019.pdf.
[7] Mahajan R, Badyal DK, Gupta P, Singh T. Cultivating lifelong learning skills during graduate medical training. Indian Pediatr 2016; 53:797-804.
[8] Kamat SK, Marathe PA, Patel TC, Shetty YC, Rege NN. Introduction of case-based teaching to impart rational pharmacotherapy skills in undergraduate medical students. Indian J Pharmacol 2012; 44:634-638.
[9] Tayem YI. The impact of small group case-based learning on traditional pharmacology teaching. Sultan Qaboos Univ Med J 2013; 13:115-120.
[10] James H, Al Khaja KA, Sequeira RP. Effective use of real-life events as tools for teaching-learning clinical pharmacology in a problem-based learning curriculum. Indian J Pharmacol 2015;5: S21-S23.
[11] Ghosh S. Combination of didactic lectures and case-oriented problem-solving tutorials towards better learning: perceptions of students from a conventional medical curriculum. Adv Physiol Educ 2007;3(2):193-197.
[12] Meier SL, Hovde RL, and Meier RL. Problem solving: Teachers' perceptions, content Area models, and Interdisciplinary connections. School Science and Mathematics 1996; 96:230-237.

[13] Michel MC, Bischoff A, Jakobs KH. Comparison of problem-and lecture-based pharmacology teaching. Trends Pharmacol Sci 2002; 23:168-170.
[14] Kumar A, Vandana Aslami AN. Introduction of "Case based learning" for teaching Pharmacology in a rural medical college in Bihar. Natl J Physiol Pharm pharmacol 2016; 6:427-430
[15] Adiga S, Adiga U. Problem based learning-An approach to learning pharmacology in medical school. Biomed Res 2010; 21:43-46.
[16] Dube SP, Ghadlinge MS, Mungal SU, Tamboli SB, Kulkarni MB. Students perception towards the problem based learning. IOSR-JDMS 2014; 13:49-53.
[17] Gupta K, Arora S, Kaushal S. Modified case-based learning: our experience with a new module for pharmacology undergraduate teaching. Int J Appl Basic Med Res.2014; 4:90-94.
[18] Chilawant KS. Comparison of two teaching methods, structured Interactive lectures and conventional lectures. Biomed Res.2012; 23:363-366.
[19] Klegeris A, Hurren H. Impact of problem-based learning in a large classroom setting: student perception and problem-solving skills. Adv Physiol Edu 2011;35:408-415.
[20] Smith M, Cook K. Attendance and achievement in problem-based learning: the value of scaffolding. Interdisc J Prob Based Learn.2012;6:129-152.