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Case Based Learning: An Effective Teaching Learning Method in Pharmacology for MBBS Students

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Abstract

Introduction: Medical education in India is currently going through major changes by bringing competency based undergraduate curriculum (CBME) from 2019. CBME aim to train graduates to efficiently take care of the health needs of the society. Pharmacology is an important subject in MBBS curriculum and involves treatment and prevention of a disease. This study aimed to compare, Case based learning (CBL) and Didactic lecture (DL) in Pharmacology and also to evaluate the student perception and effectiveness of these teaching methods. **Materials and Methods:** Total 140 MBBS students participated in this study. Students were randomly divided into two groups. Group A & B were exposed to CBL & Didactic lecture respectively. Student's knowledge of the topic was assessed before and after the sessions in both the groups. Student's perception of teaching method was assessed by five-point Likert scale. **Results:** The scores of pre-session of multiple-choice questions were compared in both the groups. There was no significant statistical difference in the marks obtained between the CBL and didactic lecture group (p>0.05). On comparing the scores post session between the groups, there was statistically significant difference between CBL and Didactic lecture group. The mean score was found to be higher in the CBL group. Most of the students strongly agreed that CBL improved their problem-solving ability, boosted confidence in clinical case scenario, improved communication skill and increased their interest in applied pharmacology as compared to didactic lecture. **Conclusion:** CBL is an effective teaching method and with student's positive response and perception, it can be a good add-on teaching method in Pharmacology for MBBS students.

Keywords: Case Based Learning, Didactic Lecture, Pharmacology.

Introduction

National Medical Council has introduced competency based undergraduate program (CBME) for MBBS students to motivate them and also aim of imparting medical education to train medical graduates efficiently to take care of the health needs of the society[1]. Combination of various teaching methodologies is the need of today's medical education and also improve student's knowledge and clinical correlation. Case based learning (CBL) is a student centered teaching method where a well-structured clinical problem designed by the teacher covering all the various domains of medical education is addressed to the student in the class[2].This type of teaching method involves active participation of the students and correlation of theory with clinical application[3].CBL also helps in long term understanding of a particular topic and helps students to identify the problem, clear doubts and promotes knowledge in treating a patient[2].Teaching pharmacology in the traditional way involves classroom lectures and is more teacher centered with minimal student active participation. To apply this knowledge into clinical practice becomes difficult for the students. It is also difficult to Correlate the mechanism of a particular drug with its clinical application for a

particular disease[4].CBL is student centered, interactive and an active learning approach targeting to improve the student's knowledge and clinical application-based examination[5].

There have been studies to evaluate the CBL with other methods of learning in various subjects taught on Medicine[4,5,6]. This study was done with an objective to compare CBL with Didactic lecture (DL) in Pharmacology department, to assess the student's performance pre and post CBL and DL sessions. Students and faculty feedback on the teaching method was also assessed.

Materials and Methods

A Comparative, questionnaire-based study was conducted in the pharmacology department of TMMC & RC Moradabad, for second year MBBS Student's. A total of 140 student's participated in the study.

The topic for CBL and Didactic Lecture was selected by a team of pharmacologist and clinician. The topic was selected as treatment of Tuberculosis and focused on the objective of the content related to pharmacology. Both faculty and students were sensitized to the nature and objective of the study and the topic of the session was given to students 1-week prior to the day of study.

On the day of study all students were given a pre-test questionnaire of 15 marks, consisting of multiple-choice questions related to the topic to be covered. Then all the students were randomly divided into two groups. Group A (CBL, N=70) and Group B (DL, N=70).

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In Group A, the faculty in charge of CBL was the facilitator for 70 students. The CBL group involved was focused on identifying key learning issues, patient problem, investigation and treatment. The group selected a team leader, a recorder and timekeeper to lead the session. The students were encouraged to participate and discuss actively with other teammates and with the facilitator during the session. The facilitator also helped in clearing the doubts of the students. It was followed by a questionnaire addressing the objective of that topic.

In group B (N=70) students were taught the same topic using didactic lecture method by another senior faculty member. Post-session both the groups were asked to fill the same questionnaire again, to compare and assess the knowledge and understanding between Pre-session and Post-session.

This was followed by a voluntary and anonymous feedback questionnaire administered to all the student and faculty of both the groups. A pre validated feedback form consisting of 9 questions on a 5-point likert scale grading (1= strongly agree, 2= agree, 3= neutral, 4=Disagree, 5= strongly disagree) was used.

Statistical analysis was performed using unpaired student t-test. Scores were expressed as mean ± standard deviation and P<0.05 was considered to be statistically significant. Comparison of improvement in pre and post session scores were done between CBL and DL group. Analysis of student and faculty feedback was also done.

A total of 140 students of MBBS 2nd year Pharmacology, participated in the study.

The scores of pre-session multiple-choice questions were compared in both the groups. Unpaired student t test was applied between group A and group B and there was no significant statistical difference in the marks obtained between the CBL and DL group (p>0.05) (Table-1 & Figure-1).

On comparing the scores post session between the groups, there was statistically significant difference between CBL and DL group. The mean score was found to be higher in the CBL group (Table-1).

Feedback score: Feedback form was distributed amongst the student for voluntary feedback and we received anonymous feedback from 140 students (Figure 2 & 3). Most of the students strongly agreed that CBL improved their problem-solving ability, boosted confidence in clinical case scenario, improved communication skill and increased their interest in applied pharmacology as compared to didactic lecture. They were also of the opinion that CBL session was interesting, interactive, enjoyable, effective learning tool and would like to have more sessions of CBL.

Feedback from faculty was also collected and they were of the opinion that though CBL is an interactive and effective teaching learning method but it is more time consuming and requires greater effort. A need of organizing more training programs on CBL for the faculty members is required in future to conduct more sessions effectively.

Results

Table 1: Comparison of Pre and Post- session marks of CBL and DL groups

	GROUP – A (CBL)	GROUP – B (DL)
Sample size	70	70
Pre-session		
Mean Marks (out of 15)	7.35	7.44
Standard deviation	2.05	1.93
P-value	P=0.7998	
Post-session		
Mean Marks (out of 15)	11	9.14
Standard deviation	1.192	1.06
P-value	P<0.0001	
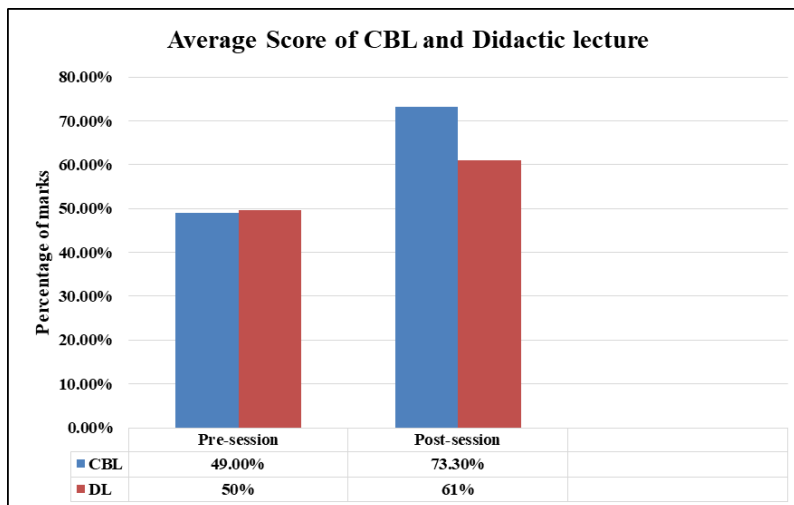
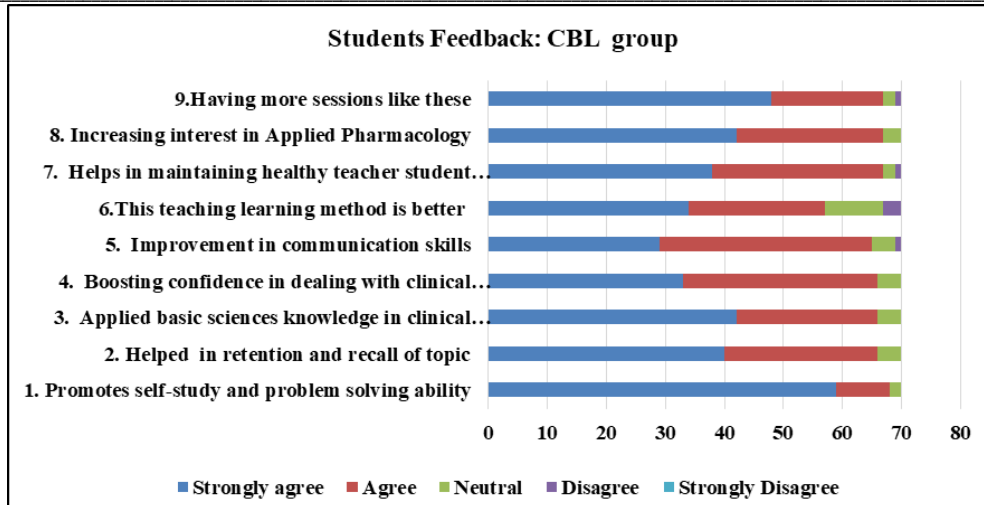**Fig. 1: Average score of CBL and Didactic Lecture (DL)**

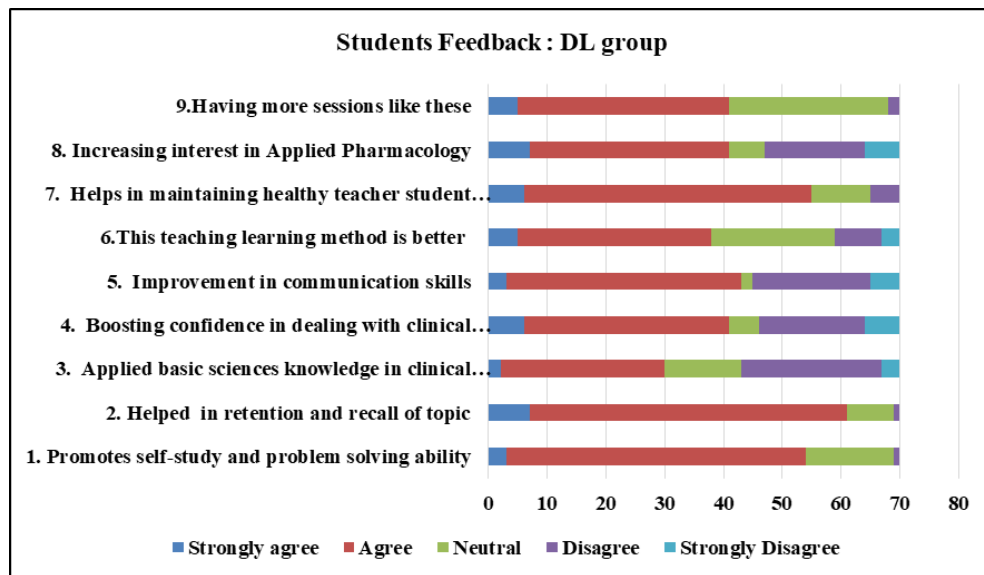Fig. 2: Feedback from the students of CBL group

Fig. 3: Feedback from the students of DL group

Discussion

CBL as compared to traditional method (Didactic lecture) in Pharmacology is more student centered and involves active participation of the students[7]. There is early clinical exposure and correlation of various components of a disease. CBME has put emphasis on student centered and outcome-based teaching methodology in medical education[8,9].

In our study, the post session score was better in the CBL group as compared to Didactic lecture. It was similar to a study done by Diwan et al where, CBL was found to be a better teaching learning method as compared to tutorial[10].

In another study by Rehman, students found CBL to be a better teaching method in understanding of a disease[11].Tushar et al, post session scores in CBL group have shown significant improvement as compared to post session scores in didactic lecture. It was found that 80.4% students feel CBL a good teaching learning method[12].

In our study, 60% students strongly agreed that CBL helped in application of basic sciences knowledge in clinical case scenario and none of the student disagreed. Whereas in Didactic lecture only 0.03

% strongly agreed and 34.3 % disagreed. In CBL group 41% students strongly agreed that it helped in improving communication skills as compared to Didactic lecture group (0.4%). The findings of our study were comparable with Tathe S et al where 82.04% students were of the opinion that CBL helped in improving learning and communication skills (50%) in large group setting as compared to didactic lecture[5].

A similar study done by Gupta et al 76% of the students were of the opinion that CBL is better alternative to Didactic lectures. CBL helps in improving the concept of Pharmacology in clinical practice[13].

Limitations: The limitations of the study were that it was conducted for only one topic in Pharmacology. The long term outcome can only be measured if we assess the students' performance throughout the year with and without CBL.

Conclusion

Pharmacology is a science which deals with treatment of a disease and its understanding is required in the clinical practice and studying medicine. Case Based Learning is an effective teaching learning

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method in Pharmacology and it helps in better understanding of the disease and also help in corelating various aspects of a disease. Positive response from the students and faculty indicates that it is a good add-on method to traditional teaching methods for better understanding of a particular topic in medicine. It also motivates students towards self-directive learning, critical thinking, arousal of interest and active participation. Therefore, CBL should be incorporated along with other traditional teaching learning methods in teaching Pharmacology to undergraduate students.

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