ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
Index Copernicus Value: 49. 23
PubMed - National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 3, Issue – 5, September - 2018, Page No. :168 – 172

Effectiveness of Case Based Learning over Conventional method of teaching among undergraduate medical students.

Anusha Vohra, MD, Associate Professor, Department of Pharmacology, Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur

Rajaat Vohra, MD, Associate Professor, Department of Community Medicine**,** Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur

Corresponding Author: Rajaat Vohra, MD, Associate Professor, Department of Community Medicine**,** Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Introduction: In the present system of medical education, knowledge is gained in isolation. Each subject is taught in different blocks with no chances to integrate the knowledge gained. One of the methods of implementing integrated teaching is case based learning (CBL).

Material and methods: It was a pre test post test study design. All 150 students were subjected to a set of 20 problem based MCQs as a pre test. One batch of 4th and 6th semester students were taught using CBL. The other batch of 4th and 6th semester was taught the same topic using the conventional method of teaching. Students were then subjected to same set of 20 problem based MCQs as a post test. Feedback was taken from the students regarding effectiveness of CBL.

Results: In students subjected to CBL, mean pre test score was 8.50 while mean post test score was 14.64. Mean pre test score of students of conventional teaching group was 8.42 while post test score was 13.28. Though there was statistically significant improvement in post test scores in both the methods, but when compared there was more improvement in scores of students taught with CBL than conventional method. All the students felt that CBL improve their ability of treatment planning.

Conclusion: The present study concludes that CBL is more effective teaching method than conventional method. CBL provides opportunities for developing and practicing contextual thinking and clinical collaboration skills.

Keywords: Integrated teaching, Traditional teaching, medical curriculum.

Introduction

In the present system of undergraduate medical education, knowledge is gained in isolation. Each subject is taught in different blocks with no chances for the student to correlate and integrate the knowledge gained. Therefore, Medicine is not grasped as a whole subject by the student and such teaching creates a disinterest among student to learn the subject. [(1)]

The Medical Council of India currently stresses on the need based curriculum to create interest among the students.[(2)] To meet this, the Medical Council of India in its amendment in 2012 has recommended the integrated learning method and also strives to make it a part of

regular curriculum.[3] An integrated approach to the teaching of topics in a course is well accepted as an effective educational strategy.[4-6] There is a need to incorporate integration in the medical curriculum in order to provide the students with a holistic rather than fragmented learning perspectives.[6]

One of the method of implementing integrated teaching is case based learning (CBL). CBL's main trait is that a case, problem, or inquiry is used to stimulate and underpin the acquisition of knowledge, skills, and attitudes of students. Cases are generally written as problems that provide the student with a background of a patient or other clinical situation. Supporting information is provided, such as latest research articles, vital signs, clinical signs and symptoms, and laboratory results. CBL allows students to develop a collaborative, team based approach to their education. Other characteristics include hypothesis generation and the consolidation and integration of learning activities.[7]

The other advantages of CBL are: [8-10]

- Intrinsic and extrinsic motivation is developed, allowing individualised learning;
- Encourages self evaluation and critical reflection;
- Allows scientific inquiry and the development of support;
- Provision for their conclusions;
- Integration of knowledge and practice; and
- Development of learning skills.

The present study is planned with the objective of formulating an integrated teaching program using case based learning in IIIrd MBBS Part-1 curriculum and assessing the outcome of the same. The study also aimed to assess the students perception regarding CBL.

Material and methods

It was a pre test post study carried out on 150 students of 4th semester and 6th semester. Due approval was taken from Institutional Ethical Committee before undertaking the study. Written Informed consent was obtained from each and every student participating in the study. One day orientation training on case based learning was provided to all students and faculties before implementing the program.

A set of 20 problem based multiple choice questions (MCQs) was prepared and students of 4th and 6th semester were subjected to it as a pre test. One batch of 4th semester and one batch of 6th semester students was taught using case based learning (CBL). The other batch of 4th and 6th semester was taught the same topic using conventional method of teaching. Thus, we had 75 students who were taught by CBL and 75 students who were taught by traditional method.

Maastricht "Seven Jump" process was used to implement CBL among IIIrd MBBS medical students.[11] Students were divided into subgroups comprising 6-7 students each. They were taught RNTCP and Family planning by CBL method in 2 sessions of 1 hour each. Faculty of the Department of Community Medicine was present throughout the session as a facilitator. Conventional teaching was also done for a period of 2 hours.

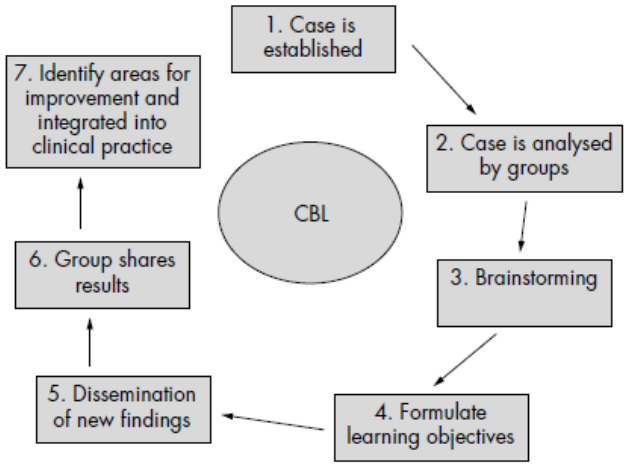

Fig 1. : Case based learning process (Maastricht "Seven Jump" process)

Students of 4th and 6th semester were then subjected to same set of 20 problem based MCQs as a post test at the end of their clinical posting of 15 days. Feedback was taken from the students regarding effectiveness of CBL in making them understand the topic, whether it created interest among students.

Marks obtained in pre test and post test in both groups (CBL and conventional method of teaching) were entered in Microsoft Office Excel. Mean and standard deviation was calculated. Paired t-test was used compare the marks obtained by the student in pre test and post test in both the groups to find whether there is a statistically significant improvement in the knowledge gained. Unpaired t test was used to compare post test marks obtained in CBL and conventional method of teaching to assess whether CBL is more effective than conventional method of teaching or not.

Results

Table 1 showed the pre test scores of students of case based learning group and conventional method of teaching group. Mean score of CBL group was 8.50 while that of conventional method group was 8.42.

Table 1: Pre test scores of CBL and Conventional method group

Groups	Number of students	Pre test score	
		Mean	Standard deviation
CBL group	75	8.50	2.59
Conventional method group	75	8.42	2.63

Comparison of pre test and post test mean score of students before and after case based learning sessions is shown in table 2. The mean pre test score is 8.50 while mean post test score is 14.64. On applying paired t test, p value comes out to be 0.000. Thus, there is statistically significant improvement in post test scores in comparison to pre test scores after case based learning sessions.

Table 2: Pre test and post test score of Case based learning (CBL) group [n=75]

	Mean	Standard deviation	p value
Pre test score	8.50	2.59	0.000
Post test score	14.64	2.20	

Mean pre test score of students of conventional teaching group is 8.42 while post test score is 13.28. (Table 3). On applying paired t test, p value comes out to be 0.000. Thus, there is statistically significant improvement in post test scores in comparison to pre test scores after conventional method of teaching.

Table 3: Pre test and post test score of conventional method of teaching group [n=75]

	Mean	Standard deviation	p value
Pre test score	8.42	2.63	0.000
Post test score	13.28	1.85	

On comparing post test scores of students, mean score of CBL group is 14.64 which is higher than that of conventional method group (13.28). On applying unpaired t test, p value comes out to be 0.000. Thus, there is statistically significant improvement in post test scores of CBL group in comparison to conventional group. (Table 4)

Table 4: Post test scores of CBL and conventional method group

Groups	Post test score		p value
	Mean	Standard deviation	
CBL group	14.64	2.20	0.000
Conventional method group	13.28	1.85	

Table 5 shows students perception regarding case based learning. 93.33% students agreed that the cases presented were interesting and involved several disciplines. 90.66% students found the cases relevant to IIIrd year students. All the students felt that the cases facilitated active discussion among the students. Around 99% students felt that CBL helped students to improve their diagnostic skills and lateral thinking. All the students felt that CBL improve their ability of treatment planning. 98% students felt that CBL is useful in preparation of clinical problem and all the students enjoyed CBL session.

Table 5: Students perception regarding case based learning (CBL) [n=75]

Questions	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)
The cases presented were interesting and involved several disciplines	0	3(4)	2 (2.66)	10	60 (80)
The cases presented were relevant to IIIrd year students	0	0	7 (9.33)	5 (6.66)	63 (84)
The cases facilitated active discussion	0	0	0	13 (17.33)	62 (82.66)
Case based learning helped improve diagnostic skills and lateral thinking	0	0	1 (1.33)	11 (14.66)	63 (84)
Case based learning improved my ability of treatment plan	0	0	0	4 (5.33)	71 (94.66)
CBL is a useful preparation in clinical problem	0	0	2 (2.66)	9 (12)	64 (85.33)
The discussion facilitated interaction between staff and students	0	0	0	17 (22.66)	58 (77.33)
I enjoyed cased based learning	0	0	0	1 (1.33)	74 (98.66)

Discussion

In the present study, it was seen that there is a statistically significant improvement in the post test mean score of the students in both case based learning (CBL) group and conventional method of teaching group.

When post test scores of CBL group and conventional teaching group were compared, it was seen that there is a statistically significant improvement in the post test mean score in CBL in comparison to conventional method. Thus, it can be concluded that teaching by CBL leads to better understanding of the subject.

A similar study by Sandhya Pillai Nair et al also showed that CBL is effective in the medical curriculum for better understanding of biochemistry among medical students. [(11)] A study by Kedar B Joshi et al showed that CBL is useful method and should be used as regular teaching method in medical curriculum. [(12)]

It was seen in the present study CBL provides opportunities for developing and practicing contextual thinking and clinical collaboration skills. It helps the students to understand practical application of the subject. A similar study by Praveen R Singh concluded that CBL is a very good approach to initiate student centred learning. It also helps students to understand practical application of the theory taught to them. [(13)]

A study by Setia S have concluded that innovative CBL paradigm appears to be an effective, superior and student centred alternative to traditional lecture format and problem based learning (PBL) from medical students' perspective in developing countries like India. [(14)]

Feedback questionnaire filled by the students revealed that most of the students strongly agree CBL is an effective method for better understanding of the topic, helps in creating interest in the subject, and enhances learning in comparison to the conventional method of teaching. CBL helped in improving their ability of treatment plan as well as in preparation of clinical problem. Majority of the

students strongly agree that the discussion facilitated interaction between students and staff and they thoroughly enjoyed CBL sessions.

A study by Thristlethwaite JE et al also concluded that students enjoy CBL and think that it enhances their learning. CBL seems to foster learning in small groups. [15]

Conclusion

The present study concludes that CBL is more effective teaching method than conventional method of teaching. CBL provides opportunities for developing and practicing contextual thinking and clinical collaboration skills. It helps the students to understand practical application of the subject. CBL may be supplemented with conventional method and may be appropriately integrated horizontally and vertically to make it more effective.

References

1. RavichandranDoraisamy, Shankar Radhakrishnan. The effectiveness of integrated teaching over traditional teaching among first year MBBS students: A preliminary study. Medical Journal of Dr. D.Y. Patil University. April-June 2013;6(2):139-141.
2. Dandannavar VS. Effect of integrated teaching versus conventional lecturing on MBBS phase I students. Recent Res SciTechnol 2010;2:40-8.
3. Jamkar AV, Yemul VL, Singh G. Integrated teaching program with student centered case based learning for undergraduates at BJ Medical College Pune. Available from:www.faimer.org/education/fellows/abstracts/04jamkar.pdf.
4. Schmidt H. Integrating the teaching of basic sciences, clinical sciences and biopsychosocial issues. Acad Med 1998;73:S24-31.
5. Harden RM. The integration ladder: A tool for curriculum planning and evaluation. Med Educ 2000;34:551-7.
6. Dunaway GA, Faingold CL. Development and implementation of a multidisciplinary sophomore medical curriculum: Integration of pharmacology with basic and clinical sciences. Pharmacologist 2001;43:83-90.
7. Mullins G. The evaluation of teaching in a problem-based learning context, In: Chen SE, et al. Reflections on problem based learning. NSW: Australian Problem Based Learning Network, 1995.
8. Schmidt H. Assumptions underlying self-directed learning may be false. Med Educ 2000;34(4):243–5.
9. Barrows H, Tamblyn R. Problem-based learning: an approach to medical education. New York: Springer Publishing Company, 1980.
10. Barrows H. A taxonomy of problem-based learning methods. Medical Education 1986;20(6):481–6.
11. Sandhya Pillai Nair, Trushna Shah, Shruti Seth, NirajPandit, GV Shah. Case based learning: A method for better understanding of biochemistry in medical students. J ClinDiagn Res. Aug 2013;7(8):1576-1578.
12. Kedar B Joshi, Anup N Nilawar, A P Thorat. Effect of case based learning in understanding clinical biochemistry. International journal of biochemical and advance research. 2014;5(10).
13. Praveen R Singh, Raksha Bhatt. Introduction of case based learning for teaching anatomy in a conventional medical school. Journal of anatomical society of India. Dec 2011;60(2):232-235.
14. Setia S, Bobby Z, Ananthanarayanan P, Radhika M, Kavitha M, Prashanth T. Case based learning versus problem based learning: a direct comparison from first year medical students perspective. WebmedCentral Medical Education 2011;2(6):WMC001976.
15. Thristlethwaite JE, Davies D, EkeochaS, Kidd JM, MacDougall C, Matthews P, Purkis J, Clay D. The effectiveness of case based learning in health professional education. A BEME systematic review: BEME guide No. 23. Med Teach 2012;34(6):e421-44.