A Study of Perception of First Year MBBS Students on Case-Based Learning in Biochemistry as A Method To Improve Analytical Thinking

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Abstracts: Background: Biochemistry is very volatile subject. To understand the subject only didactic or traditional lecture methods are not effective now a day. Health professional need to develop analytical and diagnostic thinking skills and not just a mere accumulation of large amount of facts. Hence case based learning (CBL) has been used in the medical curriculum for this reason, so that the students are exposed to the real medical problems which help them to develop analysing abilities. Aims & Objectives: To develop interest and motivate students, to assess the perception of CBL method and to evaluate analytical thinking ability of students. Methods: The present study included 148 students of first year MBBS. Traditional lecture was given to all 148 students and the pre-test was conducted by giving 10 MCQs. Then the 148 students were divided into 2 groups (Group-A and Group- B). Group A- CBL intervention was given (n = 74). Group B- CBL intervention was not given (n = 74). Again, the post test was conducted for Group-A and same MCQs were given. After four months, modified essay questions (MEQs) were given to all 148 students. Results: A 4-point Likert scale questionnaire which contained 10 questions was administered to the students, to know their perception on the usefulness of the CBL. It was observed that majority of students (97%) enjoyed the new method of teaching and developed interest in the subject. It was also observed that the intervention group's (Group A) perception was improved significantly ($p<0.05$) when compared with pre- and post-test MCQs. It was also noted from the present study that analytical thinking ability was highly increased in Group-A than that of Group- B ($p< 0.0001$). Conclusion: CBL is very effective method and it helps in improving not only student's perception but also analytical thinking ability.[Vaishali P NJIRM 2017; 8(5):67-70]

Key Words: Case based learning (CBL), MCQs (Multiple choice questions), Modified essay questions (MEQs).

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Introduction: The medical education in India is rapidly progressing and improving since last decade[1]. Learning is an active process in which the student and teacher must work mutually to make the knowledge-sharing process enjoyable and easier for comprehension. For effective learning teaching should facilitate development of analytical approaches to a problem and to address areas which pose difficulties for students. Thus, it becomes essential to utilize an approach to teaching and learning that is best suited to the needs of the students[2]. Medical graduation course is of total four and half year's duration with one-year clinical training in India. First year of this course mainly deals with basic medical science subjects like Anatomy, Physiology and Biochemistry.

Biochemistry is an important but very volatile subject. It is generally considered to be a subject of just countless biochemical structures, pathways and reactions. In the traditional system of medical education, it was mainly taught by means of didactic lectures, tutorials and practical classes, in the first year of the medical course. Hence, it was teacher centered, with minimal active participation from the students and hence, the students lacked interest and critical thinking[3]. But these days, the education system is changing to a student centered teaching–learning process with the use of various innovative teaching methods. This makes the students actively involved in the process of learning and it thus prepares them for a lifelong self-directed learning process[4].

The subject of biochemistry is a key subject which forms the base of laboratory medicine and includes diagnostic methodology. Clinical biochemistry topics link the basic knowledge with clinical content. Hence, these topics are extremely important in learning process and for practice of medicine in future[1].

Health professionals need to develop analytic and diagnostic thinking skills and not just a mere accumulation of large amount of facts.

Hence, Case Based Learning (CBL) has been used in the medical curriculum for this reason, so that the students are exposed to the real medical problems, which helps them in develop analysing abilities. This also helps them in interpreting and solving the

problems and while doing this, they develop interest. In addition to didactic lectures, CBL was used as a learning method[4].

The main objectives of present study were:

- To develop interest and motivate students
- To assess the perception of CBL method
- To evaluate analytical thinking ability of students

Methods:The present mixed (qualitative and quantitative) study was conducted in the department of Biochemistry, Dr D. Y. Patil Medical College Kolhapur, India during academic year 2015to 2016. The study was approved by institutional ethical committee. After Ethical Committee clearance totals 5cases were constructed, faculties were trained and one case was selected by departmental faculties. At the same time MCQs, feedback questionnaire and MEQs (Modified Essay Questions) were validated from departmental faculties.

In the present study 148 students were included. Traditional lecture of 55 minutes was given to all the 148 students after that their perception was assessed by using pre-test MCQ. Total 148 students were divided into two groups as Group A- CBL intervention was given (n=74) and Group B CBL intervention was not given (n=74).

Group A- students were again divided into 5 batches (15/ batch) and CBL was taught by 5 facilitators.The facilitator, during the phase, also motivated and guided the students for learning, by assisting the students through the facts and engaging them in reading to find a possible solution to the problem. Then, during the next session, the case was discussed under the guidance of the facilitator, properly and systematically, taking care to ensure that every student participated in it. Relevant questions were asked by the facilitator, to streamline the thought processes and to bring the students back to the main learning objectives, whenever required. After CBL intervention the student's perception was assessed by using post-MCQ test. At the end feedback was taken from all the students (n=74) using 4-point Likert's scale. Group B- serves as a control group. After four months interval modified essay questions were given to all the *students* (n=148) and analytical thinking skill was assessed.

Statistical Analysis: All the results were expressed as mean ±S.D. Students't' test was used to compare the continuous variables between the groups. The statistical significance was defined as a p value of <0.05. The statistical analysis was done by using SPSS, version 23.

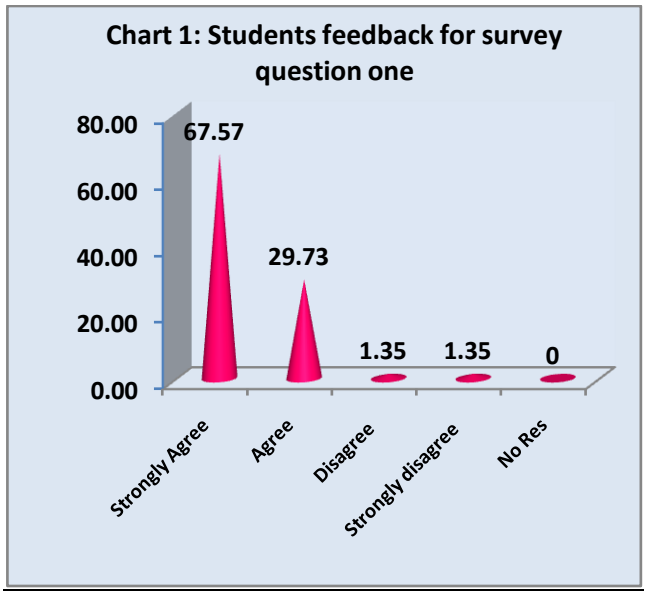
Result: Table No-1 shows student's perception on CBL method (n=74). Total 10 close ended feedback questionnaires were given after CBL intervention. It was observed that students enjoyed the new method of teaching and they felt that it could be helpful to perform better in university examination (94.59%). As seen in Chart 1, Students developed interest in the subject. The present study shows 97% of students were satisfied with CBL method.

At the same time student's perception was assessed by using Pre-test MCQs and Post –test MCQs (Chart 2), It was noted that post-test score (8.05±1.45) was increased than that of pre-test score (7.72±1.35).

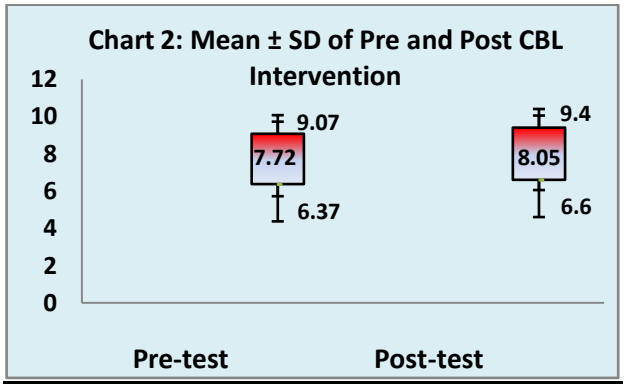
Table2: Shows Result of Modified Essay Questions.

Groups / Method	Group A (n=74)	Group B (n=74)	P Value
MEQ	5.55±2.21	1.98±2.46	P<0.0001

Results are expressed as Mean± SD.
P<0.0001= highly significant



It was also observed that the retention of knowledge and analytical thinking ability was highly increased (P<0.0001) in Group-A than that of Group B (Table 2).



Discussion: In medical education, various teaching methods are adopted to increase student motivation and enhance active learning. CBL seems to be a good method of teaching, based on results of the evaluation test and the questionnaire results, wherein the whole process can be made students–cantered.

In the present study we observed that majority of students developed interest in the subject, made the subject easier to learn, CBL could help in clearing doubts which students had after the traditional lecture. Results of the present study were supported by some of the other medical education researches, which stated that CBL could help in developing an effective learning environment, with the use of specific learning objects[5-7].

The results of the present study indicate the perception of the students was increased by this new teaching method, as their performance was increased in post-test MCQs. Our results are in accordance with other studies[8,9]

When we assessed student's retention and analytical thinking ability after four months of interval we found that there was evidence towards highly increased retention of knowledge, enhancement of integration of basic science concepts into clinical problems (analytical thinking ability), the development of self-directed learning and enhancement of student's interest in the subject matter in CBL. Traditional lectures convey.

Table 1: Percent score of student's feedback

Feedback questions	Agree (%)	Strongly agree (%)	Disagree (%)	Stronglydisagree (%)
Method used in teaching (CBL) inbiochemistry was useful and developedinterest in subject	29.73	67.57	1.35	1.35
Helped in improving understanding further	24.32	72.97	1.35	1.35
The discussion aroused curiosity about thetopic and generated lot of new ideas	43.24	54.05	1.35	0.00
I was attentive throughout this class	32.43	63.51	2.70	0.00
Can be used along with lectures	29.73	62.16	6.76	0.00
Conducted in a systematic manner	39.19	58.11	0.00	2.70
Facilitators were helpful	32.43	67.57	0.00	0.00
Teach other topics as well by this method	20.27	75.68	4.05	0.00
Will helpful to perform better in university Examination	24.32	70.27	5.41	0.00
I found the method to be good for clearing doubts which I had after the traditionallecture	25.68	74.32	0.00	0.00

Factual information well; they are not suited to higher levels of learning, such as critical thinking, analysis and problem solving, which must be learnt by doing[10].

It has been noticed from the present study that CBL could create effective learning environments and thus help in achieving the learning objectives. It has been observed that these days, college graduates are unable to think critically. Clinical case studies encourage active learning and the development of higher order thinking skills. This puts forth a need to promote a student cantered active learning with a focus on critical thinking and problem solving in clinical case studies. At the same time, it has been observed that CBL has been found to be beneficial in other subjects for the medical students.

Conclusion: CBL is very effective method and it helps in improving not only student's perception but also analytical thinking ability.

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