

## Comparison of outcome between case-based learning and seminar for small group undergraduate teaching in Ophthalmology

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### Abstract

**Background:** Case based learning and seminars can be adopted for Ophthalmology small group teaching. These methodologies reemphasises the knowledge already taught in theory didactic lectures, and help in long term retention of concepts of ophthalmic diseases to be known by a competent basic doctor. The Objectives of the study was to compare the outcome of case based learning and seminar and to know the students' opinion about Case based learning and seminar.

**Materials and Methods:** A prospective study was conducted during small group teaching for 90 students, 7<sup>th</sup> term MBBS, HIMS, Hassan in July 2015.

Students were divided into Group A and B of 45 each and underwent 2 CBL and 2 Seminar sessions on clinically important ophthalmology topics. Later they were crossed over. A pretest and post-test each of 25 score was conducted after each session and a feedback was obtained from students. Scores were evaluated and analysed.

Statistical analysis was done and represented as Percentage, mean and comparison of scores was done using paired T-test.

**Results:** Of the 90 students, scores of only 55 students were evaluated. Overall there was improvement in the post-test scores of both CBL and Seminar. Even though the difference in scores is more in CBL, outcome was found to be statistically insignificant (p value > 0.05). The student feedback showed CBL to be more effective than seminar.

**Conclusion:** CBL post test scores were more than seminar post test scores. Student's feedback analysis showed that students preferred CBL to Seminar in small group teaching in UG Ophthalmology teaching.

**Keywords:** Case based learning, Ophthalmology, Seminar.

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### Introduction

A competent basic doctor should also have appropriate knowledge of ophthalmic diseases. Case based learning and seminars can be used for small group teaching. These methods can reemphasise the knowledge already taught in theory didactic lectures, and thus help in long term retention of the concepts of the diseases taught by these methods.

Teaching Ophthalmology in medical schools is of considerable challenge because,

1. Ophthalmology is usually a subsidiary course with tight schedule.
2. Presence of enormous content that needs to be conveyed.
3. Compared to other medical specialties, Ophthalmology is perceived to be more complicated and less easy for students to grasp.<sup>[1]</sup>

Case based learning is based on the concept that students are given real life scenarios and they are made to work through these situations with the help of a facilitator. Case based learning can be considered as a

sub-category of problem-based learning, in which instead of problems, a simulated patient history and examination findings will be given. Hence it is defined as student-centered small group tutorial in which students work through health care scenarios. Whereas a seminar is a presentation delivered to an audience on a particular topic or set of topics by a single or more than one speaker and it is held for groups of 10-50 individuals, followed by discussion.

Undergraduate teaching of ophthalmology comprises of didactic lectures, tutorials and clinical teaching, during 4<sup>th</sup>, 6<sup>th</sup> & 7<sup>th</sup> term. This system is teacher-centered with minimal active participation from the students. The above mentioned conventional teaching methods are not efficient to learn comprehensive ophthalmology, especially understanding the clinical scenarios, which are taught only in theory teaching but not given importance in clinical postings. Medical practice revolves around the case tailored approach and hence a case-based integrated student centered medical curriculum is the need of the hour.

Conventional teaching within stipulated time proves ineffective in providing complete picture of posterior segment pathologies like primary open angle glaucoma, primary angle closure glaucoma, retinal vascular occlusion, Diabetic and hypertensive retinopathy, which are clinically significant vision threatening diseases, to be aware by a competent basic doctor.

The objective of our study was:

1. To compare the outcome of Case based learning and Seminar
2. To know the students' opinion towards Case based learning and seminar.

### Methodology

A prospective study was performed under a setting of small group teaching, for Ophthalmology. The study focussed on performance of case based learning for more common clinical scenarios encountered in ophthalmology. Target population included 7<sup>th</sup> term medical undergraduates at Hassan Institute of Medical Sciences, Hassan during the study period of July 2015. An informed consent was taken from all medical undergraduates for participating in the study.

The sample included a cohort of 90 students who were divided into two groups of 45 each, namely group-A and Group-B. Four common ophthalmic challenges were addressed via case based learning and seminar that included retinal vascular occlusions, primary open angle glaucoma, and primary angle closure glaucoma and diabetic and hypertensive retinopathy. The above four topics were included because they represented the important ophthalmic situations to be well versed for any practising doctor and little attention is given towards them in conventional clinical teaching. They also constitute among the difficult topics for undergraduates that needs special attention to evaluate these situations.

Protocol adopted for case-based approach was small student groups that were given a clinical scenario reflecting various situations. Every case simulated a patient where students were allowed to develop a working hypothesis. Students were divided into small groups of 5 each. In the initial phase the given clinical scenario along with the learning objectives were discussed with the facilitator and a stipulated time of 1 week was given to resolve the problem. All case scenarios had a master guide consisting of detailed history, general examination and ocular findings and necessary diagnostic tests. During the preparation phase of one week, the facilitator guided the students and engaged them in problem solving activity to arrive at a diagnosis. In CBL session, students were allowed to discuss the scenarios and present their views before the group. Further the facilitator added to the knowledge by questioning the thought process and related clinical facts. Such interactive sessions were carried out for about 40-50 minutes.

Seminar was done on an assigned topic. The topic was subdivided into 4-5 small subtopics which were presented by 4-5 students as Microsoft power-point presentations. The session was conducted for duration of 40-50 minutes and was moderated by a faculty moderator. Time allowance was given for queries at the end of session.

In group- A, students were made to go through case based learning, on primary open angle glaucoma, Retinal

vascular occlusions whereas students in group-B underwent seminar on primary angle closure glaucoma and diabetic and hypertensive retinopathy. This regime was later crossed over. So all students went through 2 CBL and 2 Seminar sessions.

**Evaluation design:** A pre-test consisting of 25 multiple option questions were given in first 10 minutes of both CBL and Seminar sessions. The same test was given at the end as post- test. These test questionnaire were validated from subject experts before considering into the study. A validated student feedback questionnaire was obtained at the end which consisted of ten Likert type questions with five response options. Scores of all students were then evaluated and analysed.

Due to university exams and other subjects' internal assessments stress on students, there was attrition loss 35 students who couldn't complete this study.

**Statistical Analysis:** The results were analysed in Percentages and mean. Results are represented as bar graphs and line graphs. Paired T-test was used to compare the pre-test and post-test scores in both the groups. The degree of statistical significance for this qualitative analysis was done using chi square test. P-value less than 0.05 was considered statistically significant.

### Results

Out Of the 90 students considered, only 55 students attended all the four sessions, so only scores of 55 students were evaluated for computation of results and data analysis. The total score was evaluated out of 25 for every session Table 1 shows – Comparison of mean pre-test and post-test for all four topics in both seminar and CBL. Mean post test scores are more with CBL than with seminar.

**Table 1: Mean of pretest and post test scores.(out of maximum score of 25)**

	Mean Pretest scores	Mean Posttest scores
POAG- CBL	14.43	18.38
PACG – Seminar	14.56	16.58
CRAO-CRVO- CBL	13.94	16.12
DM & HTN R- Seminar	12.98	15.18

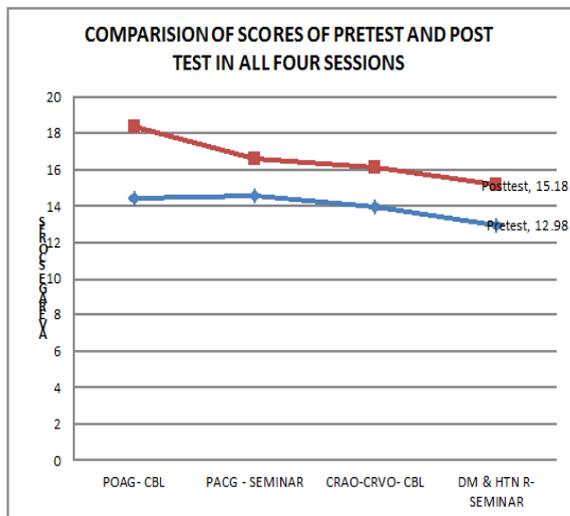


Fig. 1: Line graph showing score comparison

Student feedback form consisted 10 likert type questions that are displayed in Table 2. The student's responses for the questions were converted into percentage scores and described below.

Table 2: Student feedback form analysis

	Questionnaire	CBL Scoring in percentage	Seminar Scoring in percentage
A	Helped in understanding the subject	73%	66%
B	Helped in content retention/ reproducibility of the subject	69%	64%
C	Appropriateness of Sequencing/ flow of the content	72%	68%
D	Helped to create interest	77%	53%
E	Time management	52%	56%
F	Level of interaction between students and faculty	81.5%	49.5%
G	Ability to hold the concentration	71.3%	58%
H	Amount of preparation required	78.5%	60.5%
I	Your scoring	70%	67%
J	Your preference for tutorials/ small group teaching/ Revision teaching	65.6%	60.5%

Overall there was a statistically significant improvement in post-test scores in both CBL and seminar ( $P$  value  $< 0.001$ ). Even though the difference in mean scores is more in CBL outcome found to be statistically insignificant ( $p > 0.05$ ).

Student feedback form analysis shows better and positive response towards case based learning than that of seminar in all aspects.

## Discussion

Problem based learning was first introduced by McMaster university as an educational format centered around discussion and learning that emanates from clinically based problem.<sup>[2]</sup> Since its inception, CBL has been widely used all over the world as a part of medical curriculum. The key characteristics of CBL include active participation by students, the development of problem solving skills rather than memorizing and learning to learn in a collaborative group-centered environment. This is well appreciated by the students since it improves their self-directed learning skills and their ability to relate better to a clinical setting. It also helps them with better interaction among their batch mates and boosts their learning skills

There are many studies which deal with implementation of CBL in undergraduate curriculum and its positive influence on the learning process. Kong et al. in their study on comparison of normal didactic teaching with problem-based learning (PBL), gave a significantly higher mean results of theoretical and case analysis examinations. The same study also compares two types of PBL, conventional and digital, which was not statistically significant.<sup>[3]</sup>

Farrell et al involved 16 cases on 4 ophthalmic problems, concludes that student satisfaction was positive accounting to 85% with statistically significant gain in knowledge score points.<sup>[4]</sup> A similar study by Sahoo et al opines PBL to be comfortable module and advantageous as a learning method with students opining the process as enjoyable.<sup>[5]</sup>

Both the above studies describe the advantage of CBL, however, our study compares the CBL with seminar in order to compare and analyse these modules of teaching, thereby giving students an opportunity to choose among the two. In comparison with our results, both the studies opines regarding the students response as comfortable (88%) and advantageous (92%) as a learning method.

Malathi et al compared problem based learning with case based learning in medical students of California and inferred that CBL is more effective supporting the results of our study.<sup>[6]</sup> A slightly modified study conducted on large number of students using simulated patients by Ayaki et al showed the changes in attitudes and 75% counted it as an impressive module.<sup>[7]</sup>

In our study, the improvement in post test scores were better in CBL, though it was not statistically significant. This may be attributed to less sample size or students attrition. But the student feedback depicted that CBL gave them a better understanding of the subject with better retention and reproducibility of the content. CBL created lot of interest, interaction was at its best during CBL sessions, helping them in concentrating

better. But the amount of time and preparation needed was also more for CBL. It is very evident from the feedback that students preferred CBL for small group teaching than seminar.

### **Conclusion**

CBL post test scores were more than seminar post test scores. Students' feedback analysis showed that students preferred CBL to SEMINAR in small group teaching in UG Ophthalmology teaching.

Since it is difficult to expose the students to whole gamut of important cases in ophthalmology, CBL would be an ideal solution to give the students, an in depth understanding of common ophthalmic problems.

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### **References**

1. Qillen DA, Harper RA, Haik BG. Medical student education in ophthalmology: crisis and opportunity. *Ophthalmology*. 2005 Nov;112(11):1867-8.
2. Samrishta ghosh, Combination of didactic lectures and case-oriented problem-solving tutorials towards better learning: perception of students from a conventional medical curriculum. *Adv Physiol Educ* 31:193-197.2007.
3. Kong J, Li X, Wang Y, Sun W, Zhang J. Effect of digital problem-based learning cases on student learning outcomes in ophthalmology courses. *Arch Ophthalmol* 2009;127:1211-4.
4. Farrell TA, Albanese MA, Pomrehn PR Jr. Problem-based learning in ophthalmology: A pilot program for curricular renewal. *Arch Ophthalmol* 1999;117:1223-6.
5. Sahoo S, Sahoo and R, Sahoo I. Problem Based Learning in Ophthalmology for Medical Undergraduates. (abstracts from proceedings of AIOS 2010 meeting). Assessed on 10-8-2012.
6. Srinivasan M, Wilkes M, Stevenson F, Nguyen T, Slaving S. Comparing problem based learning with case-based learning. Effects of a major circular shift at two institutions. *Acad Med* 2007;82:74-82.
7. Ayaki M, Soda M, Nishihara H, Yaguchi S, Higuchi S, Tanaka K, et al. Tutorial (Problem-Based Learning) for clinical education of ophthalmology. *Invest Ophthalmol Vis Sci* 2005;46:1957.