ABSTRACT

INTRODUCTION Visual acuity assessment is a simple but extremely important examination in ophthalmology. This aids examination and diagnosis of common eye diseases. This is done using standardized Snellen’s chart\(^1\).

OBJECTIVE To teach visual acuity assessment to undergraduates by various Teaching-learning methods\(_2\), Obtaining perception of faculties and students for these\(_2\), To identify the method most preferred by most of the undergraduates. METHODOLOGY A prospective experimental study. Sample size = 100 After IRB approval, the study was carried out during the ophthalmic term of third MBBS students. Four teaching methods were power point presentation, role play, video clip show and clinical demonstration. Evaluation was done by pre-post test in form of standardized validated MCQs (cognitive domain) and DOPS (directly observed practical skill) with checklist (for psychomotor and affective domain). RESULTS Statistically significant improvement in learning of students observed from pre-post test. Mean value of marks improved from 5.64 to 8.94 and SD value 1.307 to 1.052 with p value 0.0001. Student’s feedback was suggestive of increase in confidence in skill with preferred method being clinical demonstration. Faculty feedback was positive with suggestion for such modules for other topics as well.

CONCLUSION Learning improved with multiple teaching-learning methods. More than 95% faculty and students agree with the teaching-learning methods. LIMITATION Long term results could not be evaluated.

Key words: visual acuity assessment, undergraduate students, multiple teaching learning methods.
Introduction:

Visual acuity assessment is a simple but extremely important examination in ophthalmology. It is an easy procedure, but if the students are not taught in both clinical posting and tutorials, they are not competent in assessing vision accurately. This leads to lack of confidence when these students are posted in eye camps.

It provides a baseline recording of visual acuity. It leads to the diagnosis and judgment of severity of the common eye diseases and is the most important prognostic factor. This aids in examination and diagnosis of eye diseases and of refractory error. It is of paramount importance for medico-legal reasons. This test is used to determine the smallest letters you can read on a standardized (Snellen’s) chart.

Knowledge of visual acuity is thus very essential part of core curriculum of ophthalmology. Mere didactic lecture doesn’t give them clarity about minute details, making the requirement of multiple teaching-learning methods more relevant. Under graduates should have clear concept about visual acuity and its assessment. They should be skilled to assess vision accurately. They should be able to communicate and reassure the patient regarding his vision problems and refer him/her appropriately.

India has the largest population of blind people in the world. That’s over 12 million people. Most of them live in the poorest parts of the country with little or no access to even basic health care facilities. 80 per cent of them (9.6 million) could have been prevented from going blind if they had received timely diagnosis and guidance.

REFRACTORY ERROR is the second leading cause of blindness in India (after cataract), and according to the World Health Organization, 153 million people worldwide live with visual impairment due to uncorrected refractive errors. It can be diagnosed if community is screened for visual acuity in eye camps. So we need to train all future health care professionals (undergraduates) for this basic skill irrespective of the fact that whether they pursue ophthalmology or not in residency.
AIMS AND OBJECTIVES

A. To educate for visual acuity assessment to all undergraduate students during their ophthalmic term.

B. Obtaining perception of faculties and students for these teaching-learning methods.

C. To identify the methods preferred by most of the undergraduates.

METHODOLOGY

The study was carried out in a tertiary eye care hospital. Out of 136 students, 100 students of sixth semester M.B.B.S. students doing one month compulsory Ophthalmology posting, enrolled for the project. These students are routinely posted to undergo training in basic ophthalmic examination and learning basic procedures including visual acuity assessment.

A prospective experimental study.

Sample size = 100

IRB approval was taken at the institute.

The study was carried out during the one month compulsory ophthalmic term of third MBBS students, after voluntary enrolment.

STUDY PERIOD: May 2015 to September 2015

The study was started with a pre test that was divided into two parts...

PART A... They were given a set of ten standardized validated MCQs (cognitive domain). These were validated by a senior faculty at our institute.

PART B... DOPS with a check list was carried out (Psychomotor and affective domain). The DOPS test was carried out with the help of faculty members.

This was followed by teaching sessions of the hundred students in groups during their posting. The sessions were spread over one week, MAINLY DIVIDED INTO FOUR SECTIONS.

1. They were first given lecture using power point; this was done for the entire batch, time duration was one hour.
2. This was followed by role play. Three students from the same batch were taken into confidence and they performed the role play in front of the whole class. Here the duration was of half an hour.

3. After role play and lecture, the students were shown the video clips of real OPD scenario. They were shown the minute details of the skill followed by discussion. This session lasted for twenty minutes. This was done in four groups of 25 students each.

4. Lastly they were shown the clinical demonstration in OPD in groups of ten. In addition to learning the clinical skill, they observed the way to communicate with the patient, and counseling the patient about common ocular problems and referring to appropriate ocular specialty.

Evaluation done in form of post test. This again comprised of same set of objective questions and DOPS WITH CHECK LIST.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Session</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture using power point</td>
<td>One single session</td>
<td>One hour</td>
</tr>
<tr>
<td>Role play</td>
<td>One single session</td>
<td>Half hour</td>
</tr>
<tr>
<td>Video clip</td>
<td>Four batches of 25 students each</td>
<td>20 minutes each session</td>
</tr>
<tr>
<td>Clinical demonstration</td>
<td>10 batches of ten students each</td>
<td>20 minutes each group</td>
</tr>
</tbody>
</table>

**OBSERVATION AND RESULT**

All the students actively participated in these sessions. The pre-test and post-test were analyzed to study the significance of change in learning of students. Both t-Test and chi square test suggested that there was significant improvement in the students after the post test.

**TABLE NO.1 and TABLE NO.2 shows the comparison of marks between pre and post test.**

<table>
<thead>
<tr>
<th></th>
<th>PRE test</th>
<th>POST test</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Of Students</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>MEAN</td>
<td>5.64</td>
<td>8.94</td>
</tr>
</tbody>
</table>
The performance improved significantly after using multiple teaching-learning methods.

**Table 3: Compares the Performance in Pre and Post Test**

The performance improved significantly after using multiple teaching-learning methods.

**Table 4: Shows that the Change in Performance is Significant**
Here group A and group B represent the pre and post test groups and comprises the same set of 100 students. Statistically significant improvement in learning of students observed from pre-post test. Mean value of marks improved from 5.64 to 8.94 and SD value 1.307 to 1.052 with p value 0.0001. Student’s feedback was suggestive of increase in confidence in skill with preferred method being clinical demonstration. Faculty feedback was positive with suggestion for such modules for other topics as well.

The students were asked to fill the feedback form.

**TABLE 5: STUDENT FEEDBACK**
TABLE 6

TABLE 5 AND 6 shows the response of the students. The students gave a positive feedback for the module. They felt more confident about their knowledge about visual acuity. They could perform the assessment better and
were now more capable of counseling the patient for his defective vision. They found multiple teaching-learning methods a better option than sticking to anyone.

**TABLE 7**: The faculty feedback was taken for the module. They all found it useful and appropriate in all aspects.

![FACULTY FEEDBACK]

**Suggestions**: 1. Involvement of Residents, 2. Similar methods for other core topics as well.

The faculty felt the need of such modules for other topics of core area as well. Most of them are not using multiple methods so far. They are using lecture for tutorials and clinical demonstration. Also involvement of residents was suggested.

**DISCUSSION**

According to MEDICAL COUNCIL OF INDIA REGULATIONS ON GRADUATE MEDICAL EDUCATION, 1997 (AMENDED UPTO FEBRUARY 2012) there are clear guidelines about undergraduate ophthalmic course; it mentions the importance of visual acuity assessment. It says...The broad goal of the teaching of students in ophthalmology is to provide such knowledge and skills to the students that shall enable him to practice as a clinical and as a primary eye care physician and also to function effectively as a community health leader to assist in the implementation of National Programme for the prevention of blindness and rehabilitation of the visually impaired⁴.

Thus, Visual acuity assessment is a very basic skill and included in core curriculum⁴. Acquiring knowledge about all the aspects of visual acuity thus becomes essential for undergraduates⁴. This not only helps them to understand the topic and gain the skill, but also they can guide the subjects with poor vision for further evaluation. This especially applies to interns who are posted in eye camps. They can counsel the patient for common causes of preventable blindness. Lastly, it is of paramount importance in medico-legal cases where first recorded vision is very crucial⁵.
Improved student learning in ophthalmology with computer-aided instruction—is another study by Devitt P, PalmerE which states that didactic lectures should be used in combination with computer assisted teaching for better performance\(^7\).

In my study, the third year undergraduate students were taught about visual acuity using various methods after a pre-test.

The performance in pre-test was poor. This can be explained on the basis of lack of direct exposure with the patient. 46% students scored less than 50% marks in the pre-test.

The four methods used were power point presentation, clinical demonstration, role play and video assisted teaching.

There was marked improvement in the post test. 98% students scored more than 50% marks.

Another study is “How effective is undergraduate and postgraduate teaching in ophthalmology?” by G N Shuttleworth and G W Marsh where aim was to gain an insight into the adequacy of ophthalmic medical education for doctors in the primary care setting. In the conclusion it was stated that It is apparent that most primary care doctors view their undergraduate ophthalmic medical education as inadequate and this is reflected in their confidence and understanding. It was strongly suggested that general ophthalmic education is aimed at teaching examination techniques and ophthalmological principles suitable for primary care practice\(^8\).

Student feedback was taken for the module. There was common consensus for using multiple teaching-learning methods for core topics such as visual acuity assessment. Student feedback was also taken for the preferred method of teaching. Clinical demonstration was found to be the preferred method by most of the students.

Faculty feedback for the teaching module was taken. There was very positive feedback from faculty. They gave common consensus that they would like to adopt the similar teaching plan for other core topics in ophthalmology. The faculty also suggested that residents can be involved for such undergraduate teaching sessions.

**CONCLUSION**

1. 98% students scored more than 50% marks in post-test.

2. Clinical demonstration is found to be most preferred method among the four methods of teaching visual acuity assessment.

3. More than 95% of students and faculty feel that we have to incorporate more than one of the above methods always in teaching visual acuity assessment.

**References**

1. Community eye health journal2007sep;20(63):52


4. Undergraduate ophthalmology education – A survey of UK medical schools Oliver Baylisac, Philip I. Murraybd & Margaret Dayanrtc pages 468-471 Published online: 28 Feb 2011

5. Comprehensive adult medical eye evaluation.


   Improved student learning in ophthalmology with computer-aided instruction.
   Devitt P1, Smith JR, Palmer E

8. How effective is undergraduate and postgraduate teaching in ophthalmology?G N Shuttleworth and G W Marsh Bristol Eye Hospital, Lower Maudlin Street, Bristol BS1 2LX, UK Correspondence: G. N. Shuttleworth, Bristol Eye Hospital, Lower Maudlin Street, Bristol BS1 2LX, UK . Eye (1997) 11, 744–750; doi: 10.1038/eye.1997.189


10. Teaching of ophthalmology in undergraduate curricula: a survey of Australasian and Asian medical schools Jennifer C Fan MBChB, Trevor Sherwin PhD and Charles NJ McGhee PhD FRANZCO