

“Evaluation of Final BDS students using mini-CEX for assessing the clinical skills in Oral Medicine”

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Abstract

Mini-CEX is an assessment approach which focuses on trainees' encounters with a variety of real patient issues, in there, routine clinical practice.

60 mini-CEX encounters were carried out involving 15 Final BDS students. They took focused history, performed clinical examination of submandibular lymph node on a patient with apical periodontitis with mandibular first molar. This was done during their clinical posting of Oral Medicine. Four assessors observed students, rated the performance, by scoring trainee on a structured form and provided an immediate feedback. Efficacy of mini-CEX method was rated on a 9-point scale. Perception of all participants and assessors regarding mini-CEX method of evaluation was taken.

The mean scores of all the 15 students from 1st to 4th encounters given by assessors were 4.20 +_0.67, 5.20+_0.56, 7.06+_0.59 and 8.60+_0.50 respectively. The comparison of mean score of all the 15 students between 1st encounter - 2nd encounter, 1st encounter - 3rd encounter, 1st encounter - 4th encounter, 2nd encounter - 3rd encounter, 2nd encounter - 4th encounter and 3rd encounter - 4th encounter given by assessors was statistically significant (p<0.05). Perception of students revealed that all students appreciated this style

Although mini-CEX is an appropriate assessment tool which observes seven competencies of undergraduate students at work place more profoundly and in much broader sense, it is a prime requirement of a competent postgraduate. This method is comparatively apt for postgraduate student because it is practically difficult to conduct routinely for undergraduates.

Keywords: Mini CEX, Oral Medicine, Final BDS

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Introduction

Acquiring knowledge and skills without application has no value in professional education. Assessment of a student's actual performance in the clinics poses a real challenge for teachers. Assessment should balance both issues of validity and reliability. The method of assessment is determined by the objectives and nature of the teaching programme, the logistics involved, and the expectations of the teachers and the licensing Board. Many of the assessment methods are variations on the traditional chair side examination which is time consuming and where no feedback is given to the students. It is proven by numerous studies that providing feedback to the students is most influential factor for their learning and achievement. The Mini-CEX (clinical evaluation exercise) is one assessment which assesses the trainee at higher levels of Millers pyramid.

In mini-CEX the encounters are intended to be short (about 20minutes) and occur as a routine part of training so that each student can be evaluated on several

occasions by different faculty members. Mini-CEX can also help to develop the conversation between a trainee and trainer. Observation of trainees is an essential responsibility of assessors and trainers. The mini-CEX will require a group of assessors, who are prepared to observe short, focused clinical encounters and then make stand-by judgments as to the levels of competence of the trainees they are assessing. Assessors need to be well informed, aware of the competencies being assessed and the required standards that need to be obtained. They should also be skilled at providing constructive feedback¹.

In India, Oral Medicine and Radiology is one of the clinical subjects in the undergraduate curriculum. Training in this subject is introduced in the third year of the course. By the end of the third clinical posting (each posting is of 12 working days), students are expected to be competent in the clinical evaluation and diagnosis and acquisition and interpretation of dental radiographic images. Formative assessment consists of assigning a case to every student, who then records the case history, examines the patient, makes a provisional diagnosis, advises and makes a periapical radiograph, and interprets it. At the end of the allotted time, students present the case findings, diagnosis, the radiographs and their report, advice appropriate investigations and formulate management plan. This is evaluated by the faculty, and marks are awarded. Each of these procedures is made up of several sub skills, which the

students are expected to perform correctly and in a systematic manner². For this every student need to demonstrate seven competencies like interviewing skills, physical examination, professionalism, clinical judgment, counseling, organization and efficiency, and overall competence. Whereas the traditional method of assessment only considers the final outcome, not how the students have reached it. The teachers do not observe the actual performance of the procedures by the students. Mini-CEX is the direct observation assessment or "snapshot" of a trainee - patient interaction which observes the seven competencies of the student at the work place.

To analyze to what extent this method of evaluation offers benefit to the dental undergraduate students, the present study "Evaluation of Final BDS students using mini-CEX for assessing the clinical skills in Oral Medicine" was undertaken in Department of Oral Medicine & Radiology at Sharad Pawar Dental College, Sawangi (Meghe) Wardha; Datta Meghe Institute of Medical Sciences, (Deemed University).

Aim

To evaluate Final BDS students using mini-CEX for assessing the clinical skills in Oral Medicine.

Objectives

1. To evaluate clinical skills of Final BDS students using mini-CEX in Oral Medicine.
2. To assess the perception of students regarding the mini-CEX method of evaluation.
3. To assess the perception of assessors regarding the mini-CEX method of evaluation.

Materials and Methods

This prospective, interventional study was conducted in the department of Oral Medicine & Radiology, Sharad Pawar Dental College, Datta Meghe Institute of Medical Sciences, (Deemed University) Sawangi (Meghe), Wardha after obtaining the prior approval from the Institutional ethics committee of Datta Meghe Institute of Medical Sciences Sawangi (Meghe), Wardha. The sample size was 15 Final BDS Students (2010 Batch). Inclusion criteria were Final BDS students posted for the clinical posting and willing to voluntarily participate in the study.

Methodology

All the enrolled 15 Final BDS students after consenting to be a part of study were briefed about the details of the study and objectives. All the participants along with the evaluators who were the assessors to the participants were sensitized with the Mini-CEX tool.

A mini-CEX encounter: All the 15 students posted in the Oral Medicine conducted a focused case history and clinical examination of a patient with apical periodontitis with mandibular first molar. He/she then provided the assessor (faculty) with a diagnosis and

treatment plan. The different assessors observed students and rated their observed performance on seven core skills: medical interviewing, physical examination, professionalism, clinical judgment, counseling, organization and efficiency and overall clinical competence by scoring the trainee on a structured form and provided an immediate feedback. To be most useful, assessor provided timely and specific feedback to the student after each assessment of trainee- patient encounter. Four such encounters for each student were carried out during the study period. The time interval between each encounter was 2 days. Each student was assessed and the improvement in their learning and performance was compared during each encounter. The encounter was of about 20 minutes and occurred as a routine part of training so that by using the above method each student was evaluated on four occasions by the different assessors.

All candidates were assessed by the examiner over 15-20 minutes thus improving the reliability. Efficacy of mini-CEX method latter was rated on a 9-point scale anchored with the words "lowest" and "highest." Ratings were made on a 9-point scale, on which 1, 2, and 3 - unsatisfactory; 4 - marginal; 5 and 6 - satisfactory; and 7, 8, and 9 - superior. The perception of all the participants regarding mini-CEX method of evaluation was assessed by administering a 10 closed ended questionnaire on a five-point Likert scale 1= strongly disagree, 2 = disagree, 3 No opinion, 4 = Agree, 5 = strongly agree. Two open ended questions each was administered to students and assessors. For every student, the marks were given by assessor to the various checklist items which were added to form a total mark, which ranged from 0 to 10. Along the study period the score from the first to the fourth encounter for each student was analyzed.

Observation and Results

There were total 60 mini-CEX encounters involving 15 Final BDS students. Each student was evaluated by different evaluators from first to last encounter. The mean scores of all the 15 students from 1st to 4th encounters given by 4 different assessors were 4.20 +_{0.67}, 5.20+_{0.56}, 7.06+_{0.59} and 8.60+_{0.50} respectively (Table 1 and Graph 1).

Statistical analysis was done by using descriptive and inferential statistics using Student's paired t test and software used in the analysis was SPSS17.0 version and p<0.05 is considered as level of significance. It was found that the comparison of mean score of all the 15 students between 1st encounter - 2nd encounter, 1st encounter - 3rd encounter, 1st encounter - 4th encounter, 2nd encounter - 3rd encounter, 2nd encounter - 4th encounter and 3rd encounter - 4th encounter given by 4 different assessors (Table 2) was statistically significant (p<0.05).

Perception of students

Following this Mini CEX exercise, perception of all the participants was taken by administering a questionnaire on a five-point Likert scale. The feedback questionnaire consisted of 10 closed ended items and

two open ended (descriptive) items. The perception of all 15 students was quantitatively analyzed and almost all the students appreciated this style (Table 3 and Graph 2).

Table 1: Scores of 4 different assessors over four encounters

| S. No of Student | 1 st encounter | 2 nd encounter | 3 rd encounter | 4 th encounter |
|------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 1 | 5 | 6 | 8 | 8 |
| 2 | 4 | 5 | 7 | 8 |
| 3 | 3 | 6 | 7 | 9 |
| 4 | 4 | 5 | 7 | 9 |
| 5 | 4 | 5 | 7 | 9 |
| 6 | 4 | 5 | 7 | 8 |
| 7 | 5 | 5 | 7 | 9 |
| 8 | 4 | 6 | 7 | 9 |
| 9 | 5 | 5 | 7 | 9 |
| 10 | 4 | 4 | 7 | 9 |
| 11 | 5 | 5 | 7 | 8 |
| 12 | 3 | 5 | 6 | 8 |
| 13 | 4 | 5 | 6 | 9 |
| 14 | 5 | 6 | 8 | 9 |
| 15 | 4 | 5 | 8 | 8 |
| Mean±SD | 4.20±0.67 | 5.20±0.56 | 7.06±0.59 | 8.60±0.50 |

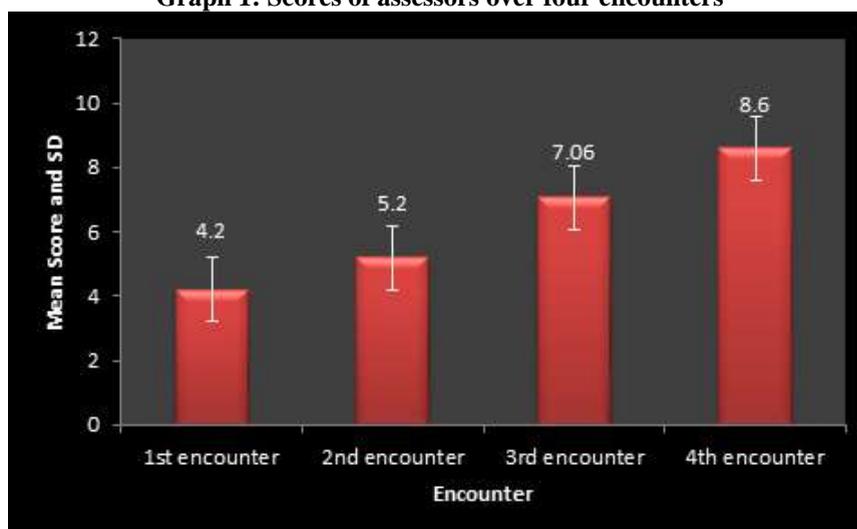
Table 2: Student's paired t test

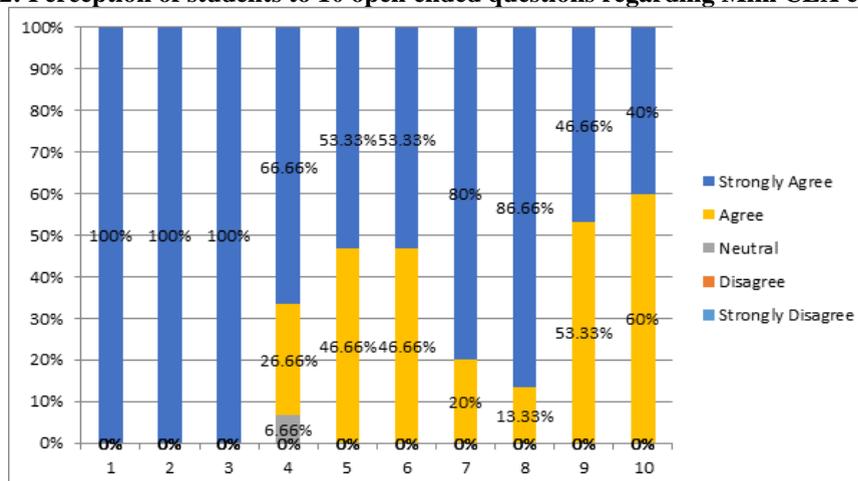
| | Paired Differences | | | | | t | df | p-value |
|-------------------------------|--------------------|----------------|-----------------|---|-------|-------|----|-----------------|
| | | | | 95% Confidence Interval of the Difference | | | | |
| | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| 1st encounter - 2nd encounter | 1.00 | 0.84 | 0.21 | 0.53 | 1.46 | 4.58 | 14 | 0.000 S, p<0.05 |
| 1st encounter - 3rd encounter | 2.86 | 0.63 | 0.16 | 2.51 | 3.21 | 17.34 | 14 | 0.000 S, p<0.05 |
| 1st encounter - 4th encounter | 4.40 | 0.82 | 0.21 | 3.94 | 4.85 | 20.57 | 14 | 0.000 S, p<0.05 |
| 2nd encounter - 3rd encounter | 1.86 | 0.63 | 0.16 | 1.51 | 2.22 | 11.29 | 14 | 0.000 S, p<0.05 |
| 2nd encounter - 4th encounter | 3.40 | 0.73 | 0.19 | 2.99 | 3.80 | 17.87 | 14 | 0.000 S, p<0.05 |
| 3rd encounter - 4th encounter | 1.53 | 0.83 | 0.21 | 1.07 | 1.99 | 7.12 | 14 | 0.000 S, p<0.05 |

Table 3: Perception of students to Mini CEX evaluation

Five-point Likert scale: 1 - Strongly Disagree; 2 - Disagree; 3 - Neutral; 4 – Agree; 5 - Strongly Agree.

| S. No. | Items | 1 | 2 | 3 | 4 | 5 |
|--------|--|---|---|--------------|---------------|----------------|
| 1. | Sensitization of assessor & the students to the Mini CEX was done. | 0 | 0 | 0 | 0 | 15 (100%) |
| 2. | The Mini CEX examination schedule was informed in advance. | 0 | 0 | 0 | 0 | 15 (100%) |
| 3. | Assessors need was well informed & made aware of the competencies being assessed. | 0 | 0 | 0 | 0 | 15 (100%) |
| 4. | Time allotted for the Mini CEX examination was sufficient. | 0 | 0 | 1 (6.66%) | 4 (26.66%) | 10 (66.66%) |
| 5. | This method helps to develop the dialogue between a trainee and trainer to put views of students as well as evaluator. | 0 | 0 | 0 | 7 (46.66%) | 8 (53.33%) |
| 6. | Mini CEX examination method helped me in preparing for the university examination | 0 | 0 | 0 | 7 (46.66%) | 8 (53.33%) |
| 7. | It offers immediate feedback to the trainee, indicating both the strengths of the performance and the areas for development. | 0 | 0 | 0 | 3 (20%) | 12 (80%) |
| 8. | Observation of trainees is an essential responsibility of supervisors and trainers. | 0 | 0 | 0 | 2 (13.33%) | 13 (86.66%) |
| 9. | In future I can be confident and competent to perform in similar situation. | 0 | 0 | 0 | 8 (53.33%) | 7 (46.66%) |
| 10. | It helps in conceptual learning & had a better understanding of patient management due to Mini CEX method of evaluation. | 0 | 0 | 0 | 9 (60%) | 6 (40%) |

Graph 1: Scores of assessors over four encounters

Graph 2: Perception of students to 10 open ended questions regarding Mini CEX evaluation

Analysis of open ended questions

Responses to open ended questions were analyzed qualitatively. Various comments for open ended items given by students were as follows:

Item: What do you think about Mini CEX exercise?

Positive comments: "Personal attention was given to each student". "Good as well as bad remarks were given immediately and the areas and ways for improvement were told". "There is definite improvement from day one to another". "There was good interaction between a student and teacher". "It will help me in improving till the final examination". "It increased my confident".

Negative comments: Majority of students commented that "Presence of a teacher was threatening. "I got nervous during getting remarks from teacher." "More time is required".

Item: Do you have any suggestion to improve the system and make it more effective?

"It should be done on various clinical cases also". "Examiner should be of junior level so that students feel free".

Perception of assessors: The perception of assessors was sought by using open ended (descriptive) item.

Item: What do you think about Mini CEX exercise?

Positive comments: "Observation of students by faculty during performing is vital". "Sensitization of assessor and the students to the Mini CEX is necessary". "Out of many formative assessment tools, Mini CEX could be one of the tools". "It certainly induces confidence and reduces fear."

Negative comments: "Definitely a time consuming exercise". "It requires more man power". "For allotting the cases of equal complexity more time and attention has to be given for case selection". "Presence of a teacher does make the difference on student's performance."

Discussion

In the traditional method of assessment, the teachers do not observe the actual procedures performed by the student; it only considers the final outcome and not how the students have accomplished it. This impacts both the 'validity' and the 'reliability'. Moreover, communication skills are rarely assessed, there is very little scope for direct feedback, and some important skills may not be tested at all. Students may also feel dissatisfied by not receiving personal attention from the faculty and be confused about which particular skill is being tested². In this context the mini CEX is a valid and reliable method to assess the clinical competencies of trainees. In this method the trainee not only have to prove but have to improve encounter by encounter. In the present study also the scores of all students over four encounters showed increasing trend of marks (Table 1).

Following this Mini CEX exercise, perception of all the participants was taken and almost all the students appreciated this style (Table 3). This finding was consistent with the study of Behere R³. They found that the best part of mini CEX was immediate constructive feedback given to the student about strengths of the performance and the areas and direction for further improvement. With it's a feature to provide feedback following a clinical assessment, the mini-CEX also serves as a formative method to guide trainees' professional development. Previous research on the mini-CEX focused on its validity, reliability, and feasibility to assess the clinical skills of residents, and the educational impact of effective feedback to foster their future learning and improvement^{4,5,6}. Additionally, feedback can be made more effective when students get guidance on how to utilize this feedback to improve their performance. In the present study, the feedback session involved first reinforcing those skills that were done well, and then discussing the areas where improvement was possible.

The students in the present study also mentioned that, there was active interaction between a student and

teacher. It helps to put views of students as well as of teacher. Archer⁷ stated that feedback should not be exclusively trainer driven but a two way process in which trainers provide comments and at the same time encourage trainees to self-reflect on their performance. Archer's model for effective feedback includes: Self-monitoring (reflection on action) supported by external feedback and linkage with personal goals (action plan) in a coherent process rather than a series of unrelated events⁸. Students in this study also stated that mini CEX certainly induces confidence and reduces fear among students. A study carried out by Singh T et al⁴ also showed that mini CEX is a good practice for the final examinations, helping to induce confidence and allay anxiety of presentation. Holboe et al⁹ also reported mini CEX, is a valuable and potentially powerful tool to provide high quality, interactive feedback that could contribute for improvement in trainees' clinical skills.

In this study, perception of the assessors was also taken and they commented that out of many formative assessment tools, mini CEX could be one of the tools. They also further stated that it is definitely a time consuming exercise and requires more man power. For allotting the cases of equal complexity more time and attention had to be given for case selection. All assessors in the study of Behere R³ also agreed that organizing and implementing the mini CEX required more planning and involvement than traditional assessment. According to assessors of the present study, presence of a teacher does make the difference on student's performance. Behere R³ and Weller JM¹⁰ similarly, found that trainees altered their behavior because they were being directly observed and assessed. Overall mini CEX was most appreciated by the students and assessors along with their pros and cons. All students felt that the constructive feedback helped reinforce the skills that they did well, and helped them identify weak areas.

Conclusion

To make a dental graduate competent to investigate, diagnose and manage oral diseases prevalent in India, every dental student need to demonstrate seven competencies like interviewing skills, physical examination, professionalism, clinical judgment, counseling, organization and efficiency, and overall competence. Although mini-CEX is an appropriate assessment tool which observes the seven competencies of the undergraduate students at the work place more profoundly and in much broader sense, it is a prime requirement of a competent postgraduate of Oral Medicine and practically difficult to conduct as a routine practice for undergraduates and therefore comparatively more apt for postgraduate students. Moreover, it is definitely a time consuming exercise and requires more man power for conducting on 100 final BDS students.

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