Evaluation of Mini Clinical Evaluation Exercise (Mini-CEX) for post-graduate students in Prosthodontics: Student and Faculty Perceptions

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Abstract

Background: The mini Clinical Evaluation Exercise or mini-CEX is a method for simultaneously assessing the clinical skills of trainees and offering them feedback on their performance. Although it is a well established method of assessment for medical residents, in dental education are very scanty especially in post-graduate education.

The aim of this study was to train the faculty for the use of Mini CEX in training post-graduate students in Prosthodontics and evaluate their perceptions regarding this novel assessment method.

Methodology: Faculty training was carried out by conducting a workshop consisting of pre-test, video demonstration, small group discussion and post-test. Total 5 faculty members evaluated 12 postgraduate students in seven competency domains on 9 point likert scale on standard miniCEX form. Focused group discussion was carried out with students and faculty to evaluate their perceptions regarding the exercise.

Results: there was a statistically significant improvement in cognitive knowledge by comparing the pretest and posttest results (7 ± 4 and 17 ± 2 respectively, p<0.0001)

Total 82 encounters were recorded by 5 faculty members and 12 postgraduate students. All seven competencies were evaluated. Mean time for observing students by evaluator was 15.25 min and evaluator giving feedback was 11.20 min. Students ratings for satisfaction with the format (mean) were 8.34 and evaluator 7.23. Main themes emerging from focus group discussions were constructive feedback, objectivity and useful for exam preparation.

Conclusions: Data from this study supports the use of mini CEX for post-graduate training in Prosthodontics. It is a cost effective way of assessing and giving constructive feedback to the students in structured manner. Further studies
in different settings are needed to generalize its use in routine post-graduate training.

**Keywords:** Assessment, mini Cex

**Introduction**

Clinical competence is ‘the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals and communities being served.1

As post-graduate students approach entry to practice, their education and assessment needs to be based on performance with real patients. This is necessary to assist in development of skills as well as to ensure their ability to provide the professional service effectively to the society. Assessing clinical competence is a complex task. Assessment methods need to cover the broad spectrum of clinical skills as well as provide a fair and reliable feedback to all students. Appropriate feedback facilitates self directed learning and professional development.

Assessment of medical students has changed considerably during the last 5 decades. Written examinations and summative ratings (practical examination and viva voce) although are used since many decades, lack structured format with respect to giving feedback. Research has shown that structured form of evaluations better than open ended ones2.

The mini-CEX serves as a standardized format for an evaluator to observe a student at the bedside, hear the student’s assessment, and critique the interaction in a non-threatening, non-graded situation3.

There have been some studies in the western countries which used the mini-CEX in the postgraduate setting in medical education4-7. It is a relatively new entrant in dental education scenario8 and but very few studies have been done in India.

The main Aim of this study is to evaluate the feasibility and usefulness of the mini-CEX as an assessment and feedback tool in the dental postgraduate education setting.

The Objectives were:

1) To introduce and pilot test mini-CEX,

2) To train postgraduates and faculty in the use of the mini-CEX,

3) To evaluate response of postgraduate students and faculty regarding the use of the mini-CEX, as an assessment and feedback tool.

**Methodology**

Faculty development is a prerequisite to train evaluators in order to implement a successful mini-CEX assessment program5. Therefore a one hour workshop comprising a pretest, mini-lecture, video-clip rating exercise, small group discussion, and a posttest. Improvement in cognitive knowledge was assessed by comparing the results between the
pretest and posttest. Initially 5 faculty evaluators and 12 postgraduate students were introduced to the mini-CEX concept.

The faculty evaluator evaluated the student's 7 clinical competency areas, using the standardized mini-CEX form.

[Figure 3] The form used a standardized 9-point Likert-scale, with a ratings span from 1–3 (unsatisfactory), 4–6 (satisfactory), to 7–9 (superior).

Each student was observed by an attending evaluator at least once. Multiplicity of evaluators during different encounters helped to even out the inter-rater variability in assessment.

In addition, the students were also asked to provide anonymous feedback, on their experience of encounters, using a 5-point Likert scale and open-ended questions.

The scores did not contribute to the final grade, as the primary goal of the exercise was to provide "real time" constructive feedback.

This study was approved by the Institutional Ethics Committee of Vidya Shikshan Prasarak Mandal Dental College and Research Centre, Nagpur on 16/12/2016, Serial number 58.

### Results

Total 82 encounters were recorded with 12 post-graduate students and 6 faculty members. Mean pre and post test scores of faculty were 7 ± 4 and 17 ± 2 respectively.

Tables 1-4 summarize details of outcomes of encounters.

#### Table 1: Details of encounter

| S no. | Focus areas assessed                                          | N (%) |
|-------|----------------------------------------------------------------|-------|
| 1     | Data gathering, Diagnosis treatment planning and Counseling   | 40    |
| 2     | Therapy / Treatment Procedure                                 | 42    |

#### Table 2: Competencies assessed

| S no. | Variables                         | N (%) |
|-------|-----------------------------------|-------|
| 1     | Interviewing skills               | 42    |
| 2     | Physical examination skills       | 82    |
| 3     | Professionalism                   | 82    |
| 4     | Clinical judgment                 | 82    |
Table 3: Time required during the exercise

| S no. | Purpose                          | Mean time | Range     |
|-------|----------------------------------|-----------|-----------|
| 1     | Evaluator observing students     | 15.25 min | 10-22 min |
| 2     | Evaluator giving feedback        | 11.20 min | 7-15 min  |

Table 4: Ratings for satisfaction with the format

|            | Mean | Range |
|------------|------|-------|
| Students   | 8.34 | 6-9.5 |
| Evaluators | 7.23 | 5-9.1 |

Focus group discussions

Assessment of residents’ perceptions of the mini-CEX was done using qualitative method of focus group discussion. A semi-structured focus group with all post-graduate students was undertaken. It was conducted by an independent moderator, audio-taped, and transcribed verbatim and organized into major themes.

The major themes included feedback, objectivity and Exam Preparation. Participants believed that the mini-CEX experience would benefit them in preparation and successful completion of their final MDS exam.

The benefits of mini-CEX as mentioned by the faculty and students were as follows:

**Faculty**

- Lacunae in clinical competence, Progress made over a period of time can be documented.
- Variety of skills evaluated in a short time,
- It is a low cost, low resource-intensive method that does not require any special preparation.
- It can be done in a natural patient care setting, providing authenticity to the assessment.

**Students**

- Exercise was relevant clinically as well as objective
- Feedback received was very useful and specific
Discussion

The basic difference between evaluation and assessment is forming value judgment. Evaluation decides final outcome (eg. Pass or fail) whereas assessment provides feedback on current state and a chance to improve in subsequent stages of course. Formative assessment is a form of learning. The ideal purpose of practical/performance assessment is to check all domains of learning including cognitive, psychomotor and humanistic qualities viz., professionalism as well as communication skills in real patient encounters. Although summative assessments are intended to provide professional self-regulation and accountability, they may also act as a barrier to further practice or training. Methods of Performance assessment are Long case, Clinical notes Portfolios, Direct observation of procedural skills (DOPS), OSCE/ OSPE and CEX & Mini-CEX.

All methods of assessment have strengths and intrinsic flaws. The use of multiple observations and several different assessment methods over time can partially compensate for flaws in any one method.

Competence is not an achievement but rather a habit of lifelong learning; assessment plays an integral role in helping physicians identify and respond to their own learning needs.

Ideally, the assessment of competence (what the student or physician is able to do) should provide insight into actual performance (what he or she does habitually when not observed), as well as the capacity to adapt to change, find and generate new knowledge, and improve overall performance.\(^9\)

Before 1950’s performance assessment in medical education largely relied on traditional bedside oral exams/long cases. In 1972, American Board of Medicine introduced Clinical Evaluation Exercise (CEX) as a way to do the same. However, it was only single encounter and took two hours to complete it. Therefore, mini CEX was introduced which is more concise and for multiple encounters in different settings to overcome these shortcomings. The mini-CEX is a way of simultaneously assessing the clinical skills of trainees and offering them feedback intended to enhance their future performance.\(^3\)

Importance of constructive feedback cannot be overemphasized in medical education. Benefits of good feedback are that it provides an assessment of strengths and weaknesses, enables learner's reaction, encourages self-assessment and promotes development of an action plan.\(^10\)

In the specialty of Prosthodontics, diagnosis and treatment planning is a very challenging task. Each clinical situation has many prosthetic rehabilitation options and choice depends upon patients' desires and systemic conditions, his socioeconomic status, available soft and hard tissue support, time and operators skills. Therefore, during postgraduate training period this skill of decision making has to be developed in a student for effective treatment outcome.

Also, there are numerous clinical procedures in our specialty to be learnt and practiced during residency including removable, fixed, implant and maxillofacial prosthodontics. While performing various procedures the student has to be not only good in dexterity but also his/ her approach should be organized with respect to instrumentation.

The importance of humanistic qualities like professionalism, ethics and communication skills cannot be overemphasized. Although, in routine clinical set-up postgraduate teachers do evaluate the residents and suggest improvement, it lacks structured rating and opportunity to give a systematic feedback. Also, lacunae in clinical competence & improvements made over a period of time are never documented on paper.
Our experience makes us believe that mini-CEX is an acceptable and practical tool for assessment of postgraduate students. It could be repeated in additional encounters to further enhance feedback and improve the reliability of the scores.

However, a single method will never solve the whole problem, not in education, nor assessment, nor research. On the contrary; strength will come from a carefully balanced combination of traditional and newer methods.

**Conclusion**

Within the limitations of the study viz., small sample size, less number of clinical encounters and single set-up, the following conclusions can be drawn:

Mini CEX was well received by both faculty and post-graduate students in the given setting.

It was a good learning experience for the students and the chance to receive structured feedback was the greatest asset of this method. Therefore it can be effectively used as one of the formative assessment method to enhance clinical performance of post graduate students.

However, before generalizing its acceptability, more such studies in different settings should be carried out in future.

**Take Home Messages**

Mini Clinical evaluation exercise works well for assessment of post-graduate students in prosthodontics.

**Notes On Contributors**

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Appendices

Declaration of Interest

The author has declared that there are no conflicts of interest.