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Teaching and Assessment of Clinical Skills in Interns using the Mini Clinical Evaluation Exercise (Mini-CEX) in a South Indian Medical College – a Pilot Study

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Abstract
Background and objectives:
Research continues to document serious deficiencies in clinical skill among students and interns of medical colleges. Increased emphasis is now being placed on defining outcomes of medical education in terms of "performance" rather than just in terms of "competence". Mini Clinical Evaluation Exercise (Mini-CEX) is one innovative Work Place Based Assessment (WPBA) tool to assess both of these. In this study,an attempt has been made to introduce Mini CEXfor teaching and assessing interns and to assess the perception of interns and faculties regarding mCEX.
Methods*: Three faculties from Department of Medicine were trained in using Mini CEX performance rating form. Thirty interns who consented to the study were divided into three groups and the faculties assessed the interns on three core skills / competencies. After assessment, faculties provided the interns a developmental feedback based on direct observation. A perception questionnaire was also used to study the perception of students and the faculty at the end of the exercise.*
Results*: The observation and feedback took an average of 18 minutes and 6 minutes respectively. Interns were rated higher for their physical examination skills (6.2) compared to interviewing and counselling skills (5.8). Highest rating was given for professionalism (only two out of 30 interns were rated superior (7-9) in the nine point rating scale. Satisfaction with the exercise was rated by faculty as 6.9 and by students as 6.4. All interns agreed that this exercise is an effective learning method. Similarly all faculties felt that this exercise is an effective teaching and assessing method.*
Conclusion*: There is a lot of potential for improvement of students with respect to clinical skills. This studydemonstrates that mCEX is feasible in our setting. It can be introduced for medical training to teach and assess clinical skills and apart from physical examination skills a lot of other skills can be taught and improved with this tool. Another important component of this tool is 'giving feedback'. The feedback should be constructive, task oriented, given as soon as possible and presented in a credible manner to the trainees.*

I. Introduction

Even in this era of rapid advancement in medical information and technology, the clinical skills remain vital to holistic healthcare. Research continues to document serious deficiencies in clinical skills among students and residents.[1]On one hand we need to correct this deficiency and on the other hand, there has also been an increasing emphasis on defining outcomes of medical education in terms of "performance" of the trainees a step beyond the description of outcomes in terms of "competence". Workplace Based Assessment (WPBA) is one such modality which assesses this "performance" in the authentic setting.[2]The cardinal elements of WPBA are **direct observation** and **conducted in workplace** in addition to **provision of feedback** to the trainees.

Mini clinical evaluation exercise (Mini-CEX) is one such innovative WPBA tool which has been found to be versatile and useful for both UG and PG training. It is being used in few institutes in our country and has been found to be feasible in Indian settings. Hence in this project we introduce Mini-CEX for clinical teaching and for assessing interns' performance at Government Theni Medical College, Theni.

II. Objectives

1. To introduce Mini-CEX for teaching and assessing interns
2. To study the perception of the interns and faculties regarding mCEX

III. Materials And Methods

Institutional Ethical Committee approval was obtained.
Resources: Three faculty members from the Department of Medicine.
Sample size: 30 interns (who consented to the study)
Setting: Inpatient setting.

The three steps of mCEX are 1. Preparation: Trainee discusses the mini CEX process with an assessor prior to seeing the patient 2. Observation: Assessor assesses a real life clinical encounter of the trainee with the patient 3. Feedback: Trainee debriefs the encounter straight away with the assessor and discusses areas for improvement.

Three faculties including the corresponding author got trained in using the mini CEX tool to discriminate among three levels of performances. The interns who got enrolled were divided into three groups, i.e. ten interns per faculty. Interns were sensitised regarding the exercise and they were given time to read and refer. They were also permitted to fix appointments with the faculty.The mini CEX form assesses trainees/interns on seven core skills/competencies (Fig 1).The competencies are Medical Interviewing skills, physical examination, professionalism, clinical judgment, counselling, organization and efficiency, and overall competence. For this study it was decided that, performances will be rated for three clinical skills viz., medical interviewing, physical examination, and counselling skill. The patients were selected accordingly.

Standard nine point Mini-CEX performance rating form was used to assess the interns. The nine-point rating scale was 1-3 = unsatisfactory, 4-6 = marginal/satisfactory, and 7-9 = superior.[3]Three interns per day were assessed by each faculty. The satisfaction of both the faculty and the intern was also recorded in the form. After assessment the faculties provided the interns a developmental feedback based on direct observation.A perception questionnaire was also used to study the students' and the faculty' perception at the end of the exercise(Table 1 & 2).

IV. Results

Faculty completed all the evaluations and all were from the inpatient setting. The observation and feedback took an average of 18 minutes and 6 minutes, respectively. Interns were rated higher for their physical examination skills (6.2) when compared to interviewing and counselling skills (5.8).Highest rating was given for Professionalism. Only two interns out of thirty were rated superior (7-9) in the nine point rating scale. Satisfaction with the exercise was rated by faculty/residents as 6.9 and by students as 6.4.

Students' perceptions:
1) All interns (100%) agreed that this exercise is an effective learning method.
2) Eighty percent of the interns felt that the time allotted to the exercise was sufficient.
3) Ninety four percent of the interns felt that this exercise should be included in the MBBS curriculum.
4) Seventy three percent felt that the exercise stimulated them to read / refer.
5) All felt that the feedback at the end of the exercise was very useful.

Faculty's perception:
1) All faculties felt that this exercise is an effective teaching and assessing method.
2) All felt adequate faculty training is a must before introducing this tool for UG and PG training.
3) They felt multiple sessions at an fixed interval has enormous potential to improve skills of the trainees both UG and PG

V. Discussion

Miller's pyramid is a way of ranking clinical competence both in educational settings and in the workplace. It distinguishes knowledge at lower levels and action in the higher level[4] (Fig. 2). To train and to assess the undergraduate and postgraduate medical trainees at the highest level of Miller's pyramid (level 4: Does) in their workplace, we have Work Place Based Assessment (WPBA) tools, which includes logbooks, Clinical Encounter Cards (CEC), Mini Clinical Evaluation Exercise (mCEX), Case Based Discussion, Direct Observation of Procedural Skills (DOPS), Multisource feedback, etc.As these tools are based on direct observation in real situation and with contextual feedback, their impact on the students is good. We need to make appropriate choice of tools, plan, train both the assessor and the assesse and then do the assessment. Mini CEX is a 10-20 minutes direct observation assessment or snapshot of a trainee – patient interaction. It facilitates formative assessment of core clinical skills and can be done as a routine.Many studies have been done to assess the feasibility and validity of mCEX as a teaching and assessment tool. The validity of mCEX has been proven by Durning SJ et al. by correlating the mCEX scores with corresponding ABIM MEF and ITE scores (American Board of Internal Medicine – Monthly Evaluation Form, American College of Physicians – American Society of Internal Medicine - In training Examination).[6]

In a study by Kogan JR, the average time taken for observation and feedback was 21 minutes and 8 minutes respectively.[7] In our study it was 18 minutes and 6 minutes respectively. In a study by Pfeiffer et al, an overall increase and then a decline in interviewing skills of medical students during their four years of medical schooling has been shown. One of the reasons for this is the de-emphasis of communication skills during the clinical years.[8] In our study, the average score for interviewing and communication skills was only 5.8, which means there is scope for improvement in this skill and the trainees and the trainers need to pay more attention to this skill.According to a study by Narcini JJ, the lowest ratings using mCEX was for physical examination and the highest was for professionalism.[9] In our study also, the highest score was for professionalism, followed by physical examination and the least is for communication skills.

Regarding the perception of students on mCEX, all felt that this tool can be included in the curriculum, it motivated them to read and that the feedback given by the trainees was useful. But the participants of the study by Malhotra et al, has perceived the assessment format as anxiety provoking. In due course, they understood the insight provided by mCEX in their clinical competence. [10] This reflects the difference in perception between different participants and also the different perception of the tools' dual roles of assessment and education. Overall the exercise was satisfactory for both the students and faculties with a score of 6.4 and 6.9 which is comparable to that obtained in the study by Kogan JR (6.8 & 7.2). [7]

Drawbacks of mCEX:

The scores given by the assessors may vary depending upon the stringency of the assessor. This may lead to measurement error. By rating each trainee by different assessors, we may bring some score stability. Also the decisions about one scale may unduly influence those on others. These effects can be reduced by combining results across competencies.[11]Multiple assessment of each student by many faculties will be time consuming and needs proper planning and implementation. We may not be sure of the quality of feedback - positive features, suggestions for development, action plan given by the assessors. To assess the feedback, it also needs to be documented, which again implies time consumption. Also training of assessors is needed to address the factors associated with provision of feedback. [11]

VI. Conclusion

From this study we believe that mCEX is feasible in our settings. It can be a useful educational instrument to monitor and to foster the trainee's development. Apart from physical examination, lot of other skills can be taught and improved using this tool. Training of the faculty in applying this tool and to give correct feedback is an important step in introducing this tool. Also multiple observations by different assessors are needed to ensure the reliability of the scores. The faculties should utilise other interactive feedback methods of self-assessment and action plans too while giving feedback.

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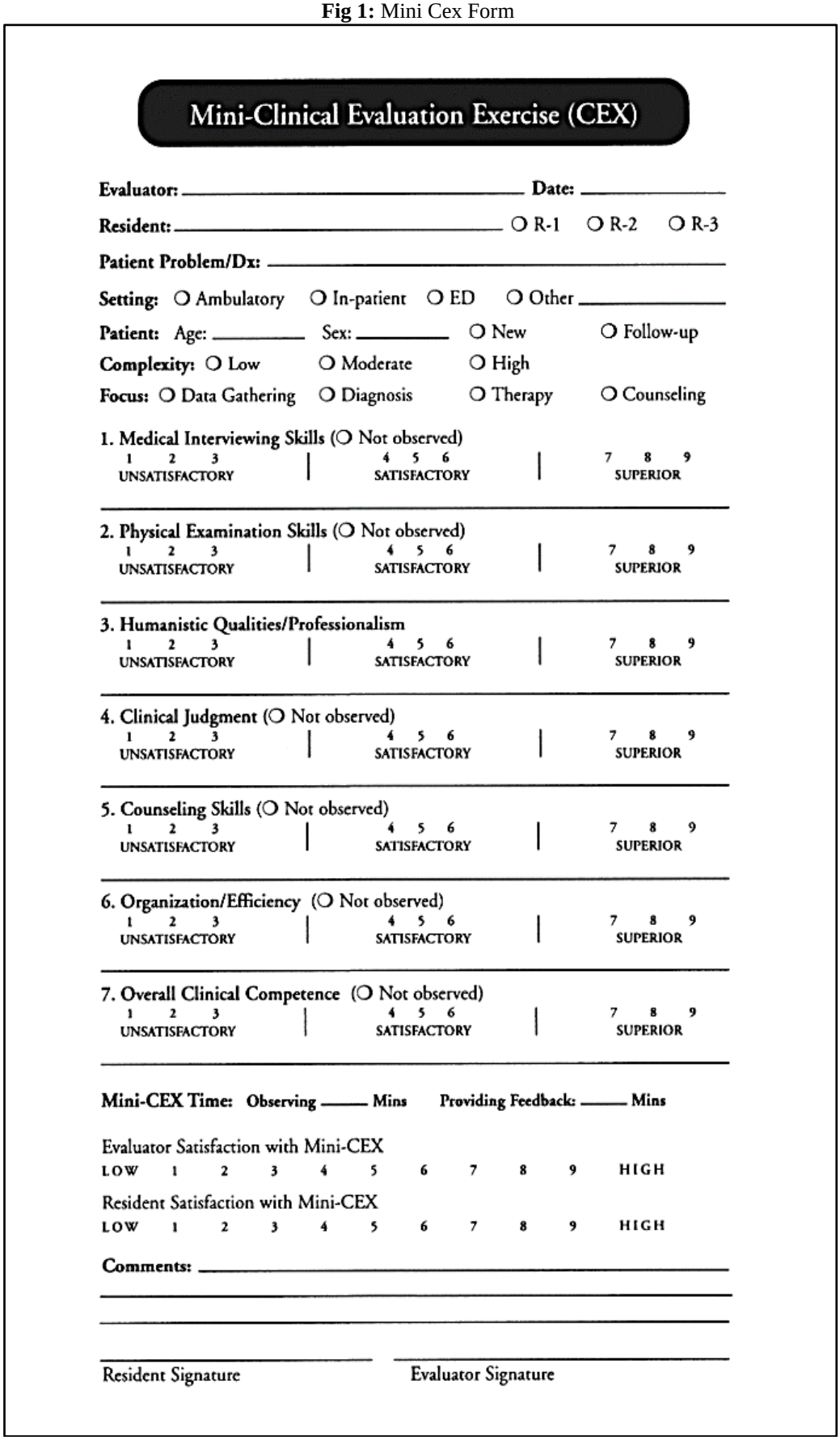
Fig 1: Mini Cex Form



Mini-Clinical Evaluation Exercise (CEX)

Evaluator: _____ **Date:** _____

Resident: _____ ○ R-1 ○ R-2 ○ R-3

Patient Problem/Dx: _____

Setting: ○ Ambulatory ○ In-patient ○ ED ○ Other _____

Patient: Age: _____ Sex: _____ ○ New ○ Follow-up

Complexity: ○ Low ○ Moderate ○ High

Focus: ○ Data Gathering ○ Diagnosis ○ Therapy ○ Counseling

1. Medical Interviewing Skills (○ Not observed)

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

2. Physical Examination Skills (○ Not observed)

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

3. Humanistic Qualities/Professionalism

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

4. Clinical Judgment (○ Not observed)

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

5. Counseling Skills (○ Not observed)

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

6. Organization/Efficiency (○ Not observed)

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

7. Overall Clinical Competence (○ Not observed)

1 2 3 UNSATISFACTORY | 4 5 6 SATISFACTORY | 7 8 9 SUPERIOR

Mini-CEX Time: **Observing** _____ **Mins** **Providing Feedback:** _____ **Mins**

Evaluator Satisfaction with Mini-CEX

LOW 1 2 3 4 5 6 7 8 9 HIGH

Resident Satisfaction with Mini-CEX

LOW 1 2 3 4 5 6 7 8 9 HIGH

Comments: _____

Resident Signature Evaluator Signature

Fig 2: Miller's pyramid

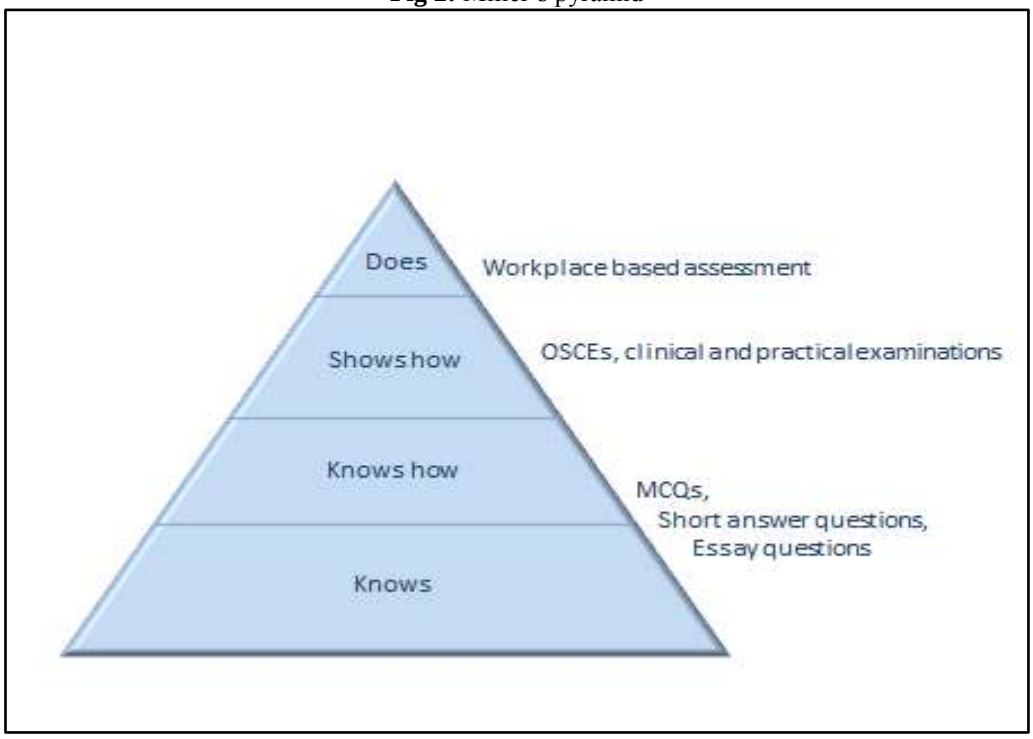


Table 1: Questionnaire for assessing the perception of mCEX by students

Students perception	**Agree**	**Can't say**	**Disagree**
Mini CEX is an effective learning method			
Adequate time was allotted by the assessor for the exercise			
Adequate time was allotted for the feedback			
Mini CEX can be included in the curriculum			
Feedback on my performance was provided			
The feedback was constructive			
Being observed by the assessor affected my performance adversely.			
The exercise stimulated me to read/refer			

Table 2: Questionnaire for assessing the perception of mCEX by faculties

Faculties perception	**Agree**	**Can't say**	**Disagree**
Mini CEX is easy to carry out			
Mini CEX is an effective teaching and assessing method			
Mini CEX requires more time and commitment than the routine assessment			
Prior faculty training is needed to introduce this exercise			
Multiple assessments for each trainee is needed			
Mini CEX is a potential tool to improve both UG & PG trainees			