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Original Article

Mini-clinical evaluation exercise (mini-CEX) as a learning and assessment tool: Residents' and facultys' perceptions.

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Abstract

Background: The desired outcome of any post graduate training is to produce competent specialists. Mini-clinical evaluation exercise (mini-CEX) is a tool in which a variety of clinical skills such as data gathering, physical examination, clinical judgment, counseling, organization/efficiency, and overall competence can be assessed in real patient situations. The present study was undertaken to find out the perceptions of pediatric residents and faculty regarding the use of mini-CEX as a learning and formative assessment tool. **Methods:** Ten paediatric post graduate residents underwent three mini-CEX encounters each in the outpatient department. Three faculty members assessed the performance of students by direct observation, rated their performances and offered a feedback by employing the standard mini-CEX format. Perceptions regarding the use of mini-CEX as a learning and assessment tool were obtained by using separate questionnaires for the residents and faculty. **Results:** All the participants (100%) agreed that mini-CEX was a useful learning and assessment tool. Eighty percent of the residents perceived that they missed the interaction with the assessor. Majority (80%) of the residents felt that the depth of their knowledge was not assessed during the encounter while a third of the faculty was also of the same opinion. There was a mixed reaction regarding time allotment for the exercise. All the participants suggested that mini-CEX should be incorporated in their training as a learning and assessment tool. **Conclusions**: Mini-CEX was perceived as a useful assessment and learning tool by the postgraduate residents and faculty of the Department of Pediatrics.

Key words: Mini-CEX, WPBA, Residents, Faculty, Perceptions.

Introduction

With advances in modern technology in the field of medicine, clinical skills among post graduate trainees have taken a back seat. With the existing methods commonly used, assessment of clinical competence of post graduate students leaves much to be desired. This is due to the fact that traditional method of assessment such as long case focuses more on presentation skills and cognition rather than assessment of clinical skills (observation during history taking, during physical examination and communication skills). The desired outcome of any post graduate training is to produce competent specialists who can deliver high quality health care to patients. Application of cognitive, psychomotor and communicative skills in real patient settings are prerequisites for professional competency. Work place based assessment (WPBA) is a form of assessment which involves direct observation of trainees' performance at their workplaces followed by a provision of feedback based on their performances.[1] WPBA is used to assess

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trainees' clinical competence in countries such as the United Kingdom and the United States but it is not employed globally. A variety of tools are available for WPBA.[2] Mini-clinical evaluation exercise (mini-CEX) is one such WPBA tool in which a variety of clinical skills such as data gathering, physical examination, clinical judgment, counseling, organization/ efficiency, and overall competence can be assessed.[2] In India, studies on the usefulness of mini-CEX as a formative assessment and learning tool in post graduate training has been reported at a few centers only.[3-7] Hence the present study was undertaken to find out the perceptions of pediatric residents and faculty regarding the use of mini-CEX as a learning and formative assessment tool.

Methods

Study design: Observational study. Setting: Pediatric outpatient department (OPD) of a tertiary level rural teaching hospital. Study period: 3 months from January 2015 to March 2015. Selection of participants: 10 residents (Pediatric post graduate trainees in 2nd and 3rd year of training) and 3 Pediatric faculty members (Professors). Study tool: Mini-CEX format as described by Norcini et al.[8] Separate questionnaires for faculty and residents. Outcome: Perceptions of paediatric residents and faculty regarding mini-CEX as a learning and assessment tool. After obtaining ethical clearance from Institutional Ethics Committee, a 2-hour workshop on Mini CEX was conducted for all the faculty members of the department as a part of faculty development to familiarize themselves with the standard nine-point scale Mini-CEX format.

They were also asked to provide constructive feedback and discuss strategies for improvement. The residents were also sensitized regarding the use of Mini-CEX as a formative assessment tool and copies of the format were made available to them. After obtaining informed consent, 10 students and 3 faculty members were enrolled for the study. Each resident was assessed thrice (once a month) by 3 different assessors on 3 different patients belonging to different levels of complexity (low, moderate and high) of cases. Patient encounters were planned in advance and a schedule with the names of students and faculty was displayed on the notice board. The assessment was done in Pediatric OPD after obtaining consent from the patients/guardians. The residents were allowed to choose their patients. Time allotted for each encounter was 30 minutes. During the first 20 minutes, direct observation of the resident performing the task was done by the assessor and the performance scored using Mini-CEX rating form. During the last 10 minutes the resident was provided with constructive feedback and suggestions for improvement. The resident and the assessor were asked to rate their satisfaction with Mini-CEX which was duly signed by them. At the end of the study period, residents and faculty were asked to provide a separate feedback (questionnaire and suggestions) on their experiences and perceptions about Mini-CEX which was analyzed.

Results

A total of 30 clinical encounters were recorded. During the 30 clinical encounters, all 4 focus areas (data gathering, diagnosis, therapy and counseling) were assessed in 23.3%, any 3 focus areas in 30% and any 2 focus areas in 46.6%. The competencies which were assessed and the scores obtained by residents are depicted in Table-1. Majority of the residents' performance was satisfactory (rating 4-6) – Table-I.

All the 3 evaluators and 10 residents were satisfied with the mini-CEX (score>8 on 10 point Likert scale). All the participants (100%) agreed that mini-CEX was a useful learning and assessment tool. Eighty percent of the residents perceived that they missed the interaction with the assessor. Majority (80%) of the residents felt that the depth of their knowledge was not assessed during the encounter while a third of the faculty was also of the same opinion. There was a mixed reaction regarding time allotment for the exercise- Tables II, III. All the participants suggested that mini-CEX should be incorporated in their training as a learning and assessment tool.

Table 1. Competencies assessed and scores

Competencies	Scores 1-3 (Unsatisfactory)	4-6 (Satisfactory)	7-9 (Superior)
Medical interviewing skills (n=14)	0	9(64.2%)	5(35.7%)
Physical examination skills (n=11)	0	7(63.6%)	4(36.3%)
Professionalism (n=9)	0	8(88.8%)	1(11.1%)
Clinical judgment (n=8)	0	6(75%)	2(25%)
Counseling skills=11)	0	8(72.7%)	3(27.2%)
Organization/Efficiency (n=8)	0	6(75%)	2(25%)
Overall clinical (n=7)	0	4(57.1%)	3(42.8%)

Table 2. Perceptions of residents regarding Mini-CEX (n-10)

Questions	*SA	A†	U‡	D§	SD‖
Structured format helped in making a systematic and complete examination	100%	-	-	-	-
Time allotment was sufficient	100%	-	-	-	-
Rating helped in identifying strengths and weaknesses	100%	-	-	-	-
Examiner bias is avoided	100%	-	-	-	-
Immediate feedback helped in improving skills	100%	-	-	-	-
Useful learning tool	100%	-	-	-	-
Useful assessment tool	100%	-	-	-	-
Direct observation by examiner made me nervous/anxious	-	20%	-	-	80%
Missed interaction with examiner	-	80%	-	-	20%
Depth of knowledge was not assessed	80%	10%	10%	-	-

*SA (strongly agree); †A (agree); ‡U (undecided); §D (disagree); ‖SD (strongly disagree)

Table 3. Perceptions of faculty regarding Mini-CEX (n=3)

Questions	*SA	†A	‡U	§D	‖SD
Direct observation and structured format helped in assessing clinical skills	100%	-	-	-	-
Time allotment was sufficient	66.6%	-	-	33.3 %	-
Examiner bias is avoided	100%	-	-	-	-
Miss interaction with students	-	-	-	-	100 %
Useful learning tool	100%	-	-	-	-
Useful assessment tool	100%	-	-	-	-
Depth of knowledge not assessed	33.3%	-	-	66.6 %	-

*SA (strongly agree); †A (agree); ‡U (undecided); §D (disagree); ‖SD (strongly disagree)

Discussion

The present study was conducted as a part requirement of Fellowship in Medical Education (FIME) at MCI Nodal Centre, St John's Medical College, Bangalore by the first author. It was a unique experience for the students and faculty of our department. Even though the entire faculty underwent sensitization, only 3 faculty members consented to participate in the study.

Perception of the residents regards mini-CEX as assessment tool

Any clinical competency assessment tool which is work place based should be direct observation, in an authentic setting, provide adequate time, unbiased and in a structured format to make it reliable and valid.[9]

The trainees in our study also strongly agreed (100%) for all of the above which reflects the validity and reliability of mini-CEX as a WPBA. All the students (100%) perceived that there was no examiner bias as the rating of the students' performances was shared with them. The students also expressed that the one to one interaction with multiple assessors helped them to improve their relationship with teachers. Another observation was that the students appreciated the structured examination which helped them to examine the patient in an organized manner. They also perceived that direct observation of data gathering and counselling by the assessor helped them in improving their communication skills which was lacking in the traditional long case examination.

Feedback is the bedrock for effective clinical education, it should reinforce good performance, correct the poor performance and also identify the areas that need to be improved.[10] In our study, all the residents strongly agreed that feedback should follow WPBA. The strength of the mini-CEX lies in the trainee receiving developmental feedback based on the direct observation of his/her clinical performance. Self-improvement in any skill requires knowledge of how one is currently performing and it is a known fact that a constructive feedback facilitates improved performance. In the present study, all the residents (100%) appreciated the immediate feedback which was provided to them as it helped them in identifying their weaknesses and strengths which fostered improved learning.

Eighty percent of residents felt that they missed the interaction with examiners and that the depth of their knowledge was not assessed as the time allotted for feedback was brief. One of the suggestions was to increase the allotted time for feedback. Some of the faculty members also suggested an increase of time allotment for feedback. In the Miller's Pyramid for assessment of clinical competence, there are 4 layers. The lowermost layer is formed by "knows" followed by "knows how", "shows how" and "does". The base is formed by knowledge (knows) and the apex is formed by performance in real-life situations (does). The concept of mini-CEX is that a student has to first "know" (factual knowledge) in order to "do" (perform). If the student does not know then he cannot perform. Mini-CEX helps to target the highest level of assessment "does" assuming that he/she already "knows".[11] Explanation of the concept of Miller's pyramid to the participants will probably clear their doubts regarding assessment of knowledge.

Anxiety was perceived by 20% of residents during the clinical encounter particularly during data gathering and counseling as they were directly observed by the examiner. Similar observation was reported during initial encounters but over time it was overcome as it provided insight into their clinical compete.[12]

Perception of the faculty regards mini-CEX as assessment tool

Faculty as a stake holder in clinical assessment have to balance their time between teaching, patient care, administrative activity and research. Mini-CEX being work placed based and of short duration favors the faculty, hence faculty members in this study strongly agreed with regards to the time allotment (66.6%). Faculty members strongly agreed

(100%) regarding the direct and structured observation of the trainees during assessments which removed bias and reflected validity of the evaluation tool. The faculty members were of the opinion that this exercise helped them to assess the clinical skills of the residents as they were provided with an opportunity to observe them directly and rate them in a structured manner.

Perception of the residents and faculty regards mini-CEX as learning tool

The new mantra in assessment is "Assessment for Learning". While most teachers are well-versed with the summative or certifying purpose of assessment (assessment of learning), using assessment as an educational tool (assessment for learning) is a recent phenomenon. [13] In the present study, all of the trainees and faculty strongly agreed that mini-CEX is an effective learning tool. This is because mini-CEX ends with a well formulated action plan for improvement of the next performance which is accepted by the trainee and concurred upon by the faculty. However, we did not compare their performances in subsequent evaluations as the clinical encounters were limited to only 3 per resident. Moreover, our objective was only to study the perceptions of residents and faculty regarding mini-CEX as a learning and assessment tool. Improvement in residents' performances in subsequent evaluations have been reported in studies from India.[4,6-7]

Based on the observations in the present study, it was found that all the participants (residents and faculty) strongly agreed that mini-CEX was a very useful learning and assessment tool. In a systematic review of tools employed for direct observation and assessment of clinical skills of medical trainees, it was observed that mini-CEX had the strongest validity.[14] We conducted the assessment in Paediatric OPD and the experience proved that it can be easily integrated into routine clinical work without hampering our work schedule. Singh T et al [7] have reported that mini-CEX can be used in different clinical settings as a part of postgraduate training. Based on the suggestions of the participants to employ mini-CEX as a learning and formative assessment tool, we have introduced it as part of postgraduate training program and is being continued.

Limitations The small sample size as only 2nd and 3rd year postgraduate trainees and 3 willing faculty participated in the study. Another limitation was the study period which was only for 3 months. As it was a part requirement for FIME, only 3 months was allotted for the study.

Conclusion

Mini-CEX was perceived as a useful assessment and learning tool by the postgraduate trainees and faculty of the Department of Pediatrics. Constructive feedback and the structured format were most appreciated as it provided the students an opportunity to be more organized and improve learning. The regulatory body of medical education in India (Medical council of India - MCI) stresses on competency based medical education. However the existing method of assessment is purely summative (long case, short case, viva etc) which is knowledge based. The need of the hour is to include formative assessments in post graduate training curriculum which will go a long way in enhancing skills of the trainees thereby improving their competency.

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Contributors

SRVR conceptualized and designed the study, conducted the mini-CEX, collected and analyzed the data, prepared the manuscript and will be the guarantor of the paper. PKNV conducted the mini-CEX, did literature review,

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