The usefulness of Mini Clinical Evaluation Exercise as a learning tool in different pediatric clinical settings

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Abstract

Background: Mini Clinical Evaluation Exercise (Mini-CEX), have been an underutilized tool for the formative assessment in India. Not many studies have been done in India to examine its feasibility and acceptability in residency programs of most clinical subjects. Aim: To assess the feasibility and acceptability of Mini-CEX in different pediatric clinical settings and to know if it helped the residents with improved learning. Methods: Pediatric residents were regularly evaluated with Mini-CEX over a period of 1 year by standard methodology. Each encounter was followed by case specific feedback given to the residents. Several such encounters were held in different pediatric clinical settings like pediatric outpatient departments (POPDs), pediatric wards, Pediatric Intensive Care Unit (PICU), Neonatal Intensive Care Unit (NICU), etc. By the end of the year, both teachers and residents were asked to give feedback on 5 point Likert scale based on their experience with the exercise. Results: The entire exercise was participated by 11 teachers and 23 residents. Mini-CEX encounters were conducted in POPDs 38%, pediatrics ward 22%, PICU 19%, NICU 15%, and casualty 6%. The overall average score for all students was 5.65. An average improvement in scores by 1.9 points was observed over a period of 1 year all students and teachers felt that the exercise was feasible in most pediatric clinical settings. Students accepted that the feedback given by the teachers well and accepted that this feedback helped them with improved learning. Conclusions: Residents and teachers, both considered Mini-CEX as a feasible exercise. Residents accepted that the feedback after each exercise helped them in their learning.

Key words: Feedback and clinical competence, formative assessment, Mini Clinical Evaluation Exercise

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Introduction

There are a number of tools available for workplace-based assessment. Case presentations, Directly Observed Procedural Skills, Objective Structured Clinical Examination, Mini Clinical Evaluation Exercise (Mini-CEX), etc. Each tool has their own strengths and weaknesses. During the training programs, given the amount of workload both on students and teachers in clinical specialties, finding opportunities to plan assessment exercises might be somewhat difficult. Here Mini-CEX can be a ready tool, which does not require a formal examination environment. It can be planned in any clinical situation without disturbing the management of the patient.[1] An earlier study from our department,[2] had clearly shown its usefulness as a formative assessment tool in pediatrics. However in that study, most of the encounters were held in pediatric outpatient departments (POPDs) and pediatric ward settings. Hence, we planned this study, to see if this exercise could also be feasible in other pediatric clinical settings.

Objectives

To assess the acceptability and feasibility of Mini-CEX in different pediatric clinical settings and to know if this exercise helped the residents by improved learning.

Methods

The study was conducted in Department of Pediatrics, Christian Medical College, Ludhiana. A regular schedule
was developed for pediatric residents to undergo Mini-CEX, and hence that each resident was supposed to have 4–6 encounters over a period of 1 year. Residents and teachers were encouraged to have these encounters in different clinical settings like POPDs, wards, Pediatric Intensive Care Unit (PICU), Neonatal Intensive Care Unit (NICU), casualty, etc. Before starting the routine, both teachers and residents were sensitized about the method to conduct Mini-CEX.

Each exercise was done using the standard methodology as described by Norcini et al.[1] The generic forms were used for the purpose. These forms can be downloaded from the website https://www.abim.org/pdf/paper-tools/mini-cex.pdf.

A record of all such encounters was maintained over 1 year. By the end of the year, both teachers and residents were asked to give feedback based on their experience with the exercise. Their opinion was recorded on a 5 point Likert Scale. Separate feedback forms were used for teachers and the students.

**RESULTS**

The entire exercise was participated by 11 teachers and 23 residents over a period of 1 year.

The focus areas during the evaluation were:
- Data gathering: 92%
- Diagnosis: 60%
- Therapy: 45%
- Counseling: 30%

The distribution of the settings where these encounters conducted were, POPDs 38%, pediatrics ward 22%, PICU 19%, NICU 15%, and casualty 6%. The overall average score for all students was 5.65. The average score for first 2 encounters was 4.7 and for last two encounters was 6.6 clearly showing the improvement in the performance over time. The most improvement was observed in areas of Humanistic Qualities/Professionalism and Counseling Skills. The least improvement was observed in physical examination skills. The average score for satisfaction after each exercise was 7.4 out 9 for students and 7.1 for the teachers.

At the end of 1 year, the feedback was taken both from students and the teachers on Likert scale of 1–5. The findings of these feedbacks are summarized in Tables 1 and 2.

**DISCUSSION**

The Mini-CEX since its inception is considered as a positive tool for the formative assessment of residents in the clinical departments.[3,4] In India, most of the clinical evaluation is still following the routine case presentations. Here, the students are evaluated on “presentation” of the case and not on their actual clinical skills. Consequently, if any feedback is provided, is usually inadequate and most times, not actionable. On the other hand, Mini-CEX, since it is directly observed, evaluates the actual skill, ranging from history, examination taking to planning the treatment. The entire exercise takes about 45 min. No advance planning is necessary, can be done in almost any clinical settings and fits well into the normal routine. This was agreed by both students and the teachers in this study, and similar observations were made in earlier studies elsewhere.[2,3,5]

Mini-CEX is objective in its approach and the results obtained are both reproducible and reliable.[4,5] Each domain assessed by the teacher is marked ranging from unsatisfactory to satisfactory to superior on a scale of 1–9.Probably because of this objectivity, the students in the present study observed that the seniority or experience of the teacher was irrelevant for this exercise to be successful.

The fundamental need for any formative assessment is to facilitate learning. Any evaluation exercise can be called successful only if it encourages students to look for more information. This can happen if the evaluation is followed

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**Table 1: Feedback given by teachers on Likert scale of 1-5 (degree of agreement with the statement)**

| Statement                                                  | Mean score | SD  |
|------------------------------------------------------------|------------|-----|
| Mini-CEX was a feasible exercise                            | 4.0        | 0.82|
| It fits well into the routine of teaching and clinical responsibilities | 3.8        | 0.79|
| Does not interfere with management of individual patients | 3.7        | 1.25|
| I believe the students took my feedback sincerely          | 3.6        | 1.17|
| Each exercise motivated students to go back to books        | 3.2        | 1.03|
| Feedback given was specific to the case discussed           | 4.5        | 1.26|
| Variety of settings for conducting Mini-CEX was generally adequate | 4.0        | 0.82|

**Table 2: Feedback recorded from the students on Likert scale of 1-5 (degree of agreement with the statement)**

| Statement                                                  | Mean score | SD  |
|------------------------------------------------------------|------------|-----|
| Mini-CEX was a feasible exercise                            | 4.3        | 0.81|
| Fits well with routine training program and clinical responsibilities | 4.0        | 1.05|
| Did not interfere with the management of individual patients | 4.5        | 0.77|
| Level of assessor (seniority/experience) was important for this exercise to be successful | 2.3        | 1.09|
| Mini-CEX increases anxiety during evaluation                | 2.1        | 0.65|
| The feedback given by the teacher was case specific        | 4.7        | 0.56|
| The feedback given by the teacher motivated me to learn more | 4.6        | 0.50|
| Variety of settings for conducting Mini-CEX was generally adequate | 4.0        | 1.00|

Mini-CEX: Mini Clinical Evaluation Exercise; SD: Standard deviation
by feedback, which is prompt, specific, and actionable.\textsuperscript{[6,7]} We observed that Mini-CEX provided useful feedback and according to the students, helped in their learning. This was also demonstrated by an improvement in average scores in last 2 evaluation exercises.

Mini Clinical Evaluation Exercise is a directly observed evaluation exercise. Before starting, it was generally believed it might induce anxiety among students and consequently affect their performance. In our study, we found that the format of the exercise did not induce any unusual anxiety and its overall acceptance was good among the students. Malhotra et al.\textsuperscript{[8]} in their study also observed that the anxiety level reduces as the familiarity with the exercise increase.

**Conclusions**

Pediatric residents and the teachers both considered Mini-CEX as a feasible exercise and agreed that the settings in this exercise were adequate. Residents appreciated the feedback given by the teachers after each encounter. They felt that each encounter motivated them to look for more information and hence helped them in their learning.

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