

# Perception of Faculty Members in Clinical and Surgical Departments on Mini-CEX as an Assessment Tool for Undergraduate Students in a Medical College in Central Kerala

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## ABSTRACT

### BACKGROUND

The Mini-CEX (Mini clinical examination exercise) is a work place based assessment (WPBA) method used for the assessment of clinical skills. The present study attempts to study the different perceptions of faculty members of clinical and surgical departments in the medical college in using Mini-CEX as an assessment method in undergraduate students.

### METHODS

This was a descriptive study done at Amala Institute of Medical Sciences, Thrissur for a period of three months. 30 faculty members from various departments were requested to conduct the Mini-CEX sessions in their departments and these faculty members were assessed by another Observer from the same department.

### RESULTS

The sample size was thirty. The faculty members with different experience levels were included in the study. They were also the observers mutually. The Mini-CEX was conducted in the hospital premises. The location varied. The duration of the Mini-CEX for a particular skill was noted in minutes. The mean in all 3 skills is around 7.9 with a standard deviation of about 1.2. This shows that the Mini-CEX duration is only about 6 to 8 minutes. The data reveals a mean of 5 minutes with a standard deviation of 1.0 for the feedback session. So in effect the whole session of Mini-CEX was over by about 11 to 13 minutes which is not a lengthy assessment session. 5 point Likert scale was used to analyse the perceptions of the faculty members in the role of examiner and observer as well. The results showed that Mini-CEX is feasible in the medical college setting and can be used for the formative assessment of undergraduate students.

### CONCLUSIONS

Mini-CEX is well appreciated and valued by the examiner for assessment of undergraduate students. Direct observation of medical trainees with actual patients and Mini-CEX during busy clinical postings is feasible with good outcomes. Mini-CEX can be used for the formative assessment of undergraduate students.

### KEYWORDS

WPBA, Mini-CEX, Faculty Perception, Undergraduate Students

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*DOI: 10.18410/jebmh/2021/490*

*How to Cite This Article:*

*Sunilkumar MN. Perception of faculty members in clinical and surgical departments on Mini-CEX as an assessment tool for undergraduate students in a medical college in central Kerala. J Evid Based Med Healthc 2021;8(29):2661-2666. DOI: 10.18410/jebmh/2021/490*

*Submission 24-12-2020,*

*Peer Review 03-01-2021,*

*Acceptance 05-06-2021,*

*Published 19-07-2021.*

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## BACKGROUND

The goal of medical education is to impart the best health care to community. In the present pattern of medical education there is a shift to competency based medical education (CBME). In the implementation of CBME there is great importance of workplace-based assessment (WPBA) tools.<sup>1</sup> WPBA are assessments of performance in the workplace. Thus, in comparison to many other assessments in medical education, these scenarios do not occur in artificial settings, but take place as part of the daily work of a medical student. Another important aspect of WPBA is that they offer the opportunity to provide students with a real and timely feedback on their performance. Therefore, they play an important role in CBME.<sup>2</sup>

The Mini-CEX (Mini clinical examination exercise) is a WPBA method used for the assessment of clinical skills and was developed in 1995 by the American Board of Internal Medicine. This also includes counselling skills and assessment of professionalism of the student as well. After an examiner observes a student's performance in a normal clinical encounter, the student receives real feedback.<sup>1,3</sup> For each session with the real patient, the examiner recorded the date and time of the session, the patient's problem on 3-point scale (low, moderate, and high), the sex of the patient, the number of minutes spent in observing the session, and the number of minutes spent in giving feedback.

A 9-point scale was used (in which 1 – 3 were "unsatisfactory," 4 – 6 were "satisfactory," and 7 – 9 were "above expected"), the faculty rated the student on medical interviewing skills, physical examination skills (mental status examination), humanistic qualities / professionalism, his clinical judgment, counselling skills, organization and efficiency in the exam, and level of his/her overall clinical competence.<sup>4</sup> After the Mini-CEX, the examiner completed the rating form and provided feedback to the student.<sup>5</sup> The study was conducted to explore the perception of faculty members in clinical and surgical departments on Mini-CEX as an assessment tool for undergraduate students in our Medical College situated in Central Kerala.

The objective of my study was to determine the perception of faculty members in clinical and surgical departments regarding the use of Mini-CEX as an assessment tool in undergraduate teaching.

## METHODS

Amala Institute of Medical Sciences, Thrissur is a tertiary level medical college and hospital, situated in Central Kerala. It was a descriptive study done here and convenient sampling was observed. A total of 30 Mini-CEX were conducted. The study was conducted for a period of three months from April 2019 to July 2019.

The inclusion criteria were - all faculty members of clinical (General Medicine, Paediatrics, Dermatology, Psychiatry) and surgical departments (General Surgery, ENT, Obstetrics and Gynaecology, Ophthalmology, Orthopedics) and the final year medical students undergoing

posting in that departments who were willing to take part in the study were included. Informed consent was taken from the faculty members and students before the study. The sample size decided was only 30.

Sampling technique observed was the following: after taking permission from the respected Principal of our medical college and the head of the departments, the faculty members of the clinical and surgical departments were initially given sensitization on Mini-CEX in their departments itself by me with the help of a power point presentation on Mini-CEX. Those faculty members who were not present during the session were individually met and explained about the Mini-CEX and the study. After obtaining Institutional Ethics Committee clearance to conduct the study (IEC NO: AIMSIEC / 1 / 2019), the faculty members were requested to conduct the Mini-CEX sessions in their departments during the study period. The Mini-CEX was conducted on three skills: a "Medical interviewing skills/history taking", "Physical examination skills" and "Counselling skills" in the respective clinical scenarios in these departments.

The methods of data collection were as follows: The faculty members were given the validated Mini-CEX evaluation questionnaire to assess the students. These sessions were conducted by the Professors, Associate Professors, Assistant Professors and senior residents in these departments. These faculty members were requested to give a good feedback and fill in the feedback form also on the Mini-CEX conducted after the session. The Mini-CEX sessions conducted by these faculty members were assessed by another Observer from the same department. The observer could be a senior and junior resident staff or mutually by the same faculties in between them of these departments. The observer was requested to fill in the feedback form about the Mini-CEX session conducted before them.

Tool used was a validated Mini-CEX questionnaire for the faculty members conducting the Mini-CEX and 2 feedback forms: 1) for the faculty members conducting Mini-CEX on the session conducted and 2) for the Observer faculty who was observing the Mini-CEX session. Outcome measurement was the inference from the validated Mini-CEX questionnaire for the faculty members conducting the Mini-CEX and 2 feedback forms already mentioned. The study was started after obtaining IEC clearance of our institute and written informed consent was obtained from the consenting faculty members and students. The patients consent also was obtained for participating in the study in Malayalam language. The validated questionnaire on Mini-CEX and feedback form was explained thoroughly to the participants before it was filled by them.

Statistical analysis was done as follows. The data collected was discussed with the statistician of our medical college and entered in MS Excel and analysed using licensed SPSS 21. The data was expressed in terms of proportions. Chi square test and its extension were used to analyse the results. Any relevant associations and correlation between various categories observed during this study were assessed and highlighted with the help and guidance of statistician. Also a 5 point Likert scale was

used to analyse the attitude of the faculties and observers conducting the Mini-CEX sessions. The data of statistical analysis are being demonstrated with the help of pie charts, histograms and tables.

**RESULTS**

The sample size was thirty. During this study the clinical departments of Paediatrics, General medicine and surgical departments such as General surgery, E.N.T and Obstetrics and Gynecology were included. The faculty members participating in the study included (Table 1) Professor 7 (23 %), Associate professors 7 (23 %), Assistant professors 10 (33 %) and senior residents 6 (20 %). So examiners of different experience levels were included in the study and these members were given the questionnaire on Mini-CEX to assess the students in their departments.

Category of Examiner	Frequency	Percent
Professor	7	23.3
Associate Professor	7	23.3
Assistant Professor	10	33.3
Senior Resident	6	20.0
<b>Total</b>	<b>30</b>	<b>100.0</b>

**Table 1. Category of Examiner Conducting the MINI-CEX**

These faculty members in the role of examiners for the Mini-CEX were requested to be the observers for the other sessions. The professors were not finding enough time to be the observers due to their higher responsibilities in the department activities. So the Assistant professors and senior residents became the observers for more sessions. Assistant professors 10 (40 %) and Senior residents 7 (28 %) participated as observers in the session. There were 11 students who were informed before in advance of the Mini-CEX to present their knowledge in the skills assessed. The unprepared students constituted 63% in this study. The Mini-CEX is a WPBA which can be conducted in the hospital premises. The location were in the following –in the Casualty 1 (3 %), in the ICU 1 (1.3 %), Ward 18 (60 %) and in the outpatient 10 (34 %).

A 9-point scale was used (in which 1 – 3 were “unsatisfactory,” 4 – 6 were “satisfactory,” and 7 – 9 were “above expected”), the faculty rated the student on medical interviewing skills, physical examination skills (mental status examination) and counselling skills. The examiners gave a median score of 6.0 in medical interviewing skills, 5.0 in physical examination skills and 5.0 in Counselling skills. The scores in the questionnaire were assessed and was found to be varying.

The examiners actively distributed the marks in different skills This shows that the faculty members were clearly identifying the subgroups in the Mini-CEX questionnaire and giving the scores. The duration of the Mini-CEX for a particular skill was noted in minutes. Table 2 shows the mean duration and also the standard deviation. The mean in all 3 skills is around 7.9 with a standard deviation of about 1.2. This shows that the Mini-CEX duration is only about 6 to 8 minutes and will not take much quality time of the examiner of different specialities.

Duration of Performance Skills in Mini -CEX in Minutes	Mean	Std. Deviation
Medical Interviewing skill	7.967	1.2172
Physical examination skill	7.933	1.2015
Counselling skills	7.567	1.1943

**Table 2. Duration of Performance Skills in MINI-CEX in Minutes**

After the Mini-CEX, the examiners completed the rating form and provided feedback to the students. The faculty members were asked to give the feedback after rating the MINI-CEX and the duration taken for each feedback is also noted in Table 3. The data reveals a mean of 5 minutes with a standard deviation of 1.0. So, in effect the whole session of Mini-CEX was over by about 11 to 13 minutes which is not a lengthy assessment session.

The feedback form of the examiners ie their attitudes about the Mini-CEX session (Table 4) and also the feedback form of the observers i.e. their attitudes about the Mini-CEX conducted, using a five -point Likert scale (Table 5)was collected from each of the faculty members.

Duration of Feedback by Examiner in Minutes	Mean	Std. Deviation
Medical Interviewing skill	5.000	.9826
Physical examination skill	5.033	1.1290
Counselling skills	4.900	1.0289

**Table 3. Duration of Feedback by Examiner in Minutes**

Sl. No.	Points to be Noted	1 Strongly Disagree	2 Disagree	3 Cant Say	4 Agree	5 Strongly Agree
1	I directly observed the student's performance.					30 (100 %)
2	It took me 10-15 min to complete the exercise					30 (100 %)
3	I provided the feedback in a constructive way					30 (100 %)
4	The exercise is easy to carry out					30 (100 %)
5	I feel that Mini-CEX can sample more areas for assessing student's competence than the traditional internal assessment				14 (47 %)	16 (53 %)
6	I found it difficult to examine the students more often	5 (16 %)	2 (7 %)		14 (47 %)	9 (30 %)
7	Mini -CEX requires more time and commitment than the usual method of internal assessment	7 (23 %)	23 (77 %)			
8	Evaluation of a candidate by Mini -CEX is better than traditional way of internal assessment			6 (20 %)	16 (53 %)	8 (27 %)
9	Mini -CEX can supplement the traditional way of internal assessment				13 (43 %)	17 (57 %)

**Table 4. Feedback Form of Faculty Members Using a Predesigned and Validated Questionnaire on a Five-Point Likert Scale**

The feedback forms of the faculty members after the Mini-CEX session and the feedback forms filled by the Observer were thoroughly analysed. The results showed that the faculty members appreciated the Mini-CEX session, and the Observer also effectively gave the feedback after the Mini-CEX.5 point Likert scale was used to analyse the perceptions of the faculty members in the role of examiner and Observer as well.

Sl. No.	Points to be Noted	1 Strongly Disagree	2 Disagree	3 Cant say	4 Agree	5 Strongly Agree
1	It fits well into the routine of teaching and clinical responsibilities				6 (20 %)	24 (80 %)
2	Does not interfere with the management of individual patients					30 (100 %)
3	Adequate time was given by the assessors for the exercise				16 (53 %)	14 (47 %)
4	Being observed by the assessor affected the performance of the student adversely	30 (100 %)				
5	Feedback on performance was provided					30 (100 %)
6	The feedback was constructive (the strength of the student were mentioned and weaknesses were pointed out in a non-threatening way with comments on how to improve)					30 (100 %)
7	Having examined by multiple assessors is a good idea					30 (100 %)
8	Students took back feedback sincerely					30 (100 %)
9	Student motivation is present					30 (100 %)
10	Mini-CEX can be incorporated for internal assessment in undergraduates					30 (100 %)

**Table 5. Feedback Form of Observer Faculty Using a Predesigned and Validated Questionnaire on a Five-Point Likert Scale**

Category of Examiner	Medical Interviewing Skill	Physical Examination Skill	Counselling Skills
Professor	4.286 ± .7559	4.571 ± .9759	4.857 ± 1.0690
Associate professor	5.286 ± .9512	5.000 ± 1.0000	4.857 ± .8997
Assistant professor	5.200 ± 1.0328	5.400 ± 1.0750	5.000 ± .9428
Senior Resident	5.167 ± .9832	5.000 ± 1.5492	4.833 ± 1.4720
P value (ANOVA)	0.181	0.546	0.988

**Table 6. Association of Category of Examiner and Duration of Feedback of Examiner**

The perception for points such as (I directly observed the student’s performance, It took me 10 - 15 min to complete the exercise, The exercise is easy to carry out, I provided the feedback in a constructive way) in the feedback form was 100%. This shows that Mini-CEX was well appreciated and valued by the examiner for assessment of undergraduate students. When the feedback form of observer faculty using a predesigned and validated questionnaire on a five-point Likert scale was analysed it showed that Mini-CEX was feasible in our medical college setting and can be used for the formative assessment of undergraduate students. The majority of points in the feedback form were accepted by all faculty members.

The association of Category of examiner and duration of feedback of examiner in 3 different skills after rating the Mini-CEX was compared using Anova test (comparing average time) in Table 6 and it was not statistically significant in our study as the number of higher order faculty members were less probably.

Score Obtained by Student in each Skill of Mini-CEX	Spearman's Rank Correlation Coefficient (r)	P Value
Medical Interviewing Skill	-0.201	0.286
Physical Examination Skill	0.036	0.852
Counselling Skills		0.001 0.999

**Table 7. Correlation of Duration of Skills and Marks Obtained**

Correlation of duration of skills and marks obtained by the students were analysed using the Spearman's rank Correlation in Table 7. A positive correlation is when two variables are directly proportional and negative correlation is when these two are inversely proportional. The range is -1 to +1 and correlation was not significant. This is attributed probably due to less sample size in our study. The satisfaction score of the faculty members in the study filled by them in the Mini-CEX questionnaire was analysed and the median was 8.0. So they favoured Mini-CEX by giving a good score.

**DISCUSSION**

Literature review has shed light to the fact that CBME is being practised worldwide. One of the most frequently used assessment tools that measure the trainees’ performance in workplace is the Mini-CEX. It has been widely used in undergraduate and postgraduate medical education programs around the world both for formative and summative purposes. Often, it is required that different experts rate several clinical sessions of a student throughout the course, rather than one single occasion to be observed by one individual evaluator.

The study to evaluate the perception of the faculty members in clinical and surgical department of our medical college was accepted by all faculty members approached to include in the study. The idea that new curriculum is being implemented in 2019 by the MCI in our country and that too based on CBME was highlighted to the participants. The importance of WPBA and Mini-CEX per se was given due importance.

The faculty members were enthusiastic to know that medical interviewing skills, physical examination skills (mental status examination), humanistic qualities / professionalism, his clinical judgment, counselling skills, organization and efficiency in the exam, and level of his/her overall clinical competence can be assessed using the Mini-CEX. The benchmark is the feedback given by the examiner at the end of the skill performance. Overall the time taken for a MINI-CEX session also is not hindering their routine working schedule. So department activities are not suffering any delay if Mini-CEX is used and can be effectively done in various settings be it in the ward, outpatient clinic, ICU or in casualty premises. This exercise does not require much preparation by the faculty, but if the student is informed in advance about the session and skill, if he/she prepares well can score well in the Mini-CEX.

In medical interviewing skills the student is assessed if he/she facilitates patients telling history, effectively used

questions/directions to obtain accurate, additional information needed, responds appropriately to affect, and non-verbal cues. In physical examination skills the student is given good score if he follows efficient, logical sequence, balances screening / diagnostic steps for problem, informs patient, sensitive to patient's comfort, modesty. In counselling skills the student is assessed if he / she explains rationale for test / treatment, obtains patients consent, educates / counsels regarding management.

Norcini JJ, et al noted that in the implementation of a successful medical education curriculum greater faculty involvement in teaching and direct observation of medical trainees with actual patients are important for the assessment of their clinical skills.<sup>6</sup> Kogan JR et al<sup>7</sup> postulated that it is pertinent in the application of these skills in the areas of medical interviewing, physical examination, and counselling for the successful practice of medicine. Wragg A<sup>8</sup> et al noted that very often medical students report that they are rarely being observed during patient examination sessions; one main reason is a lack of faculty time and increased number of students appearing for the exam.<sup>7,8</sup> Crossley J et al demonstrated that Mini-CEX should be used in the workplace during daily clinical work.<sup>9</sup> However, it has been also shown that these assessments are perceived as additional workload for the faculties and the department and implementation of Mini-CEX is challenging.<sup>10</sup> So implementation matters and effective faculty cooperation and participation in establishing newer methods in the assessment of students is necessary.

Various studies on WPBA have highlighted that these have been conducted in different contexts (Paediatrics, Emergency medicine, General medicine, Psychiatry etc.).<sup>1-3,9,10,11</sup> Very often medical students report that they are rarely being observed during patient examination sessions; one main reason is a lack of faculty time and increased number of students appearing for the exam. But here each student is taken due concern and assessed properly. The studies also varied in several other aspects: either original or modified version of the Mini-CEX form has been used in different studies;<sup>3,10-12</sup> the tool has been used for different purposes (formative vs. summative assessment); different numbers of encounters have been considered adequate; raters have been different (faculty members, senior residents, etc.); the length of rotation in which Mini-CEX was used varied; various numbers of forms have been filled for each learner; and finally, different outcomes have been evaluated.<sup>13</sup> Students value observation and feedback. Direct observation of medical trainees with actual patients and Mini-CEX during busy clinical postings is feasible with good outcomes.<sup>13,14</sup> Schopper H et al<sup>11</sup> found that students are pleased with the observation and feedback process in their study on Mini-CEX.<sup>9,11</sup> Gerald Choon et al<sup>14</sup> also highlighted the importance of WPBA in their study.

The various faculty members of clinical and surgical departments are now acquainted with Mini-CEX and their various perceptions are assessed. There is a positive response from them on using this WPBA tool in the assessment of undergraduate students. This will ultimately result in more number of Mini-CEXs being conducted in

various departments whereby the students are benefitted and they can gain good knowledge in each skill in the Mini-CEX to become a well-qualified Indian Medical Graduate (IMG).

### Limitations

The higher order faculty members were few in the study such as Professors and Associate professors as compared to the Assistant professors and senior residents. So the perception of the higher order members is few. The faculty members in the role of examiners for the Mini-CEX were requested to be the observers for the other sessions. The professors and Associate professors were not finding enough time to be the observers due to their higher responsibilities in the department activities. So the Assistant professors and senior residents became the observers for more sessions. The study sample size was small (30). More associations and correlations could not be identified as statistically significant in the present study. The study is planned to be continued and to involve all the faculty members of the clinical and surgical departments.

## CONCLUSIONS

Mini-CEX is well appreciated and valued by the examiner for assessment of undergraduate students. Direct observation of medical trainees with actual patients and Mini-CEX during busy clinical postings is feasible with good outcomes. Mini-CEX can be used for the formative assessment of undergraduate students. It can be included as an assessment method in undergraduate teaching as students are assessed in get seven skills already mentioned in various domains and when prepared in advance do well in the skills. Students value observation and feedback. So the faculty can give effective feedback on improving the skill in Mini-CEX. And thereby the student can become well qualified after many sessions. Mini-CEX can make the learning more interesting and appealing to faculty members and undergraduate medical students. A change from the traditional medical curriculum to the new curriculum with all armamentariums is the need of the hour. There lies the importance of assessment methods such as Mini-CEX.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

I sincerely thank Prof. Dr. Sajith Kumar, Chief Coordinator, Advanced Medical Education Training Programme, NMC Nodal Centre, Govt. Medical College, Kottayam, Kerala, Prof. Dr. Saritha and Prof. Dr. Sathy who provided all guidance during the training in Advance Course in Medical Education. I acknowledge the timely help and advise by Mr. Vidhu the statistician of our medical college during the data analysis. I also acknowledge the help and support of all faculty members and students of our medical college who participated in this study.

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