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## MINI-CEX: A tool for assessment in obstetric examination

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### Abstract

Maternal care is a primary health indicator. A good obstetric examination will segregate the high risk pregnant women and help in appropriate management and care. Hence we took up this study to assess the performance of antenatal check up by MBBS phase III students using MINI-CEX which is an assessment tool in curriculum based medical education (CBME) and to assess the perception of students and faculty towards using MINI-CEX. An experimental study done on 30 final year MBBS students and 5 faculty of Gadag Institute of Medical College in a bedside setting. The faculty were asked to conduct MINI-CEX in a real time setting and complete the scaling. They were asked to feedback the students in the sandwich technique. The perceptions of students and faculty were evaluated by a prevalidated questionnaire in four aspects of reaction, learning, transfer, results. Most of the students and faculty more than 60% agreed that MINI-CEX will bring about improvement in history taking, clinical examination, humanistic skills and also clinical judgement making. Most of the faculty agreed and strongly agreed that MINI-CEX identifies the problem area in the student and has room for the faculty to give feedback to improvise on those areas. MINI-CEX will enable students to diagnose antenatal cases correctly and identify high risk cases and helps in better development of the skill of examination and empathetic talking to the patients.

**Keywords:** Antenatal examination, high risk pregnancy, MINI-CEX, assessment method

### Introduction

Maternal care is a primary health indicator. It starts with preconception, antenatal, intranatal and postnatal care. A good obstetric examination or antenatal examination will segregate the high risk pregnancy and help in appropriate management and care. Early diagnosis and treatment play a key role in reducing maternal morbidity and mortality.

Despite an increasing emphasis on workplace-based assessment (WPBA) during medical training, the existing system largely relies on summative assessment, whereas formative assessment is less valued. Various tools have been described for workplace-based assessment, mini-clinical evaluation exercise (MINI-CEX) being one of them. MINI-CEX is well accepted in western countries; however, it is still not widely used in India <sup>[1]</sup>.

MINI-CEX is a useful method of assessing clinical competence. It is called mini because it takes comparatively less time than a conventional case presentation. However, the bigger advantage of MINI-CEX is the structured feedback that it provides to the students as well as the faculty, thus helping them to make better decisions <sup>[2]</sup>. MINI-CEX is a 10 to 20 min snapshot of doctor/patient interaction. It is designed to assess the clinical skills, attitudes, and behaviors of students essential to providing high-quality care.

In our institution, undergraduates of Obstetrics and Gynecology do not have a structured assessment program during their clinical postings, and the focus is on the summative assessment at the end of the course. Similarly, there is no structured feedback that can help the students to take remedial actions well in time. MINI-CEX, a workplace-based assessment tool can prove beneficial in identifying the gaps in knowledge and any improvement required in teaching. Hence, this study was conducted for the application of MINI-CEX for M.B.B.S phase III students and to obtain the perception of faculty as well as the students toward MINI-CEX.

### Objectives

1. To assess the performance of antenatal check up by MBBS phase III students using MINI-CEX.
2. To assess the perception of students and faculty towards using MINI-CEX

**Materials & Methods:** This study was a quasi-experimental study. The source of data were final year M.B.B.S students of Gadag Institute of Medical sciences, Gadag. 30 M.B.B.S phase III students and five faculty were included in the study. The study setting was a bed side assessment in real time at ward /OPD setting. The duration of the study was one year. Seven core clinical skill assessments were done, and the performance was rated on a 7-point scale (grouped into: well below expectations for stage of training, below expectations for stage if training, borderline for stage of training, meets expectations, meeting above expectations for stage of training, meeting well above expectation for stage of training, unable to comment). Students were observed and evaluated while performing a history or physical examination, followed by structured feedback. Immediate feedback to the students was given by the faculty. The feedback from faculty and students regarding the perception of MINI-CEX was taken as well. Statistical analysis was done using SPSS version 20 and analysis of variance (ANOVA) for inferential statistics.

The Institutional ethical committee clearance was obtained and Informed consent from students and faculty was obtained. The faculty and students were oriented with MINI-CEX in a 1 hour session. The faculty during end posting were asked to conduct MINI-CEX in a real time setting and complete the scaling and then take the traditional viva in the same sitting and score the students like they did traditionally. Then they were asked to feedback the students in the sandwich technique.

The perceptions of students and faculty were evaluated by questionnaire on likert scale in four aspects of reaction, learning, transfer, results. The questionnaire was prevalidated by the experts.

**Ethical consideration:** The study was conducted only after approval from the institutional ethics committee and after obtaining due consent from participating faculty and students.

**Results:** The clinical assessment of the students were as follows:

- **History taking:** Out of 30 students, 14 students (49.5%)

were meeting the expectations. Only 7 were above expectations and rest of them were borderline (6 students) and remaining 3 were below expectation.

- **Physical examination skills:** Out of 30 students, 13 students (43.3%) were meeting the expectations. Only 2 were above expectations and rest of them were borderline (12 students) and remaining 3 were below expectation.
- **Professionalism:** Out of 30 students, 11 students (36.6%) were meeting the expectations. 16 students were borderline (53.3%) and remaining 3 were below expectation. None of them were above expectations.
- **Clinical judgment:** Out of 30 students, 14 students (46.6%) were meeting the expectations. Only 1 student was above expectation and rest of them were borderline (14 students) and remaining 4 were below expectation.
- **Communication skills:** Out of 30 students, 10 students (33.3%) were meeting the expectations. Only 4 students were above expectation and rest of them were borderline (12 students) and remaining 4 were below expectation.
- **Organization /efficiency:** Out of 30 students, only 6 students (20%) were meeting the expectations whereas 25 students (66.6%) were borderline and 3 students were below expectation. Only 1 student was above expectation in organization.

#### Overall clinical care

Out of 30 students, 10 students (33.3%) were meeting the expectations. Only 2 students were above expectation and rest of them were borderline (16 students) and remaining 2 were below expectation.

The perceptions of students and faculty were evaluated by a questionnaire on likert scale of 1 to 5 as shown in Table 1 and 2 respectively.

**Likert scale in Percentages: Strongly agree=5, agree=4, undecided=3, disagree=2, strongly disagree=1**

**Table 1:** Student Questionnaire

Student Questionnaire	5	4	3	2	1
Do you agree that "Assessment Drives Learning	47	53	0	0	0
MINI-CEX will bring about improvement in the present system of assessment in medical education	40	57	3	0	0
MINI-CEX will bring about improvement in history taking abilities of the medical student.	60	40	0	0	0
MINI-CEX will bring about improvement in clinical examination skills of the medical student.	50	50	0	0	0
MINI-CEX will bring about improvement in the humanistic qualities of medical student like showing respect, compassion, empathy towards the patient.	47	47	6	0	0
MINI-CEX will bring about improvement in the counselling and communication skills of medical student	47	40	13	0	0
MINI-CEX provides structured teaching and feedback	44	53	3	0	0
MINI-CEX focuses on formative assessment which is very important component of CBME. This will help students as well as teachers to get feedback and further helps in improving teaching learning methods.	37	53	10		
MINI-CEX identifies the problem area in student and has room for the student to improvise on those areas.	60	36	4	0	0
Were you nervous during MINI CEX	YES 86	NO 14	-	-	-
Are you aware that FEEDBACK is very important in the new CBME curriculum and helps the students in improving learning methods and assessments.	YES 90	NO 10	-	-	-
MINI-CEX is a better assessment tool in comparison to the traditional method of assessment.	36	54	10	0	0
There should be a routine use of MINI-CEX as a tool for formative assessment	14	70	16	0	0
Table -2					
Faculty Questionnaire	5	4	3	2	1
Do you agree that these Faculty development programmes FDP s are important to improve teaching and assessment skills of medical faculties	40	60	0	0	0
Do you agree that "Assesment drives learning	40	60	0	0	0
MINI-CEX will bring about improvement in the present system of assessment in medical education	100	0	0	0	0
MINI-CEX will bring about improvement in the history taking abilities of the medical student	20	80	0	0	0
MINI-CEX will bring about improvement in the clinical examination skills of the medical student.	20	80	0	0	0

MINI-CEX will bring about improvement in the humanistic qualities of the medical student like showing respect, compassion, empathy towards the patient.	40	60	0	0	0
MINI-CEX will bring about improvement in the counselling and communication skills of the medical student.	20	80	0	0	0
MINI-CEX provides structured teaching and feedback	20	80	0	0	0
MINI-CEX focuses on formative assessment which is very important component of CBME. This will help students as well as teachers to get feedback and further helps in improving teaching learning methods.	40	60	0	0	0
MINI-CEX identifies the problem area in the student and has room for the faculty to give feedback to improvise on those areas.	40	60	0	0	0
MINI-CEX is better assessment tool in comparison to the traditional methods of assessment	0	100	0	0	0
There should be routine use of MINI-CEX as a tool for formative assessment	0	100	0	0	0

### MINI-CEX- Clinical Evaluation Tool

**Mini Clinical Evaluation Exercise (Mini-CEX)**

Assessor's Registration Number (e.g GMC, NMC)

Trainee's GMC Number

Date of Assessment (DD/MM/YY)   /   /

Assessor's Name

Year of specialty training: ☐ 1 (ST3) ☐ 2 (ST4) ☐ 3 (ST5) ☐ 4 (ST6) ☐ 5 (ST7)

Case description:

Setting:

Difficulty of case(s): ☐ Low ☐ Medium ☐ High

What type of consultation was this?: ☐ Good news ☐ Bad news ☐ Neither

	Well below expectation for stage of training	Below expectation for stage of training	Borderline for stage of training	Meets expectation for stage of training	Above expectation for stage of training	Well above expectation for stage of training	Unable to comment*
1. History taking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Physical examination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Clinical Judgement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Organisation / efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Overall clinical care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\*Unable to comment – Please mark this if you have not observed the behaviour and feel unable to comment.

Assessor's comments – if you have noticed anything especially good or needing further development please note it here:  
(mandatory field)

Trainee's comments (mandatory field)

Trainee's Signature

Assessor's Signature



## Discussion

The objectives of the study were thought with three types of expected outcomes.

The first objective was to assess the performance of antenatal checkup by MBBS phase III students using MINI-CEX.

The short term outcome (1 -2 years)

1. Students will understand better.
2. They will be satisfied because we give them feedback.
3. They develop the skill of examination
4. They develop empathetic talking to the patients.

### Intermediate Outcome (3-5 Years)

1. Students will learn the sequence of examination.
2. They will arrive at the diagnosis better.
3. They will be able to identify high risk antenatal cases.

### Long -Term Outcomes (5-10 Years)

Segregation of high risk pregnancy cases and thus reduction in maternal morbidity and mortality.

### The second objective was to assess the perception of students and faculty towards using MINI-CEX

The short term outcome (1 -2 years)

1. Sensitisation of the faculty for in depth assessment.
2. Sensitization of the students for in depth learning.
3. How well are the faculty satisfied with the tool -reaction
4. Intermediate Outcome (3-5 Years)
5. To bring out best out of IMG-transfer
6. Long -Term Outcomes (5-10 Years)
7. Overall improvement in maternal health care

MINI-CEX is a 'hybrid' tool that allows assessment as well as feedback at the same time and thus blurs the boundaries between formative and summative assessment. A large number of medical schools in the West use this tool for residency assessment [3]. With some modifications, it has also been used for assessment of undergraduate medical students [4]. Since CBME is introduced very recently in India, we need more studies pertaining to use of MINI-CEX.

The analysis by Zaki *et al* [5] has also shown that the MINI-CEX has a high satisfaction level among assessors and students. Similarly in our study also there was a higher percentage of agreement among both students and faculty regarding the effectiveness of MINI-CEX at various levels of assessment as shown in table -1 and table -2. This level of satisfaction is not surprising as the MINI-CEX resembles the ordinary interaction between assessors and students in the clinical setting. Furthermore, the high satisfaction can be explained by the fact that some studies reported orientation programs where the trainees/ faculty members were familiarized with MINI-CEX before assessment. Bashir and colleagues reported that most of the faculty members had prior training on how to assess the trainees using the MINI-CEX, meaning that their perception of the tool might have influenced their answers toward the acceptance of the assessment tool [6]. Similarly in our study also we have oriented both the faculty and students with MINI-CEX tool at the beginning.

The educational impact in the included studies was indirectly analyzed through the feedback provided by the students. Bashir and colleagues reported that most emergency medicine residents agreed that the MINI-CEX had improved their medical interviewing, physical examination, communication, professionalism, and organization skills [6]. Similarly in our study as shown in table -1, 40 to 50% students agreed/strongly

agreed that MINI-CEX will bring about improvement in history taking, physical examination, clinical examination and communication skills. Moreover, the study reported that most faculty members agreed that the MINI-CEX had improved their attitude toward student training. These findings imply that MINI-CEX bears a favorable educational impact. However, there have been claims that the MINI-CEX may not have any educational impact. For instance, in the study by Bashir *et al*. [6], two residents strongly disagreed that MINI-CEX had enhanced their medical interviewing skills, and three strongly disagreed that it had improved their physical examination skills. These responses show that there is still a gap in the educational impact of the MINI-CEX. However in our study none of the students or the faculty disagreed that MINI-CEX had improvement in the examination skills.

In our study 13% of students remained neutral /undecided whether MINI-CEX will bring about improvement in counselling or communication skills, 10% were neutral about whether MINI-CEX is a better assessment tool in comparison to the traditional method of assessment and 16% remained undecided about whether there should be a routine use of MINI-CEX as a tool for formative assessment as shown in table -1.

These observations suggest that although very few remained neutral majority believed that MINI-CEX will bring about improvement in various aspects of skill development.

However, a higher percentage of faculty felt that MINI-CEX requires more effort than traditional methods. They were of the opinion that it is time consuming and thus require more number of staff.

According to Bashir and colleagues, some residents felt uncomfortable while being examined [6]. Similar findings were noted in our study students were nervous as they were under the pressure of direct observation and were very conscious as they were not used to this change in environment of the assessment.

The analysis done by T. Singh and M. Sharma reveals that MINI-CEX is an acceptable and practical tool for assessment of residents. It is a low expertise, low resource-intensive method that does not require any special preparation [7].

Furthermore, a 2010 literature review by Hawkins and colleagues applied Kane's framework to synthesize the evidence on the validity of MINI-CEX and found that the MINI-CEX was a valid assessment tool for clinical competence [8].

## Conclusion

MINI-CEX is an acceptable and practical tool for the assessment of M.B.B.S students; especially formative assessment. It improves the learning environment and leads to improvement in medical interviewing or history taking skills, physical examination skills, humanistic qualities /professionalism, and communication or counselling skills. It was done in the actual patient encounter hence, it is expected to prepare the students to deal with patients in a better way in the future. MINI-CEX is an assessment tool which will enable students to diagnose antenatal cases correctly and identify high risk cases. It helps in better development of the skill of examination and better development of empathetic talking to the patients.

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