

TRAINING WORKSHOP ON CONDUCTING WORKPLACE-BASED ASSESSMENT (WPBA) USING MINI-CLINICAL EVALUATION EXERCISE (MINI-CEX) TOOL

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ABSTRACT

INTRODUCTION

Mini-Clinical Evaluation Exercise (mini-CEX) is one of the valid, reliable, feasible and effective tools used for workplace-based assessment (WPBA). Faculty development is essential to train the assessors for successful implementation. Bilwal Medical College, a constituent college of Liaquat University of Medical and Health Sciences, Jamshoro Sindh Pakistan organized a one-day Training Workshop (TW) on “Conducting WPBA using mini-CEX tool” for clinical faculty members.

MATERIAL AND METHODS

The objectives of this descriptive cross-sectional study were to 1) report brief description of the TW and process of group-work practice session; 2) assess feedback of the participants at New World Kirkpatrick’s Model (NWKM) level I and II and 3) assess the cognition of participants about miniCEX using pretest-posttest. Feedback of the participants was taken on the valid questionnaire. Pretest and posttest were done utilizing the same format. Narrative description of the proceedings and process documented. Data of the feedback, pretest and posttest was analyzed with SPSS for central tendency and paired t-test was used for comparison.

RESULTS

Description of TW is documented in methods section of this article. Rating of the participants for attributes (usefulness, content, relevance, facilitation and overall) of TW and practice session on scale 1-10 (1=poor; 10=excellent) were remarkable. Significant enhancement ($p<0.001$) in the level of knowledge and understanding was perceived by the participants regarding the performance-based assessment (PBA), WPBA and utility of mini-CEX as a tool for assessment. The participants perceived significant ($p<0.001$) positive change in the level of confidence for conducting WPBA utilizing the miniCEX tool. The cognition of the participants was significantly ($p<0.003$) improved after participation in the TW revealed in pretest-posttest analysis.

CONCLUSION

Based on the findings of results, this TW was successful in educating medical faculty members about the utility of training for conducting WPBA, specifically with miniCEX tool.

KEYWORDS

Feedback, Faculty, miniCEX, Pretest-Posttest, Training Workshop, WPBA.

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INTRODUCTION

Workplace based assessment (WPBA) is used to assess the learner's practice i.e. skills and attitudes to foster and nurture their learning. Three key components of WPBA are i) direct observation of patient-learner interaction in a real-life situation, ii) done at a workplace, and iii) provision of two-way feedback given immediately after encounter at workplace.¹⁻³ WPBA is a formative assessment technique used to assess the performance of learner.²⁻³ The assessment of performance is better done at 4th level of Miller's pyramid in the workplace.^{1,4} The assessment of medical, dental, nursing and allied health sciences students is principally imperfect minus the assessment of performance.¹

Many tools have been used for WPBA such as mini-Clinical Evaluation Exercise (mini-CEX), Direct Observation of Procedural Skills (DOPS), Acute Care Assessment Tool (ACAT), Clinical Work Sampling (CWS), Chart Stimulated Recall (CSR), Peer Assessment Tool (mini-PAT), Patient Satisfaction Questionnaires (PSQ), Portfolio; but mini clinical evaluation exercise (miniCEX) tool is amongst the commonest one.^{1,5}

mini-CEX is one of the effective, valid and reliable assessment tools used for WPBA.⁽⁶⁾ It actively engages an assessor, assessing and rating the learner's performance on a short and focused task in a real-life clinical situation utilizing a structured rating format. This direct observation is followed by constructive feedback on the performance of the learner by assessor and learner's feedback on his/her own learning.^{3,6-7}

American Board of Internal Medicine is a pioneer for the developing mini-CEX tool, a method of assessing clinical competence on real patients started using in 1995.⁷⁻⁸ Overall clinical competence includes interviewing skills (history taking skills), physical examination skills, professionalism, clinical judgment, counselling skills, organization skills, critical thinking skills.^{4,7,9-10} It is of 10-20 minutes' short doctor-patient encounter i.e. interaction; learners are advised to undertake minimum 4-6 encounters observed by the different observers at each encounter.¹¹ To achieve reproducibility of 0.80, 10-12 miniCEX encounters have been recommended in literature.¹²

mini-CEX has proven its clinical utility both in undergraduate medical students' clinical clerkship and post graduate residents' training in any of the specialty and sub or super specialty of clinical field.^(7,13) It is not frequently used as a tool for WPBA both in undergraduate and postgraduate health professions education institutions in Pakistan.⁽³⁾ In Pakistan, some of the institutes have started using this tool for WPBA for postgraduate residents and found it to be feasible and valid tool of WPBA assessment.¹⁴

Faculty development training can boost the full assessment potential of the mini-CEX.⁹ It's a prerequisite to train the assessors for successful implementation of mini-CEX assessment plan.¹⁰ With the intention to add mini-CEX tool in the assessment toolkit of undergraduate medical students during clinical learning, Bilwal Medical College (BMC), Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro Sindh Pakistan organized one-day Training Workshop on "Conducting Workplace-based Assessment (WPBA) using mini-Clinical Evaluation Exercise (mini-CEX) tool" for clinical faculty members of

various clinical departments. There were three objectives of this study: 1) to describe briefly academic proceedings of the training workshop and process of group-work practice session on mini-CEX; 2) assess the feedback of the medical faculty members participated in the training workshop at New World Kirkpatrick's Model (NWKM) level I and II and 3) assess the cognition of faculty members about miniCEX using pretest and posttest.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted at Bilwal Medical College (BMC), Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro Sindh, Pakistan. The main objectives of the study were to 1) report brief description of the "Training Workshop on Conducting Workplace-based Assessment (WPBA) using mini-Clinical Evaluation Exercise (mini-CEX) tool" and process of group-work practice session on mini-CEX; 2) assess the feedback of the medical faculty members participated in the training workshop at New World Kirkpatrick's Model (NWKM) level I and II and 3) assess the cognition of faculty members about miniCEX using pretest and posttest.

Objective Number 1 of the study

Brief Description of the "Training Workshop on Conducting Workplace-based Assessment (WPBA) using mini-CEX tool"

One-day Training Workshop on "Conducting Workplace-Based Assessment (WPBA) using mini-CEX tool" was organized by the Medical Education Department of BMC, LUMHS, on December 18, 2023. It was held at District Hospital Kotri, one of the teaching hospitals of BMC. The specific objective of the training workshop was to enable the participating faculty members of clinical sciences departments to conduct WPBA using the mini-CEX tool.

Nineteen participants from various clinical sciences departments (Obstetrics & Gynecology, General Surgery, Plastic Surgery, Urology, Neurosurgery, Internal Medicine, Dermatology, Cardiology, and Neurology) nominated by the head of various departments attended the training workshop. The methods used for conducting the training workshop were Interactive Tutorial with Brainstorming, Experience Sharing Exercise and Group Work Practice on a mini-CEX tool.

Principal author was the main resource person and facilitator while faculty from the department of general surgery did co-facilitation during Group Work Practice.

The topics covered during tutorial were 1) Brief overview of Assessment of Performance and WPBA, 2) mini-CEX covering introduction to mini-CEX, mini-CEX as an assessment tool, mini-CEX-as a trainee-patient interaction, original assessment form of mini-CEX, definition of mini-CEX, uses of mini-CEX, attributes of mini-CEX, utility of mini-CEX, competencies to be assessed with mini-CEX, strengths of mini-CEX and its caveats, how to use mini-CEX form during trainee-patient encounter.

The program schedule with sessions including interactive tutorials, group work exercises and individual task exercises is shown in Table I.

Table 1. Training Workshop on Conducting WPBA using mini-CEX tool. Program Schedule

Time	Session
09.30-09.35	Opening Session
09.35-09.45	·Introduction of the participants ·Expectation of the participants
09.45-09.50	Objectives & Methodology
09.50-10.00	PRE-TEST
10.00-10.45	Tutorial 1. with brainstorming · Brief Overview on Assessment of Performance and Workplace-based Assessment (WPBA)
10.45-11.45	Tutorial 2. with brainstorming · Mini- Clinical Evaluation Exercise (min-CEX)
11.45-12.00	Tea Break
12.00-13.00	Group Work Practice on min-CEX
13.00-13.10	POST-TEST
13.10-13.20	Feedback from the participants
13.20-13.30	Certificate Distribution & Closing

Process of Group Work Practice on mini-CEX

The group work practice on mini-CEX was done by the participants on two simulated situations (scenarios) given below:

- 1) A-26-year female, doctor, primigravida visits the outpatient department (OPD) of Obstetrics and Gynecology (OBGY), Bilawal Medical College (BMC) Teaching Hospital (TH).
- 2) A-26-year male, computer engineer, visits the outpatient department (OPD), of Internal Medicine (IM), Bilawal Medical College (BMC) Teaching Hospital (TH) with backache for the last one month.

The Group-work practice was done as follows

Participants were divided into four groups A, B, C and D. Among them two groups were selected randomly for the clinical encounter on two simulated situations documented above i.e. Group A & C and two other groups were nominated as observer groups i.e. Group B & D, for simulated situation-1 & 2 respectively. One participant from each clinical encounter group (A & C) acted as a teacher, another as a patient and third one as a student. A simulated patient and student of each group were briefed about their respective scenario and role to play. Teachers used the checklist to assess the student in the simulated clinical situation, subsequently provided the feedback. The time allocated for the encounter was 20 minutes.

Instructions to Both Clinical Encounter Groups and Observer groups

Instructions to Clinical Encounter Groups

- Group decides the role of the participants within the group who act as a student, a patient and a teacher. Student has to take the history from the simulated patient. Teacher has to observe and assess the history taking skills, communication skills and professionalism using a checklist and provide feedback to the student. Subsequently the student gives his/her feedback too.

Instructions to Observer Groups

- Group has to observe the entire process of encounter without interruption; each one takes notes. Group then sits together and each member shares the notes among each other and the leader of the group gives feedback in a plenary session.

Reflections by teacher, student & patient

- After the act of encounter, the teacher, student, and patient share about his/her reflections verbally on “whether they felt

any difficulty in the simulation practice, was it easy, if it would have been done in a real situation, etc. The time allocated for the reflection was 10 minutes.

Feedback for the teacher, student & patient

- Each teacher, student & patient received feedback verbally from the participants of the respective observer group about his/her performance. The time allocated was 10 minutes Reflections by the participants.

- At the end of the practice session, participants reflected on “What they learned, and how they will conduct the assessment using miniCEX”.

Objective Number 2 of the study

Assessment of the feedback of the medical teachers participated in Training Workshop

The written feedback was taken from the participants utilizing a validated questionnaire after taking informed consent from the participants. The feedback questionnaire was comprised of four parts:

First Part- Rating of the Participants on attributes of training workshop

This part contained one question i.e. “rating training workshop” on scale 1 to 10 (1=poor; 10=excellent) for usefulness, content, relevance, facilitation and overall.

Second Part- Rating of the Participants on practice session conducted in training workshop

This part contained just one question rating practice session of a training workshop on scale 1 to 10 (1=poor; 10=excellent).

Third Part- Feedback of participants on Level of Knowledge and Understanding after participation in training workshop

This part contained a retro-pre-questionnaire having three questions on the level of knowledge and understanding before and after participation on Likert scale 1 to 4 (1=little; 4=very-good). The questions were about performance-based assessment, workplace-based assessment and mini-CEX.

Fourth Part- Feedback of participants on Confidence Level in conducting WPBA utilizing miniCEX tool.

This part contained one retro-pre-question on Level of Confidence in conducting workplace-based assessment using mini-CEX before and after participation in training workshop at Likert scale 1-4 (1=not confident; 4= extremely confident)

Objective Number 3 of the study

Assess the cognition of faculty members about mini-CEX using pretest andposttest.

Prior to starting the tutorial, pre-test was done and utilizing the same questionnaire post-test was done after the completion of group practice session. The pre-test & post-test format is given in table 2.

Table 2. The pre-test and post-test format used

Name: (optional) _____ Age: _____
 Duration of teaching in (years): _____ Specialty: _____
 Answer with your own knowledge. Do not worry about grade

Question	Response
Q1. Enlist main three attributes of mini-CEX? (each one of one to four words) 3-Marks	
Q2. In Miller's pyramid, at what level is mini-CEX positioned? (one-two words) 1-Mark	
Q3. In what scenarios can mini- CEX be used? 1-Mark	
Q4. What is the focus of mini- CEX in the assessment? (one word) 1-Mark	
Q5. What are its strengths of mini- CEX as an assessment tool? (write three, not more than one sentence for each) 3-Marks	
Q6. How long should one session of the mini- CEX assessment take? (write in minutes) 1-Mark	
Q7. How many times should it be carried out? (minimum number of sessions) 1-Mark	
Q8. How should you provide effective feedback? (three points) 3-Marks 1-	
Total Marks 14	

Informed consent was taken from the participants and study was approved by the Principal of BMC. The immediate outcome measures were evaluated in accordance with NWKM levels I and II.¹⁵

Data Management

Out of nineteen participants sixteen participants filled the questionnaire. The eighteen participants consented to solve the pre-test while sixteen solved the post-test, so, the sixteen participants' pre-test and post-test scores were computed and compared. The collected data was entered in SPSS version 23; checked for completeness, accuracy and consistency. It was analyzed for the central tendency (mean with standard deviation; median with interquartile range). As data of retro-pre-questionnaire was normally distributed, hence, paired t-test was used for comparing the means of the participants' level of confidence about knowledge and understanding before and after the training workshop. p-Value was computed for the significance. As data of pre-test was normally distributed, so, paired t-test was used for comparing the means of the pre-test and post-test scores.

RESULTS

Out of nineteen participating faculty members, sixteen provided the feedback after completion of the workshop and did pretest and posttest. The response rate was 84.2%. The findings are described according to objectives of the study.

• **Objective Number 1 of the study: Briefly Description of methods about process and proceedings of the training workshop and group-work practice session**

It is documented in methodology section (see methodology section of article)

• **Objective Number 2 of the study: Assessment of the Feedback of the Participants**

The findings are explained under 4 headings I-IV.

I. Rating of the participants on attributes of Training Workshop

Participants rated on the attributes of the training workshop on scale 1-10 (1=poor, 10=excellent) i.e. usefulness, content, relevance, facilitation and overall; score is mentioned in Table 3.

Table 3. Rating of the Participants on attributes of Training Workshop on Conducting WPBA using mini-CEX tool

Item	Score (mean±standard deviation)
a. Usefulness (1-10)	8.75±1.57
b. Content (1-10)	8.75±1.48
c. Relevance (1-10)	8.81±1.51
d. Facilitation (1-10)	8.69±1.74
e. Overall (1-10)	8.63±1.54

Rating training workshop on scale 1 to 10 (1=poor, 10=excellent)

WPBA= Workplace-based Assessment
 mini-CEX= mini-Clinical Evaluation Exercise

II. Rating of the participants on the practice session conducted in the training workshop

Participants rated the practice session conducted in training workshop on scale 1-10 (1=poor, 10=excellent) as 8.31±1.30.

III. Feedback of participants on level of knowledge and understanding after participation in a training workshop on retro-pre-questions.

Feedback of the participants on level of knowledge and understanding after participation in the training workshop is given in Table 4.

Table 4. Feedback of participants on level of knowledge and understanding after participation in training workshop on retro-pre-questions

Level of knowledge and understanding	Before participation in training workshop	After participation in training workshop	p-value
About performance-based assessment (PBA)	1.63±0.72	3.06±0.57	< 0.001
About workplace-based assessment (WPBA)	1.63±0.72	3.19±0.54	< 0.001
About miniCEX	1.44±0.51	3.25±0.58	< 0.001

Rating on Likert scale 1-4 (1=Little; 4=Very Good)

WPBA= Workplace-based Assessment
 mini-CEX= mini-Clinical Evaluation Exercise

IV. Feedback of participants on Confidence Level in conducting WPBA utilizing miniCEX tool

Level of the confidence of the participants in conducting WPBA utilizing miniCEX tool assessed through retro-pre-question before and after workshop on Likert scale 1-4 (1=Not Confident; 4=Extremely Confident) was 1.75±0.68 and 3.00±0.36 respectively. The increase was very significant, p-value < 0.001.

• **Objective Number 3 of the study: Assessment of the cognition of faculty members about mini-CEX using pretest andposttest.**

Pretest & Post test Result of participants participated in Training Workshop on Conducting WPBA using mini-CEX tool

The mean pre-test & post-test scores of the participants were 3.50±2.13 and 9.75±2.7 respectively. The p-value was 0.03, significant one.

DISCUSSION

The key objectives of this study were to: 1) describe briefly academic process and proceedings of the training workshop and group-work practice session on mini-CEX; 2) assess the feedback of the medical faculty members participated in the training workshop at New World Kirkpatrick's Model (NWKM) level I and II and 3) assess the cognition of faculty members about miniCEX using pretest and posttest.

Liang Y. and M. Noble L concluded that faculty training is one of the practice points for successful implementation of mini-CEX as an assessment tool. The training can optimize the educational potential of the mini-CEX as a formative assessment tool.⁽⁹⁾ Deshpande S et al documented that training of the assessors is essential component for the effective execution of mini-CEX (10) Shahid Hussain expressed "faculty development training is essential to meet the challenges in implementation of miniCEX as a tool for formative assessment."¹⁶

Keeping this in mind, BMC organized a training workshop to enhance the understanding of the faculty members about WPBA and optimize their capacity to use mini-CEX as a formative assessment tool for assessing the skills of both undergraduate and postgraduate learners. We have documented the brief description in material and methods section about process and proceedings of the training workshop and group-work practice session (First Objective of this study) in this article. This may help other health professions education institutes in organizing and conducting similar training workshops for their faculty members.

The second objective of this study was to assess the feedback of the participant faculty members to get to know their reaction on the training workshop and their confidence level. The responses of participants were assessed on one of the items of each level 1 and 2 of The New World Kirkpatrick' Model; the Level-1 is emphasis on Reaction (Participants consider the training constructive, engaging and relevant to their jobs) and Level-2 focus on Learning (participants attain the intended knowledge, skills, attitude, confidence and commitment based on their participation in the training.^{15,17-18}

Level-1 emphasis on Reaction: The rating of the participant faculty members was notable overall; also, on usefulness, content, relevance and facilitation of the training workshop. The rating on the practice session was remarkable too. Significant enhancement ($p < 0.001$) in the level of knowledge and understanding was perceived by the participants with regard to the performance-based assessment (PBA), WPBA and utility of mini-CEX as a tool for assessment.

Level-2 focus on Learning (Confidence): The participants perceived significant ($p < 0.001$) positive change in the level of confidence for conducting WPBA utilizing the miniCEX tool.

The findings of this study are consistent with the findings of other studies. A study done by Liao KC et al in their study concluded as "enhancement in cognition of faculty members after participation in miniCEX workshops and positive effect on practice behavior of faculty members."¹⁹ Aleluia I et al mentioned that faculty members felt that they recognize the role of miniCEX, and significance of the training and

now they are able to assess the students and give feedback. They perceived their knowledge and understanding has enhanced.²⁰

There was significant gain ($p < 0.003$) in scores secured in posttest compared with means of scores obtained in pretest. (Third objective of the training workshop). The knowledge and understanding of the participants significantly improved after participation in the training workshop. The findings of this study are consistent with the findings reported in other studies. Deshpande S et al. reported remarkable improvement (pretest and posttest scores, $p < 0.05$) observed in cognition of faculty members after participation in one-hour training workshop for successful implementation of miniCEX.⁽¹⁰⁾ Significant improvement of knowledge of faculty members after participation in training revealed in pretest and posttest scores ($p < 0.05$) in study done by Liao KC et al.¹⁹ Aleluia I et al. documented significant ($p < 0.05$) improvement in knowledge of the faculty members after participation in trainings to use miniCEX. They analyzed pretest and posttest scores and concluded that there is evolution of scores of teachers in the workshops.²⁰

This descriptive cross-sectional study has certain limitations of. The results of this study cannot be generalized as this study was conducted for one training session having less than 30 participants from the same medical school. Furthermore, only items of NWKM level 1 and 2 were assessed in this study which may indirectly foretell the final level 4. The some of the data of the study is perceptual one i.e. based on the immediate reaction of the participants, so, the long-term impact of the training workshop could not be inferred but anticipated.

Based on the positive findings of the assessment of immediate feedback at level 1 & 2 of The NWKM and significant increase in the posttest scores of the participants, this training workshop was successful in educating medical faculty members about the utility of training for conducting WPBA, specifically miniCEX tool. For the strengthening of WPBA assessment capacity of faculty members, continuous professional learning is required in order to strive in the era of technology and artificial intelligence. Faculty members' participation as a teacher/assessor in a faculty development program related to the assessment is critical to reinforce their capacity of assessing learners.

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CONFLICT OF INTEREST

None

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