



THE EFFECTIVENESS OF MINI-CEX ASSESSMENT TOOL FOR CLINICAL COMPETENCY ACHIEVEMENT IN CLINICAL PRACTICE AMONG ANESTHESIA TRAINEE.

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INTRODUCTION

The module of program in anesthesia training has experienced a shift from discipline-based education to proficiency-based education. The aptitude rooted curriculum in anesthesia trainee education amounts to 60% focus of clinical application based out of its overall credits.¹ Hence, this sort of variation demands amendments in learning practice together with assessment process. Seemingly, it has been found troublesome for anesthesia trainee to adapt skillful abilities during the course of clinical internship program.² Such limitations can bring about deficiency in acquiring clinical proficiency as a skillful anesthetist according to the approved standards in anesthesia education.³

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ABSTRACT... Objectives: To determine the efficacy of Mini-CEX in assessing clinical expertise of anesthesia trainee during examination at Anesthesia department of Multan Hospitals. **Study Design:** Prospective Observational Study. **Setting:** Department of Anesthesia and Intensive Care Ch. Pervaiz Ellahi Institute of Cardiology and Nishtar Hospital Multan. **Period:** January 2017 to March 2019. **Material & Methods:** The design of study was prospective observational study having the post-test with control group only. The size of the sample was based upon 70 trainee anesthesia being divided into two further groups: 35 trainee anesthesia were included in the control group whereas 35 trainee were part of the intervention group. The analysis of data was done by Mann Whitney test and it was descriptive type of test. **Results:** The mean result of Preoperative examination skills among the intervention group was greater than the control group. The mean score of Preoperative examination competence in control group was 72.11 ± 4.56 , while the mean score of Preoperative examination competence in intervention group was 81.28 ± 2.86 . The mean score of anesthesia trainees towards satisfaction of control and intervention group was 5.37 ± 0.38 and 8.95 ± 0.64 , respectively. While the mean score of evaluators towards satisfaction of control and intervention group was 6.24 ± 0.53 and 8.04 ± 0.52 , respectively. The difference of clinical abilities was significant among the two groups having the p value 0.000 ($p < 0.05$). **Conclusion:** Clinical expertise among anesthesia trainee was significantly ameliorated after the use of Mini-CEX program. It is therefore suggested for anesthesia trainers to use the Mini-CEX program in order to determine the clinical skills among students.

Key words: Anesthesia Trainee, Clinical Skills, Mini-CEX, Preoperative Examination.

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An examination which is performed to determine the clinical skill is known as procedural skill assessment examination.⁴ The expectation from student is such that they are able to perform the practical examination with expert skills.⁵ To fulfill such expectations, it is required that a clinical evaluation is conducted which can also enhance the motivation of students towards learning.⁶

Multiple methods of clinical evaluation in anesthesia training are available for example direct observation, viva voce, journal report, objective examination, mini-CEX, case-based discussion, multisource feedback and many more. The validity of these methods is still being assessed.⁷ Various inconveniences are encountered in each of the above method on part of student and

examiner as well as the patients. Usually, it's only once that the performance assessment is done, and that too by one examiner only.⁸ There is lack of observation and feedback which does not enable the examiner to determine the benefits or disadvantages of a certain test type.

Multiple benefits of mini-CEX have been observed in evaluation of clinical practice among anesthesia trainee. There is possibility of conducting this program in a number of settings.⁹ It can be performed in different scenarios and clinical cases which increases the exposure of student to perform numerous clinical interventions which in turn enhances the performance of students.¹⁰ It also provides the clinical examiner with satisfaction by using this tool for evaluation. In this way, the evaluator is able to provide constructive response with regards to students' performance.

The feedback also proves to be a way of guidance in order to correct or improve students' weakness. It implies that the aforementioned benefits of mini-CEX enhance the ability of students' learning and improving the strength of healthcare provision to the patients. The evaluation by mini-CEX is done for about 15 minutes when the student is performing a procedure on patient, after that, 5 minutes are spent giving constructive feedback to the students according to their level of performance.

The following study is performed to inquire the variance of students' proficiency evaluation among control and intervention group after the usage of mini-CEX. It is expected that the use of mini-CEX during the course of anesthesia training will improve the clinical proficiency of anesthesia trainees.

MATERIAL & METHODS

The mode of study was mock experimental which only used the post-test involving only the control group design. The subjects of study were all anesthesia trainees enrolled in the fellowship program performing the clinical practice in hospital. The sampling was done by using the technique of non probability consecutive sampling. The study took place from January

2017 to March 2019.

The study was performed after obtaining the approval from the institutional Ethics committee. An emphasis was done on various ethical issues such as secrecy and anonymity, self-confidence, benevolence, and integrity. The study was performed at hospital as the anesthesia trainees were based in this hospital. 8 operation rooms were used to perform the study, 4 of them were used for the control group while 4 were used for intervention group. Two procedures were used during the course of this study. One was the air way assessment before general anaesthesia and performing Subarachnoid Block used in the evaluation of clinical practice of anesthesia trainee during their fellowship program. In order to obtain assessment data from control group, rating scale was put into use.

The second tool that was used was the mini-CEX assessment sheet that was formulated by Norcini et al in 2003 that involves the identification of the evaluator and the student and the scale ranges from 1 to 9. The category of this scale included three types of performances being "superior", "meet expectations", and "remedial". The elements that were assessed by this tool included the intervention strategy, exam performing ability, proficiency in treating the patients. If a student was able to score ≥ 75 he was categorized as "competent" and if the score was ≤ 75 , he was put into the category of "incompetent". After the completion of evaluation, the satisfaction of student and the clinical evaluator was evaluated regarding the mini-CEX tool and customary assessment method.

SPSS version 24 was used for data analysis, mean and SD was calculated for numerical data and frequency percentages were calculated for qualitative data. Student t-test and chi square test were used to see association among variables. P value ≤ 0.05 was taken as significant.

RESULTS

Seventy patients were included in this study, both genders. The patients were further divided into two equal groups i.e. controls n=35 (50.0%)

and interventions $n=35$ (50.0%). The mean age of control group was 24.51 ± 2.44 years. There was $n=19$ (54.3%) males and $n=16$ (45.7%) female. The mean age of intervention group was 23.80 ± 1.32 years. There was $n=15$ (42.9%) males and $n=20$ (57.1%) females. (Table-I).

Variable	Group		P-Value
	Control $n=35$ (50%)	Intervention $n=35$ (50%)	
Age (years)	24.51 ± 2.44	23.80 ± 1.32	0.133
Gender			
Male	$n=19$ (54.3%)	$n=15$ (42.9%)	0.339
Female	$n=16$ (45.7%)	$n=20$ (57.1%)	

Table-I. Demographic variables of the respondents.

The mean score of Procedural competence in control group was 72.11 ± 4.56 , while the mean score of Procedural competence in intervention group was 81.28 ± 2.86 . The mean score of anesthesia trainees towards satisfaction of control and intervention group was 5.37 ± 0.38 and 8.95 ± 0.64 , respectively. While the mean score of evaluators towards satisfaction of control and intervention group was 6.24 ± 0.53 and 8.04 ± 0.52 , respectively. The differences were statistically significant at ($p=0.000$). (Table-II).

Variable	Group		p-Value
	Control $n=35$ (50%)	Intervention $n=35$ (50%)	
Procedural Skill competence	72.11 ± 4.56	81.28 ± 2.86	0.000
Anaesthesia Students' Satisfaction	5.37 ± 0.38	8.95 ± 0.64	0.000
Evaluators' Satisfaction	6.24 ± 0.53	8.04 ± 0.52	0.000

Table-II. Satisfaction criteria of the Respondents.

DISCUSSION

In our study in intervention group a great number of respondents assure satisfaction over mini-CEX programming. In a study done by Philips SJ et al¹¹, the results demonstrated that regardless of strongly suggestive educational hypothesis and after being used widely in medical education system for many years, there remain a number of

problems encountered in the efficacious usage of mini-CEX.

There are various factors that affect the procurement of response to the students after mini-CEX assessment. In a pilot study performed upon final year medical students by Fernando N et al¹², it was evident that those examiners who gave away a broad range of scores with regards to particular expertise field had more chance of recording sections for improvement and plan of action.

However, Suhoyo Y et al reported¹³ a number of challenges are encountered when mini-CEX is implemented in different cultures and regions of the world. This problem can be tackled easily by the careful management of innovation process and considering the local and cultural context. Hence mini-CEX can be applied without the underlying idea being changed. In a study done by Seadon H et al¹⁴ on trainees of New Zealand, a strongly positive academic influence was described. In its written form, 95% expert categorized mini-CEX under "things that trainee did well.

When Hill F et al¹⁵ determined the factors affecting the adopting and the adapting of mini-CEX, found out that it must be endorsed with regards to particular settings and local interest. The assessment must be included in the final evaluation of students. Hawkins RE et al¹⁶ reported that if the choice of selection is given to the trainees in for their cases and assessors, it is implied to have an effect on the grading outcomes especially with regards to summative evaluation.

Liao KC et al¹⁷ concluded that mini-CEX is termed as "valid and reliable" tool in order to determine the clinical proficiency of trainees by. To employ a fruitful mini-CEX evaluation program, it is suggested as a prerequisite to develop the faculty for training the evaluators.

A meta-analysis was performed by Ansari A et al¹⁸ in order to determine the "construct and criterion" foundation of mini-CEX to evaluate the clinical performance. The mini-CEX can be used on a daily basis but limited to field of program

and purpose of evaluation. In conclusion, mini-CEX has established to be beneficial in training assessment having clear evidence of construct and criterion validity.

A score analysis done by Jackson D et al¹⁹ showed exceptional reliability data. It is suggested that further research is required in order to ensure the complete utilization and benefits of mini-CEX. Especially, the assessors need proper training if better outcome is desired. Overall, it is believed to be of similar value in terms of measurement characteristics, as those of other skills evaluation procedures.²⁰

CONCLUSION

Clinical expertise among anesthesia trainee was significantly ameliorated after the use of Mini-CEX program. It is therefore suggested for anesthesia trainers to use the Mini-CEX program in order the determine the clinical skills among students.






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2	Azeem Gulzar	Data collection, Literature review.	
3	Bilal Nazar	Manuscript writing, Data analysis.	
4	Masood Alam	Study design, Literature review.	
5	Rahat Akhtar	Manuscript writing, Data analysis.	
6	Farman Ali	Statistical Analysis, Final Proof Reading.	