SHORT REPORT

Mini-CEX as a formative assessment tool for undergraduate medical students in ophthalmology

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Abstract

Mini-clinical evaluation exercise is a compound tool that allows assessment and feedback from a knowledgeable assessor. When it is conducted during clinical rotations, it gives the margin of improvement in skills via constructive feedback. The current study was planned to assess if mini-clinical evaluation exercise is an effective assessment tool. Starting from January 15, 2022, 80 medical students of the 4th year were enrolled, with 40(50%) of them having had conventional rotation of one month, and the other 40(50%) having had to exposure to mini-clinical evaluation exercise mini-CEX during their rotations. At the end of rotation on February 15, 2022, clinical skills of the 2 groups were assessed. The score of the intervention group having had mini-clinical evaluation exercise exposure was better than the control group. Hence, mini-clinical evaluation exercise was found to be a formative assessment tool for 4th year undergraduate medical students.

Key Words: Mini-clinical evaluation exercise, Teaching learning tool, Undergraduate medical students, Ophthalmology.

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Introduction

Mini-clinical evaluation exercise (mini-CEX) is a tool to clinically assess medical students and to give them feedback for improvement of clinical skills. Generally, students are not supervised properly during their history-taking and examination. It has been known that feedback is an important tool for learning, and is an integral part of mini-CEX.[1] Feedback has a strong influence on achievement, and helps in the improvement of skills.[2]

A member of faculty evaluates the performance of students as they do the examination. An important part of mini-CEX is the feedback that is immediately given to the students from a knowledgeable evaluator.[3] The assessor records their performance on reliable and standard rating form. It has already been shown to have high reliability and validity for assessing residents of Internal Medicine.[4]

Mini-CEX uses a rating scale developed by the American Board of Internal Medicine that evaluates 6 core competencies; medical interviewing skills, physical examination skills, professionalism, counselling skills, clinical judgments and efficiency.[5] This rating scale, in the form of a proforma, consists of standardised nine-point scale, with 1-3 = unsatisfactory, 4-6 = satisfactory, and 7-9 = superior.[6] Feedback is given at the end of the assessment to each student This helps them in improving the competencies expected.[7,8]

The current study was planned to assess if mini-CEX is an effective assessment tool in improving the teaching-learning process.

Methods, Results and Discussion

The current interventional study was conducted at the Department of Ophthalmology, Unit 2, King Edward Medical University / Mayo Hospital, Lahore, Pakistan, from January 15 to February 15, 2022, and comprised 4th year medical students. Of the 80 students, 40(50%) in group A underwent mini-CEX evaluation during their clinical rotation every week on different methods (one method assessed twice in a week), while 40(50%) in group B were taught in the conventional manner without exposure to mini-CEX evaluation. The ward test results of the groups were compared at the end of their clinical rotation.

Mini-CEX standard questionnaires were used and checklists for specific clinical methods to be assessed were developed by department faculty. The checklists were further validated by senior faculty members of the department. To optimise the efficacy of the project, a prior training programme on mini-CEX was organised for faculty members and students to ensure that there was minimal inter-assessor variability in marking. A session was conducted on giving constructive feedback. Clinical examination of squint was taught to the students as per schedule. Group A students were further divided in

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Table-1: Comparison of scores in various clinical methods of ophthalmology as per mini-clinical evaluation exercise (Mini-CEX).

	Pupillary Reflexes			Visual Field			Squint			Ptosis Assessment		
Competencies	**Mean ± SD(1&2) (1&2)**	**t**	**p**	**Mean ± SD (1&2)**	**t**	**p**	**Mean± SD (1&2)**	**t**	**p**	**Mean ± SD (1&2)**	**t**	**p**
Medical Interviewing Skills												
	3.32±1.185	16.6	0.000	3.20±1.244	15.92	0.000	3.17±1.337	14.97	0.000	3.22±1.250	14.27	0.000
	7.20±0.882			7.12±0.965			7.30±1.017			7.20±1.042		
Physical Examination Skills												
	4.47±1.198	14.35	0.000	4.42±1.217	16.41	0.000	4.22±0.973	16.64	0.000	4.42±1.129	11.59	0.000
	7.45±0.677			7.45±0.749			7.47±0.715			7.32±0.729		
Professionali-sm												
	4.25±1.031	14.09	0.000	4.32±1.141	12.79	0.000	4.60±1.104	12.59	0.000	4.50±1.062	14.64	0.000
	7.45±0.782			7.42±0.812			7.57±0.843			7.57±0.902		
Clinical Judgement												
	4.47±0.715	18.22	0.000	4.50±0.816	20.44	0.000	4.60±0.810	16.32	0.000	4.60±0.744	18.02	0.000
	7.50±0.679			7.32±0.572			7.47±0.598			7.37±0.585		
Counseling Skills												
	4.20±1.159	17.01	0.000	4.37±1.191	14.01	0.000	4.60±0.810	16.21	0.000	4.45±1.036	14.8	0.000
	7.57±0.675			7.42±0.675			7.52±0.750			7.40±0.777		
Efficiency												
	4.12±0.911	21.22	0.000	4.175±1.00	19.97	0.000	4.32±0.997	16.89	0.000	4.20±1.042	20.81	0.000
	7.80±0.723			7.80±0.607			7.80±0.648			7.92±0.572		
Overall Clinical Competence												
	4.42±0.712	24.22	0.000	4.30±0.757	25.59	0.000	4.40±0.708	25.56	0.000	4.42±0.675	25.56	0.000
	8.12±0.563			8.05±0.597			8.02±0.576			8.05±0.638		
Assessor's satisfaction												
	7.40±0.632	7.34	0.000	7.35±0.667	25.56	0.000	7.40±0.632	7.34	0.000	7.35±0.667	25.56	0.000
	8.32±0.525			8.12±0.073			8.32±0.525			8.12±0.073		
Student's satisfaction												
	7.82±0.780	2.33	<0.05	7.82±0.780	5.64	0.000	7.82±0.780	2.33	<0.05	7.82±0.780	5.64	0.000
	8.17±0.549			8.00±0.452			8.17±0.549			8.00±0.452		

SD: Standard deviation.

Table-2: Intergroup comparison of skills assessment score.

	CONTROL GROUP	INTERVENTIONAL GROUP
Mean±SD (of results)	10.82±0.516	15.92±0.338
T	20.96	47.02
P	<0.001	<0.001

SD: Standard deviation.

batches and one teacher facilitated each batch. Every student in these batches was advised to revise the method daily, and then they were called for assessment twice in the next week. Similarly, methods for ptosis assessment, pupillary reaction, visual field and extra-ocular movements were taught, revised and assessed. Every student was evaluated according to the checklists and for the competencies mentioned on a standard mini-CEX proforma. These competencies were rated in each encounter on a 9-point scale.

The checklist was based on 6 core clinical competencies (Figure). Data was analysed using SPSS 26.

Of the 320 encounters planned for group A before their final ward test, 310(96.8%) took place. There were 23(57.5%) females and 17(42.5%) males in the group, and the assessors were professor, associate professor, assistant professor and senior registrar. The gender distribution in group B was 19(47.5%) females and 21(52.5%) males.

The competencies assessed were those of standardised mini-CEX proforma as well as additional clinical skills of ophthalmological examination as per the checklists. It was ensured that each student got assessed by the same assessor who had done the mini-CEX scoring to rule out any inter-assessor variability with respect to marking/scoring.

The findings showed that scores improved in successive assessments of each method (Table 1). The clinical skills of students in group A improved significantly compared to those in group B (Table 2). The mean Skills Assessment Score of group B was 10.82±0.516(54.1%) compared to

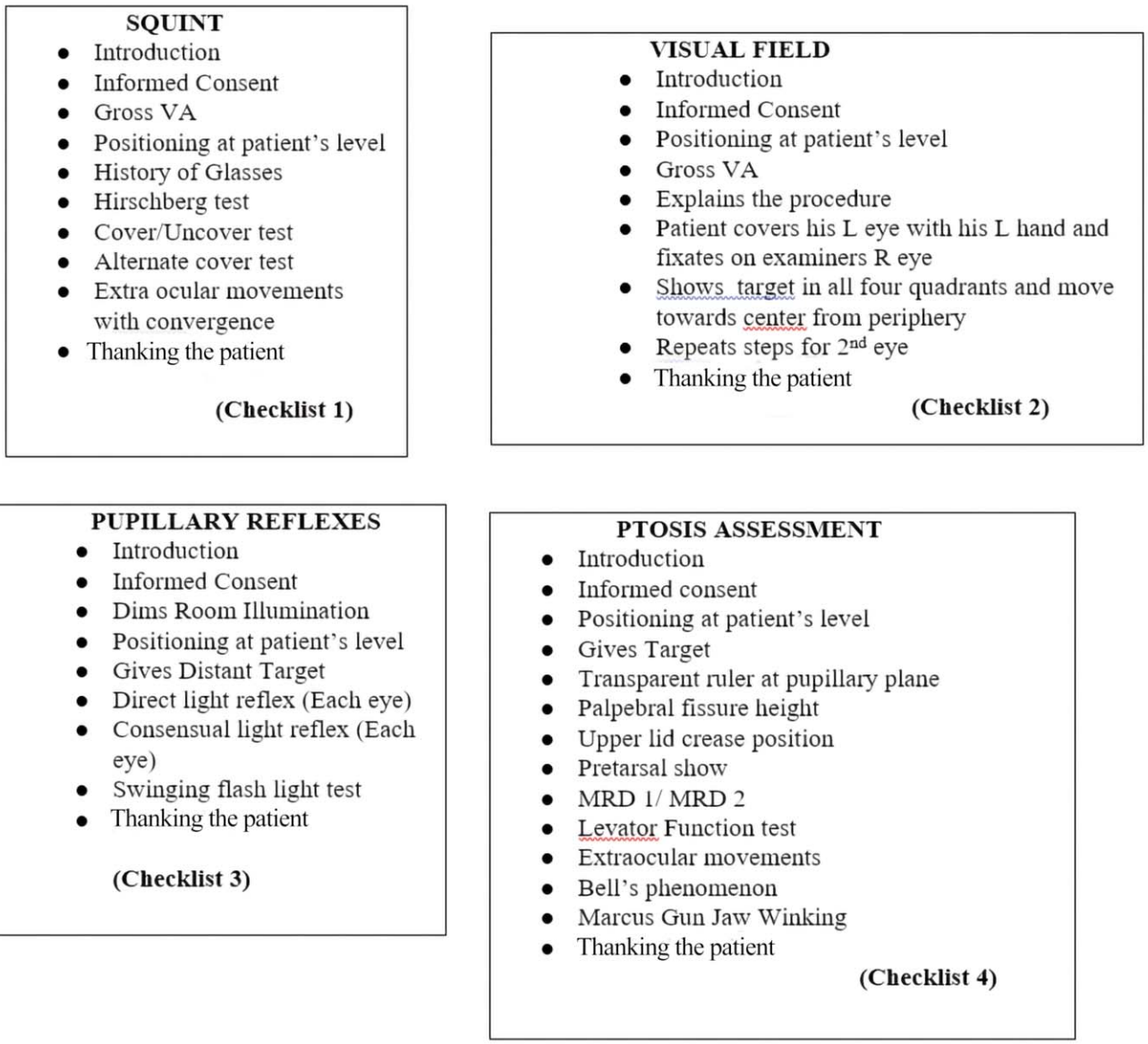

Figure: Mini-clinical evaluation exercise (mini-CEX) checklists used in the study,

15.92±0.338(79.6%) in group A ($p<0.05$).

39(98%) students were satisfied with the intervention, and 38(95%) of them found it useful for learning purposes. All 5 (100%) Assessors also found it to be an effective teaching tool. 35(88%) students reported that the time allotted was sufficient, 30(75%) said they were anxious about the process, and 36(90%) said they felt more confident in successive assessments.

Conclusion

Mini-CEX was found to be an effective assessment tool for undergraduate medical students, and helped improve clinical skills of the student, and made them feel confident.

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Conflict of Interest: None.

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Authors' Contribution:

HK: Design, data analysis, interpretation, drafting and agreed to be accountable for all aspects of the work.

NC: Supervision, topic and agreed to be accountable for all aspects of the work.

NA: Writing, finalising, revision, drafting, final approval and agreed to be accountable for all aspects of the work.

AM: Data collection, writing, drafting, revision and agreed to be accountable for all aspects of the work.

ZK: Supervision, drafting, revision and agreed to be accountable for all aspects of the work.