

EFFECTIVENESS OF PEER ASSESSMENT IN SKILL TRAINING AMONG POST GRADUATE STUDENTS IN MEDICAL COLLEGE

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ABSTRACT

Background: Peer assessment is a method of teaching -learning assessment where in students give formative feedback to their peers with the help of a tool or checklist. This study is to determine the perception and effectiveness of peer assessment in skill training among post graduate students. **Materials and Methods:** Students underwent skill training in foleys catheterization by medicine faculty. After the demonstration students performed the skill while being assessed by faculty and a peer with a validated checklist and gave feedback. The score and overall grades by faculty and peer assessment were compared. The perception of students was collected with a help of a questionnaire. Faculty trained in constructive feedback did reflective observation with the help of validated reflective observation checklist. **Result:** Among 15 Medicine post graduates 12 participated. Mean score as per faculty assessment was 21.35 and that by peer was 20. On paired t test, p value of 0.113 this was not significant. Interclass correlation coefficient with p value of 0.011, indicating that inter rater agreement is poor. Comparison of performance grading revealed that measure of agreement, Kappa value was 0.551, p value 0.001 indicating moderate agreement. Reflective observation by faculty showed that there was good participation, engagement. Feedback was very specific but peer communication was poor. Student perception survey showed that they were more comfortable receiving feedback than giving. It revealed many advantages and few challenges as well. **Conclusion:** Peer assessment in postgraduate skill training can empower students to be more responsible in their medical education and foster active learning. Peer assessment can be used as formative assessment for postgraduates.

INTRODUCTION

Peer Assessment is a collaborative process where learners evaluate and provide feedback to their peers on their learning outcomes and processes, aiming to enhance overall performance through interpersonal interactions and constructive feedback.^[1] In this method of assessment medical students can provide constructive feedback to fellow students regarding a various competencies, such as knowledge, clinical skills, and professionalism.^[2] Though this method is widely used for communication skills, literature on its use for assessment of skill training is lacking.^[3] With the implementation of newer curriculum in medical education system there is need of implementing innovative methods to involve postgraduate students in training of undergraduate

medical students and peers. This may alleviate the faculty burden and help in early development of future medical teachers. Hence training postgraduates in skills as well as in assessment is worthwhile.

An important component of learning is student motivation which is directly linked with positive stimulation of students enabling their active participation in the classes.^[4] Peer assessment can provide such stimulation and enable active learning in them. Critical observation of a peer performing skill also aids in enhancing the skill training.^[5,6] Improving health care quality through upgraded skill training of health care professionals with mannequins, feedback devices and constructive feedback through trainers or peers' augments patient care.^[5,7-9]

Hence this study is done to evaluate students' perception of peer assessment during skill training and to analyze the correlation between peer-assessed performance and faculty-assessed performance.

MATERIALS AND METHODS

It was an observational mixed method study. Study was conducted among Medicine post graduates of first year attending skill training class on Foleys catheterization on a task trainer. The institution ethical clearance was obtained (FMIEC/CCM/092/2025). Informed consent was obtained from students. Inclusion criteria: 1. First year medicine postgraduates attending skill and simulation class on foleys catheterization. 2. Post graduates consenting for the intervention. Exclusion criteria: Students with prior extensive experience in peer assessment. Briefing on the procedure and demonstration of foleys catheterization was done by medicine faculty. Students also underwent a short training on constructive feedback. Then assessment was performed as Objective Structured Clinical Examination (OSCE). Students performed the skill of foleys catheterization individually while being assessed by faculty and a peer with a validated OSCE checklist. The peer assessor also gave feedback at completion of the task and faculty assessor reinforced with her feedback. The score was marked out of 25 by faculty and peer assessor and grades were given as per scores as excellent (23-25), very good (20-22), good (17-19), satisfactory (14-16), needs improvement (10-13) and unsatisfactory (<10).

A skill and simulation faculty trained in constructive feedback did reflective observation with the help of validated faculty reflective observation checklist. This checklist included three components student engagement, quality of feedback and reaction to feedback. Both student perception survey and faculty reflective observation checklist were validated by skill and simulation educator.

After the skill training class and OSCE, the students were asked to fill the student perception survey questionnaire through google forms within 24 hours. Students were told that it is voluntary and their responses will be anonymized, and the data obtained will be used for publication and research. The survey questionnaire included 3 sections. Section one gathered demographic information such as year of study, previous experience with peer assessment and feedback. Section two included questions on perception of peer assessment as follows;

1. How confident do you feel in your ability to assess your peers' work?
2. How fair do you believe peer assessments are compared to instructor assessments?
3. To what extent do you believe peer assessment contributes to your learning?
4. How comfortable do you feel giving feedback to your peers?

5. How comfortable do you feel receiving feedback from your peers?

Section three included perception regarding benefits and challenges of peer assessment. Questions in section two and three were on a Likert scale of 1 to 5. Following were suggested as benefits to be marked on Likert scale 1. Receiving feedback helps in learning, 2. Improves ability to accept feedback, 3. Critical observation helps in learning, 4. Reveals gaps in knowledge, 5. Comparison with own performance aids learning, 6. Encourages collaborative learning, 7. Helps in remembering better, 8. Increases concentration during the skill training, 9. It makes learning interesting, 10. Assessment is less threatening, 11. Helps gain teaching experience, 12. Assessing peers is easier than assessing juniors, 13. Increases confidence and self-esteem, 14. Improves leadership skills.

Following were suggested as challenges of peer assessment to be marked on Likert scale. 1. Difficult being objective with peers, 2. Discomfort in giving negative feedback, 3. Lack of confidence in peer feedback quality, 4. Concerns about fairness, 5. Peers hesitate to give constructive feedback, 6. Time-consuming, 7. Encourages unhealthy competition, 8. Reduced opportunity of receiving feedback from teachers.

Section 4 included open ended questions such as their positive and negative experience and any other suggestions.

Statistical Analysis: Statistical analysis was done using SPSS 23 software. Mean score of faculty and peer assessment score was calculated from the marks obtained on checklists. These were compared with paired t test. The agreement between faculty and peer assessment score was analyzed by calculating interclass correlation coefficient for kappa value. Kappa value of one was considered as perfect agreement between both scorers. Student perception survey and faculty reflective observation checklist will be analyzed with frequencies and percentages. Answers to open ended questions were compiled and analyzed.

RESULTS

Among 15 Medicine post graduate students 12 participated in the study.

Table 1 shows that mean score as per faculty assessment was 21.35 and mean score by peer assessment was 20. On paired t test, p value of 0.113 this was not significant. Interclass correlation coefficient with p value of 0.011, which is low indicating that inter rater agreement is poor.

Comparison of performance grading revealed that measure of agreement, Kappa value was 0.551, p value 0.001 indicating significance as shown in table 2. This indicates moderate agreement.

Reflective observation by faculty as depicted in table 3 showed that there was good participation (75%), engagement (58.3%), peer communication was

lacking at 33.3%. Overall quality of feedback was very good (75%). Feedback was very specific (91.7%), inputs for improvement given very well (83.3%) but they were not very good in giving constructive feedback (66.7%). Reaction to peer feedback was excellent (91.7%).

Student perception survey showed that previous participation in peer assessment was 16.7% and prior training in constructive feedback was 16.7%. Students were more comfortable receiving feedback (91.6%) than giving feedback (75%). Among advantages as shown in table 4 they felt peer assessment helped in learning (91.5%), revealed knowledge gaps (91.7%), better retention (100%), critical observation helped (100%), made learning interesting (83.3%), it was a teaching experience (100%) and 91.7% felt assessment felt less threatening. Further sessions to include this method of learning and assessment was requested by 83.3%

of students. Overall satisfaction of students was excellent 66.7% and very good 33.3%.

Among challenges of peer assessment 33% expressed lack of confidence in peer feedback, 25 % had concerns of a fair feedback, 16.7% felt it reduced opportunity for teacher feedback. Few were uncomfortable giving negative feedback (41.7%), small fraction felt it is time consuming 16.7% and that it promotes unhealthy competition (8.3%).

Some of the responses for open ended questions were as follows:

- It was very innovative, please keep more such sessions.
- We need more time for this class
- Thank you for introducing me to this technique
- It trained me for an OSCE session to perform as well as to conduct

Table 1: Comparison of faculty assessment score and peer assessment score

	Mean	Std. Deviation	Paired t test P value
Faculty score	21.35	2.97	0.113
Peer score	20.00	3.30	

Table 2: Comparison of Faculty and Peer Grading.

		faculty grading				Total	Measure of agreement	
		Excellent (1)	Very good (2)	Good (3)	Satisfactory (4)			
peer grade	1	3	0	0	0	3	Kappa value 0.551	P value 0.001
	2	1	2	0	0	3		
	3	1	1	2	0	4		
	4	0	1	0	1	2		
Total		5	4	2	1	12		
Interpretation of kappa								
<0.2		Poor agreement						
.2 - .4		Fair						
.4 - .6		Moderate						
.6 - .8		Good agreement						
.8 - 1.0		V. good agreement						

Table 3: Reflective observation checklist responses by staff during peer assessment.

		1	2	3	4	5	Mean	SD
		N (%)	N(%)	N(%)	N(%)	N(%)		
1	Student engagement							
	Active participation	0(0%)	0(0%)	2(16.7%)	1(8.3%)	9(75%)	4.58	0.79
	Engagement level	0(0%)	0(0%)	2(16.7%)	3(25%)	7(58.3%)	4.42	0.79
	Peer interaction	4(33.3%)	2(16.7%)	5(41.7%)	1(8.3%)	0(0%)	3.58	1.16
	Clarity of communication	0(0%)	2(16.7%)	4(33.3%)	2(16.7%)	4(33.3%)	3.67	1.15
	Use of criteria	0(0%)	0(0%)	2(16.7%)	3(25%)	7(58.3%)	4.42	0.79
2	Quality of feedback							
	Specific	0(0%)	0(0%)	1(8.3%)	0(0%)	11(91.7%)	4.83	0.58
	Gave input for improvement	0(0%)	0(0%)	0(0%)	2(16.7%)	10(83.3%)	4.83	0.58
	Constructive feedback	0(0%)	1(8.3%)	2(16.7%)	1(8.3%)	8(66.7%)	4.33	1.07
	Feedback within context	0(0%)	1(8.3%)	1(8.3%)	2(16.7%)	8(66.7%)	4.42	1.00
	Respectful	0(0%)	2(16.7%)	1(8.3%)	1(8.3%)	8(66.7%)	4.25	1.22
3	Reaction to feedback							
	Receiving feedback well	0(0%)	1(8.3%)	0(0%)	0(0%)	11(91.7%)	4.75	0.87

	Response to criticism	0(0%)	0(0%)	1(8.3%)	0(0%)	11(91.7%)	4.83	0.58
	Handling disagreements	0(0%)	0(0%)	0(0%)	1(8.3%)	11(91.7%)	4.92	0.29

Table 4: Advantages of peer assessment on student perception survey.

	1	2	3	4	5	mean	SD
previous participation	2(16.7%)	10(83.3%)	0(0.0%)	0(0.0%)	0(0.0%)	1.83	0.39
prior training	2(16.7%)	10(83.3%)	0(0.0%)	0(0.0%)	0(0.0%)	1.83	0.39
confident	0(0.0%)	0(0.0%)	2(16.7%)	7(58.3%)	3(25.0%)	4.08	0.67
fair compared to teacher	0(0.0%)	2(16.7%)	2(16.7%)	5(41.7%)	3(25.0%)	3.75	1.06
contribute to learning	0(0.0%)	0(0.0%)	0(0.0%)	5(41.7%)	7(58.3%)	4.58	0.51
Comfortable giving feedback	0(0.0%)	1(8.3%)	2(16.7%)	4(33.3%)	5(41.7%)	4.08	1.00
Comfortable receiving feedback	0(0.0%)	0(0.0%)	1(8.3%)	7(58.3%)	4(33.3%)	4.25	0.62
helps learning	0(0.0%)	0(0.0%)	0(0.0%)	1(8.3%)	11(91.7%)	4.92	0.29
ability to accept feedback	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	12(100.0%)	5.00	0.00
critical observation helps	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	12(100.0%)	5.00	0.00
reveals knowledge gaps	0(0.0%)	0(0.0%)	0(0.0%)	1(8.3%)	11(91.7%)	4.92	0.29
comparison helps	0(0.0%)	0(0.0%)	0(0.0%)	2(16.7%)	10(83.3%)	4.83	0.39
collaborative learning	0(0.0%)	0(0.0%)	0(0.0%)	1(8.3%)	11(91.7%)	4.92	0.29
remember better	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	12(100.0%)	5.00	0.00
Improved concentration	0(0.0%)	0(0.0%)	0(0.0%)	1(8.3%)	11(91.7%)	4.92	0.29
interesting	0(0.0%)	0(0.0%)	0(0.0%)	2(16.7%)	10(83.3%)	4.83	0.39
less threatening	0(0.0%)	0(0.0%)	0(0.0%)	1(8.3%)	11(91.7%)	4.92	0.29
teaching experience	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	12(100.0%)	5.00	0.00
Easy to assess peers	0(0%)	0(0%)	2(16.7%)	3(25%)	7(58.3%)	4.42	0.79
Increases confidence	0(0%)	0(0%)	0(0%)	2(16.7%)	10(83.3%)	4.83	0.39
Leadership skills	0(0%)	0(0%)	0(0%)	2(16.7%)	10(83.3%)	4.83	0.39
overall satisfaction	0(0.0%)	0(0.0%)	0(0.0%)	4(33.3%)	8(66.7%)	4.67	0.49

5 strongly agree 4 agree 3 neutrals 2 disagree 1 strongly disagree.

Table 5: Challenges of peer assessment on student perception survey.

	1	2	3	4	5	Mean	SD
Difficult to be objective	1(8.3%)	3(25.0%)	0(0.0%)	4(33.3%)	4(33.3%)	3.58	1.44
discomfort being negative	1(8.3%)	3(25.0%)	1(8.3%)	2(16.7%)	5(41.7%)	3.58	1.51
lack of confidence in feedback	2(16.7%)	1(8.3%)	3(25.0%)	5(41.7%)	1(8.3%)	3.17	1.27
concerns on fair feedback	2(16.7%)	1(8.3%)	2(16.7%)	4(33.3%)	3(25.0%)	3.42	1.44
hesitate to be constructive	2(16.7%)	1(8.3%)	3(25.0%)	4(33.3%)	2(16.7%)	3.25	1.36
time consuming	2(16.7%)	2(16.7%)	4(33.3%)	2(16.7%)	2(16.7%)	3.00	1.35
unhealthy competition	2(16.7%)	1(8.3%)	4(33.3%)	4(33.3%)	1(8.3%)	3.08	1.24
reduced opportunity for teacher feedback	3(25.0%)	1(8.3%)	3(25.0%)	3(25.0%)	2(16.7%)	3.00	1.48
overall satisfaction	0(0.0%)	0(0.0%)	0(0.0%)	4(33.3%)	8(66.7%)	4.67	0.49

5 strongly agree 4 agree 3 neutrals 2 disagree 1 strongly disagree.

DISCUSSION

Our study showed that mean score as per faculty assessment and mean score by peer assessment was appearing to be very close but interclass correlation coefficient indicated poor inter-rater agreement. However, comparison of performance grading which was marked based on scores revealed moderate measure of agreement. In this study mean peer assessment score was less than the mean faculty assessment score, which shows that students were stricter with their peers. Most of the students were performing this kind of assessment for the first time and lacked experience compared to teachers.

Studies have shown that comparison of peer assessment score and faculty assessment scores are variable. Alzaabi S et al,^[6] Chen L et al,^[10] Dagmura H et al,^[11] Inayah et al,^[12] showed that peer ratings were higher compared to that of faculty. All of these studies were conducted among undergraduate

medical students of various academic years. Kim K et al,^[13] also showed weak associations between assessment scores rated by faculty and peer examiners regardless of whether peer examiners were high or low achievers. This observation suggests that high performing students do not necessarily better assess student performance than their low performing peers. Cheon Set al,^[14] conducted study among ophthalmology residents to evaluate the accuracy of peer assessment of surgical skills of cataract surgery in a simulation setting. A fair to excellent inter-rater reliability was seen between expert assessor and peer assessor scores. The disparity in scores might suggest that students use checklist as learning tool as well as for assessment whereas faculty use it purely as assessment tool.

Existing literature shows that peer feedback is useful but students need training and practice. Feedback quality must be assessed for effectiveness.^[3] This study included Reflective observation of the peer

assessment exercise by faculty which revealed good student participation and engagement. Overall quality of feedback was very good. Feedback was very specific with inputs for improvement but peer communication, constructive feedback skill and effective use of checklist was lacking. Observations from Alzaabi et al,^[6] were also consistent with our study where students lacked in communication and observational skills.

Student perception survey of peer assessment revealed excellent agreement with benefits of the exercise which was consistent with many studies. Peer assessment and feedback enhanced learning, revealed knowledge gaps, helped in better retention, critical observation helped, made learning interesting, felt less threatening and that it was a good teaching experience were the benefits reported in our study. In Alzaabi et al,^[6] students felt that it helped in learning clinical skill and it created a safe learning environment. Improvement in clinical skills was observed in Chen L et al.^[10] In Kim et al,^[13] students felt they received more feedback from peers than teachers, they could pick their own weakness easily and they also got an opportunity to see performance of high achievers and learn. Study in Tayem et al,^[15] showed that there was improvement in student motivation, respect for peers, communication skill, self-assessment skill and helped them identify learning needs.

Challenges of peer assessment observed in our study included lack of confidence in peer feedback, concerns of a fair feedback and reduced opportunity for teacher feedback. Few students were uncomfortable giving negative feedback and found the exercise time consuming. Similarly, Larchenfeldt S et al,^[3] identified barriers in implementation of peer assessment as lack of training among peer assessors making it less reliable, students may perceive peer feedback inappropriate and hurtful. In study by Alzaabi et al,^[6] students found the exercise to be time consuming.

Peer assessment and feedback can be valuable addition to formative medical education assessment. It can provide multiple opportunities to interact with and observe peers. Proper training in constructive feedback and more practice with peer assessment may help overcome challenges.

CONCLUSION

We performed a study to explore the effectiveness of peer assessment in postgraduate clinical skill training. Faculty assessment score was higher compared to peer assessed score. Statistically showing poor agreement. However, performance grading showed moderate agreement. Student perception of peer assessment was excellent and identified many advantages such as enhancing learning, revealing knowledge gaps, better retention, critical observation being helpful, made learning interesting, excellent teaching experience and it was

less threatening. It also identified few challenges like lack of confidence in peer feedback, concerns regarding fair feedback, reduced opportunity for faculty feedback. With adequate training of post graduates in peer assessment and constructive feedback this method of assessment can be used for formative assessment of undergraduate and postgraduate learning. Peer assessment in postgraduate skill training can empower students to be more responsible in their medical education and foster active learning.

Limitations

Study was conducted with a small sample size hence lacking generalizability. Postgraduates lacked prior formal training in assessment and constructive feedback, so peer assessment in this study may not be in par with faculty assessment. In the absence of a control group, the perception survey may have got influenced by the positive experience during the peer assessment activity. Repeated peer assessment, utilization of senior postgraduates to assess junior postgraduates and training in constructive feedback may improve the outcome of peer assessment.

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