



## Original article

### Reciprocal 360<sup>0</sup> Assessment by Students: An Integrated Approach Teaching, Learning and Assessment

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#### ABSTRACT

**Introduction:** Though assessment is an inevitable part of medical education, an ideal, flawless assessment tool is yet to evolve. The affective domain which is paramount in medical profession, is being neglected in routine assessments. In this novel approach, the students themselves are the assessors and the teacher is a silent observer, who monitors the process. In a community training programme, one student acts as the Trainer, while the other as Assessor who assesses the affective domain, using pre validated check lists which minimize subjective errors. Subsequently, their roles are reversed making it reciprocal. This can be used as an effective assessment tool, since the anxiety factor of the student is considerably reduced and less manpower is required. **Objectives:** (1)To teach the students how to assess the affective domain. (2)To assess student performance by peer/ fellow students, using pre-validated check lists. **Materials & Methods:** Selected 64 consenting first year medical students and staff to monitor the student activity. Following a training on assessment of the affective domain, the students performed reciprocal assessment. **Results:** Pre and post test scores analysed using Wilcoxon Signed Rank Test, showed a mean  $\pm$  SD of (42.67 $\pm$ 5.750) before and (63.17 $\pm$ 0.983) after the training. The **p** value was 0.027, showing the significance of training. **Conclusion:** Incorporating affective domain makes peer assessment more efficient. This novel approach, "Reciprocal 360<sup>0</sup> Assessment by Students" can be used as an effective peer cum facilitator assessment tool in medical education, which is feasible, comprehensive, less time consuming and cost effective.

**KEYWORDS:** Affective domain, Comprehensive, Medical Education, Pre validated Checklist, Reciprocal 360<sup>0</sup> assessment.

#### INTRODUCTION

Assessment[1,2] is a science and an art. Students are conventionally assessed by the Teachers [3,4], and it is a stressful process for the students. It is a common occurrence that the students accuse bias from teachers. Another fact is that, in our conventional assessment systems, much importance is given to the knowledge[cognition] and practical [psychomotor] skills alone, and the affective domain is being neglected[5]. In order to become successful, a doctor ought to be compassionate. Hence assessment of the affective domain, that deals with our attitudes, values, and emotions, is paramount in healthcare system[6].

This can help nurturing the proper attitude in our medical students, towards the patients. Here, a novel approach of Reciprocal 360<sup>0</sup> Assessment[1,7] by Students, is being described. In a Community Training Programme, one student acts as the Trainer while the other student as the

Assessor. In the first phase, the Assessor assesses the Trainer student using a check list[9]. In the second phase, their roles get reversed, where the trainer student becomes the assessor and vice versa. The Assessor student assesses affective domain of the trainer student[10].

Here, the teacher remains a silent observer, who monitors and consequently assesses the overall process. By incorporating the affective domain, peer assessment becomes more efficient. This Reciprocal 360<sup>0</sup> Assessment can be used as an effective peer cum facilitator assessment tool, since the anxiety factor of the student is considerably less and the manpower required is significantly reduced. The pre-validated checklists[11] minimized the subjective errors[12,13]. **Objectives:** (1)To teach the students how to assess the affective domain. (2)To assess student

performance by peer/ fellow students, using pre-validated check lists.

## MATERIALS AND METHODS

In this quantitative study, sixty four (n= 64) first year medical students of a Tertiary Care Rural Medical School were selected by random recruitment after obtaining written informed consent. The staff were selected from the departments of Community Medicine, who are involved in field work in the selected area, and from Physiology to monitor the student activity. All stages of planning, implementation and follow up were documented. Photographs were taken at different phases and a light refreshment was arranged. Checklists were prepared in advance and Pre validated, focusing at the affective domain of trainers. Six criteria were in the checklist, including self-introduction and proper demonstration.

The students were divided into teams of 2 members each, where one student was the trainer, who demonstrated proper hand washing techniques. The other student being a silent observer, assessed the performance of the first student using the checklist(with 'yes' or 'No' options for each parameter). Following this as the pre test, the students were trained on assessment of the affective domain using the checklist, focussing at the trainer's attitude towards the learner. The parameters were; self-introduction, effective set-induction, encouraging the learner to learn, correction of errors and debriefing.

A near-by village having families of similar socio economic status was selected, and the team of students and the staff were taken to the location by the college bus. An on the spot briefing session was conducted, reiterating the importance of documentation. A team of two students visited their allotted two houses and performed as per the lesson plan and the checklist (with 'yes' or 'No' options for each parameter) were filled then and there. While the trainer student took class, the assessor evaluated him and, their roles were reversed in the next house, making the assessment reciprocal, thereby minimizing bias. Student performance results in the pre and post tests were tabulated in excel sheet and analysed using Wilcoxon Signed Rank Test.

## RESULTS

The affective domain was assessed before and after the training by the checklists (parameters 1,2,4,5 & 6) with 'yes' or 'No' option, showing the interest and attitude of the trainer student, towards the learner subject[Table 1 & 2]. The student performance, tabulated in excel and analysed by running Wilcoxon Signed Rank Test. The results shows an increase in the number of students performed correctly in all the parameters after training; with a mean  $\pm$  SD of (42.67  $\pm$  5.750) before and (63.17 $\pm$ 0.983) after the training respectively. The p value was 0.027 after using Wilcoxon Signed Rank Test(Table 3).

**Table 1: Pre test showing the student performance under each parameter**

Sl. No:	Pre test: Parameters with yes/no options	Students with 'yes' score [n =64]
1	Self-introduction	40 (62.50%)
2	Set induction [Introduction of the concept]	42 (65.63%)
3	Correct Demonstration	54 (84.38%)
4	Encouraging the subject to perform	40 (62.50%)
5	Correction of errors	42 (65.63%)
6	Debriefing	38 (59.38%)

**Table 2: Post test showing the student performance under each parameter**

Sl. No.	Post test: Parameters with yes/no options	Students with 'yes' score [n = 64]
1	Self-introduction	64 (100%)
2	Set induction [Introduction of the concept]	64 (100%)
3	Correct Demonstration	64 (100%)
4	Encouraging the subject to perform	62 (96.88%)
5	Correction of errors	63 (98.44%)
6	Debriefing	62 (96.88%)

**Table 3: Student performance comparison before and after the training**

No. of students with 'yes' score in all parameters	Mean $\pm$ SD
1. Before the training	42.67 $\pm$ 5.750
2. After the training	63.17 $\pm$ 0.983
<b>P value</b> (comparing the 2 groups)	<b>0.027</b>

## DISCUSSION

Assessment is a vital element in medical education[1] as it measures the effectiveness of the training. It is agreed that assessment protects the public from poor-quality care as it helps to make sure that the doctor is competent enough[2,3]. To evaluate competence, assessment is increasingly being used in every phase of professional development[2]. In order to make effective and efficient delivery of healthcare, not only knowledge and skills, but also empathy, analytical and communication skills are required[5,6]. Though there are various methods of evaluation in medical education, there are no much comprehensive approaches [8,9]. The contemporary method of theory and practical exams are more subjective, as the results can vary with the assessor. There are several domains in which assessment is in its infancy and remains problematic[1,2]. Another aspect of the current system is that it is time consuming and requires more manpower.

All assessment methods have their own strengths and intrinsic flaws[1]. The affective domain[5,6] of the students are not evaluated in the present system, which is paramount in becoming a successful health professional[7]. Multisource ("360-Degree") Assessment[1,8] is a questionnaire-based, comprehensive assessment method in which the evaluation is done by peers, patients, and coworkers, where, all the four domains[5,6] of teaching-learning are assessed. Though commonly used to assess peer performance, for quality improvement in industrial settings, such comprehensive approaches are now getting incorporated in health care system as well[4], especially in formative assessment[12,13].

Peer assessments have shown to be consistent, regardless of the way the assessors are selected [1]. Though there are very few published data, on the effectiveness of multisource feedback in medical education, several programs are being implemented in the United Kingdom for all the first and second year house officers and for recertification in internal medicine in the United States[1]. 360° evaluations are being used at undergraduate[9,14] and postgraduate levels[15] to assess a range of competencies.

An ideal assessment tool should satisfy the five criteria; reliability, validity, impact on future learning, acceptability, and costs effectiveness, put forth by Van Der Vleuten C [16,17]. The amount of stress undergone by the students during routine assessment, can be minimized using peer review system. It is agreed that assessment by peers, promotes professionalism, teamwork and communication[16,17]. In our project, the lesson plan, teaching hand washing, was used as an assessment tool for comprehensive peer assessment, using pre validated check lists, focussing on the affective domain of the trainer.

Use of checklists and the reciprocal assessment minimized possible subjective bias. The Wilcoxon Signed Rank Test was run on the student performance before and after teaching assessment method, showed a *p* value of 0.027, indicating that the effect of training was significant. Hence, training the students to assess the affective domain, makes reciprocal peer assessment more efficient. Being a community based project, involving teamwork, the students found it interesting and inspiring[19] and this novel method which is cost effective[20], can be used as an effective assessment tool in Medical Education.

## CONCLUSION

Training the students on assessment of the affective domain makes peer assessment more efficient. Hence, this novel method, "Reciprocal 360° Assessment by Students" can be used as an effective assessment tool in medical education, which is easy, comprehensive, less time consuming, and cost-effective.

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