Image Based Teaching and Computer Assisted – Image Based Assessment for Undergraduate Medical Students in Dermatology Clinics amidst the COVID-19 Pandemic: Students’ Perspectives

The emergence and rapid escalation of the coronavirus disease-19 (COVID-19) pandemic have caused a global disruption in medical education. A major challenge for the medical fraternity in this pandemic is the inability to reproduce the experience of real-time clinical exposure to patients for the students. To overcome the shortcomings, such as lockdown restrictions and reduced outpatient consultations, our department created an Image-Based Teaching (IBT) module followed by Computer-Assisted-Image-Based Assessment (CA-IBA) at the end of their clinical rotation. We have evaluated the perceptions of undergraduates about the IBT and CA-IBA. This cross-sectional pilot study was conducted among 26 final-year undergraduate medical students in the Department of Dermatology at Sri Manakula Vinayagar Medical College and Hospital, Puducherry.

On the week before to the clinical posting, an intra department faculty meeting was held. For each clinical topic, 10–15 images were selected from our department image bank to cover the varied clinical presentations of each disease, diagnostic signs, and representative images of the laboratory procedures were chosen by the faculty. The findings in images were marked with annotations such as arrows and circles for better understanding. In a big ventilated hall, clinical sessions were conducted over 2 weeks using the selected images in an interactive manner.

At the end of the clinical posting, each student was allotted a personal desktop computer in our digital library preloaded with a Microsoft PowerPoint presentation consisting of 10 image-based clinical scenarios [Figure 1]. Each image was accompanied by a set of five questions, giving equal weightage of marks to each of them. A maximum score of 100 was allotted, with 10 marks for each scenario. The examination answer sheets were evaluated by two examiners separately and the mean value was taken as the final mark.

A feedback questionnaire covering various attributes of IBT was collected from the students maintaining their anonymity and responses were recorded using the 5-point Likert scale. The questionnaire had good reliability (Cronbach’s alpha -0.702). The data were entered in MS Excel and analyzed using the SPSS version 24 software (SPSS Inc., Chicago, IL, USA) package. The overall response to the IBT was positive and encouraging. The feedback received is documented in Table 1.

Clinical Dermatology is a visually oriented field, which can be easily taught and assessed through images. However, there is a paucity of literature regarding the use of images in undergraduate Dermatology teaching and assessment in India.[1] In our department, previously Kumar et al.[2] had studied the role of clinical images as a teaching tool supplementing the conventional clinical teaching in the dermatology specialty. A significant improvement in the student’s knowledge and skills was observed after the introduction of clinical images as a teaching tool in that study. Fawcett et al.[3] demonstrated improved diagnostic skills in skin lesions among family medicine residents, when they used digital photographs made into posters as a mode of teaching. Rimoin et al.[4] reported longer retention of learning and better...
Table 1: Student’s perceptions about image-based learning (n=26)

| Attributes                                                      | Strongly disagree n (%) | Disagree n (%) | Neutral n (%) | Agree n (%) | Strongly agree n (%) | Mean±SD |
|-----------------------------------------------------------------|-------------------------|----------------|---------------|-------------|----------------------|---------|
| Reliable tool for facilitating visual/spatial learning          | -                       | 1 (3.8)        | 3 (11.5)      | 12 (46.2)   | 10 (38.5)            | 4.19±0.80 |
| Illustrates important concepts and aids understanding           | -                       | 4 (15.4)       | 9 (34.6)      | 13 (50)     |                       | 4.35±0.74 |
| Do you feel image-based learning enhances your observational skills? | -                       | 3 (11.5)       | 9 (34.6)      | 14 (53.8)   | 3 (11.5)             | 4.27±0.72 |
| Facilitates your ability to describe the lesions in Dermatology | -                       | 3 (11.5)       | 9 (34.6)      | 10 (38.5)   | 3 (11.5)             | 4.42±0.70 |
| Promotes self-directed learning                                  | -                       | 6 (23.1)       | 10 (38.5)     | 10 (38.5)   | 3 (11.5)             | 4.45±0.75 |
| Helps in developing logical thinking and abstract concepts       | -                       | 2 (7.7)        | 10 (38.5)     | 15 (57.7)   | 4 (15.4)             | 4.35±0.79 |
| Stimulates deep learning                                         | -                       | 2 (7.7)        | 10 (38.5)     | 15 (57.7)   | 4 (15.4)             | 4.33±0.79 |
| Facilitates constructing of new knowledge based on prior knowledge and experience | -                       | 4 (15.4)       | 13 (50)       | 9 (34.6)    | 4.19±0.69            |         |
| Provides an interactive learning environment                     | -                       | 4 (15.4)       | 13 (50)       | 9 (34.6)    | 4.19±0.69            |         |
| Facilitates effective use of learning resources                  | -                       | 4 (15.4)       | 13 (50)       | 9 (34.6)    | 4.19±0.69            |         |
| Helps in achieving curriculum outcomes                           | -                       | 4 (15.4)       | 13 (50)       | 9 (34.6)    | 4.19±0.69            |         |

This method of teaching and assessment can be considered in places where adequate faculty, image banks, and ample electronic facilities are available. We have perceived an increased attention span of students and their interaction with faculty throughout this method of teaching. A major limitation of our study is a smaller sample size. We suggest that IBT and assessment could be a good substitute to other traditional methods as evident from the feedback received from our students. Further longitudinal studies in the future can help in improving this teaching and assessment modality.

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Nil.

Conflicts of interest
There are no conflicts of interest.

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Palaniappan, et al.: Image based teaching and assessment for undergraduate medical students

identification of skin lesion morphologies, configurations, and distributions when trained with clinical images.

The validity and reliability of CA-OSCE as an assessment modality have been established in previous studies.[4] Grover et al.[6] reported improved student performance and attendance rates with CA-OSCE when compared to assessment through essay-type questions. A majority of the students found CA-OSCE to be interesting, stimulating, and challenging. Chaudhary et al.[7] stated that their students felt that CA-OSCE was less chaotic and more uniform. Similar to our study, Thakkar et al.[8] named CA-OSCE as IBA. They found that it had a better validity in assessing diagnostic and management skills when compared to Semi-Structured Viva (SSV).

Figure 1: Computer-assisted image based assessment

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Figure 1: Computer-assisted image based assessment

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