

## Interdisciplinary Communications

# Problem solving interactive clinical seminars for undergraduates

The traditional format of lecturing, the oldest method of teaching, continues to find favor in medical education. Pedagogical research reports a drop in attention within 10–30 min into such a lecture, attributed to the passive role played by the students, thus making them less suitable for higher levels of learning such as application and analysis.<sup>[1]</sup> In addition, the focus on theoretical aspects of topics and the lack of an integrated approach have resulted in poor diagnostic and therapeutic knowledge among medical students.

In this regard, the concept of interactive seminars with problem-based learning (PBL) has gained importance. PBL is structured in accordance with the educational principles obtained from the adult learning theory and is heralded as an effective method to impart clinical reasoning skills.<sup>[2]</sup> For medical education, this consists of a clinical scenario, wherein students discuss the patient complaints and physical findings and propose explanations for the occurrence.

In this context we have evaluated a different mode of clinical titled lectures, “Problem solving interactive clinical seminars (PSICS) based on clinical scenarios”, which is being conducted over the last few years in the department of surgery. This study was carried out to assess the educational effectiveness of PSICS and to determine the students’ involvement, interest, and preference for this mode of clinical lectures.

PSICS have been conducted in the department of surgery at Jawaharlal Institute of Postgraduate Medical Education and Research in Puducherry, India, for the last several years. PSICS are held once a week in a 75 min session for the undergraduate medical students of final year with a class strength ranging from 50 to 70 students for different years.

All students of a batch were listed alphabetically and divided into groups of four–six each. A batch of students in this institute is designated according to the year of joining the course. The topics shortlisted for the seminars were: upper gastrointestinal bleed, lower gastrointestinal bleed, goitre, head injury, dysphagia, obstructive jaundice, acute

abdomen, and mass in the right iliac fossa. Each topic was in turn divided into four to five subtopics, covering all aspects of the clinical problem, e.g.: *Topic*: Obstructive jaundice; *Subtopic*: Definition, Related anatomy and pathophysiology, Causes of surgical importance, Relevant history and physical examination, Investigations, Treatment of gall stones, Treatment of cancer. Each group was allotted a topic and each student a subtopic, with 2 weeks for preparation.

Students were advised by faculty on the source of reliable and relevant material and aspects of the topic to be highlighted, laying emphasis on a clinical and integrated approach. Once the material was prepared it was revised and corrected by the faculty and supplemented with X-rays/videos. Each PSICS was moderated by the same faculty member of the surgery department for 5 years.

Each topic was covered in two sessions. Following the students’ presentations, mock clinical case scenarios were posed, and the class was questioned with regard to patient’s diagnostic evaluation and further management. Thus an interactive problem-solving session was conducted. Attendance statistics for PSICS and concurrently held conventional surgical lecture classes were noted for 5 years, to allow for comparison. Feedback was obtained from students on completion of their final year of under graduation and not immediately at the end of our seminar. Attendance and feedback were compared for the same batch of students.

To evaluate PSICS, random sampling of students was spread over five batches, among those who had completed final year of under-graduation and had more than 80% attendance in the PSICS classes. Instead of selecting all 30 students from a single batch, we decided to extend our evaluation over a period of 5 years by screening and sampling students to arrive at the representative sample. Thirty were chosen to provide feedback based on a questionnaire, assessing various aspects of PSICS [Table 1]. The feedback parameters were devised to primarily assess the impact of the core concepts based on which the PSICS were designed: (a) Interactive format (first and second parameters); (b) use of audio-visual aids (third parameter); and (c) problem-based learning (fourth and fifth parameters).

It was noted that the average attendance for PSICS was 82%, higher than that of the conventional lecture classes (67.5%). More than 65% of the students rated PSICS as ‘very good’ on parameters of concept of involvement of students, use of audio-visual aids and clinical scenario discussions

**Table 1: Response of students on the PSICS<sup>a</sup> method obtained from questionnaire (n=30)**

| Parameters                                                                  | Very good, no. of responses (% of total responses) | Good, no. of responses (% of total responses) | Average, no. of responses (% of total responses) | Not useful, no. of responses (% of total responses) |
|-----------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------|--------------------------------------------------|-----------------------------------------------------|
| Concept of involvement of students in preparation of topic                  | 20 (66.7)                                          | 6 (20)                                        | 4 (13.3)                                         | –                                                   |
| Coordination and working in a team for the overall preparation of the topic | 16 (53.3)                                          | 9 (30)                                        | 5 (16.7)                                         | –                                                   |
| Exposure to and enhancement of skills in use of audio-visual aids           | 23 (76.6)                                          | 7 (23.3)                                      | –                                                | –                                                   |
| Mock clinical case scenario discussion                                      | 23 (76.6)                                          | 4 (13.3)                                      | 3 (10)                                           | –                                                   |
| Interest generated in patient management                                    | 19 (63.3)                                          | 4 (13.3)                                      | 7 (23.3)                                         | –                                                   |
| Rating of this approach over conventional didactic lectures                 | 20 (66.7)                                          | 4 (13.3)                                      | 6 (20)                                           | –                                                   |

<sup>a</sup>Problem solving interactive clinical seminars.**Table 2: Categorization and distribution of responses for all parameters altogether (n=180)**

| Parameters       | Very good | Good | Average | Not useful |
|------------------|-----------|------|---------|------------|
| No. of responses | 121       | 34   | 25      | –          |
| % of responses   | 67.2      | 18.8 | 13.8    | –          |

[Table 1]. In comparison with the conventional lectures, 20/30 students (66.7%) heralded PSICS as ‘very good’. Among the 180 responses for all the parameters together, ‘very good’ comprised 121 (67.2%) and there was not a single response of ‘not useful’ [Table 2].

Bruner’s learning pyramid depicts how the retention rate with traditional lectures is only 5% and increases to 20% with the use of audio-visual aids, 50% with incorporation of discussions and 75% with PBL.<sup>[1]</sup> Studies conducted by Struyf *et al.* also reported that students perceive PBL as a “powerful learning environment”.<sup>[3]</sup>

In our study, PSICS were better attended, encouraged active participation and team working, increased familiarity with the use of audio-visual aids, generated greater interest in patient management and was rated superior to the conventional lectures. These results may be attributed to the following reasons: (1) An interactive format enhances the student’s role from passive recipients to active contributors to the learning process, thus increasing quality of attention and motivation to self-study.<sup>[4]</sup> (2) The exposure provided to practical problems and their solution strategies encourages students to develop evaluation and decision-making skills and a greater interest in patient management.<sup>[2,5]</sup> (3) An opportunity to improve skills in use of audio-visual aids and working in a team makes the learning process more satisfying.<sup>[1,4]</sup> Interactive seminars are preferred over the conventional lectures by students and with the incorporation of audio-visual aids and PBL, the learning process may be made more effective and enjoyable.

## ACKNOWLEDGMENTS

The authors sincerely thank all the students who participated in the study and provided their valuable feedback.

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**DOI:**  
10.4103/0976-500X.95539