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RESEARCH ARTICLE

Pre-directed problem-based learning as tool for teaching clinical problems in first professional MBBS students

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ABSTRACT

Background: In a typical problem-based learning (PBL), the learning objectives are not shared with the learner when the PBL exercise is given to them. This student's unawareness of predefined objectives might be a significant hindrance in directing the student's effort in the appropriate direction. **Aim and Objective:** The present study was designed with an aim to develop and validate a modification in existing PBL in the form of pre-directed PBL (PD-PBL), where the learning objectives and outcomes are shared with the learner at the time of giving the exercise. **Materials and Methods:** The present study was designed as a prospective observational study in the Department of Physiology of Geetanjali Medical College and Hospital. One hundred forty-three students from 1st-year MBBS participated in the study. A PBL session was planned for a clinical problem of respiratory physiology. The learning objectives and the questions to determine the learning outcome were prepared. Students were given 1-week time for analysis of the problem. At the end of 1 week, a large group presentation and discussion session were planned. The faculty members and a respiratory physician were assigned the task of being observers. Later, students and faculty feedback were taken. **Results:** Analysis of feedback pointed that PD-PBL session was helpful in understanding the clinical condition with the help of basic physiology. **Conclusion:** PD-PBL would be helpful in correlating the knowledge of basic subject with the clinical scenario. Further studies are needed to evaluate the effectiveness of PD-PBL sessions in other subjects.

KEY WORDS: Problem-based Learning; Learning Objectives; Analytical Skill; Pre-directed Problem-based Learning

INTRODUCTION

During the long era of medical teaching, many attempts have been made to improve the teaching pattern. According to the earlier curriculum, during the early years of MBBS, more emphasis was given to the basic knowledge of medical subjects. However, according to the new competency-based curriculum, the clinical exposure has become mandatory for the students in the first MBBS itself.[1] There are many tools designed for the teaching of applied aspects in all the subjects of the first MBBS, but the problem-based learning (PBL) has always remained the widely used tool. PBL deals in two important aspects of learning, first is, what they learn, and second is, how they learn.[2] In a standard PBL, a clinically oriented problem is provided to the students. Students are expected to dissect the problem and attempt to identify the condition by correlating the clinical feature and laboratory findings.[3] Many previous studies have shown that PBL-based teaching is associated with better "deeper" learning of topic as compared to the traditional teaching.[4]

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Despite the fact, there are numerous advantages of PBL, but there are a few associated disadvantages too. In a typical

PBL, when the PBL exercise is given to them, the learning objectives are not shared with the learner. A first MBBS student, who is naive about the complexities of the medical curriculum, may not understand his learning requirements. This may result in a non-achievement of the learning goals of an individual.[5]

Hence, the present study was designed with an aim to develop and validate a modification in existing PBL in the form of pre-directed PBL (PD-PBL), where the learning objectives and outcomes will be shared with the learner at the time of giving the exercise.

MATERIALS AND METHODS

The present study was designed as an educational interventional study in the Department of Physiology of Geetanjali Medical College and Hospital between January 2020 and February 2020. One hundred forty-three students from 1st-year MBBS participated in the study. The study was conducted after obtaining approval from the Human Research Ethical Committee. An informed consent was taken from the students.

The PD-PBL session was planned for respiratory physiology. Sensitization of faculty of the department of respiratory medicine was done, and they were involved in framing a problem (paper case on the chronic obstructive pulmonary disease). The learning objectives and the questions to determine the learning outcome were prepared. These objectives and questions were designed to provide the understanding of various physiological parameters and their derangement resulting in the disease process. The entire PD-PBL was validated by the faculty of the department of physiology and other experts from the department of respiratory medicine.

The didactic lectures were conducted on respiratory physiology and pulmonary function tests. In the meantime, the clinical case scenario (with some questions) was given to the students. The students were required to meet their learning objectives and find out the answers to the questions posed to them. They were given 1-week time to solve the given problem.

Some of the students even came back to sought for some more detail on the case for a better understanding of it. At the end of 1 week, a large group presentation session was planned, where a panel of students was randomly selected as experts, and a few students were randomly selected as speakers by random number generator. The faculty members and a respiratory physician were assigned the task of being observers. The speakers presented the case and discussed the learning outcome in front of the large group. The panel experts (the students) also posed some conceptual questions to the speakers. It was followed by the open house discussion, where the students (audience) also participated in the discussion. In case, the questions were beyond the knowledge of students, they were answered by the faculty and respiratory physician.

Students' feedback, with the help of a questionnaire (using Likert scale), was taken at the end of the session. Focused group discussion (FGD) was done to take the faculty feedback. Students' feedback was analyzed manually and expressed in terms of percentage for each response.

RESULTS

After analyzing the students' feedback [Figure 1], it was observed that 62.9% of students strongly agreed and 31.5% agreed that the learning objectives were defined at the beginning of the session, which had helped them achieving them the desired learning of the topic. About 61.5% of students strongly agreed and 33.6% of students agreed that they found an improvement in their analytical skills after the session. About 67.1% of students strongly agreed and 27.3% of students agreed that they could better correlate the physiological basis of the clinical problem. About 57.3% of students strongly agreed and 34.3% of students agreed that they had worked in teams and developed the team spirit. However, 7.7% of students remained neutral on this aspect. About 57.3% of students strongly agreed and 30% of students agreed that they felt encouraged to participate in the group discussion before and during the presentation session of the PD-PBL, whereas 11.2% of students chose to remain neutral. About 52.4% of students strongly agreed and 35.6% of students agreed that the presentation session was useful in clearing their doubts, which arose during the self-directed learning period. About 60.8% of students strongly agreed and 27.3% of students agreed that applied physiology should be taught in PD-PBL sessions, whereas 2.8% of student disagreed with this methodology of teaching and learning.

Some of the verbal/feedback responses from faculty were (1) "*The session was great. Students participation was commendable but, how many times, we can conduct such session*?" (2) "*I was thrilled to see the involvement of students at first MBBS level*, *I still yearn to see such enthusiasm in final year students.*"

DISCUSSION

The medical education technologies, across the globe, are acquiring newer tools to achieve higher domains of learning. The PBL is an important tool to develop analytical skills in students.[6] However, in a traditional PBL, the learning objectives and outcome are not shared with the students. In the first professional of MBBS, the students require early

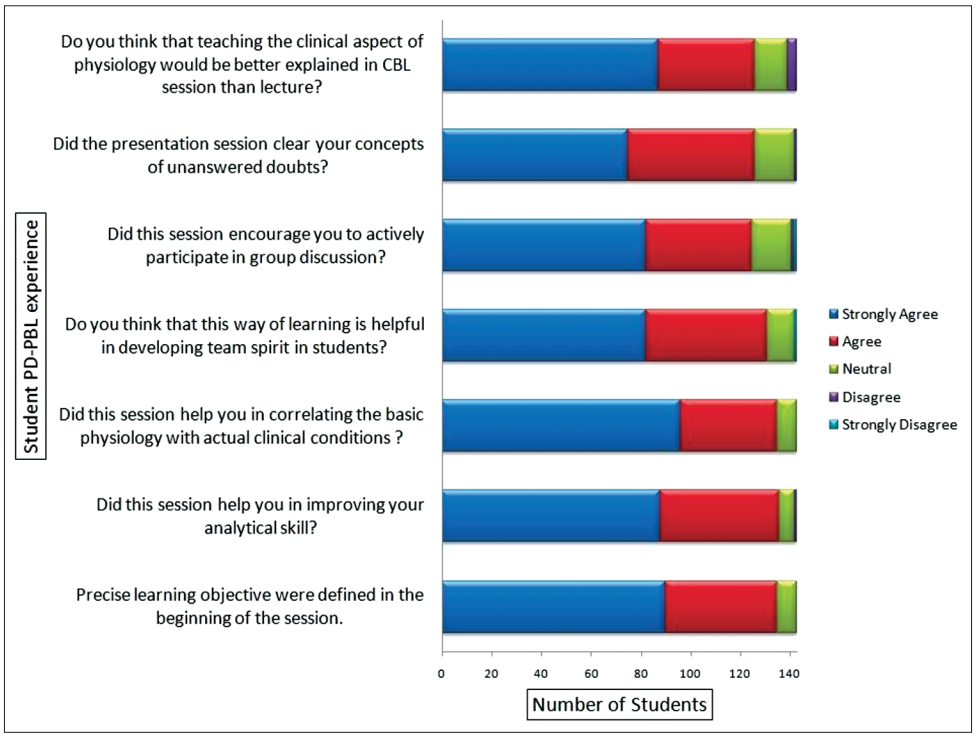

Figure 1: Students feedback analysis. X-axis – shows the students response on the Likert scale (Strongly agree, Agree, Neutral, Disagree, and Strongly disagree). Y-axis – shows students Pre-directed problem-based learning (PD-PBL) experience; These seven-question were asked for the assessment of PD-PBL session

clinical exposure, but they have limited exposure and aptitude for clinical case studies. Hence, if these students are given PBL, along with learning direction in the form of objectives and outcomes, it would facilitate learning and minimize their learning gaps.

The present study also reports that the students appreciated in PD-PBL in terms of understanding the physiological aspects of the disease processes, correlation of various aspects of clinical history with laboratory findings, X-ray picture, and pulmonary functions.

The students expressed that PD-PBL is a better learning tool, where they had learned the importance of teamwork while working on the problem. They also had found the presentation quite informative and productive.

The faculty had also complemented on the efforts made by students, but they had their reservations about the feasibility of the tool, as it is quite laborious and meticulous further on FGD, it was proposed that PD-PBL could be designed for most important, community-based scenarios, which a student is most likely to come across when he reaches the clinics. This would enhance problem-solving abilities and prepare him as a competent medical graduate.

Although PD-PBL has many advantages, PD-PBL teaching pattern also has some issues. First, it is not equally effective in all subjects. For example, for anatomy, a traditional lecture and dissection session would be far effective. Second, the problem is associated with the participation of all the students. We have come across many students who do not take much part in the discussion because they already had enough knowledge about the topic. There is a second group of overenthusiastic students who, again and again, attempt to show their knowledge by interfering with the session.

CONCLUSION

In medical education, teaching methodology is ever-evolving. In most of the medical subjects, PBL is an effective way of learning. Its "effectiveness" lies two components – (1) a well prepared clinical problem and (2) active students participation with appropriate guidance. However, in a PBL session, students are not aware of the learning objectives of the session. It might compromise the effectiveness of the complete exercise. To overcome this weakness of a standard PBL, we introduced PD-PBL. PD-PBL is PBL session, in which students are well aware of the learning objectives of the session, which helps them to direct their thinking process and efforts in the appropriate direction. The present study results indicate that PD-PBL session is effective in orienting the student's interest and attention in correlating the clinical condition with the knowledge of basic physiology. Hence, PD-PBL would be helpful in correlating the knowledge of the basic subject with the clinical scenario. Further studies are needed to evaluate the effectiveness of PD-PBL sessions in other subjects.

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