

Introducing Case Study-based Panel Discussion as an Effective Means of Self-Directed Learning in Phase 2 MBBS Students: A Cross-sectional Study

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ABSTRACT

Introduction: The introduction of Competency Based Medical Education (CBME) curriculum in 2019 in India has endorsed many new concepts like Early Clinical Exposure (ECE), Self-Directed Learning (SDL) etc. SDL is an active learning approach in which case-based scenarios are provided and learners are guided by questions, leading them to answers using recommended learning resources.

Aim: To evaluate the outcome of introducing case study-based panel discussion as SDL and analyse student and faculty perception.

Materials and Methods: This was a cross-sectional study conducted in Department of Pathology at ESIC Medical College, Faridabad, Haryana, India from May 2021 to October 2021 on 100 Bachelor of Medicine and Bachelor of Surgery (MBBS) phase 2 students. First, Didactic Lecture (DL) was taken on Diabetes Mellitus (DM). Then case study-based panel discussions were done during the practical classes assigned for SDL. Students were divided into five cohorts of 20 students each. Two faculty members were assigned for each cohort of 20 students. The assigned faculties observed and gave their inputs to their

respective cohorts. Data from pre and post-test questionnaires having 15 Multiple Choice Questions (MCQ's) both theory (n-7) and problem based learning questions (n-8) was analysed statistically. Feedback from students and teachers was collected using a questionnaire in the five-point Likert scale format.

Results: The pre (8.43±1.79) and post-test (12.53±1.46) scores comparison revealed statistically significant ($p < 0.001$) improvement in the post-test scores. An 89% of students opined that Case-Based Learning (CBL) improved their clinical, logical, analytical and communication skills and 92% students found the whole experience of CBL enjoyable. A 100% of the faculty felt the whole experience was motivating (25% strongly agree and 75% agree) and 33.34% of faculty strongly agreed that CBL helped in bridging the gap and 41.67% strongly agreed that it improved student involvement. However, all faculty found it to be time consuming (25% strongly agree and 75% agree) and 83.34% felt it was an extra burden for them.

Conclusion: Students reported an improvement in their learning, interaction, communication and analytical skills through the introduction of this innovative method of teaching Pathology using case study-based panel discussion as a means of SDL.

Keywords: Diabetes, Didactic, Pathology, Problem based learning

INTRODUCTION

The SDL has become an integral part of MBBS curriculum after the implementation of CBME in 2019 [1]. SDL requires efforts and policies both at the teachers' level and at the institutional level [2]. SDL is a promising methodology that promotes students in becoming lifelong learners [3,4]. It promotes higher order cognitive skills and increases self-efficacy of the students. Onus of learning lies with the learners [5]. Malcolm Knowles in 1975 best described SDL as "a process in which individuals take initiative, with or without the help of others, in diagnosing their own learning needs, formulating goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes". Willingness of the learners to drive their own learning was added later to the definition of SDL [6].

SDL has been conducted with different approaches. The two main ways are case scenario-based and problem-based learning. One form of SDL exercise practiced is to give case-based scenarios to the students and guide them with questions, encouraging them to find answers using recommended learning resources [7]. Panel discussion fosters student engagement in learning [8]. It facilitates clarification on complex topics, highlights the multidimensionality of the topic under discussion, and develops critical thinking in both panelists and the audience fostering logical thinking. It also improves

presentation skills and augments self-confidence. It initiates the cognitive aspects in an interactive way. With correct planning and use, panel discussions are a stimulating and effective teaching tool [9]. Case study-based panel discussion approach helps students gain in-depth knowledge and help build correlation between various sign/symptoms and presentation which would facilitate in attain a diagnosis. Evidence showed that this promoted the learning of the young future doctors (MBBS Phase 2 students) by their own initiative, interest and discussions among peers leading to better understanding of the disease processes [10].

Phase 2 comprises of para-clinical phase i.e., second professional which is of 12 months duration consisting of para-clinical subjects namely Pathology, Pharmacology, Microbiology, Community medicine, Forensic medicine and Toxicology [11].

In this study, the authors intended to introduce case study based panel discussion as an innovative and effective means of SDL in Phase 2 MBBS students.

MATERIALS AND METHODS

This was an institution-based cross-sectional study conducted in Department of Pathology at ESIC Medical College and Hospital, Faridabad, Haryana from May 2021 to October 2021 on MBBS phase 2 students after approval of the Institutional Ethics Committee

(IEC) of the college (134/A/11/16/Academics/MC/2016/182 dated 9.04.2021). The intake strength of the institute is 100 students per batch.

Inclusion criteria: MBBS phase 2 students who were willing to participate in the study were included in the study.

Exclusion criteria: MBBS phase 2 students who were not willing to participate in the study were excluded from the study.

Sessions within the curriculum in pathology were identified when students were taught DM using DL. Students were divided into five cohorts of 20 students each from a batch of 100 students who volunteered for case study-based panel discussion. Four different cases studies on DM A, B, C, D were identified to be discussed with each cohort. Faculties were assigned to each cohort who moderated the discussion with a checklist to maintain the uniformity. All students were asked to prepare all the four case studies (A, B, C, D) on DM and the schedule was planned in advance. This ensured that all the 100 students were exposed to all four cases of DM.

Panel discussions were done during the practical classes assigned for SDL. Five cohorts were run in parallel for 1.5 hours in different places in the department. The roll numbers assigned to the students were taken as sampling frame and five students were randomly selected using random number tables. The selected five students out of cohort of 20 students formed the panel for the first case study while the rest listened and questioned the panelists as an audience following which they shared their thoughts and queries regarding the case. Each panel discussion lasted for 20 minutes in which panelist discussed the case for eight minutes followed by discussion with participants for 10 minutes. Two faculty members were assigned each for five groups of 20 students each and additional two faculties were invited from Department of Physiology and Community medicine for integration and alignment. Faculty gave their inputs in the last two minutes. The assigned faculties observed and gave their inputs to their respective cohorts. A set of another five panelists were chosen for the next case study and the process was repeated.

Therefore, all four cases were discussed by four groups of different panelists in a span of 1.5 hours in each cohort. At the end of the panel discussions the entire batch assembled, and the faculty debriefed the entire class on the salient features of all the four cases studies and consolidated their learning's. Debriefing was done in the next practical session for one hour about the entire clinical presentation of Diabetes.

Questionnaire having 15 MCQ's both theory (n-7) and problem based learning questions (n-8) was shared with students before and following the case-based panel discussion. Each right answer was given one marks and no negative marking was done.

Feedback forms regarding the sessions were shared with both the students and the faculties. It contained 10 items with responses on Likert scale comprising: 1) Strongly agree; 2) Agree; 3) Undecided; 4) Disagree; and 5) Strongly disagree. Pre and post-test scores were recorded. Student's feedback to assess the effectiveness of case study-based panel discussion sessions was taken based on questionnaire having 10 items on the five-point Likert scale comprising: 1) Strongly agree; 2) Agree; 3) Undecided; 4) Disagree; and 5) strongly disagree. Completed questionnaires were collected and data analysed. Experts from the Pathology department who were not study participant reviewed and finalised the questions.

STATISTICAL ANALYSIS

The data obtained was entered in Microsoft Excel sheet and statistically analysed using Epi Info version 7. The scores were presented as mean and standard deviation. The feedback of students and faculty were presented as proportions. The statistical analysis was done using Student paired t-test for comparing mean pre and post-test scores. Statistical significance was set at p-value ≤ 0.05 .

RESULTS

A total of 100 students participated in the study. The pre and post-test scores comparison revealed significant improvement in the post-test scores [Table/Fig-1]. The pretest score was 8.43 ± 1.79 while the mean of post-test score was 12.53 ± 1.46 and this was statistically significant. On further analysis, problem based questions showed significant statistical improvement while the theory based question did not show much difference. Mean score of problem based question in pretest was 4.20 ± 1.16 . While score of problem based question in post-test was 6.43 ± 1.15 and was statistically significant. Mean score of theory based question in pretest was 4.73 ± 1.12 while in the post-test it was 5.11 ± 1.10 but the difference in score was not statistically significant [Table/Fig-1].

Variables	Mean \pm SD	p-value
All MCQ pretest (number of question=15)	8.43 \pm 1.79	<0.001**
All MCQ post-test	12.53 \pm 1.46	
MCQs with problem based questions pretest (number of questions=8)	4.20 \pm 1.16	<0.001**
MCQs with problem based questions post-test	6.43 \pm 1.15	
MCQs with theory based questions pretest (number of questions=7)	4.73 \pm 1.12	0.89
MCQs with theory based questions post-test	5.11 \pm 1.10	

[Table/Fig-1]: Mean MCQ scores of students: pre- and post-case study-based panel discussion session.

**A p-value < 0.05 was considered to be statistically significant

Student feedback regarding introduction of case study-based panel discussion as an effective means of SDL method is shown in [Table/Fig-2]. In the present study, students opined that CBL is a more interesting method of teaching learning as compared to DL (35% strongly agree, 58% agree). Students also opined that CBL improved their clinical, logical, analytical and communication skills. Most of the students found the whole experience of CBL enjoyable. However, a few students (8%) felt that CBL did not improve their oral presentation skills.

Questions	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Was the whole experience enjoyable.	30	62	4	2	2
CBL helped break the monotony of Didactic Lectures (DL).	25	65	6	3	1
CBL improved my clinical, logical and analytical skills.	31	58	8	2	1
CBL improved my communication skills.	29	59	5	5	2
CBL taught me the importance of team work.	25	60	10	3	2
CBL is a more interesting method of teaching learning as compared to DL.	35	58	3	2	2
CBL motivated me to read more about the topic.	28	61	8	2	1
CBL increased my understanding of the topic.	22	72	4	1	1
CBL improved my oral presentation skills.	26	53	13	5	3
CBL helped me to solve clinical situation by applying the concept of basic sciences.	22	57	15	5	1

[Table/Fig-2]: Students (n=100) feedback regarding introduction of case study-based panel discussion as Self-Directed Learning (SDL).

CBL: Case based learning; DL: Didactic lecture

Faculty perception of CBL using panel discussion was positive. A 33.34% of faculty as per Likert scale scoring strongly agreed that it helped in bridging the gap and 41.67% strongly agreed that it

improved student involvement while all faculty were of the opinion that it was time consuming (25% strongly agree and 75% agree) and an extra burden (83.34%) for them. At the same time 100% of the faculty felt the whole experience was motivating (25% strongly agree and 75% agree) while 58.34% agreed it improved their knowledge [Table/Fig-3].

Questions	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Has helped in student learning	4 (33.34)	6 (50)	2 (16.66)	0	0
Was useful in bridging the learning gaps	4 (33.34)	5 (41.67)	2 (16.66)	1 (8.33)	0
Students were more involved, engaged and interested	5 (41.67)	5 (41.67)	1 (8.33)	1 (8.33)	0
Was time consuming session	3 (25)	9 (75)	0	0	0
An extra burden on faculty	5 (41.67)	5 (41.67)	1 (8.33)	0	1 (8.33)
Created a sense of responsibility among the students?	3 (25)	7 (58.34)	2 (16.66)	0	0
Whole experience was motivating for faculty also	3 (25)	9 (75)	0	0	0
Has improved the faculty's knowledge about newer TLM	2 (16.66)	7 (58.34)	3 (25)	0	0
Faculty felt that CBL should be incorporate for other important topics also in Pathology	3 (25)	5 (41.67)	1 (8.33)	2 (16.67)	1 (8.33)
Should be combined with traditional TLM	3 (25)	6 (50)	2 (16.67)	1 (8.33)	0

[Table/Fig-3]: Faculty (n=12) feedback regarding introduction of case study-based Panel discussion as Self-Directed Learning (SDL).

CBL: Case based learning; DL: Didactic lecture; TLM: Teaching learning methods

DISCUSSION

Indian medical education system has seen a paradigm shift to student centered learning from being teacher centered [5]. The present study was an attempt to introduce case study-based panel discussion as a means of SDL in Phase 2 MBBS students for DM and gather and analyse student and faculty feedback on this.

It was observed in the present study that the overall performance of the students improved (higher post-test scores) after a case study-based panel discussion (SDL session) which followed a DL session. Previous comparisons between SDL and teacher-centered learning showed varying results. Pai KM et al., concluded from their study that SDL using case-based scenarios was found to be equally effective as lecture. Authors found no statistically significant difference between the mean test scores of the two groups that was subjected to SDL when compared to group that only attended lectures [12].

Contrary to the findings of the present study, Babu R et al., found the mean score after the online lecture session was significantly higher (13.08±1.32) than after the online self-paced learning session (11.58±1.46). The authors concluded that instructor-led method of learning was more beneficial than self-paced learning which is a form of self-directed learning [13].

Similar to the findings of the present study few previous studies done by Mahmoud FN Vinay G and Veerapu N and Peine A concluded on comparing the pre and post-test outcomes that self-instructed group of students performed better than students in the lecture group [14-16]. Gade S and Chari S observed that following implementation of CBL there was a significant improvement in students' performance when pre and post-test scores were compared (p-value=0.018) [10]. The authors used a paper-based case scenario of a topic taught through DL for case based learning [10]. Zia S et al., observed

that students who were exposed to both sessions of SDL and lecture showed statistically better results of MCQs test (6.5±1.47 and 6.3±1.14) with p-value <0.05 as compared to those students who attended only lecture sessions (4.8±1.38 and 4.6±1.42) with p-value <0.05 [17]. Study done by Thota S et al., found there was a statistically significant increase in post-test scores (3.78±0.72) of lecture cum SDL session when compared to post-test scores of SDL session alone (3.28±0.85) reflecting the importance of both lecture and SDL [18]. Patra S et al., in their study observed that 67% of students were satisfied and 66% were motivated to read and get into the depth of a topic after implementation of SDL [4]. Qualitative analysis showed that although the students enjoyed the SDL based learning process they also felt that facilitators could have taken a more active approach in imparting knowledge and skills.

A study done by Acharya S et al., demonstrates that the study group significantly performed better than the control group establishing the superiority of panel discussions over DLs. Student's feedback taken after the SDL session showed that panel discussions had better impact on students' self-confidence, learning, logical analysis and over all understanding of the subject [9].

Maurya A et al., concluded from their study that panel discussion was more effective than DL. Mean score of panel discussion was 15.32 and the mean score of lecture was 14.52 (p-value: 0.015). Of the students, 29.41% agreed and 70.59% strongly agreed that panel discussion method as a newer teaching learning method for quality enhancement in nursing education [8].

Similar to the findings of the present study, faculty views on SDL were very encouraging in a study done by Bhandari B et al., [19]. Contrary to the findings of the present study the students felt that SDL did not help them in improving their analytical skills. The study showed that SDL was well accepted by most of the students and faculty members and were satisfied (satisfaction index SI 70) with the approach. The students considered SDL as an effective way of learning (SI-85). However, 2% students in the present study considered lectures better than SDL as they were unable to concentrate during self-study, this finding was similar to opinion of some students in another study was Patra S et al., [4].

An 86.7% students highly appreciated CBL, 83% reported that it helped in self-study, 79.2% reported improvement in soft skills in study done by Gade S and Chari S [10]. An 86% faculty members (n=7) found CBL as a better method of teaching learning but reported that it requires more time, faculty and infrastructure similar to the findings of the present study. The whole experience was motivating for 100% of the faculty (25% strongly agree and 75% agree). A 33.34% of faculty strongly agreed that CBL helped in bridging the gap and 41.67% strongly agreed that it improved student involvement. However, all (25% strongly agree and 75% agree) faculty agreed that it was time consuming and 83.34% felt it was an extra burden for them.

Gune AR et al., concluded SDL helped in improving the understanding of the subject [20]. SDL enabled the students in honing their communication skills and also provided encouragement to the students for active participation leading to improved learning with better retention. Study done by Angadi NB et al., showed that students were of the opinion that SDL helped them to establish their learning goals. Incorporation of SDL has helped students in better understanding and correlation of subjects across the phase [21].

Agarwal P et al., observed that 84% students found SDL as a more interesting and enthusiastic method of learning whereas 10% students still preferred the conventional teaching way of DLs [22]. Faculty perception of SDL was positive. In a previous study done by Murad MH et al., the authors recommend considering SDL as an effective strategy for more advanced learners i.e. SDL should be used in the later years of medical college and in doctors in practice [23].

Limitation(s)

The present study has the limitations that it was conducted for a short duration with limited (only one) topic in Pathology and only on one MBBS batch of students. A study of longer duration with wide-ranging content area needs to be done to ascertain the impact of SDL on traditional curriculum. Validity assessment of survey questionnaires was not done.

CONCLUSION(S)

Students reported an improvement in their learning, interaction, communication and analytical skills through the introduction of this innovative method of teaching pathology using case study-based panel discussion as a means of SDL. More sessions on commonly encountered case scenarios will be beneficial for students in recalling basic science knowledge during their journey through clinical departments and finally in successful management of patients.

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