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RESEARCH ARTICLE

Learning to learn and teach: Student seminar as a teaching-learning method in undergraduate medical physiology through students' perspective

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ABSTRACT

Background: The efficacy of traditional lectures has been debated. Still a predominant form of educational technique, lectures have failed to transfer concepts as effectively as active learning approaches. Innovative teaching-learning methods such as students' seminars that can hold the attention span of the students for a longer time need to be explored. **Aims and Objectives:** The aim and objective of this study were to evaluate the efficacy of student seminar as a teaching-learning method in undergraduate physiology through students' perception. **Materials and Methods**: This was a cross-sectional questionnaire-based study conducted in a private medical college of Pune, across 3 years involving 596 1st-year MBBS students of three academic year batches. The selected topic was divided into five subtopics to be presented in 10–12 min. Five volunteers from students presented a subtopic under a teacher's guidance, while the non-presenting students read the topic too before attending the students' seminar. A questionnaire containing 13 questions of both open-ended and close-ended types was designed to extract feedback from the students. The data were analyzed in Microsoft Excel. **Results:** Majority of the students gave a positive feedback to various aspects of the seminar. Negative response was given to only two items in the questionnaire. **Conclusion**: Students' seminar is a potentially important resource of teaching-learning method yet to be fully tapped and hence needs to be incorporated on a regular basis in the medical curriculum.

KEY WORDS: Student Seminar; Undergraduate Medical Physiology; Teaching-learning Methods, Students' Perspective

INTRODUCTION

Medical students are expected to understand, retain, and apply a challenging amount of knowledge and skills in a limited time during their training in medical school.[1] Physiology is a subject that is integral to the studies of all health science students.[2] Students find it challenging to cope with understanding physiology.[2-4]

The famous American writer, lecturer, and humorist, Mark Twain (Samuel Clemens) had written: "Few sinners are saved after the 1st 20 min of a sermon" (presumably because no one is listening after 20 min). When teachers focus on content and limit the time for thinking as it happens in lectures, students seem like parrots, repeating what they believe the teacher wants to hear and tending to forget much of the information learnt.[5] According to the regulations by the Medical Council of India, teaching-learning methods shall be student centric. The student should be made competent to become a life-long learner committed to

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continuous improvement of skills and knowledge. Learning experiences such as small group discussions, patient care scenarios, workshop, seminars, role plays, and lectures should be incorporated in the curriculum.[6]

The term "best evidence medical education" was coined to describe the implementation of methods and approaches to education based on the best available evidence.[7] Many educators opine that central to the success of all health-care professions education is the development of the autonomous learner who can acquire and integrate new information without the constant presence or supervision of an instructor.[8] Evolution in medical education and training has resulted in moving away from traditional classroom-based didactic methods toward more student-centered activities like active learning.[1] Active learning has been defined as the process of involving students in doing things and thinking about the things they are doing.[9] Active learning methods are supposed to leave students with a greater level of knowledge and better learning skills compared with students exposed to other forms of learning.[10] Medicine has long cherished the tradition of the student as teacher. Furthermore, as medical students learn teaching methods, they become more effective communicators and enhance their patients' success at learning the information they need for managing their own health and treatments as well.[11] Hence, it is essential for the students and the faculty to experiment innovative and active learning methods such as student seminars.

In the recent years, with the MBBS admissions becoming centralized through National Eligibility Cum Entrance Test rather than through State Level Entrance Test, the demographics of medical students in Indian Medical Colleges have changed. This reduces the probability of the past studies on various teaching-learning methods being applicable today, bringing up a new issue.

Questionnaires are widely used curriculum assessment tools because they provide a lot of information rapidly, at a small cost, and with minimal staff involvement. It is of utmost importance to ask for the opinions of the students who receive the education. Hence, student surveys serve as an important measure to evaluate academic programs.[12] To the best of our knowledge, there is limited research studying students' seminar as a method of teaching-learning for undergraduate medical physiology. In light of the above facts, the present study was carried out with the objective of assessing students' perception about students' seminar as a teaching-learning method in undergraduate medical physiology.

Aims and Objectives

The aim and objective of this study were to evaluate the efficacy of student seminar as a teaching-learning method in undergraduate physiology through students' perception.

MATERIALS AND METHODS

This cross-sectional questionnaire-based study was conducted in a private medical college of Pune, across 3 years involving 1st year MBBS students of academic year batches 2015–16, 2016–17, and 2017–18. A questionnaire containing 13 questions of both open-ended and close-ended types was designed to extract feedback from the students. The institutional ethical clearance was obtained. It was distributed at the beginning of the seminar, instructing them to fill it up at the end of seminar. Written informed consent of all the students was obtained. The questionnaires were collected after the seminar was over. The sample size was 596, though we had envisioned a still larger sample size of around 750 (250 students in each of the three batches). However, 99 students were absent, 36 questionnaires were rejected due to incomplete or incorrect filling, and 19 questionnaires were blank, amounting to a total reduction of sample size by 154.

An academically important topic from the subject of physiology was selected by the faculty members of the department of physiology. The topic selected for both the academic years 2015–16 and 2017–18 was Cerebellum and that for 2016–17 was neurophysiology of vision. The topic was then divided into five subtopics. Students' guide was appointed by the Head of Department among the assistant professors. An announcement was made in the lecture hall 4 weeks before to encourage voluntary participation in seminar. Non-presenting students were also instructed to read the topic thoroughly. Five students were selected on first–come, first-serve basis. Subtopics were allotted among them by lucky draw. Students were then given instructions to read the topic thoroughly, gather information from the library and the internet, prepare written notes, and meet the teacher-in-charge after 5–7 days. After 5–7 days, the guide went through the students' notes, checked the authenticity of the matter taken from the internet, and solved the students' doubts. Now, the students were instructed to prepare powerpoint presentations (PPTs) in 5–7 days. Again, the guide checked the PPTs and cleared doubts of the students. Now, the students were again given 5–7 days for preparing in such a way that they present their respective subtopics in a maximum duration of 10–12 min. The guide conducted a trial students' seminar and encouraged students to use whiteboard, pointers, and videoclips if suitable, interact with the audience, and invite queries from audience (non-presenting students and faculty members). They were also instructed to show practically few tests in clinical examination, wherever required.

The faculty members from the departments of other pre-clinical and clinical subjects were also invited well in advance to attend the students' seminar along with the faculty members of the department of physiology. All the three seminars were arranged from 9:30 a.m. to 11:30 a.m., a total of 2 h duration. On the day of students' seminar, the guide coordinated the program, and students presented their respective subtopics

and were assessed by the judges (three selected from senior faculty). After each student finished with his/her subtopic, the audience as well as the judges was free to ask queries to the presenter. In case, the student was not able to give a satisfactory answer to any question, and the question was transferred to the audience. At the end, 1st and 2nd prizes along with certificates of participation were handed over to the students.

RESULTS

Findings of the present study are depicted in Tables 1-3 and Figure 1.

DISCUSSION

In the present study, analysis showed that out of the 13 items in the questionnaire, majority of the students gave positive feedback to all the items except for two items to which they majorly gave a negative response. Similar studies done previously on active learning in physiology show findings consistent with ours.[10,13-17]

Most students in our study found the seminar interesting and were looking forward to it [Table 1 - Questionnaire item No. 1 and 6]. These findings of our study are consistent with those of Devi *et al.*[10] and Gomathi *et al.*[18] However, our findings contradict those of Jaykaran *et al.*[19] in which not a single student found seminar as interesting, and Garg *et al.*[20] in whose study only 1 of63 found it interesting.

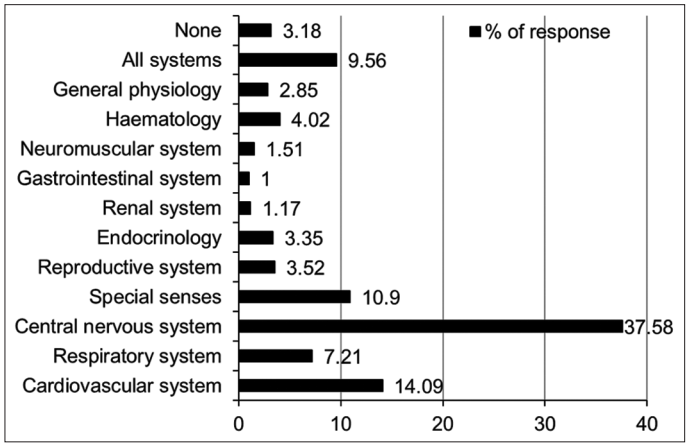

Figure 1: Students' preferences of various systems for seminar topics expressed as percentages

Majority of the students found seminar a better method of learning as compared to traditional lectures [Table 1 - Questionnaire item No. 2]. Bahmed *et al.*[14] too got a similar result.

Furthermore, most students preferred seminar to be a part of routine teaching [Table 1 - Questionnaire item No. 3]. In a study by Bhosale *et al.,*[21] students opined that seminars are good adjuvants to routine teaching. Devi *et al.*[10] too found a similar result.

In our study, most students wanted more seminars to be conducted in their academic year which again reflects the students' interest [Table 1 - Questionnaire item No. 5]. However, this was opposed to Garg *et al.*[20] finding that just 1.6% wanted more seminars to be conducted.

Most students felt stimulated to read the topic [Table 1 - Questionnaire item No. 8], which again was inconsistency with the findings of Devi *et al.*[10] and Gomathi *et al.*[18]

All the above findings of our study substantiate that students' seminar kindles fun among them and hence facilitate learning. Learning is not committing a set of facts to memory, but the ability to use resources to find, evaluate, and use information. Memorizing discourages deep thinking. Deep thinking is imperative for understanding. To stimulate thinking, learning should be made fun.[5]

Majority acquired additional information on the topic [Table 1 - Questionnaire item No. 7], and this too was consistent with the findings of Devi *et al.*[10] and Gomathi *et al.*[18] in their respective studies. The amount of knowledge transferred from the lecturer to the student is relatively

Table 1: Distribution of the students according to their responses for each item in the questionnaire (*n*=596)

Q. No.	Feedback	Yes	No	Cannot say
		n (%)	*n* (%)	*n*(%)
1.	It was interesting	450 (75.5)	85 (14.26)	61 (10.23)
2.	It is a better method of learning than traditional lectures	373 (62.58)	115 (19.29)	108 (18.12)
3.	It should be a part of routine teaching	363 (60.9)	146 (24.49)	87 (14.59)
4.	It should replace revision classes	258 (43.28)	267 (44.79)	71 (11.91)
5.	More seminars should be conducted in the academic year	413 (69.29)	94 (15.77)	89 (14.93)
6.	I was looking forward to this activity	380 (63.75)	113 (18.95)	103 (17.28
7.	I have acquired additional information on the topic today	401 (67.28)	104 (17.44)	91 (15.26)
8.	I feel stimulated to read the topic	424 (71.14)	87 (14.59)	85 (14.26)
9.	I had come prepared for the topic	391 (65.6)	205 (34.39)	

Table 2: Distribution of students according to their point of view from which the program was helpful

Q. No. 10	Seminar was helpful from the point of view of -	% of response
a.	Theory	32.71
b.	Practical	15.77
c.	Both	49.66
d.	None	1.84

Table 3: Distribution of students according to their choice for seminar extension at various levels expressed as percentages

Q. No. 11	Seminars should be conducted in -	% of response
a.	All three 1st year subjects as horizontal teaching	30.2
b.	At intercollegiate level	6.54
c.	After completion of each system	17.78
d.	All of the above	45.46

small.[22] Incremental active learning is a promising approach for building effective and robust medical concept extraction models while significantly reducing the burden of manual annotation.[23]

The most chosen topic for seminar was central nervous system, followed by cardiovascular system which in turn was followed by special senses [Figure 1]. This may be according to the level of difficulty of the topic from the students' perspective. Only 3.18% of students did not want seminar on any topic.

It is also seen that most students felt that the program was beneficial to them from the point of view of both theory and practicals [Table 2]. A very negligible percentage of 1.84% felt that it was not helpful from either theory or practical point. It covers both theoretical and practical aspects and hence is time saving. This is an important finding and can be harnessed to schedule the timetable of 1st year MBBS teaching program.

The fact that, in our study, majority of the students felt students' seminars should be extended as an activity in horizontal teaching, at intercollegiate level and at the end of each lecture, illustrates the approval of students for this simple yet effective method [Table 3].

In response to an open-ended question which asked for any suggestions from students, some comments were worth pondering upon. For example, 48.6% of students commented: "There should be more blackboard teaching." This may be owing to various features of blackboard teaching such as its spontaneity, flexibility, nonlinearity, and better flow of thought supported by natural breaks by the peer teacher (e.g., while writing or cleaning the blackboard), allowing peer learners to more easily follow the material and make notes, and have better retention of the subject.[24,25] Other comments include: "More number of people should get an opportunity to participate" and "everyone should get a prize," again prove the students" approval regarding this activity. Few negative comments like "seminars are a time waste" and are "boring" were also given.

Most students gave negative feedback to the questionnaire item which asked whether students' seminar could replace revision classes [Table 1 - Questionnaire item No. 4]. This may be due to their academic immaturity to function as adult learners.[13] Majority of the students mentioned that they did not come prepared with the topic [Table 1 - Questionnaire item No. 9]. This finding of our study concurs with Konda *et al.*[26] but contradicts those of Parekh *et al.*,[13] and Joshi *et al.*,[27] who observed that students not only referred to the topic before they attended the lecture but also developed curiosity about the unsolved activities. The unpreparedness of the students in our case may be due to lack of motivation when they are not themselves presenting leading to a passive attitude of the students. Remodeling the traditional patterns of seminar by addition of quiz,[18,28] test sessions,[28] role plays,[28,29] problem-based learning[28,30] and group discussions[28,31] with seminars have shown to accentuate the students' interest, enthusiasm, and motivation hence imbibing the learning spirit. Yet, a point worth mentioning is that, in the current study, though only few non-participants had prepared and come, the sessions turned out to be quite interactive due to the queries and discussion stimulated by the students (presenters and non-presenters). Furthermore, the overwhelming response from the students also encouraged many faculty members to experiment and explore other teaching-learning methods.

The molecular signals associated with stress can facilitate synaptic potentiation in brain circuits involved in the formation of memory and also can be behaviorally reinforcing to learning. However, higher levels of stress can have opposite effects.[11] The relaxed teaching environment in student seminars as compared to faculty-led sessions may be judiciously employed to moderately engage the stress system to get the desired effects.[11,29] Furthermore, student seminars allow the students to personalize learning at their own pace within the time-tabled slots,[13,27] hence decreasing their stress. In our study, the students' inclination toward seminar as reflected by their feedback may owe to the stress-free ambience of students' seminar.

In addition, student seminars give the presenting students a good exposure to the teaching profession. In view of the rising pressure for junior doctors to choose career pathways earlier,[32] student seminars at the undergraduate level will definitely enable them to choose a career which suits their interests.[33]

Strength of the Study

Our study has analyzed a large sample size across students of three separate (but consecutive) academic batches.

Limitations of the Study

Questionnaires were only locally validated. Analysis with pre-test and post-test questionnaires would have been more supportive but was not done in the present study. We have analyzed only one teaching-learning methodology, i.e., students' seminar, but several teaching-learning methodologies should be studied to gain a more global perspective on the entire curriculum.

CONCLUSION

Student seminars should be incorporated as a teaching-learning method in the medical curriculum on a regular basis and utilized by the teaching faculty for teaching physiology, as students definitely appreciate the method. Students' seminar is a potential important resource of teaching-learning method yet to be fully tapped. Modifications to design a still more organized and structured method require continuous research on teaching-learning methods. Further studies are also warranted to assess the students' preferences of teaching-learning methods across various medical subjects, to facilitate an integrated approach in teaching-learning.

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