National Journal of Physiology, Pharmacy and Pharmacology

RESEARCH ARTICLE

Use of scenarios to increase the effectiveness of lecture-based sessions in pharmacology

Sushil Sharma, Navdeep Dahiya

Department of Pharmacology, Armed Forces Medical College, Pune, Maharashtra, India

Correspondence to: Sushil Sharma, E-mail: sushkehar@rediffmail.com

Received: August 25, 2016; **Accepted:** January 23, 2017

ABSTRACT

Background: The current system of pharmacology teaching in India is mostly through lectures, which is a teacher oriented, monotonous and passive way of learning and does not encourage higher order thinking or ability to critically appraise the new information. Further, the lecture-based sessions ensure that the medical students are overloaded with facts about hundreds of drugs, but they find it difficult to integrate this knowledge into clinically relevant situations or apply them to the management of patient's illness. However, lectures are still a very important teaching-learning (TL) method especially for large group teaching and need to be continued as they are a part of curriculum in India. Hence, there is a dire need for innovative approaches to increase the effectiveness of lecture-based pharmacology teaching to MBBS students. **Aims and Objectives:** To study the effect of scenarios in increasing the effectiveness of lecture-based sessions in pharmacology teaching of MBBS students. **Materials and Methods:** A few important chapters of pharmacology were covered through traditional lecture-based approach and the last 15 min were devoted for the discussion of scenarios relevant to the topic of the session (lecture + scenarios approach). The scenarios were prepared to ensure that they incorporate the specific learning objectives of the TL session and to also cover the major pharmacological principles of the topic. Further, these scenarios were prepared to aim for the higher levels of cognitive domain such as application, analysis, and synthesis. These lecture + scenarios sessions were compared with pure lecture-based sessions that were simultaneously conducted by other faculty members of the department. **Results:** More than 90% of the students found that use of scenarios at the end of the lecture made the TL sessions more interesting, interactive, student oriented, and also helped to increase their attention span. More than 85% of the students felt that the scenarios were greatly helpful in understanding the pharmacological concepts, improved critical thinking and made them more motivated to do self-study. The attendance of the students was substantially higher for the lecture + scenario sessions (91%) as compared to the pure lecture-based sessions (80%). The students' test scores in topics conducted by lecture + scenarios sessions were higher (62%) when compared with topics covered through pure lecture-based sessions (54%). **Conclusions:** The use of scenarios at the end of lecture-based pharmacology session helps to make the lectures more interesting, interactive, relevant, and finally effective TL sessions for MBBS students.

KEY WORDS: Scenarios; Lectures; Pharmacology

Access this article online	
Website: www.njppp.com	Quick Response code
DOI: 10.5455/njppp.2017.7.0825423012017	

INTRODUCTION

The undergraduate (UG) teaching in pharmacology has always been a challenging task for medical teachers. The current system of teaching pharmacology especially in India has been traditionally lecture - based and is likely to remain so at least for the next few years. Traditional lecture

format, notwithstanding its many advantages as a large group teaching-learning (TL) method, is a monotonous and passive way of learning.[1] This type of TL method is teacher oriented and the students consider such lectures to be occasions where they are expected to passively sit back and soak up knowledge. Further, lecture-based teaching used in the present form is not an effective method of encouraging higher order thinking and gives very little opportunity to process or critically appraise the new information that has been received during the lectures.[2]

Moreover, due to the vast and ever advancing nature of the subject, it usually becomes difficult to keep the content interesting and meaningful. As a result, the current lecture-based TL sessions ensure that the under-graduate medical students are given plenty of information about various theoretical aspects of pharmacology but there is a big void in the clinical application of this knowledge.[3] This is because even though the students are overloaded with facts, they find it difficult to integrate them into clinically relevant situations and ultimately apply them to the management of patient's illness.[3] The result is that pharmacology is perceived by many UG students as a dry and difficult 2nd MBBS subject.[4] A survey by Vasundara et al. (year 2010) to assess the clinical application of pharmacology knowledge in patient care found that pharmacology teaching needs radical changes.[5] Even the Medical Council of India in its vision document is emphatic about the need to make the teaching of basic sciences clinically relevant for the students.[6]

One popular alternative to lecture-based teaching is problem-based learning (PBL) which is based on problems usually written around clinical cases. Students work through these problems defining what they do not know and what they need to know to understand the problem.[7] Here, the teachers serve as facilitators who build the learning environment, initially providing guidance in the early stages and later, as learners gain expertise the guidance is gradually scaled down.[8] The PBL approach encourages the students to be "adult learners" and teaches them to analyze and research problems. However, PBL is a drastically different process from our current TL process, is most effective as a small group teaching tool, is very resource intensive and requires complete revamping of the current syllabus.

A number of methods and new techniques have been tried by various academicians elsewhere. Introduction of problem-solving interactive clinical seminars for UGs has been found to make the learning process more effective.[9] A number of researchers have also tried integration of two or more subjects in UG curriculum and found encouraging results.[10] But most of these approaches have been used as small group TL methods and are time and resource intensive.

There is an urgent need to implement some innovative techniques to improve our lecture-based teaching and learning which can be reasonably applied within our framework. One approach that can be used in our current setup is the judicious use of scenarios as a supplement to traditional lecture-based sessions.[11] The term "scenario-based learning (SBL)" refers to any educational approach that involves the use of scenarios to bring about desired learning intentions.[11,12] Scenarios may constitute a given set of circumstances, a description of human behavior, an outline of events, a story of human endeavor, an incident within a professional setting, or human dilemma. In this context, a scenario would be a clinical situation requiring applied knowledge of pharmacotherapeutics.

Objectives

This study was undertaken to study the perceptions, attendance and test scores of the students' on lecture + scenario based sessions as compared to pure lecture-based TL sessions.

MATERIALS AND METHODS

Study Design

The study was a medical education interventional study conducted in the Department of Pharmacology of a medical college.

Study Population

The study was conducted on 2nd year MBBS students of the medical college as part of their regular training program after taking approval from the Institutional Ethics Committee. All 135 students of IV term/semester who came to attend pharmacology lectures were explained the study and consent taken before the start of the TL sessions.

Time of Study

The study was conducted between October 2015 and March 2016.

Methodology

A few important chapters of pharmacology were identified and made part of the study to be covered in 20 sessions over a period of 3 months. These chapters were covered through traditional lecture-based approach and the last 15 min were devoted for the discussion of scenarios relevant to the topic of the session (lecture + scenarios approach). The scenarios were prepared to ensure that they incorporate the specific learning objectives of the TL session and also cover the major pharmacological principles of the topic. Further, these scenarios were prepared to aim for the higher levels of cognitive domain such as application, analysis, and synthesis. Students were encouraged to participate actively in a friendly, nonthreatening environment. At the end of the study period, these lecture + scenarios sessions were compared with pure

lecture-based sessions that were simultaneously conducted by other faculty members of the department during the same period. A representative power point slide showing examples of scenarios created during the study are shown in Figure 1.

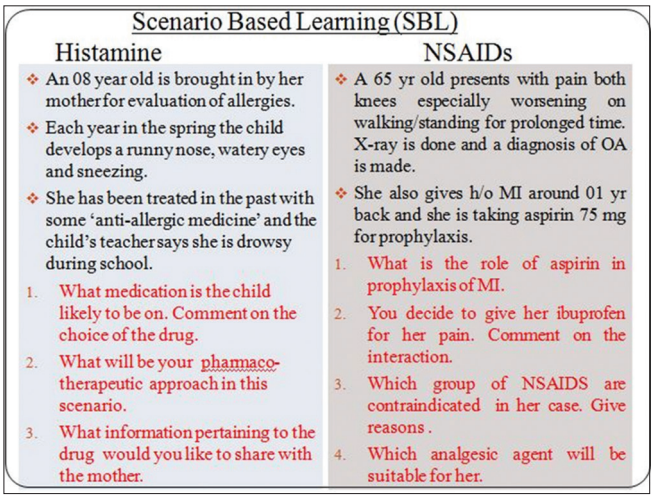

Figure 1: Representative examples of scenarios

Outcome Measures

The following were considered as outcome measures of the influence of the scenarios on the lecture-based sessions.

Feedback questionnaire

At the conclusion of the TL sessions, the students were asked to evaluate the approaches - pure lecture versus lecture + SBL by filling the validated feedback questionnaire anonymously. The questionnaire consisted of structured (based on Likert scale) and open-ended questions regarding the suitability, usefulness, interest generated, motivation levels, and other desired learning outcomes of the sessions. The responses obtained in the feedback questionnaires were then analyzed using descriptive statistics.

Attendance

The average attendance in the lecture + scenario sessions was noted and compared with the pure lecture based pharmacology sessions that were held during the study period.

Test scores

The test scores of the students for the topics covered by the two approaches - lecture + scenario versus pure lectures were evaluated and compared.

RESULTS

The responses on the feedback questionnaire were overwhelmingly positive and the average rating of almost all of the response stems were between score 4 (agree) and score 5 (strongly agree) in favor of the scenarios based approach as shown in Figure 2.

The analyses of the responses in percentages were also done as depicted in Figure 3.

It was seen that more than 90% of the students found that the use of scenarios at the end of the lecture made the TL sessions more interesting, interactive, student oriented and also helped to increase their attention span. Also, more than 85% of the students felt that the scenarios were greatly helpful in understanding the pharmacological concepts improved critical thinking and made them more motivated to do self-study.

Further, as the feedback questionnaire had the scope to elicit subjective responses of the students on the scenarios based teaching approach, these responses were also analyzed. As seen from the responses, these are overwhelmingly positive in favor of the scenario-based teaching approach and the students felt that they made teaching of pharmacology lectures much more interesting, relevant and effective. A few sample comments are shown in Figure 4.

Finally, the outcome measures, *viz.,* attendance and the test scores were also analyzed in Figure 5. The attendance of the students was substantially higher for the lecture + SBL sessions (91%) as compared to the pure lecture-based sessions (80%). The students' test scores in topics conducted by lecture + SBL were higher (62%) when compared with topics covered through pure lecture-based sessions (54%).

DISCUSSION

The ultimate aim of teaching pharmacology to medical students is that they appreciate pharmacological principles and are able to relate and apply them in the practice of medicine. Traditionally, in India, the teaching of pharmacology in medical colleges follows a discipline-based and lecture-based approach with heavy emphasis on acquiring factual knowledge concerning drugs without adequately training the medical students in their therapeutic application.[13] Moreover, it is not be an effective method of encouraging higher order thinking and gives very little opportunity to process or critically appraise the new information that has been received during the lectures. It is, therefore, not surprising that knowledge of basic pharmacology has remained poor among medical practitioners and students perceive it to be a very difficult and dry subject with minimal relevance.[14]

There are studies in the literature where the researchers have used PBL and other case-based learning approaches for small group teaching which can be very time and resource intensive requiring specialized time slots. The above approach may require a certain level of change in administrative policy at the level of departmental/institution/university in our setup which may not be feasible at all times. However, our study is unique as the departmental training program was left undisturbed and the lectures continued as earlier, only the last

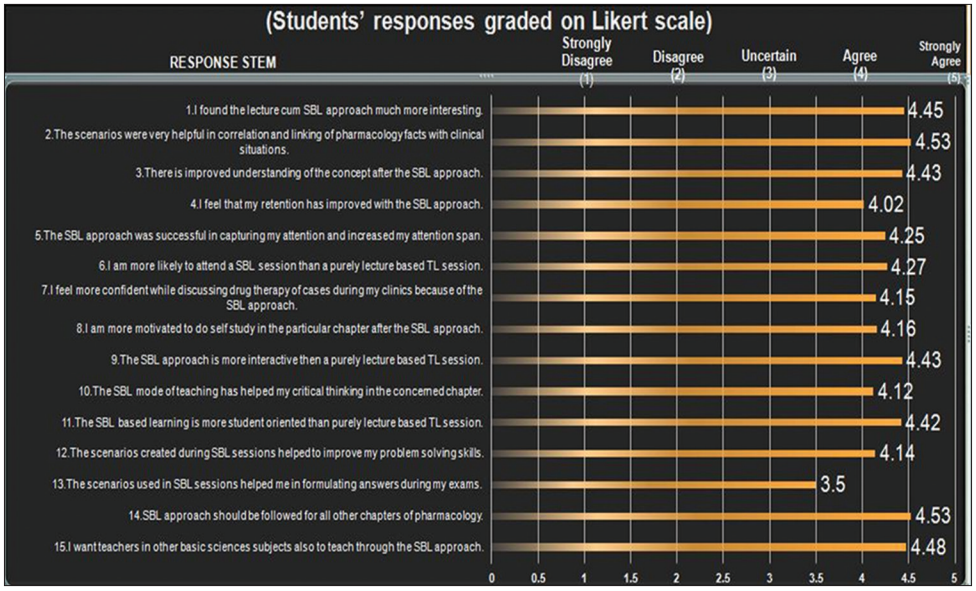

Figure 2: Feedback questionnaire and student responses of students

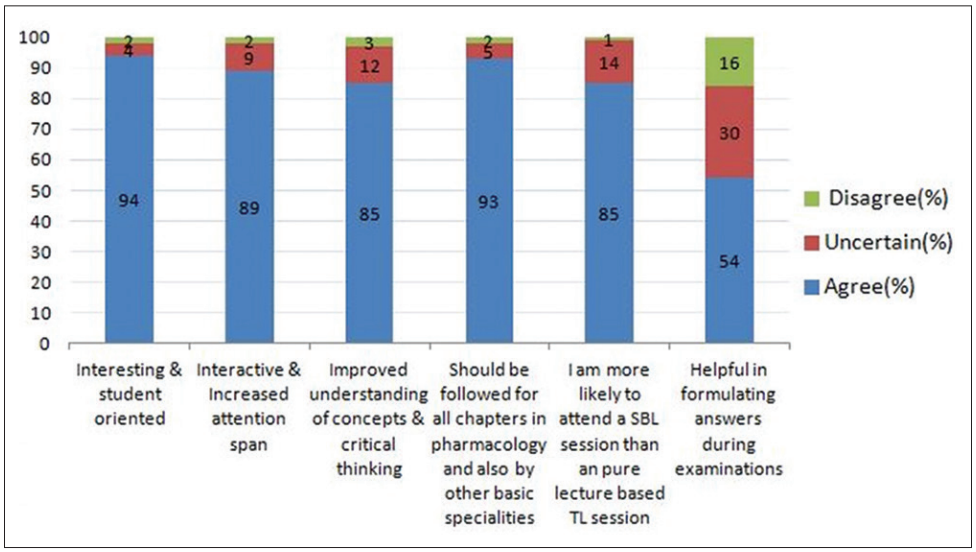

Figure 3: Student responses on scenarios + lecture based sessions (%)

15 min were utilized to discuss 2-3 scenarios based on the specific learning objectives of that particular session.

This approach helped to shift the focus from content centered lecture to learning through real life scenarios and the students are challenged to address the situation based on their knowledge of pharmacology. With these scenarios, the students were able to see firsthand how their learning and skills can be applied in a real-world situation. This made the sessions interesting, interactive and increased the intrinsic motivation of the students as was seen from their responses to the questionnaire. This internal motivation is likely to have far-reaching positive influence on their learning process all through their medical career.

The students reported that scenarios enhanced their ability to understand the concepts and assimilate the knowledge in an effective manner. In a way, it is like bringing the patient bedside to classroom. Furthermore, these scenarios also helped in applying the knowledge of pharmacotherapeutics, as was evident from the higher test scores in these sessions as compared to the pure lecture-based sessions. One significant outcome of the study was the increase in the attendance of the students which is a reflection of the interesting, relevant and interactive nature of the sessions.

CONCLUSIONS

The use of scenarios at the end of the lectures made the lecture-based TL sessions more interesting, interactive, student-oriented making the students more likely to attend the teaching sessions. The scenarios also helped to increase the intrinsic motivation toward learning pharmacology by making the learning sessions much more relevant to real life situations wherein the students were challenged to address the situation based on their knowledge of pharmacology.

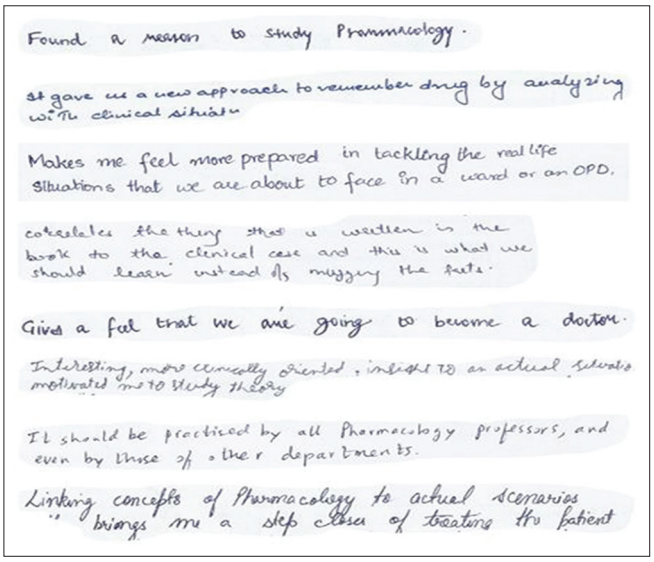

Figure 4: Sample responses from students on scenarios + lecture based sessions

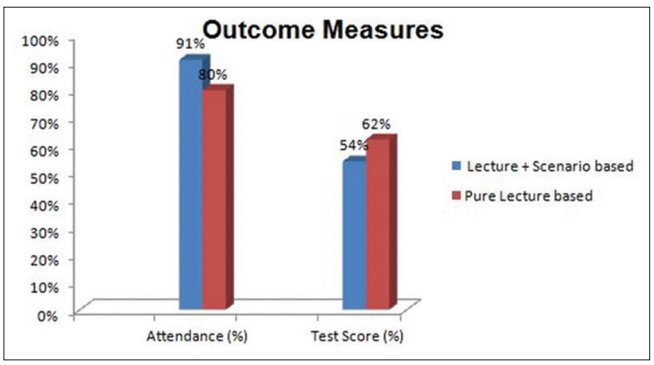

Figure 5: Comparison of outcome measures (attendance and test scores)

This approach also was helpful to substantially increase the attendance and test scores of the students as compared to the pure lecture-based sessions. In conclusion, the judicious use of scenarios can be a great tool to increase the effectiveness of lecture-based sessions in pharmacology.

REFERENCES

1. Cantillon P. ABC of learning and teaching in medicine. Teaching large groups. BMJ. 2003;326:437-40.
2. Bligh D. What's the Use of Lectures? San Francisco, CA: Jossey Bass; 2000.
3. Urrutia-Aguilar ME, Martinez-Gonzalez A, Rodriguez R. Measuring the effectiveness of pharmacology teaching in undergraduate medical students. J Patient Saf. 2012;8(1):26-9.
4. Jaykaran, Chavda N, Yadav P, Kantharia ND. Intern doctors' feedback on teaching methodologies in pharmacology. J Pharmacol Pharmacother. 2010;1(2):114-6.
5. Vasundara K, Kanchan P, Pundarikaksha HP, Girish K, Prassana S, Jyothi R. An imperative need to change pharmacology curriculum: A pilot survey. Indian J Pharmacol. 2010;42(6):420.
6. MCI-Vision; 2015. Available from: http://www.mciindia.org/tools/announcement/MCI_booklet.pdf. [Last accessed on 24 Mar 2016].
7. Hmelo-Silver CE. Problem-based learning: What and how do students learn? Educ Psychol Rev. 2004;16(3):235-6.
8. Hmelo-Silver CE. Problem based learning: Effects on the early acquisition of cognitive skill in medicine. J Learn Sci. 1998;7(2):173-208.
9. Rao BB, Kate V. Problem solving interactive clinical seminars for undergraduates. J Pharmacol Pharmacother. 2012;3(2):205-6.
10. Kate MS, Kulkarni UJ, Supe A, Deshmukh YA. Introducing integrated teaching in undergraduate medical curriculum. Int J Pharm Sci Res. 2010;1(1):18-22.
11. Errington E. Creating Learning Scenarios. Palmerston North, New Zealand: Cool Books; 2005.
12. Bloomfield L, Magney A. Does facilitator expertise matter? A perspective from scenario-based learning question. Focus Health Prof Educ Mult Disciplinary J. 2009;10(3):12.
13. Sekhri K. Teaching methodologies in pharmacology: A survey of students' perceptions and experiences. J Educ Ethics Dent. 2012;2(1):40.
14. Bhosale UA, Yegnanarayan R, Yadav GE. Attitude, perception and feedback of second year medical students on teaching-learning methodology and evaluation methods in pharmacology: A questionnaire-based study. Niger Med J. 2013;54(1):33.

How to cite this article: Sharma S, Dahiya N. Use of scenarios to increase the effectiveness of lecture-based sessions in pharmacology. Natl J Physiol Pharm Pharmacol 2017;7(5):517-521.

Source of Support: Nil, **Conflict of Interest:** None declared.