ORIGINAL RESEARCH PAPER

Pharmacology

KEY WORDS: PBL-only teaching methods, Lecture with PBL, Teaching learning methods

A COMPARATIVE STUDY BETWEEN PROBLEM BASED LEARNING ONLY AND PROBLEM BASED SESSION AFTER DIDACTIC LECTURE IN PHARMACOLOGY TEACHING IN MEDICAL STUDENTS.

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ABSTRACT

Aim of Pharmacology teaching is to make student thoroughly understand & application in clinical practice. There is no single method of teaching that can ensure it. Now a days, only problem based teaching is followed to quickly cover the various chapters and to integrate with other specialty, while only lecture-based method overloads medical students with facts about hundreds of drugs, but they find it difficult to apply them in patient's illness. However, a judicious mixture of didactic lectures with PBL may motivate the students and they will be able to apply principles of pathophysiology and Pharmacology to various clinical conditions. The outcomes of lecture with PBL and only PBL teaching is compared. The problem after lecture-based pharmacology session helps to make it more interesting, interactive, relevant, and effective teaching method.

CONCLUSION- it was observed that students performed better with lecture +PBL in comparison to only PBL sessions in Pharmacology.

INTRODUCTION

Adult teaching is a very challenging task for a teacher and especially pharmacology is more difficult as it is the study of drugs and deals with the sources, uses, metabolism, excretion, doses, adverse effects, interaction and contraindication of drugs. Students may 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.[1] The result is that pharmacology is perceived by many students as a dry and difficult 2nd MBBS subject.[2] Moreover, due to the vast and ever advancing nature of the subject, it usually becomes difficult to keep the content interesting and meaningful. The current system of teaching pharmacology especially in India has been traditionally lecture - based Traditional lecture format has many advantages as a large group teaching-learning (TL) method, is a monotonous and passive way of learning [3]. This method is teacher oriented and the students are expected to passively sit back and soak up knowledge. Although it is not an effective method of encouraging higher order thinking [4] but there is a big void in the clinical application of this knowledge.[1] 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.[5]

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 and decide what they need to know to understand the problem.[6] 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.[7] 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 teaching method. PBL only approach satisfies the assumptions underlying adult learning theory and therefore facilitates a greater understanding clinical sciences, improves retention and recall of important units of information. Now a days it is seen that only problem based teaching is followed to quickly cover the various chapters and to integrate with medicine and other specialty in spite of empirical reviews suggesting that its effectiveness may be limited.[8] Now the question arises whether PBL only session is more effective or lecture mixed with PBL session. A number of researchers have also tried integration of two or more subjects in UG curriculum and found encouraging results.[9] But none of these approaches have compare PBL only session against lecture with PBL session as far as productive teaching is concerned.

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.[10] the problem 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 pharmaco therapeutics.

Thus a well-organized lecture with PBL session remains one of the most effective ways to integrate and update information from multiple sources on complex topics.[11] it fosters life-long self-directed learning skills and strengthens hypothetico-deductive reasoning, hence better preparing students for their future as medical practitioners.

Objectives

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

MATERIALS AND METHODS

Study Design

The study was a medical education interventional study conducted in the Department of Pharmacology of Narayan Medical College, Sasaram

Study Population

The study was conducted on 2nd year MBBS students of the medical college as part of their regular training program. 80 students of 4th semester who have given consent and came to attend pharmacology lectures were explained the study and consent taken before the start of the sessions.

Time of Study

The study will be conducted between March 2019 to May 2019.

METHODOLOGY

Eighty students were selected and who have given their consent. A few important chapters of pharmacology were identified and made part of the study to be covered in 10 sessions over a period of 1 months. The clinical problems were prepared to ensure that they incorporate the specific learning objectives of the teaching session and to also cover the major pharmacological principles of the topic. Further, these cases were prepared to aim for the higher levels of cognitive domain such as application, analysis, and synthesis. Firstly these problem were discussed with the students. Then the topic were covered through traditional lecture-based approach and the last 15 min were devoted for the discussion of problem that was discussed earlier (lecture + PBL approach).

At the end of the study period, these lecture + PBL sessions were compared with only problem-based sessions on that specific topic in the department of pharmacology. Students were encouraged to participate actively in a friendly, nonthreatening environment. A representative power point slide showing examples of scenarios created during the study are shown in Figure 1.

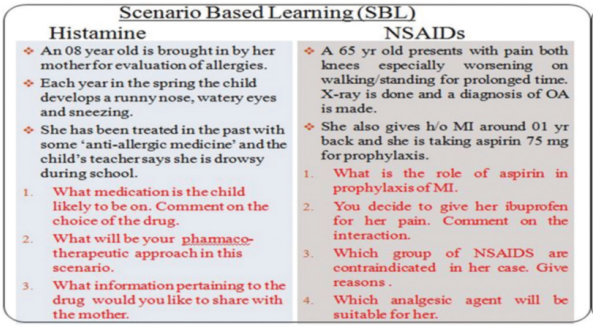


Figure 1: Examples of scenarios

Outcome Measures

The following were outcome measures of the influence of Lecture with PBL on PBL only session.

Feedback questionnaire

At the conclusion of the Study, the students were asked to evaluate the approaches pure PBL versus lecture + PBL by filling the validated feedback questionnaire anonymously. The questionnaire consisted of structured (based on Likert scale, strongly disagree=1 to strongly agree=5) 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

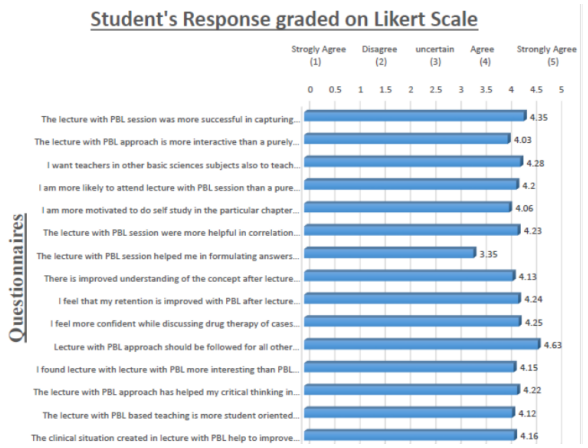
The average attendance in the lecture + PBL sessions was noted and compared with the pure problem based pharmacology sessions that were held during the study period.

Test scores

The test scores of the students for the topics covered by the two approaches - lecture + problem versus pure problem 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 Lecture with PBL based approach as in Figure 2.



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

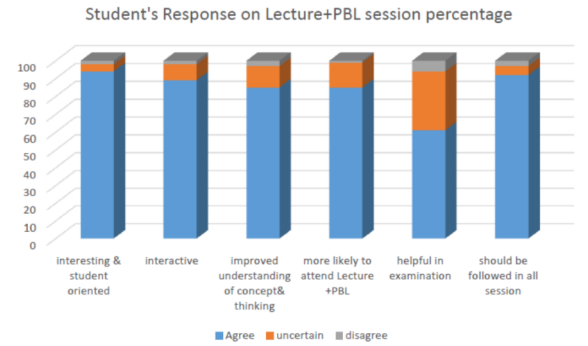


Figure: 3 Student responses (%) on lecture+PBL

It was seen that more than 91% of the students found that the use of problem at the end of the lecture made the teaching more interesting, interactive, student oriented and also helped to increase their attention span. Also, more than 80% of the students felt that the problem combined with lecture were greatly helpful in understanding the pharmacological concepts improve ability to correlate different system of the body.

Further, as the feedback questionnaire had the scope to elicit subjective responses of the students on the problem based teaching approach, these responses were also analyzed. As seen from the responses, these are overwhelmingly positive in favor of the lecture with problem-based teaching approach and the students felt that they made teaching of pharmacology lectures much more interesting, relevant and effective. Finally, the outcome measures *as* attendance and the test scores were also analyzed in Figure 5.

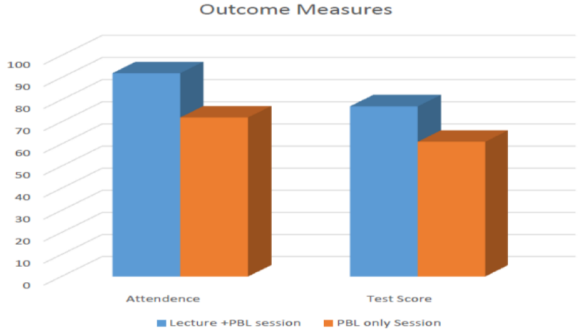


Figure 5 Comparison of outcome measures (attendance and test scores)

The attendance of the students was substantially higher for the lecture + PBL sessions (92%) as compared to the pure PBL-based sessions (72%). The students' test scores in topics

conducted by lecture + PBL were higher (77%) when compared with topics covered through pure PBL-based sessions (61%).

DISCUSSION

The aim of teaching is to make student that they understand pharmacological principle and concepts and able to relate and apply them in the practice of medicine. Traditionally, in India, the teaching of pharmacology in medical colleges follows a lecture-based approach with heavy emphasis on acquiring factual knowledge concerning drugs without adequately training the medical students in their therapeutic application.[12] Moreover, it is not be an effective method of encouraging higher order thinking and to process 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.[13]

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 consuming requiring specialized time slots. The above approach may require a certain level of change in administrative policy at the level of 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 15 min were utilized to discuss 2-3 problem based on the specific learning objectives of that particular session. Moreover here we compare the outcome of PBL only with lecture +PBL session.

This approach helped to shift the focus from only clinical based learning to content centered lecture with real clinical situation and the students are challenged to deal with the situation based on their knowledge of pharmacology. With these situations, 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 lecture combined with clinical situation 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 or pure problem based session.

CONCLUSIONS

The use of scenarios at the end of the lectures made the teaching sessions more interesting, interactive, and student-oriented making the students more likely to attend the teaching sessions. The clinical problem 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.

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

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