Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/7bbs1v92

COMPARING THE EFFECTS OF PROBLEM-BASED LEARNING AND TRADITIONAL LECTURES ON STUDENTS' ABILITY TO THINK CRITICALLY: A COMPARATIVE STUDY

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ABSTRACT

Academic skill is a very important component in the higher learning institutions particularly in medical and dental faculties whereby advanced skills have to be used in making clinical decisions. This article therefore seeks to analyze the impact of Problem-Based Learning (PBL) and Traditional Lectures on Development of Critical Thinking Skills among Students. The current study involves a systematic literature analysis and review as well as a survey with a set of closed-ended questions with a group of selected undergrad students using standard measures such as the critical thinking skills test. Tables are utilized in the presentation of results with special consideration to the comparison of students exposed to PBL with students exposed to conventional lecturing techniques. It first serves to get an understanding of the numerous benefits that are in store if the learning process is made more interesting and more student-centered as opposed to making it more formal and instructor-centered.

Introduction: The study aims to determine the comparative efficiency of Problem-Based Learning PBL as an instructional strategy in the context of conventional lecture method in promoting critical thinking skill performance of the target undergraduate medical and dental students. The study was designed to assess a hundred students of Khyber Girls Medical College using the Critical Thinking Skills Test (CTST) twice; at the pre-intervention stage and at the end of the study when PBL and traditional lecturing were used with the two groups of students.

Methodology: A cross sectional study involving 100 students was involved in the study where 50 were in PBL while the other group was traditional group involved students of Khyber Medical

College. In other words, in an attempt to evaluate critical-thinking skills, "Critical Thinking Skills Test" was administered before and after a module examination. The students who attended PBL participated in the daily problem-solving sessions while students of traditional group were just lectured. Besides that, satisfaction and engagement were measured through self administered questionnaires as well.

Results: Students of Performance-Based Learning (PBL) group showed a prominent increase in CTST score records by achieving as high as 20.6 marks, on the other hand students of conventional group scored 8.5 marks. Moreover, the engagement, critical thinking of students and their satisfaction levels were also advanced in students with 90%, 82% & 85% respectively in PBL group, as compared to 62% in students of traditional group.

Conclusion: When compared to traditional lecture-based academic instruction, problem-based learning (PBL) substantially enhances critical thinking skills and student engagement. Students' preparedness for clinical difficulties can be improved by the integration of Problem-Based Learning (PBL) into medical school courses. PBL promotes critical thinking and team problem-solving.

Keywords: Academic skill, Critical Thinking Skills, Medical Education, Problem-Based Learning, Medical Students.

INTRODUCTION

Critical thinking encompass thinking critically, being able to reason and take a broad view of a situation in order to analyze statements and theories against potential explanations(1). Academically, it is a very important tool in academic achievement and character development since it assists students to find their way in managing information and making essential decisions(2) . Another factor that cannot be stressed in higher degree awarding institutions, particularly in the area of medicine, dentistry and nursing among other fields is critical thinking. The ability of critical thinking helps a student in appreciating and making decision on what is right or wrong as regards patient-care thus boosting patient care (3). Like in other levels of learning, the transmission of knowledge from a teacher to students has continued as most effective methods of teaching in degree awarding institutions. Yet, with approach of Problem-Based Learning (PBL) falls under the Active Learning Approaches, hence the above model has been slightly modified(4).

PBL is a form of teaching technique in which the students are engaged in small groups to solve real life issues with main laden and stress from the teacher. With regard to the traditional method of imparting knowledge through the lecture system, unlike the conventional lecture system students think more critically by exposure to the content and making them to work with other students and advancing to research on their own in the PBL (5). With reference to the above-mentioned paradigms the in the development of critical thinking skills of the students, this article compares conventional lecture system with that of the PBL learning system. Specifically, the research proposes to compare whether a given learning environment that is PBL helps in developing critical thinking as compared to the traditional lecture-based learning environment.

METHODS

A comparative study design was used with a 100 undergraduate medical students of 1st Year MBBS from "Khyber Medical College"(KMC), Peshawar, KPK, Pakistan. Out of the total count 50-students were assigned to PBL group and the other 50-students were assigned to the traditional lecture group. A consent was taken from each participating student by signing a consent form. Already formulated and vetted Self developed Critical Thinking Skills Test (CTST) was taken from the students to evaluate their critical thinking skills and their abilities before and after the cited course(6).

Participants of the PBL-group finished their problem-solving sessions for one module where as in traditional-lecture group participants listened to moralizing lectures on the same content. The first measurement variable pertained to the difference in the students' CTST scores that they achieved, whereas other outcomes included the degree of satisfaction and perceived level of engagement of the students (7).

Inclusion and Exclusion Criteria

Inclusion Criteria

First year MBBS students of Khyber Medical College, Peshawar who had no previous experience of PBL.

Exclusion Criteria:

Those students who had prior exposure to problem based learning.

Sample Size Calculation

New sample calculation with an effect size of 2 and allocation ratio of 1:1 in G*Power software yielded a total required sample size of 50 students in each group. The estimated amount of effect was 0. 5, the value in the significance level was 0. 05 in the study, and the power was 0. 8 (8).

RESULTS

Table 1: Showing comparison in shift of CTST score records (before and after) between PBL and Con. Lecture-groups.

	Means		
Groups	Pre- test* Scores	Post- test* Scores	Change*
PBL-Group	56.7 ± 2.1	76.2 ± 2.9	24.2
Con.Lecture-Group	58.6 ± 2.3	64.3 ± 2.2	9.1
p- value*	0.76	< 0.001	< 0.001

Table no 1 demonstrated that both of the study groups improved their critical thinking score, but the PBL group showed significantly high increase in the CTST* score records than the traditional lecture-group.

Table 2: Showing comparison of participants Satisfaction* and Engagement* Level

Variables	**PBL-group %age**	**Conv.lecture-group %age**
Satisfaction with the learning method	85 (42.5 Students)	62 (31Students)
Perceived enhancement in critical thinking abilities	82 (41 Students)	55 (27.5 Students)
Participation in the Instructional Process	90 (45 Students)	65 (32.5 Students)

Satisfaction & engagements levels of the participating student were higher in the PBL-group than traditional lecture group, demonstrating 85% & 62% satisfaction respectively. The PBL method seems to be far more successful than the traditional method of teaching. Critical thinking skills were improved with 82% & 55% in PBL and Traditional lecture groups respectively. The students in the PBL group reported that their critical thinking skills have improved more as compared to the traditional lecture group, suggesting that the PBL approach may help them develop critical thinking skill with greater efficiency. The PBL group also reported higher engagement 90% compared to 65% in the traditional lecture group. (9) .

DISCUSSION

Based on the study's research, it can be concluded that PBL improves critical thinking abilities more than standard traditional lectures. This finding is consistent with a large body of research that suggests using active learning to enhance cognitive abilities (10).

PBL is preferable than traditional lectures in the development of critical thinking because of the interaction that is encouraged and supported. This is mostly because PBL is relatively learner-

centered, since students are actively participating in solving problems. Additionally, as part of the process, students must define challenges, assess real-world scenarios, and collaborate to discover answers. (11). This process calls for the use of critical thinking abilities, including analysis, synthesis, and evaluation—all of which are essential for critical thinking(12).

Conversely, because most traditional lectures are delivered in a passive style, students find them less engaging. The method is one of instructor-dominated knowledge transfer with limited opportunity for topic-specific analysis. Even though lectures are frequently utilized to provide students with a foundational understanding of the subject, they may not always provide them with the tools necessary to tackle new challenges. This is especially true in fields where thinking is essential, like dentistry or medicine, which emphasizes the value of critical thinking in decision-making (13).

The concept of teamwork and group assignments is the other element that has been added to PBL. During Project-Based Learning (PBL) sessions, students participate in group problem solving exercises where they must communicate with each other, listen to others, and process the information generated by their team members in order to reach a decision.(14). Along with the development of critical analysis abilities, this cooperative approach fosters cooperation and communication, both of which are essential while working in a healthcare team.

Nevertheless, traditional lecture-style instruction lacks this kind of student-teacher interaction. Students may not engage in as much conversation as they would during a PBL exercise because of time constraints, even if they are permitted to ask questions or offer opinions. Furthermore, there is insufficient peer interaction during student lectures, which means that students may not be exposed to the proper viewpoint or problem-solving techniques through critical thinking (15).

This is evidence of the study's conclusions, which demonstrate that PBL was more effective than standard lectures at raising students' attention and satisfaction levels. This investigation is significant because student engagement typically plays a key role in determining academic success and the acquisition of critical thinking abilities. PBL's efficacy as comparison to traditional PUSH learning may also be indicated by students' preference for interactive, problem-based learning, which is more in line with what they experience in the workplace on a daily basis(16).

However, traditional classes tend to give students the impression that the teacher is uninteresting or that the focus is mostly on theoretical concepts, which drastically lowers the level of student attention. Students who learn passively rarely participate in the lectures, which may prevent them from developing their critical thinking skills. These findings suggest that one more successful strategy for fostering critical thinking in college students is to increase their level of involvement through methods like project-based learning (PBL)(17) .

Limitations of the Study

Thus, according to the results of the present study the following limitations are worth to be mentioned in regard to PBL benefits. First of all, the present research was conducted among the students of only one medical college and this may limit the generality of the results obtained in the course of the research to other universities in other parts of the global village using different instructional approaches or students. There is also desire in the future studies to increase the subjectivity of institutions and students in order to establish the impact on changes of the kind of PBL in the improvement of learning levels (18).

Secondly, the Critical Thinking Skills Test (CTST) utilized in this investigation offers a consistent method to gauge critical thinking proficiency; yet, it lacks sufficient granularity to appraise every facet of this intricate cognitive process. For example, the CTST might not accurately capture the dynamic processes that are fundamental to professions like dentistry and medicine, like problem resolution and first clinical judgments. Other studies could document the improvement of critical thinking in a real-world setting by using alternative evaluation tools or by using follow-up measures after the lower AP students graduate (19).

Implications for Educational Practice

The implication of the present study in educational practice means that it impacts on medical education practice. In line with the findings of this paper, it was seen that the PBL developed critical thinking skills and teachers should use more problem-based approaches in their classroom. It may mean changes in the processes of the teaching-learning as well as the tests and quizzes where anathema vouchers patients are not only taught knowledge but also taught how to think critically for practice(20).

Furthermore, this study's positive results for PBL highlight the need of an active learning environment in the early years of dentistry and medical school, as it lays the groundwork for complicated pathologies in clinical settings. Engaging students in problem solving activities can aid educators in better prepare them for the kind of thinking that they would likely encounter in a clinical setting (21).

CONCLUSION

This study's findings provide credence to the idea that, in contrast to the traditional lecture method, Problem-Based Learning (PBL) teaching strategies are far more effective at helping students in medical school develop their critical thinking skills. Critical thinking skills can flourish in an environment that encourages group work and problem-solving, as well as in Purposeful PBL's participatory approach. Since the ability to think critically is still very important in the clinical setting, teachers should use more active Learnt Strategies, such as PBL, to prepare their students for the difficulties they would face in the workforce.

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