

INNOVATION IN MEDICAL EDUCATION: IMPLEMENTATION OF PROBLEM BASED LEARNING UNDER THE UMBRELLA OF A TRADITIONAL CURRICULUM - PERCEPTIONS OF STUDENTS AND FACULTY

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ABSTRACT

Objective: To take the feedback of the students regarding the process of PBL, and of the faculty about student's performance.

Study Design: Descriptive study.

Place and Duration of Study: The department of Medical education, Rawalpindi Medical College from 2007 till June 2008.

Subjects and Methods: The study was carried out in the first year class of 270 students at Rawalpindi Medical College. The Basic Sciences teaching was augmented by problem-based learning and integrated approach. Students of first academic year were allocated randomly to 20 batches each comprising 12-13 students. One facilitator was randomly allocated to each batch. Basic science faculty was made to participate actively in problem based learning along with clinical experts. The completed program was evaluated based on structured questionnaires.

Results: The response of students towards PBL as teaching strategy, was encouraging. Quantitative analysis showed that the mean score of the student's performance was 14.74 (SD±3.255) out of 20. Most of the students (78.6%) agreed that the problem based learning facilitated their learning process whereas 6.5% disagreed and 14.9% did not comment.

Conclusion: The study showed that it is possible to adopt problem based learning in the undergraduate medical course under a conventional curriculum.

Keywords: Adult learning strategies, Curriculum, Problem based learning

INTRODUCTION

Problem Based Learning (PBL) has grown in popularity in many parts of the world¹. The concept is however new in Pakistan². Undergraduate medical education, like any other educational program, needs ongoing improvements to meet the challenging demands of medical practice in the 21st century. Although the complexities of medical care have increased dramatically over the last century, the methods of teaching medicine have changed a little³. The General Medical Council, has stated explicitly that "modern educational theory and research" must influence teaching and learning⁴.

The past decade has seen concerted attempts to revolutionize undergraduate medical training in the West. The debate whether "new" curriculum using modern

methodologies will actually produce better doctors as compared to the traditional curriculum, is still going on⁵. PBL is a modern teaching tool, organized with small groups of learners and accompanied by a facilitator. During the PBL process learners discuss problems, define what they know, generate hypotheses, derive learning goals and organize further work⁶. A PBL cycle should conclude with learners, reflecting on the learning that has taken place⁷. The PBL can be summarized as a small group teaching method for both acquisition of knowledge and development of generic skills⁸. The present study was carried out to evaluate the learning process of PBL in our setup.

MATERIALS AND METHODS

This descriptive study was carried out in a class of 270 students at Rawalpindi Medical College for a duration of seven months. The traditional curriculum was horizontally integrated. Six modules were identified according to the course content outlined by the

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University of Health Sciences. The senior faculty from basic and clinical subjects was involved in developing the modules. The time for PBL sessions, twice a week and of two hours each, was incorporated within the first year time table.

First year undergraduate class of 2007-08 was exposed to PBL sessions, from December 2007 till June 2008. The whole class of 270 students was randomly divided into 20 groups of 13/14 students each. Each group had almost the same gender distribution. No other variable was considered during group allocation of students. Each group was facilitated by a randomly assigned faculty member from the basic and clinical sciences. These PBL facilitators were trained through workshops⁹. A special "7 -days Training of Trainer Program" was organised in the same manner as documented in literature¹⁰.

Initially the space in library and anatomy museum for managing small group sessions was used. Chairs, flip charts, markers and other related paraphernalia were procured. The integrated scenarios were developed jointly by the identified faculty of basic and clinical sciences according to the level of the learners. PBL scenarios covered the topics that were taught in traditional manner according to the course content. Implementation of PBL varies across educational institutions¹¹. PBL tutorials conducted at RMC have been modeled after the Maastricht 'seven jump processes'⁶.

Standardized questionnaire forms were used for evaluation after completion of each problem. The questionnaires were designed to evaluate:

The facilitator and the PBL process by the student: The student evaluation form had fourteen statements assessing the facilitator and the PBL process on a five point Likert scale, ranging from 1 to 5; 1=strongly agree, 2=agree, 3=cannot comment, 4=disagree, 5=strongly disagree. There was an open-ended question asking for suggestions to improve the PBL sessions. There was also a question regarding

implementation of PBL. The evaluation form was filled in by the students anonymously.

The entire group by the facilitator: Each student was individually marked for their role in the group process. There were four categories i.e. active participation, working as team member, asking relevant questions and preparing assignments, The marks were given out of a maximum of 20. The results were interpreted as; 1 to 4=worst, 5 to 8=satisfactory, 9 to 12 =good, 13 to 16=better, 17 to 20= best.

Data was analyzed using SPSS version 15. Descriptive statistics were used to describe the data i.e mean and standard deviation (SD) for qualitative variables while frequency and percentages for quantitative variables.

RESULTS

The majority of students i.e. 236 out of 270 (87.4%) participated in evaluation process. The response of the students against each question was analyzed. Their responses were grouped in four categories and positive responses i.e. agreed and strongly agreed were added together.

Self perception of learning was a new concept and students found it interesting. Process of learning especially team work and problem as a learning tool was appreciated by majority of students. Environment is the basic of any kind of learning and this was appreciated by more than half of the students (Table). But some of them found it difficult to complete their assignments. Regarding assessment of facilitator by students; majority of the students agreed that facilitators kept the group focused on the task. Most of the students also gave feedback, that facilitators created a supportive group climate during the sessions. Furthermore they agreed that facilitators showed concern with progress of individuals and stimulated individual involvement.

According to facilitator's feedback, on an average, performance of majority of students was good while that of only 1.7% students was worst (Fig. 1). The mean score of the students regarding their performances was 14.74 ± 3.255 , the maximum attainable scores being 20 (Fig. 2).

Table: Response of students regarding PBL.

Category	Strongly Disagree	Disagree	Cannot Comment	Agree	Strongly Agree
	%	%	%	%	%
Self perception of learning					
All members of group participated in discussion equally	14.6	28.9	5.6	39.8	11.1
Working as a team was productive	2.9	4	11.9	54.8	26.4
Process of learning					
The use of problems as learning tool facilitated your learning	2	6.3	12.8	56.3	22.6
Working in groups improved understanding of the subject	3.6	7.1	11.3	54.5	23.5
Completing assignments related to PBL problems was easy	13.7	28.1	20.4	31.8	6
Environment of learning					
Using electronic resources, primarily the internet, to find information was easy	13.9	19.9	16.3	37.4	12.5
Library resources, other than electronic ones, were accessible	13	15.3	19.4	45.3	7
Use of computers as an investigative tool in the laboratory was beneficial	7.8	9.8	18.9	47.3	16.2
Facilitator's assessment					
Facilitator did not dominate group discussion	6.6	14.2	9.8	49.1	20.3
Facilitator created a supportive group climate	2.4	4.8	8.7	55.6	28.5
Facilitator showed concern with progress of individuals	1.6	5.5	9.2	51.8	31.9
Encouraged involvement of group members	3.4	5.5	9.4	52.5	29.2
Facilitator kept the group focused on the task	1.1	4.2	7.4	59.1	28.2
Facilitator addressed group problems when asked	1.9	9.1	11.6	55.2	22.2



Fig. 1: Perception of facilitators about performance of students

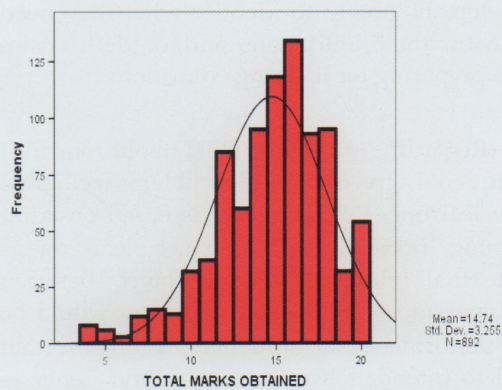


Fig. 2: A histogram showing the distribution of scores of students based on facilitator's evaluation.

The response of students about the implementation of PBL session was extremely encouraging. Overall 78.6% of the students

were in agreement for implementation of PBL as a learning methodology however 6.5% students disagreed and 14.9% gave no comment.

DISCUSSION

Learning with the problem-based approach is considered an interesting method to study basic and clinical medicine as a majority of the students enjoyed studying in this system. The system of PBL practiced at Rawalpindi Medical College (RMC), while allowing some degree of early exposure to clinical situations in the form of professional skills, enables students to deal with hypothetical cases. Literature proved that feeling of satisfaction derived from the act of discovery certainly adds to the enjoyment of learning¹².

Regarding self perception of learning majority of students agreed that working in a team is beneficial for them and all members of group participated equally. It is proven that PBL promotes student's interpersonal skills and ability to work as team members⁵. Furthermore student's mood, class attendance, faculty attitudes, academic process variables has shown supporting results with superiority of PBL over traditional curriculum¹³. The feature of self-appraisal or awareness by itself is considered a skill and it motivates students for further self-directed learning¹⁴. In fact, the new face of the PBL at RMC aided the students to develop the ability to identify what they need to learn, their limitations and/or deficiencies thus preparing for life-long education.

Regarding process of PBL, about four fifth of students agreed that PBL problems facilitated their learning. PBL approach is based on adult learning principles¹⁵ and since learning is contextual, closer the resemblance between problem and real life situation better would be the performance of students¹⁶. Problems that lead to intended learning issues and generate interest are considered good by the students¹⁷. However, some of our students felt that there might remain some gaps in their knowledge. Gaps in knowledge are probably the same in both traditional and PBL curricula for the same obvious reason: time factor limitations vs. how much "core" knowledge needs to be covered.

Students also perceived that working in groups enhanced their understanding. Research also proved that students learned through PBL based curriculum found learning to be stimulating and engaging, and showed better interpersonal skills and psychosocial knowledge as well as better attitudes towards patients as compared to those of traditional curriculum¹⁸.

More than half of students agreed that learning environment was conducive and electronic resources were available and useful. Ready access to library and computer facility is a necessity for successful PBL¹⁹ and learning environment is more stimulating and more humane⁶. This is in accordance with human psychology as human functioning is based on interaction between person, behavior and environment²⁰. Evidence also shows that instructional material also influences the interest in learning and efficacy of learning environment²¹.

Regarding facilitators performance, most of the students agreed that facilitator did not dominate group discussion. From constructivist perspective role of instructor is to guide learning process rather than provide knowledge¹⁵. Literature has also proved that PBL promotes interaction between students and faculty. Our study proved that facilitator showed concern with the progress of individuals. This is beneficial effect of PBL where role of tutor is to scaffold student learning. Actually this facilitator role is a challenge for teachers because they have to know working with group, asking open ended questions, maintaining interest and motivation level and resolving conflicts²². PBL has proved to be beneficial for life-long learning because it activates prior knowledge and promotes self directed, group facilitated learning²³.

Some students were initially confused about the concept of PBL and how to approach the task. Most students enjoyed the teamwork aspect of the task. The exercise was not too challenging for them, yet many were unsure if they were achieving the learning outcomes. Students are likely to benefit from a wider

application of PBL. However, factors such as institutional restrictions, staff motivation and training, availability of resources and learning context have impact on the implementation of PBL.

There is limited evidence regarding its superiority to other educational strategies but there is moderate evidence that satisfaction level of doctors was high with PBL²⁴ and PBL performed well as an adjunct to traditional teaching²⁵.

CONCLUSION

Contrary to the common belief, our study has proved that PBL can be successfully implemented as an adjunct to the conventional instructional methods, in a resource limited public sector medical college, after proper faculty training. Feed back from students and faculty members was very encouraging regarding implementation of PBL. RMC is looking forward to execute this methodology gradually in all the years as results of current study supported that combination of both conventional and new integrated curriculum may provide more effective training for undergraduate medical students.

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