



Problem Based Learning: Learning from the Experiences of Medical Students

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ABSTRACT

Introduction: Problem based learning (PBL) is student centered learning approach that has been implemented in many medical colleges. Since the literature has controversial takes on the utility of PBL, exploring student perspectives might share insights on the contextual merits and demerits of PBL approach. **Aims & Objectives:** To evaluate experience of medical students regarding PBL in hybrid integrated curriculum. **Place and duration of study:** May to June 2018 at two medical colleges of Lahore (Shalamar Medical College & University College of Medicine and Dentistry). **Material & Methods:** Descriptive cross sectional study conducted in May to June 2018 at two medical colleges. Sample size was 188 students of 1st and 2nd year MBBS of Institute 1 and 110 students of 1st and 2nd year MBBS of Institute 2. Pre validated questionnaire was distributed and students were asked to record their experience about PBL using a 5-point's Likert scale. Data was analyzed by using non-parametric statistics. **Results:** Institute 1 (188 participants), Institute 2 (110 participants), females being 205 (68.79%). Mean score <3 indicates bad experience while >3 indicates good experience about PBL. Results showed that students of both institutes found several key benefits of PBL acquiring critical thinking, problem solving, communication skills and team work. PBL was perceived as better learning approach than lectures. Moreover students of Institute 1 mean score <3.0 showed dissatisfaction regarding tutor performance in PBL facilitation which was statistically significant (0.048). **Conclusion:** It is recommended that tutor and student training should be mandatory before introducing PBL. PBL session marks can be included in internal assessment. Only senior faculty and volunteering to facilitate should conduct PBL sessions.

Key words: Problem based learning, Students experiences, PBL tutoring, Skill development, PBL Critical thinking, Teamwork.

INTRODUCTION

The change of medical education from traditional to integrated curriculum has been adopted by different medical schools worldwide.¹ Traditional curriculum is teacher centered while integrated curriculum is more inclined towards student centeredness. One of these approaches is problem based learning (PBL).² Problem based learning is implement in medical colleges either as pure or hybrid models. In pure problem based learning model, it is the main teaching and learning strategy adopted throughout the curriculum. Students learning in hybrid problem based learning model is supported by previous knowledge of students through formal lecturing,

small group discussion, skill labs before the PBL session.¹ Few medical schools placed 1st session of PBL at the start of module and students gained knowledge for 2nd session by didactic lectures, small group discussions and by self-directed learning.² Problem based learning is a constructivist pedagogy which has many advantages. It helps students to explore the concepts, build on prior knowledge³ so that they become self- directed learners, critical thinkers and problem solvers. Student become able to integrate basic subjects to clinical subjects more better.⁴ In addition, PBL also contributes in the development of communication, interpersonal and presentation skills.⁵ The tutor has important role in PBL sessions as facilitator, to guide students how they keep themselves focused on their objectives.⁶ That's why,

skilled and trained facilitator plays an important part in the accomplishment of PBL session.⁷

Although most studies tend to report an optimistic and positive impact of PBL on students learning, there are some controversial finding as well. For instance few studies reported that PBL is a time consuming process and it may not have a significant impact on knowledge acquisition. Two studies in this regard had conflicting findings. Chang J revealed PBL as a positive teaching and learning strategy which enhances student's knowledge and interpersonal skills with potential areas of improvement and continued fine-tuning.⁸ On the other hand, Khan IA suggested that PBL was time taking, resource demanding approach, majority students were unable to identify the benefits of PBL.⁹ These controversial findings demand further exploration of student perceptions.

This study aimed to investigate the experience of medical students in different educational settings to understand the expected PBL outcomes (skill development, studying in PBL small groups, learning preference and tutoring practices).¹⁰

MATERIAL AND METHODS

This descriptive cross sectional study was conducted from May 2018 to June 2018 at two different medical colleges, the University College of Medicine and Dentistry, University of Lahore and Shalamar Medical and Dental college Lahore, The targeted population was 1st year and 2nd year MBBS students.

A total of 188 students of 1st year and 2nd year MBBS of the University College of Medicine and Dentistry and 110 students of 1st and 2nd year of Shalamar Medical and Dental College were targeted.

Inclusion criteria: 1st year and 2nd year undergraduate MBBS students of either gender from the academic year 2017-18.

Exclusion criteria: Students of BDS, post graduate students, incomplete questionnaires were excluded, those students not willing to participate.

Data collection technique: This study was based on self-administered and pre-validated questionnaire on experience of medical students regarding PBL. The questionnaire was devised by extensive literature review using the search engines Medline, PubMed and Google scholar. The key words were problem based learning experience of medical students, PBL in integrated curriculum, Pre-validated questionnaire on PBL, Controversial studies on PBL. Questionnaire was reviewed by

current research supervisor and piloted on twenty third year medical students.

The questionnaire was divided into four subscales and had total 16 items. The first subscale consisted of 5 questions, which measured the participants experience related to the benefits of Problem based learning sessions regarding *skill development*. Second subscale consisted of 4 questions, which measured the student's experience of working and study in groups (*group dynamics*) during and in between PBL session. The third subscale consist of 2 questions which measured students learning preference PBL or lecture. The fourth subscale consisted of 4 questions, which measured the students experience about tutor practice during PBL session. Last item was open ended question, if someone liked to add anything else regarding PBL. These questions were answered on a five point's Likert scale.

Strongly disagree (1), Disagree (2), Neutral (3), Agree (4) and Strongly agree (5)

Ethical approval: The Research Ethical Committee, University College of Medicine and Dentistry, University of Lahore approved the study. Participants were informed about purpose of the study, information about items in the prevalidated questionnaire were explained and study subjects individuality was assured by giving them a code before data analysis.

Statistical analysis:

Data were coded and entered into Microsoft Excel software and analyzed by using SPSS version 21.0. Data were analyzed and presented as mean \pm SD. Data was not normally distributed, Shapiro Wilk test were applied ($p= 0.00$) therefore non parameter test such as Mann-Whitney -U test were used to identify the significance difference ($p < 0.05$) among the subscale and groups (Institute 1 and 2).

RESULTS

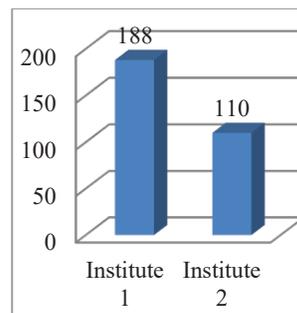


Fig-1: Number of participant institute wise

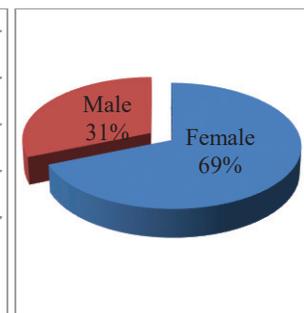


Fig-2: Gender distribution of participants

S. no	Item	Institute 1 n=188 Mean± SD	Institute 2 n=110 Mean±SD	P Value Institute 1 and 2
1	I gained critical thinking skills through PBL tutorials	3.27± 1.34	3.31± 1.08	0.484
2	I gained problem-solving skills in PBL tutorials	3.47± 1.23	3.29± 1.02	0.016
3	I gained the ability to think laterally in solving problems in PBL tutorials	3.26± 1.18	3.32± 1.12	0.472
4	I have gained skills in making diagnosis in PBL	3.43 ± 1.23	3.47 ± 1.05	0.859
5	PBL enhanced my communication skills Development	3.67 ± 1.26	3.56 ± 1.16	0.12
	Sum (Mean score)	3.42± 0.16	3.39± 0.11	0.32
6	PBL tutorials promote team work	3.59 ± 1.29	3.59 ± 1.17	0.11
7	Participants in PBL group contributes actively in the discussion	3.17 ± 1.33	3.07 ± 1.24	0.987
8	Small groups in PBL session encourage the students to share their ideas in group	3.49 ± 1.28	3.63 ± 1.06	0.179
9	Students like to share their knowledge with group members in PBL session	3.69 ± 1.20	3.55 ± 1.15	0.08
	Sum (Mean score)	3.48± 0.22	3.4± 0.22	0.12
10	Students prefer PBL classes on didactic lecturing	2.93 ± 1.32	3.17 ± 1.18	0.13
11	Students understand difficult concepts much better in PBL rather than teach in a lecture	3.25 ± 1.34	3.45 ± 1.18	0.06
	Sum (Mean score)	3.09± 1.33	3.3± 1.18	0.16
12	Tutor provides a relax atmosphere during PBL session	3.19 ± 1.38	3.46 ± 1.12	0.007
13	Tutor asks frequent questions during session about the problem being solved	2.65 ± 1.26	3.22 ± 1.05	0.197
14	Tutor uses questions to keep the students on track	2.45 ± 1.29	3.41± 1.06	0.009
15	Tutor actively resolves the conflicts among group participants	2.80 ± 1.33	3.50 ± 1.10	0.02
	Sum (Mean score)	2.7± 0.32	3.2 ±0.4	0.048

Table-1: Evaluation of experience of medical students regarding PBL in two different institutes.

DISCUSSION

According to this study, the students of both institutes found PBL a better learning methodology in acquiring critical thinking, problem solving, communication skills and studying in small groups. Pertaining to tutor performance, the institute 1 mean score <3.0 showed student's dissatisfaction towards their tutor performance in PBL conduction, P value (0.048) is statistically significant.

In imparting skill development subscale (item 1-5) the mean score of Institute 1 was 3.42, which is higher than Institute 2(3.39), that was good response (Table-1). This shows that the PBL system of the Institute 1 is more effective in imparting skill development competencies in its students as compared to the Institute 2.

Regarding group process subscale (item 6-9) the mean score was 3.4 for both institute which is a concurrent finding. The PBL system is equally effective in both institutes when it comes to the outcome of group process.

Pertaining to learning preference subscale (item 10-11) the mean score of Institute 1 and Institute 2 is 3.09 and 3.4 respectively. Both institutes showed adequate response but the institute 2 is lead in generating learning preferences about PBL system.

Regarding tutor practice subscale (item 12-15) the mean score of Institute 1 was 2.7 which showed their dissatisfaction towards tutor practice in PBL conduction while the mean score of Institute 2 was 3.2 which was superior response towards their tutor practice in PBL conduction.

The finding was similar to those from Turan et al, in which students are not satisfied with their tutor performance in PBL process. This may be because of unpreparedness of tutor for PBL (tutor didn't go through facilitator guide for PBL), lack of training of faculty who were involved in PBL conduction. On the other hand students of Institute 1 devalued their tutors because of other factors, as students may have had issues with a specific tutor or vice versa.

It is suggested that proper and frequent training sessions should be conducted for faculty, hiring of more qualified, experienced faculty and, assigning PBL to well versed, passionate faculty members and voluntary participants so they follow all steps of PBL in true spirit. This finding is supported by another study conducted by El Aziz El Naggar¹¹ in which he evaluated the educational effectiveness of implementing a facilitator training workshop. Results of his study showed that facilitator training workshop was effective in improving tutor facilitation skills in the areas of constructive active learning, collaborative learning, self-directed

learning, and increased the educational outcomes of the PBL sessions from students:

It was observed in open ended question of this study survey, most of the students complained that PBL marks were not included in internal evaluation, therefore students were not taking PBL and tutor sincerely. It was deduced that PBL marks should be included in internal evaluation.¹²

Results of this study showed that students found PBL a better learning approach with successful outcome. That PBL should be commenced by more medical colleges gradually, to extract and spread advantages of PBL. The study also revealed the importance of evaluation of effectiveness and weaknesses of existing PBL model which would eventually help in improvement through feedback of actual product of this system.

This cross-sectional study was based on self-reported information provided by the students and on convenient sampling method. Due to limited time frame, this was a pilot study of small sample size in between two institutes only.

Similar studies should be conducted in other medical colleges, upon introduction of PBL as one of the methods of active learning in curriculum. Their faculty and administrative staff involvement is essential for data regarding logistics, feedback, concerns and hindrances pertaining to PBL.

CONCLUSION

This study reveals that medical students of both institutes consider PBL as valuable learning methodology. It also emphasizes the important role of PBL in curriculum which enables self reflection in students, regarding enhancement in their different learning skills and helps students assess their tutor performance during PBL conduction. The investigator strongly recommends tutor and student training be made mandatory before introducing PBL.

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