

Perspectives on Problem-based learning (PBL)

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Abstract:

Background. PBL provides motivation for self directed learning, offers an opportunity to work in groups and helps develop problem solving skills. Problem based learning (PBL) has emerged as an effective teaching learning tool and has been adopted by many medical schools worldwide. PBL has been recently adopted as one of the teaching-learning methods even in the department of Physiology in our institute.

Aim: To assess the students' perception and opinion on problem based learning.

Methods: We conducted a cross sectional study which included fifty MBBS students of NEIGRIHMS. The students were voluntarily asked to respond to a 7 item questionnaire evaluating their perception and opinion on PBL. Perception was measured with a 3 point likert scale. Paired t-test was applied to compare the scores of perception before and after PBL exercise and p-value of less than 0.05 was considered as statistically significant.

Results: Overall students had negative perception before PBL introduction with mean 0.61 ± 0.15 . After PBL introduction majority of students showed positive response of all items and there was significant increase in the score with mean value was 0.90 ± 0.10 . Though most students reported that PBL sessions enhances their problem solving skills (93.5%) and communication skills (93.5%) but majority of them not sure to completely change to PBL.

Conclusion: Our findings shows strong positive response in favour of PBL. However on question of complete changeover to PBL, majority of students are not certain and disagree for such a transition. Hence, adoption of a combination of conventional and PBL can be a mainstay in the medical teaching learning curriculum.

Key Words: Problem based learning, teaching learning tool, group learning,

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I. Introduction

Problem based learning (PBL) was initially introduced by McMaster University in the mid 1970's as part of a case based learning method. Eventually, this same method of teaching-learning was adopted by Maastricht University and the Harvard Medical Schools as well (1). Today, PBL has become a part of the teaching-learning methods used in many Asian Medical Schools which includes the Indian Medical Institutions. As PBL is designed to motivate self-directed and higher order form of learning as a team or a group (2,3) it therefore inculcates qualities like team work, coordination, cooperation, leadership, mutual respect amongst members, art of listening and skills to search for resource materials, to review and also to conduct critical evaluation of such resource materials. (4,5,6,7) This active form of learning is found to be appealing to students as it motivates them to become independent learners, problem solvers and to even monitor their own learning. A number of studies conducted to find the perception of students about problem based learning have revealed positive learning outcomes with respect to identification of learning objectives, improved solving skills, improved communication skills and in enhancing understanding of clinical concepts. However, very few studies have indicated results that are not favourable to PBL. As, we have adopted problem based learning as one of the teaching and learning methods in the department, we are therefore interested to find out the actual response of students to PBL in our set up. Hence, the objective of this study is to assess the perception and opinion of students in NEIGRIHMS with regards to problem based learning and to compare with studies done elsewhere.

II. Materials and Methods

Study design-crosssectional study

Study population: Fiftyfirst year MBBS students of North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong

PBL Session

The design of the allotted problems or cases in PBL is based on real or hypothetical cases that demonstrates core learning objectives with integration of basic and clinical sciences knowledge. Orientation of the teachers and students to PBL was done prior to PBL sessions. Each PBL case was presented to students and conducted over the course of 3-4 class sessions, with duration of 50-60mts each and spaced at least 1 week apart. Students were assigned to work in groups of 8-10 by their instructor. Groups were selected by the instructor in a manner to ensure proportional representation of students with various academic strength in each group. Participants were allotted different roles which included roles of chair, scribe and group members and the functions of each role was explained in detail by the instructor.

The Questionnaire

A self-administered questionnaire consisting of seven questions relating to important issues for evaluation of students' perception and opinions regarding effectiveness of PBL was employed. The variables for perception included items like: find lectures interesting, pay adequate attention, interact with teachers. The variables for opinion included items like; development of communication skills, team working skills, group consistency, and preference of PBL for clinical concepts

Data collection- Questionnaires were distributed to the 50 student research participants after taking their consent. Participation was voluntary and names of participants were kept confidential.

Statistical analysis:

Data were analyzed using SPSS version 22. Results of descriptive analysis were tabulated in the form of percentage, mean and standard deviation for each individual item. Perception was measured with a 3 point likert scale. Paired t-test was applied to compare the scores of perception before and after PBL exercise and p-value of less than 0.05 was considered as statistically significant

III. Results and observation

The study included 50 medical students, all enrolled in the first year of Medical School. Table 1. showing overall students had negative perception before PBL introduction with mean 0.61 ± 0.15 . After PBL introduction majority of the students showed positive response of all items and there was significant increase in the score with mean value was 0.90 ± 0.10

Table 1. Perception on PBL, before and after PBL

Perception	Before PBL		After PBL		P-Value
	Mean	SD	Mean	SD	
1. Find lectures interesting	1.70	.87	2.77	.50	<0.01
2. Pay adequate attention	1.77	.77	2.53	.68	<0.01
3. Interact with teachers	1.67	.84	2.53	.77	<0.01
4. Participate in group discussions	1.70	.83	2.80	.61	<0.01
5. Learn from fellow students	2.37	.85	2.83	.46	0.01
6. Understand applied clinical aspects	1.93	.82	2.77	.50	<0.01
7. Feel motivated to learn the subject in depth	1.77	.72	2.73	.52	<0.01
Total	0.61	0.15	0.90	0.10	<0.01

Table 2. figure shows students Opinion on PBL (N=31). The percentage of students who thought that PBL enhances problem solving skills and improves teamwork skills were found to be 93.5% whereas 3.2% disagreed and were not sure. Regarding critical thinking majority of students agreed (87%) and 12.9% were not sure. Regarding group consistency in PBL; only 70.9% of students agreed that the groups were consistent, whereas 3.2% and 22% were not sure and disagreed respectively. Only 32.2% agreed to change teaching-learning to complete PBL but majority of students were not sure (51.6%) and 12.9% disagree.

Table 2: Opinion on PBL

Sl. No	Questions	Yes N=%	No N=%	Not Sure N=%
1.	Help in self- directed learning	24 (77.4)	1 (3.2)	6 (19.3)
2.	Want integrated system (Conventional and PBL)	23 (74.1)	1(3.2)	7 (22.5)
3.	A Complete changeover to PBL	10 (32.2)	4 (12.9)	16 (51.6)
4.	Stimulates critical thinking	27 (87)	0	4 (12.9)
5.	Integrated basic science with clinical knowledge	25 (80.6)	0	4 (12.9)
6.	Identifies knowledge gaps	26 (83.8)	3 (9.6)	2 (6.4)
7.	Enhances problem solving skills	29 (93.5)	1(3.2)	1(3.2)
8.	Improves communication skills	24 (77.4)	2 (6.4)	5(16.1)
9.	Improves team working skills	29 (93.5)	0	2 (6.4)
10.	Group consistency	22 (70.9)	1(3.2)	7 (22.5)

IV. Discussion

According to the outcome of the comparison between the Pre PBL and the Post PBL perceptions, our study demonstrates that the overall students' perception on PBL was positive. Our studies shows highest mean score in learning process which is in agreement with Al-Drees et al and other similar studies (9,10,11). Our study also showed much higher mean score for perception items such as 'learn from fellow students, participation in group discussion and better understanding' of the topics which integrated basic and applied clinical aspects.

The influence of PBL on problem solving skills and team working skills scored the highest of all items (93.5%) which again is reflecting students positive opinion on this form of teaching learning method. Our finding is also in agreement with a study done at Faculty of Medicine, Qassim university, in which 81.4% of participants pointed out that PBL system improved their problem solving skills (12)

Majority of students admit that PBL helped them to apply basic science to explain clinical phenomena. About 80.6% of students in our study, viewed this educational strategy as preferable for understanding clinical concepts, a finding which is even higher than study done by Sheikh et al (8) study where only 69% concurred with such a view. Indeed, studies have shown that basic science learning is more efficient through the PBL approach. (13,14) A high percentage reported that the PBL sessions helped them to understand basic sciences concepts, increase their knowledge, and improve problem solving skills. Findings in our study are also supported by previous studies which showed that PBL sessions lead to better factual recall, and a substantial increase in students' knowledge and skills (10,11) Most of the students also pointed out that PBL is helpful to sharpen their critical thinking and a good percentage of participants reported that PBL stimulated self-learning. These findings are in contrast to study done by Elzubeir MA which featured negative responses as PBL resulted in increased volume of matter to be learned and excess self-directed learning (15). Our study has also indicated a strong positive opinion on the enhancement of communication skills and interpersonal relations, following PBL sessions.

PBL sessions are conducted in small groups which provides a conducive atmosphere for students to feel more at ease to ask questions, interact, postulate hypothesis, suggest necessary required informations and to justify their views. In spite of this student friendly ambience in PBL sessions and the positive perception and opinions that students have on PBL, it is surprising to note that only 32.2 percent of students however, agreed to a complete transition of the curriculum from conventional to PBL and a thumping majority of 74.1% wanted an integration of conventional teaching method and PBL.

It may be mentioned here that this study has limitations as it was based on students' perceptions and opinions only. The study could have given us an in-depth knowledge if we could have included assessment by some form of evaluative process about their knowledge and understanding of the topic taken in PBL sessions.

V. Conclusion

Our findings, shows strong positive response in favour of PBL. However, on question related to complete changeover to PBL, majority of students are not certain and not in favour of such a transition. Hence, adoption of a combination of traditional frontal lectures and PBL can be the mainstay in the medical teaching learning curriculum. It can also be mentioned here, that perception and opinions on PBL indicated in our study are found to be similar to indications which were found in many studies done in India and abroad.

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