

Pros And Cons Of Problem-Based Learning In Medical Education: Students' Viewpoint

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Abstract: Background and Objectives: Problem-based learning (PBL) is an innovative educational approach in which the students determine what they need to learn. The present study was done to review the pros and cons of PBL, with the aim to introduce reforms in the traditional teaching methodology. Methods: A total of 200 MBBS students participated in the study. Six PBL exercises were allotted to the students and after their completion, they were asked to fill the questionnaire regarding their perceptions about PBL on a 5-point Likert scale, as well as open ended questions to elicit two reasons each for liking and disliking PBL. Results: Regarding the students' perceptions, the mean/median scores of all the items was found to be ≥ 3 , indicating the positive inclination of students towards PBL. The major favourable factors of PBL were the opportunity of group discussion (16%) and better understanding (15.8%). The major drawbacks in PBL were that preparation required more time (20.5%), inadequate discussion (12.8%) and large group size (11.0%) Interpretation and Conclusion: Students generally favour PBL, as it enhances their ability to handle and solve real-life problems; however, few of the challenges are also accompanied with it which should be looked into to improvise it. [Manisha J NJIRM 2016; 7(4):78-81]

Key Words: Medical education, Problem-based learning, Pros & Cons

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Introduction: 21st century has brought new challenges in its wake in the context of medical education as well with a necessity to teach relevant material to students in such a way that critical thinking is fostered at all levels of education. The approach of Problem-Based Learning (PBL) in medical education can be considered as the most significant educational innovation in the past 35 years. Problem-based learning is defined as "an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem"¹. PBL is a powerful class room process, which uses real-world problems to motivate students towards identification and application of research concepts and information, and encourages them to work collectively and communicate effectively. It is a strategy that inculcates habits of learning. PBL is an active and very effective learning technique for students to learn more, apply, integrate, and retain information².

PBL is a process, which is carried out as follows: firstly, a problem is assigned to students, who, in a groups of 10-12 students organize their ideas, define its nature and try to find its solution with available knowledge; then students undergo brainstorming on the problem and identify aspects of it that needs to be clarified and requires research (learning issues); followed by prioritization of the issues and planning to solve it; when the students meet again, they share and explore

the collected knowledge about the learning issues and utilize it to propose an informed solution to the problem and after finishing working with the assigned problem, the students evaluate themselves, their peers (group members) , and the process³.

Thus, PBL instils many different kinds of skills like problem solving, argumentation rules⁴, collaborative spirit⁵ and peer tutoring⁶. It is an innovative educational approach focussed towards the students in which students decide what they need to learn^{7,8}.

The evaluation of any innovative teaching learning strategy is required to implement it properly^{9, 10}. Understanding the present situation and students' perceptions on PBL are essential pre-requisites for modifications of the curricula. Thus, the views and feedbacks of the students regarding PBL have great values to rectify the curriculum. The present study was done to review the pros and cons of PBL as a step to further improvise this upcoming teaching methodology.

Method: A total of 200 first year medical undergraduate students of School of Medical Sciences and Research, Sharda University participated in the study. Ethical approval from the Institutional Ethics Committee for conducting the study was obtained. The study was conducted over a period of two years on two batches of 100 students each. The students were initially briefed about the principles,

methodology, and practice of Problem Based Learning. For each PBL exercise, the students were then divided into groups of 15-18 students and each group was allotted a facilitator. A common clinical case scenario was assigned to all groups at one time followed by brainstorming and self learning by students for one week. Subsequently, two sessions of 2 hour formal discussions over two weeks were conducted for each exercise. Six such exercises on different topics were conducted over a period of one year for each batch. At the end of all the PBL exercises, the objective of this research study was explained to the students and they were invited to participate. The students who gave their informed verbal consent were included in the study. None of the students refused to participate in the study. The students were asked to fill 12-item questionnaire regarding their perceptions for PBL with respect to enhancement of knowledge, skills and aptitude by a 5 point Likert scale. The Likert scale is an ascending order of score(1, 2, 3, 4 and 5 standing for Strongly disagree, Disagree, Partially agree, Agree and Strongly agree respectively). Along with that, in order to get a wider opinion regarding the PBL, they were given open-ended questions to express two reasons each

for liking and disliking PBL T-L strategy, constituting a total of 400 responses each.

Statistical Analysis: The data was entered and analysed using Statistical Package for Social Sciences (SPSS version 16). Mean Score with Standard Deviation as well as Median Score for each item were calculated. The mean/median score of any item ≥ 3 indicated a positive attitude towards PBL curricula. Percentage frequencies of reasons for liking and disliking PBL were obtained.

Results: In Table 1, the mean and median scores of all the items were ≥ 3 which strongly favoured the fact that PBL T-L strategy helped in enhancement of knowledge, skills & aptitude. Table 2 shows that the major reasons for liking PBL were that it encouraged group discussion among students (16%), led to better understanding (15.8%) and found it to be interesting also (10.5%). Table 3 shows that the major issues among students causing dislike for PBL were that preparation requires time (20.5%), inadequate group discussion(12.8%), large group size (11%) and briefing inadequate (10.8%).

Table 1. Students' Perceptions regarding PBL with respect to enhancement of Knowledge, Skills and Aptitude

Statement	Frequency of Responses for each statement(N=200)					Mean Score (SD)	Median Score
	Strongly Disagree n (%)	Disagree n (%)	Partially agree n (%)	Agree n (%)	Strongly Agree n (%)		
Improved presentation skills	0(0)	21(10.5)	58(29.0)	82(41.0)	39(19.5)	3.70(0.90)	4
Improved acquiring information beyond books	0(0)	20(10.0)	61(30.5)	70(35.0)	49(24.5)	3.74(0.94)	4
Helps in understanding all aspects of a problem	2(1.0)	12(6.0)	89(44.5)	79(39.5)	18(9.0)	3.50(0.78)	3
Improved communication skills	0(0)	32(16.0)	49(24.5)	72(36.0)	47(23.5)	3.67(1.00)	4
Improved proficiency with computers and IT	0(0)	56(28.0)	54(27.0)	44(22.0)	46(23.0)	3.40(1.12)	3
Improved Confidence	0(0)	16(8.0)	75(37.5)	64(32.0)	45(22.5)	3.69(0.91)	4
Encourages self directed learning	0(0)	17(8.5)	58(29.0)	87(43.5)	38(19.0)	3.73(0.87)	4
Enjoyed active participation	1(0.5)	9(4.5)	59(29.5)	95(47.5)	36(18.0)	3.78(0.80)	4
Better comprehension	0(0)	10(5.0)	66(33.0)	99(49.5)	25(12.5)	3.70(0.75)	4
PBL helped in developing critical thinking	4(2.0)	17(8.5)	74(37.0)	88(44.0)	17(8.5)	3.49(0.84)	4
PBL Learning is in-depth study and lasts longer	0(0)	11(5.5)	51(25.5)	86(43.0)	52(26.0)	3.90(0.90)	4
I would like to use PBL as a T-L Methodology	15(7.5)	16(8.0)	73(36.5)	58(29.0)	38(19.0)	3.44(1.12)	3

Table 2. Reasons for liking PBL as a teaching methodology

Likes	No. (%)
Group discussion	64(16.0)
Use of audio-visual aids	18(4.5)
Helps to solve clinical problems	28(7.0)
Improves presentation skills	24(6.0)
Interesting	42(10.5)
Helps to gather information from other sources than text books	29(7.3)
Different aspect of a problem covered	24(6.0)
Self directed learning	14(3.5)
Learning lasts longer	12(3.0)
Improves communication skill	27(6.8)
Better understanding	63(15.8)
Team work valuable	19(4.8)
Improves confidence	15(3.8)
Active participation	13(3.3)
Creates curiosity	8(2.0)
Total	400(100)

Table3. Reasons for dislikes of PBL as a teaching methodology

Dislikes	No. (%)
Preparation requires time	82(20.5)
Inadequate group discussion	51(12.8)
Lack of coordination	41(10.3)
Large group size	44(11.0)
Briefing inadequate	43(10.8)
Students don't take seriously	20(5.0)
Problem in searching information	31(7.8)
Introverts are unable to express	31(7.8)
Creates confusion	7(1.8)
Waste of time	21(5.3)
Difficulty in understanding	11(2.8)
Good for only selected topics	14(3.5)
Inadequate individual participation	4(1.0)
Total	400(100)

Discussion: Problem-based learning is an innovative and challenging approach to medical education--innovative because it is a new way of using clinical material to help students learn, and challenging because it requires the medical teacher to use facilitating and supporting skills rather than didactic, directive ones. For the student, problem-based learning emphasises the application of knowledge and skills to the solution of problems rather than the recall of facts.¹¹

The present study showed that the PBL improved the presentation skills, communication skills and proficiency with computer and IT among students. Similar finding was observed in a study by Nahar¹² among medical students in Saudi Arabia in which 77.1% students agreed that PBL improved presentation skills. A study carried out by Koh¹³ based on systematic review of 15 studies on problem based learning showed that PBL improved presentation and communication skills of the students. Another study carried out by Thirunavukkarasu¹⁴ among the medical students of Chennai also found that PBL improved the communication skills in 80% students. The present study also showed that PBL motivated the students for self-directed learning and led to better understanding

of the concepts which is also well supported by the systematic review carried out by Koh¹³. Another study carried out by Shamshan¹⁵ in a medical school of Saudi Arabia also reported that PBL helps in improving the understanding of the subject. Our study showed that PBL improved critical thinking among students. Similar are the findings of the study carried out by Nahar¹² among Saudi medical students in which 81.4% students perceived that PBL improved critical thinking. Contrary to this, are the findings of the systematic review by Koh¹³ which showed very little impact of PBL on critical thinking. In the present study, it was found that PBL encouraged the students to gather academic information beyond the textbooks. Similar are the findings of the study conducted by Nanda¹⁶ among the medical students of Karnataka in which information gathering was observed to be significantly better with PBL than the traditional method. Other reasons for liking PBL as a teaching methodology in our study were that PBL makes learning more interesting, inculcates the habit of teamwork and improves the problem solving skills among the students. A study conducted by Al-Naggar¹⁷ among the Malaysian medical students also highlighted the fact that PBL holds the interest of the students and promotes their problem solving skills. Nanda¹⁵ also observed that PBL enhanced the

teamwork and interpersonal relationships among the students. Though majority of the students in the present study favoured the PBL teaching methodology but PBL needs to be improvised as many students perceived few problems with this methodology. The major reasons for disliking the PBL methodology were reported as that preparation for PBL requires more time as compared to the conventional teaching methods; few students reported that group discussion was inadequate. Few students also found the briefing to be inadequate and some of the students also perceived the group size to be large. The study by Al-Naggar¹⁷ among Malaysian medical students also found the PBL to be more time taking than conventional method. Student contact hours are four times greater for educators in a problem-based learning curriculum than for educators in a traditional curriculum. As a consequence, the economic viability of problem-based learning becomes a major concern. Another limitation of problem based learning as reported by Koh¹³ was that PBL does not improve the possession of medical knowledge, though the application of knowledge was enhanced through this process.

Conclusions and Recommendations: The present study revealed that PBL is a self learning strategy that empowers students to engage in problem solving and collaborative learning and improves confidence, presentation and communication skills and critical thinking. It has been found to be an interesting teaching methodology that leads to better understanding and long lasting learning. Students generally favour this strategy as it enhances their ability to handle and solve real-life problems. However, few of the challenges are also accompanied with PBL methodology which should be looked into to improvise it. Moreover, it is recommended that further studies should be carried out among medical students of India and abroad to review the strengths and pitfalls of PBL which would provide useful data towards the integration of PBL in future Indian medical curriculum.

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