The Perception and Usefulness of Problem Based Learning Among Medical Students

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ORIGINAL

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Abstract

Background: Problem Based Learning (PBL) has been increasing adopted in medical school worldwide. Problem based learning is an instructional strategy in which learner-centred method is utilised and “problems” are used as the focus of learning in small groups. Problem-based learning grounded in cognitive theory and with its origins in medical education, is a useful approach for teaching students how to think critically and solve problems they will encounter.

Objectives: To determine the student’s perception and usefulness of problem based learning among the clinical specialties of medical departments of Melaka Manipal Medical College.

Methodology: College based cross sectional study was conducted at Melaka Manipal Medical College, Melaka, Malaysia from August to October 2012. Self-administered questionnaires were distributed to final year medical students who had undergone PBL classes in all discipline. Data were analyzed by using SPSS 16 software. To assess perception, five points Likert scale was used for scoring.

Results: There were 220 students participated in this study and majority of the respondents were Malay 84 (38.2%) with mean age of 23 years (SD: 0.88). Most of the students (78.3%) perceived that facilitator motivated them to study during the session, (76.9%) perceived that PBL classes were well plan and structure and (75%) of them perceived that PBL classes helped them to identify the weakness in learning topics and to develop communication skill. Regarding usefulness of PBL classes more than 90% of students stated that PBL classes helped them to develop team collaboration, self-directed learning, and problem solving skill.

Study Limitations: This is the cross-sectional study regarding the student's perception on usefulness of problem based study. It will be better if we can perform intervention study regarding usefulness of the PBL classes.

Conclusions: There is strong evidence that students have positive perception on PBL classes and helped them to develop scientific basis of deep and structured learning. However, there is a need to continually evaluate teaching strategies employed within medical schools to ensure effective learning.

Keywords

PBL; Medical students;
Perception; Malaysia.

Introduction

Problem Based Learning (PBL) has been increasing adopted in medical school worldwide. Problem based learning is an instructional strategy in which learner-centred method is utilised and "problems" are used as the focus of learning in small groups. Problem-based learning grounded in cognitive theory and with its origins in medical education, is a useful approach for teaching students how to think critically and solve problems they will encounter. [1]

PBL has disadvantages as well as advantages. However, such method is found to be more effective than learning based on established disciplines in the traditional curriculum. [2] Traditional undergraduate medical school curricula are often divided into pre-clinical and clinical years, and are dominated by a teacher-centred, reductionist approach, with a didactic, fragmentary manner usually in large lecture theatres by teachers with expertise in the areas of their research interests. [3]

Problem-based learning (PBL), however, provides opportunities for authentic, integrated problems to drive the learning of undergraduate students and to reduce the burden of factual information. Underpinned by constructivist, experiential, adult learning principles. [4] PBL is increasingly considered to be among the best educational practices

that medical schools internationally are adopting as they revitalize their curricula and shift to a learner-centred focus.

Over the last 20 years, there has been increasing interest in problem-based learning (PBL) in undergraduate medical education. PBL was pioneered by the McMaster Medical School in Canada in 1969 and soon, thereafter many medical and health institutes across the world adopted this innovative approach. PBL is an instructional strategy in which learner-centred method is adopted and students learn by working on real life problems and activities, where teacher acts as a facilitator. [5] PBL embraces a pedagogic theory intended for enhancing self-motivation, active, life-long learning, critical thinking, professional behaviours, effective communication and collaborative team-work approaches of students. [6] However, for PBL to be effective, construction of well-designed cases/problems that drive meaningful learning is crucial as these are the starting point for students' learning activities that largely impact on the quality of student learning. [7]

Problem-based learning occurs in the context of a community of learners who share the same objective: solving the problem. Ideally, the group should consist of 5 to 7 members but can be modified to accommodate up to 14 members. Unlike the lecture

format, the PBL process addresses group dynamics, including the relationships and contributions of each group member. Leadership, cooperation, communication, resource utilization, collaborative team building, and decision making skills are crucial to group success and are developed through the PBL learning process. The active-learning process of the PBL environment allows the learner to engage the real world problem with enthusiasm, initiative, and inherent motivation because the knowledge acquired is integrated, flexible, and immediately useful. The content to be learned is immediately important and relevant to the learner's life and career. The PBL process likely facilitates the development of the relationship among learning, cognitive competence, and motivation. [8]

In our college, PBL classes were conducted under guideline of each department. We would like to determine the student's perception and usefulness of problem based learning and their opinion on how to improve their PBL classes better. From this research result will give perception and usefulness of PBL classes on the students and that can apply on the improvement of PBL classes among disciplines.

Objectives

To determine the student's perception and usefulness of problem based learning among the clinical specialties of medical departments of Melaka Manipal Medical College.

Material and Methods

College based cross sectional study design was conducted at Melaka Manipal Medical College, Melaka, Malaysia from August to October 2012.

Data was collected in the form of pre-tested self-administered questionnaires. Each questionnaire consisted of FOUR sections, Section (A) - Socio-demographic character, Section (B) - Usefulness of PBL classes, Section (C) - Perception

of PBL classes and Section (D) Student's opinion to improve PBL classes. In order to standardize the questionnaires, a pilot study was conducted among the third year medical students; content validity was examined.

The pre-tested structured closed ended questionnaires were distributed to all the final year students during their PBL classes. The purpose of the study was explained and informed written consent was obtained. All the collected data were tabulated and analyzed by using the statistical package for social science, SPSS, version 16.0. The data were screened for accuracy and incomplete data were excluded from analysis. To assess perception, five points Likert scale was used for scoring, 5. Strongly agree, 4. Agree 3. Not Sure 2. Disagree and 1. Strongly Disagree. Operational definition for problem based learning is the learning that results from the process of working towards the understanding or resolution of the problem. Perception was defined as way of understanding upon peer assisted learning by the students. The study was approved by research committee Melaka Manipal Medical College on May 2012.

Results

There were total 254 students in the academic year belonging to the final year and among them 220 respondents participated in this study which gave a response rate of 87.7%. It was found that majority of the respondents were Malay 84 (38.2%), followed by Chinese 65 (29.5%) and Indian 60 (27.3%). The mean age of respondents was 23 years (SD- 0.88). The sex distribution revealed that the majority of the respondents 147 (66.8%) were female.

Perception of students on their PBL session classes

Total 13 perception statements with three negative and ten positive statements were used to assess the students' perception on their PBL classes. The

response (%) of perception of students on their PBL session was shown in **table 1**.

The students perceived positively on the PBL classes were well plan and structure (76.9%), PBL classes' link to the lecture classes (52.7%), PBL classes covered all areas in key topic (69.5%) and PBL classes help to identify the weakness in learning topics (75.0%). In this study 70.0% of students perceived positively on the statements "PBL classes motivate self-study", 68.6% of students strongly agree and agree on the statement "Facilitators were devoted and gave sufficient time to each students", 78.3% of the students gave positive response to the statement "Facilitators were encouraged to motivate me to study about the topic" and 56.8% of them stated that PBL classes made them increase Level of understanding.

Usefulness of PBL session

Regarding usefulness of PBL classes above 90% of students stated that PBL classes developed team collaboration, self-directed learning, and problem solving skill. **Figure 1**

The student's opinion to improve PBL session

We have assessed the student's opinion to improve PBL session by statements as well as open ended questions. Regarding the statement "I wish PBL classes to be more interactive" 71.4% of the student strongly agree and agree on that statement and 71.6% of the students stated that "Some PBL classes need to be conduct in small group discussion".

The students gave opinion to things to improve in PBL session and 31.8% of them stated that PBL classes need more interaction, 18.2% prefer less students teacher ratio and 46.4% of them prefer to discuss real case scenario in PBL session. **Figure 2**

Discussion

There were total 220 respondents participated in this study. It was found that majority of the respondents were Malay 220 (38.2%). The mean age of respondents was 23 years (SD: 0.88). The sex distribution revealed that the majority of the respondents were 147 (66.8%) female.

Table 1. Responses (%) of perception of students on their PBL session classes.

Statement	SA	A	U	DA	SDA
PBL classes were well planned and structured	11.4	65.5	17.3	3.6	2.2
PBL classes were not link to lecture class	2.7	23.6	20.9	44.5	8.2
PBL classes covered all areas in key topics	6.8	62.7	24.1	6.4	0
PBL classes helped to identify the weakness in learning topics	9.5	65.5	21.8	3.2	0
The concepts of topics became clear after PBL classes	12.3	61.4	23.2	3.2	0
PBL classes motivated self-study	18.6	51.4	25.5	3.2	1.4
Facilitators were devoted and gave sufficient time to each students	14.1	54.5	26.4	4.5	0.5
Facilitators were encouraged to motivate me to study about the topic	13.8	64.5	18.2	3.2	0.5
Level of understanding not much increased after PBL classes	1.4	18.6	23.2	50.9	5.9
PBL classes helped to develop communication skill	11.8	63.2	17.3	7.7	0
PBL classes did not help much for exam	0.9	13.2	28.2	45.5	12.3
I wish PBL classes to be more interactive	10.9	60.5	20.9	7.7	0
Some PBL classes need to be conduct in small group discussion	20.5	51.4	21.8	5.5	0.9

SA: Strongly Agree, A: Agree, U: uncertain, DA: Disagree, SDA: Strongly disagree

Figure 1: Usefulness of PBL classes. **Figure 2:** Things need to be improved in PBL classes.

Perception of PBL classes

Total 13 perception statements were used to assess the perception of students on PBL classes. The students perceived positively on the PBL classes were well plan and structure (76.9%), PBL class's link to the lecture classes (52.7%), PBL classes covered all areas in key topic (69.5%) and PBL classes help to identify the weakness in learning topics (75.0%). In a study CHANG *et al* 2004, most students preferred PBL in the following 6 aspects: learning about anesthesia, understanding other medical knowledge, being interested in and motivated to learn, training for future work, training of personal abilities, and being confident and satisfied with the teaching method ($p < 0.05$). [9]

In this study 70.0% of students perceived positively on the statements "PBL classes motivate self-study" In a study KONG *et al* 2009, the students believed that introducing PBL into ophthalmology could improve educational quality and effectiveness. Digital PBL cases stimulate interest and motivate students to further improve diagnosis and problem-handling skills. [18] In a study by HOFFMAN *et al* 2006, the PBL curricular changes implemented with the graduating class resulted in higher performances on USMLEs. These changes better prepare graduates with knowledge and skills needed to practice within a complex health care system. Outcomes reported in a study support the investment of financial and human resources in the PBL curriculum. [19]

In this study 68.6% of students strongly agree and agree on the statement "Facilitators were devoted and gave sufficient time to each students" and 78.3% of the students gave positive response to the statement "Facilitators were encouraged to motivate me to study about the topic" and 56.8% of them stated that PBL classes made them increase Level of understanding

In a study BERMEN A *et al* 2006 the students perceived that PBL helped them with in-depth understanding of certain topics and link their basic

science knowledge to clinical classes. They felt that guidance from subject specialists and well-prepared facilitators of the sessions were beneficial. [12] In a study CHENG *et al* 2004 the students prefer to modified the assessment tools and content of PBL to implement of PBL for teaching anesthesia. [9]

In a study Bhattacharya N, the respondent found out that both students and teachers found PBL rewarding. Implementation of PBL is feasible even in a traditional set-up despite limited resources, rigid time schedules and little interaction among various disciplines. [13] In a study BERMEN A *et al* 2006, PBL classes provided guidelines for searching for resource materials and briefing the students and facilitators about the philosophy and principles of PBL may make the PBL sessions more beneficial. [12] In a study by BURGUNS *et al*, it was evaluated PBL versus academic courses and the results showed significantly higher scores for PBL (McNemar test $p < 0.0001$). [12]

We have assessed the student's opinion to improve PBL session by statements as well as open ended questions. Regarding the statement "I wish PBL classes to be more interactive" 71.4% of the student strongly agree and agree on that statement and 71.6% of the students stated that "Some PBL classes need to be conduct in small group discussion".

The students gave opinion to things to improve in PBL session and 31.8% of them stated that PBL classes need more interaction, 18.2% prefer less students teacher ratio and 46.4% of them prefer to discuss real case scenario in PBL session. In a study BERMEN *et al* 2006, most students reported their participation in discussion during PBL sessions but the level of participation varied. Some of them worked hard to prepare themselves for discussion while others were relatively passive. [12]

There are some studies that the student preferred PBL classes than traditional tutorial classes. According to Koh, PBL undergraduate students are used

to working in a poorly structured education environment and, therefore, are encouraged to work independently. Furthermore, they often work in small groups, which encourage them to develop good communication among themselves but the study observed that PBL students feel less confident when compared to traditional learning method students. PBL students may feel insecure exactly because they are required to work on an independent basis instead of playing a secondary role in the learning process. [11] The study by Millan stated that traditional learning method students consider themselves to be better prepared for internship activities than PBL students, according to the following three comparative means: by analyzing the answers to each question, by grouping these answers into dimensions, and by calculating the means of answers to the whole questionnaire. [17]

Conclusion and Recommendation

The study result revealed that there is strong evidence that students have positive perception on PBL classes and helped them to develop scientific basis of deep and structured learning. However, there is a need to continually evaluate teaching strategies employed within medical schools to ensure effective learning.

Conflict of interest

It was declared that there is no conflict of interest that might bias the outcomes of the paper.

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