

## Original Article

# Evaluation of Problem Based Learning by Tutors and Students in a Medical Faculty of Turkey

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## ABSTRACT

**Objectives:** To determine the opinion of tutors and students in charge of problem-based learning (PBL) courses during the academic year of 2006-2007 about the extent of contribution of PBL to certain skills in comparison with conventional education and to clarify whether or not they are content with PBL

**Design:** Cross sectional research

**Setting:** Akdeniz University Faculty of Medicine, Antalya, Turkey

**Subjects and Methods:** One hundred and fifty three tutors in charge of PBL courses during the academic year of 2006-2007 and all of the first year medical students (n = 170) were included. A questionnaire was sent to the study population in June 2007.

**Intervention:** Analysis of completed questionnaire

**Main Outcome Measure:** Independent sample t-test analysis was used to determine whether mean scores were different in two groups.

**Results:** Majority of the tutors (87.5%) and students (97.1%) responded to the questionnaire. The question "Is PBL an application that is in general beneficial to the student?" was answered as "yes" by 66.9% of the tutors. The question "Are you content with PBL?" was answered as "yes" by 54.9% of the tutors. On the other hand, 74.5% of the students answered "yes" to this second question.

**Conclusion:** Our results show that PBL is well received by tutors and students and they think that PBL offers significant contribution to the students in areas that are considered to be superior aspects of PBL when compared to conventional education.

KEY WORDS: evaluation, medical education, medical students, problem based learning, tutor

## INTRODUCTION

Problem based learning (PBL) was introduced into medical school curricula by McMaster University in 1969 and has since been adopted by many medical schools worldwide<sup>[1,2]</sup>. PBL is both a method and philosophy involving problem-first learning *via* work in small groups and independent study<sup>[3]</sup>.

In a PBL program, the students use a seven-step procedure to structure their activities. This procedure consists of clarifying vague phrases and concepts in the problem, defining the problem, analysing the problem on the basis of prior knowledge, arranging the proposed explanations, formulating learning objectives, trying to fill in the knowledge gaps by means of self study and finally reporting the finding in the groups<sup>[4-13]</sup>. Such learning is based on adult learning model, with emphasis on self-directed learning.

The first applications of PBL began in 1997 in Turkey. Until today, four medical schools have been

performing their education programs completely based on PBL while most of the remaining medical schools in Turkey have adopted the hybrid education model<sup>[14]</sup>. We, Akdeniz University Faculty of Medicine (AUFM), are one of the faculties that have been implementing the hybrid education model since the academic year of 2002-2003.

The faculty members (tutors) and students constitute the most crucial points in PBL<sup>[15,16]</sup>. We believe that soliciting the opinion of both the tutors and the students may be extremely beneficial for evaluation of PBL. Moreover, it is also important for the detection and the subsequent improvement of the shortages of the education program. When we reviewed the literature, it was seen that there are many studies about PBL. However, only a limited number of studies have been performed for investigating the opinion and thoughts of the tutors and the students together<sup>[17-20]</sup>.

Thus, the aim of the present study was to determine the opinion of tutors in charge of PBL

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**Table 1:** Answers of tutors to the question "Is PBL a beneficial practice for the students in general?" according to their departments

Departments of tutors	Is PBL a beneficial practice for the students in general?							
	Yes		I am indecisive		No		Total	
	n	%	n	%	n	%	n	%
Basic sciences	25	80.6	6	19.4	0	0.0	31	100.0
Medical sciences	37	64.9	12	21.1	8	14.0	57	100.0
Surgical sciences	27	60.0	7	15.6	11	24.4	45	100.0
Total	89	66.9	25	18.8	19	14.3	133	100.0

PBL = Problem based learning

courses during the academic year of 2006-2007 and their students about the extent of the contribution of PBL to learning certain skills in comparison with conventional education and clarify whether or not they are content with PBL.

## SUBJECTS AND METHODS

This is a cross-sectional and descriptive study.

### PBL Setting in Curriculum

Basic medical sciences are being taught in an integrated program composed of five thematic blocks during first two years in AUFM. The courses of different disciplines are integrated on the organ system based themes in these blocks. The duration of each block is eight weeks and the first week is allocated to PBL modules. A case-based scenario is used in PBL sessions. Our students are expected to achieve relevant learning objectives while trying to solve the problems they face in the scenario. Problem solving is only a part of the PBL module. PBL week is entirely devoted to PBL activities and free of other traditional classes. Throughout this week, in three half-day time period, PBL small group discussion sessions, laboratory and field studies, clinical skill practices, and supportive theoretical conferences take place.

### Participants and Collection of the data

The research population consisted of 153 tutors and all the students enrolled in first years (n = 170). Before taking charge in a PBL module, the tutors of AUFM had participated in the PBL courses supported by the faculty developmental program. PBL course

is a part of faculty developmental program which is obligatory for faculty members participating in teaching and tutoring activities. This PBL course takes three days. In the first two days theoretical information is provided to the participants. After that, two sample PBL sessions among participants are carried out and all participant tutors take part in these sessions as both students and tutors. After the course, all participants observe a real PBL module (three full discussion sessions) and are certified to be a tutor for PBL module.

In this study, a questionnaire was sent to the study population in June 2007, which is the final month of the term. Questions included in the questionnaire aimed to determine the department of the tutor, whether he / she thinks that PBL is a beneficial application for students, and finally whether he / she is content with PBL. Additionally, a literature review was performed to determine areas which are accepted as better improved by PBL rather than by conventional education<sup>[2-7]</sup>. Twelve subject headings were determined and questions related to these subject headings were included in the questionnaire. In both questionnaires for tutors and for students, the participants were asked to answer the questions using a 5-point Likert scale (1 - it did not contribute at all, 5 - it contributed well enough).

### Statistical Analysis

Data analysis was carried out using SPSS package version 13.0. Independent sample t-test analysis was used. P-values less than 0.5 were considered statistically significant.

**Table 2:** Answers of tutors to the question "Are you content with PBL?" according to their departments

Departments of tutors	Are you content with PBL?							
	Yes		I am indecisive		No		Total	
	n	%	n	%	n	%	n	%
Basic sciences	23	74.2	5	16.1	3	9.7	31	100.0
Medical sciences	30	52.6	11	19.3	16	28.1	57	100.0
Surgical sciences	20	44.4	10	22.2	15	33.3	45	100.0
Total	73	54.9	26	19.5	34	25.6	133	100.0

PBL = Problem based learning

**Table 3:** Responses of both tutors and students to the question "Are you content with PBL?"

Research population	Are you content with PBL							
	Yes		I am indecisive		No		Total	
	n	%	n	%	n	%	n	%
Tutors	73	54.9	26	19.5	34	25.6	133	100.0
Students	117	74.5	23	14.6	17	10.8	157	100.0

PBL = Problem based learning

## RESULTS

Majority of the tutors (87.5%) and students (97.1%) responded to the questionnaire. 66.9% tutors answered "yes" to the question, "Is PBL an application that is in general beneficial to the student?". When the answer was evaluated according to the departments, it was determined that this answer was mostly given by the tutors employed in departments of basic sciences (80.6%, Table 1).

The question, "Are you content with PBL?" was answered as "yes" by 54.9% tutors. When the answer was evaluated with regards to the tutors' departments, it was determined, once again, that the answer "yes" was mostly given by tutors employed in the departments of basic sciences (74.2%, Table 2). 74.5% students also answered "yes" to this question (Table 3).

Among the close-ended questions those aimed at determining the opinion of tutors and students about the extent of PBL's contribution to certain subject headings, "it contributed" response was ticked by most of the tutors and students for statements, "interpersonal relationships, adaptation to teamwork" and "developing communicational skills", respectively (Table 4).

When the mean scores obtained from the responses to the above-mentioned questions were compared, a significant difference was observed between the mean scores given by the tutors and the students. It was determined that the students gave higher scores to the six items given in Table 5 ( $p < 0.05$ ).

## DISCUSSION

It was observed that similar results have been obtained with studies in the literature which aim to determine opinion of tutors and students about PBL application in medical education<sup>[17-21]</sup>. Our study revealed that the majority of the tutors in charge of PBL sessions felt that PBL was a beneficial application for the students and that they were content with PBL. Additionally, it was found that a great majority of tutors felt that PBL offers significant contribution to students in areas, which were considered as the superior aspects of PBL when compared to conventional education.

It was a striking finding that the number of tutors who were content with PBL and thought that PBL was beneficial to the students were higher in the departments of basic sciences when compared to the other departments. Since PBL is an education model that is used in basic sciences in medical education, the answers given by the tutors employed in these departments become more important. Additionally, the high rate of students (74.5%) who are content with PBL is an eminently important finding. When the mean scores of the study groups given to items aimed to determine skills that are better acquired through PBL than through conventional education were compared, it was found that the mean scores given by the students were higher for eight items. This finding shows that the students feel that PBL makes positive contributions in terms of skills mentioned in those items. In the light of these findings, it may be

**Table 4:** The percentage of tutors and students who said "it contributed" and "it contributed well enough" with PBL's contribution in certain subject headings

Subject headings	Tutors		Students	
	n	%	n	%
Interpersonal relationships, adaptation to teamwork	95	71.4	105	61.8
Skill of telling the information gained to others	95	71.4	116	68.2
Developing the skill of communication	88	66.7	123	72.4
Self-directed learning and use of resource	86	64.7	106	62.4
Developing the skill logical thinking	81	61.4	123	72.4
Using the information sources like library and internet for access to information	80	60.6	101	60.1
Problem solving skill	80	60.6	121	71.2
Developing the skill of decision-taking	70	52.6	122	71.8
Integrating obtained knowledge	66	50.0	111	65.3
Skill of selecting useful information among information sources	64	48.5	81	48.2
Increasing the motivation for learning	63	47.7	114	68.3
The development of the skill of approaching the patient as a biopsychosocial whole	57	42.9	117	68.8

**Table 5:** Mean scores obtained from responses of both tutors and students to the suggestions of PBL's contribution in certain subject headings

Subject headings	Tutors		Students		Statistical analyses	
	Mean	SD	Mean	SD	p-value	t*
Interpersonal relationships, adaptation to teamwork	3.81	1.08	3.70	1.05	0.34	-0.95
Skill of telling the information gained to the others	3.79	0.93	3.74	1.05	0.65	-0.45
Developing the skill of communication	3.72	0.94	3.95	1.05	0.05	1.96
Self-directed learning and use of resource tutors	3.61	0.91	3.63	1.18	0.89	0.13
Developing the skill logical thinking	3.57	0.95	3.85	1.06	0.01	2.35
Using the information sources like library and internet for access to information	3.60	0.99	3.57	1.13	0.81	-0.23
Problem solving skill	3.61	0.97	3.88	0.99	0.01	2.42
Developing the skill of decision-taking	3.43	0.94	3.87	0.97	0.00	3.92
Integrating obtained knowledge	3.33	1.01	3.71	1.10	0.00	3.12
Skill of selecting useful information among information sources	3.34	0.94	3.19	1.28	0.243	-1.16
Increasing the motivation for learning	3.40	1.01	3.81	1.08	0.00	3.37
The development of the skill of approaching the patient as a biopsychosocial whole	3.29	1.02	3.83	1.08	0.00	4.37

\* Independent sample t-test

concluded that PBL is useful in teaching especially of basic sciences in medical education and it helps the students to acquire skills which are crucial components of education.

On the other hand, it is an interesting finding that the tutors employed in surgical sciences were those who were least content with PBL. When the responses of this group to the open-ended questions aimed at determining the opinion and suggestions about PBL were examined, it was determined that some problems were mentioned in their answers. These problems were the time-consuming nature of PBL, the difficulty of allocating time for PBL while being busy with the routine tasks, the burden of acting as orientators for a topic in which they are not competent, and the lack of their faith in PBL. In order to solve these problems, attempts were made to assign the tutors to PBL sessions once in every term and particularly to modules that are closely relevant to their branches.

The part of the questionnaire entitled "Your opinion and suggestions about PBL" helped determine points on which the tutors and students would like to see the greatest improvement. According to this part of the questionnaire, the tutors asked for the selection of topics that are susceptible to self-directed learning and convenient to be discussed comprehensively and demanded better construction of scenarios. The students, on the other hand, requested tutors to attend the PBL modules well-prepared and have a participation standard. Moreover, they have requested better selection of PBL topics. All these requests are and will be taken into consideration in the process of planning and developing educational and instructional activities.

## CONCLUSION

Our results show that PBL is well received by the tutors and students in AUFM and PBL is acceptable in a Turkish setting of undergraduate medical education in our faculty.

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