

ORIGINAL ARTICLE

PROBLEM BASED LEARNING (PBL): AN ANALYSIS OF MEDICAL STUDENTS' REFLECTION

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ABSTRACT

Background: The task of teaching and learning is a dynamic process which requires continuous struggle for the improvements of this process through research. The development of the innovative teaching strategies may enhance the interest of learners in the learning process. Over the past many decades, Problem Based Learning (PBL) has achieved importance in the medical education because of its usefulness and effectiveness in learning. The successful development and further improvements in any of teaching strategy depends upon the feedback. Objective of the study is to evaluate the perception of medical students about the PBL as a teaching strategy.

Materials & Methods: This cross-sectional study has been conducted in the setting of pathology department, faculty of medicine, Northern Border University, Arar- Kingdom of Saudi Arabia. After getting the ethical approval (reference number: 431018129) from the Local Committee of Bioethics at Northern Border University, the questionnaire has been distributed among the 3rd year MBBS student. The study duration is one year which started from January 2022 and completed in December 2022. The sample size was calculated by using Cochran formula with a confidence level of 95%, margin of error of 5%, estimated variance for proportion is 50% and the number of medical students enrolled in third year MBBS. With the help of sample size calculator, the sample size was determined which turn out to be 140. Two hundred questionnaire have been distributed among the willing medical students of this class by a convenience sampling technique.

Results: A total of one hundred and forty-one completely filled responses had been received from the medical students. The response rate is 70.5%. According to the perception of majority of the students, the PBL has improved their skills of giving good presentations and help to work in collaborations. A significant number of them think that the PBL has improved their understanding regarding the diseases. The challenges in the PBL sessions include an irrelevant discussion by some of students due to lack of knowledge, significant time consumption in gathering & arranging the learning material and the number of students in the PBL group.

Conclusion: This study highlighted merits and some of challenges of PBL according to the students' perception. The students' reflection regarding the PBL may be helpful for the further improvement of this teaching strategy.

KEY WORDS: Problem Based Learning (PBL); Medical Education; Learning Process.

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INTRODUCTION

Teaching & learning is very important for the growth of the nations. Effective teaching strategies are essential for the acquisition of knowledge and psycho-

motor skills. The teaching & learning is a dynamic process. The improvements in this process require research and development of the innovative teaching strategies which can create interest of learners in the learning process and facilitate the teachers in teaching. Different teaching methodologies have evolved over the past centuries. There are merits and demerits of each teaching strategy. Over the past many decades, PBL is gaining importance in the medical education as a useful and effective learning technique in most of the countries all over the world. This concept has been widely accepted and practiced in the medical education. The PBL is an innovative teaching approach in student centered teaching techniques. This innovative teaching strat-

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egy stimulates critical thinking among the students and improves the autonomous learning, expression of language, retrieval of literature, interpersonal communication and team work.¹⁻⁴ PBL is based on human health issue and the students are engaged to explore the mechanism and principle of the underlying process to find out the proper explanation of the phenomena or events for better management strategies of the given problem. The problem based learning (PBL) takes place in small groups containing 8-10 students. In this process of learning, the student raise questions and reply to questions along with explanations and discussion about the disagreement. Maastricht 7 jumps approach is employed in PBL which includes the clarification of concepts, the problem definition, analysis of the problem, deriving learning objectives, self-learning and discussion on the gained knowledge. PBL improved the learning capability of learners in virtual environment.⁵ There are certain challenges which are faced by the students and tutors in the application of PBL.⁶⁻⁷ The identification of these difficulties and problems is very important for the improvements in this teaching strategy. Purpose of our study was to explore the advantages and difficulties encountered by medical students in PBL.

MATERIALS & METHODS

This cross-sectional study was done in Northern Border University by distributing a survey to the willing participants among the medical students of NBU, Arar in KSA during the period of one year from January 2022 to December 2022. Convenience sampling technique was employed in distributing the questionnaire among the medical students of 3rd year MBBS class. The questionnaire has been developed by the members of this research team and a pilot study was done. The questionnaire was translated into Arabic to facilitate the student for better understanding. The questionnaire contains twenty-two questions and it does not contain any question related to personal identification such as name, identification number, e mail or phone number. Likert scale (five point) was used which included as Strongly agree: 5 agree: 4, neutral: 3, disagree: 2, strongly disagree:1. After collecting the responses from the students, the data was entered into computer and analyzed with the help of computer software (SPSS).

RESULTS

A total of one hundred and forty-one completely filled responses had been received from the medical students. The majority of them stated that PBL has improved their presentation, communication skills and their confidence had been improved. A significant number of the students narrated that PBL has improved their understanding regarding the diseases. The important challenges the students faced in the PBL sessions was the irrelevant discussion by

some of students due to lack of knowledge followed by significant time consumption in gathering & arranging the material and depending on students' number in the each PBL group (Table 1).

Table 1: The Perception of Medical Students Regarding PBL (Based on 5 point Likert scale)

Question	Mean Score
Do you think that the problem based learning help in improving	
Presentation skills	4.20
Communication skills	4.18
Computer and information technology skills, AV, computers	3.53
In acquiring knowledge beyond the prescribed text books of the subject	3.72
Better understanding of diseases	3.98
Performance as team member / group member in Group dynamics	3.91
Confidence	4.15
Learning more independently	3.92
Critical thinking	3.30
Active participation	3.60
Enjoyment in the learning process	3.53
Interest in the studies / course	3.29
Deep learning of the subject	3.55
Do you think that the following are demerits/ challenges in PBL which you faced during the process of PBL	
More time consuming process as Preparation requires more time	3.80
Some group members do irrelevant discussion due to lack of knowledge or misconceptions	3.86
Lack of harmony and coordination among the group member occurs	3.12
8 – 10 is a large group size and it should be reduced to 5 students in one group	3.83
Some members of group are non-serious and affect the others	3.44
Instead of better understanding, Creates confusion in the mind	3.35
A significant time is consumed in arranging the things and gathering the material	3.85
There is more difficulty in the understanding of the clinical cases without having basic knowledge about these diseases	3.49
Feel more stress and depression in the presence of very bright students during the discussion	2.82

DISCUSSION

In medical colleges, the traditional lecture is frequently employed as teaching methodology which is a teacher centred approach.⁸⁻⁹ Traditional lecture based approach is a useful instructional strategy for short-term learning.¹⁰ Therefore, PBL which is lifelong learning skills has become a fundamental target of medical educationist worldwide.¹¹ Many medical universities have moved toward novel learning methods which involves student centred learning.¹² In PBL, the learners choose the learning outcomes from clinical scenario.¹³ The learner does independent or as a team studies to achieve the learning outcomes.¹⁴ PBL has solved the problem of teaching a great deal of information that was formerly passively delivered and not linked to practical applications.¹⁵ Students general skills, such as working together and interacting with others, appear to have improved because of PBL strategy.¹⁶⁻¹⁷

Group dynamics has been an integral component in any student-centered instructional approaches and curricula yet it is not easy to customize it to all students' learning styles. PBL in the field of medicine was introduced for the first time in the 1960s at McMaster University.¹⁸ It helps students to acquire necessary skills and knowledge and also helps to improve group collaborations and communications.¹⁹⁻²⁰ PBL contributes in the promotion of communication skills and presentation skills, helps students to develop motivation and encouragement and helps them to learn professional ethics and behavior.²¹⁻²² Subsequently, the students develop self-directed skills.¹⁸

PBL is a cutting-edge educational student-centered strategy that in many studies has been shown to have a beneficial influence on students' learning. PBL have helped the students to learn the topics by integrating basic subjects' concepts with clinical subjects helping them to develop better holistic approach to clinical cases and also helped in improving their computer and communication skills.²³⁻²⁶

In our study we found that students strongly agreed that in 84% of them presentation skills were improved; Communication skills in 83.6% and Computer and information technology skills in 70.6% and helped them to have better understanding of topic in 79.6%; and to learn the group dynamics in 78.2% while learning the topics.

An earlier survey comparable to our study determined that 64.4% of students made use of books and 93.1% utilized the internet as sources of information.²⁷ Students in a separate study stated that PBL improved their knowledge of subjects as well as motivated them to continue with self-directed learning.²⁸ A further research investigation also found that PBL significantly improved subject understanding among the students.^{28,29} Similar

outcomes were found in another study, where 81.4% of students said PBL enhanced critical thinking.²⁸ PBL's propensity to make learning more fun, promote the practice of teamwork, and strengthen the skills of learners to solve problems were additional factors why students preferred it as a teaching style. According to Malaysian students, PBL is very intriguing and assists them to expand their ability to solve problems.³⁰ All of the aforementioned findings are in accordance with what we found in our current study. Additionally, systematic reviews' results that PBL had very little effect on critical thinking are in complete contrast to our study results.²⁹⁻³⁰

It has been found in our research that PBL stimulated learners to explore knowledge about academia outside of their textbooks. Comparable findings were found in a study, in which it proved that PBL was much superior to the other common approach for obtaining information.³⁰ The students felt that the preparation for PBL required more time than traditional teaching approaches. Some students complained that the explanation was not sufficient and others thought the group size was big. Students contact hours can be increased much in comparison to they would have in a conventional curriculum.²⁰⁻³⁰ In conclusion for students the time and resource viability had been a major concern.

In our present study also the challenges identified regarding PBL had been mainly that 76% of students found PBL to be more time consuming process. It was found that 77.2% students in the group as a team member gets into irrelevant discussion causing their time waste, 68.8% of students felt that in groups when few students are non-serious affect the performance of others in the team. 77 % Students also stated that a significant time was consumed in searching and arranging the resource material. 56.4% students also felt that they are more stressed out and feel depressed in the presence of outstanding students during working in their groups.

Our findings had given a great insight that PBL was a form of independent learning approach that enabled students to involve themselves in interactive learning as well as problem-solving. It proved to be a successful method of instruction that contributed to more profound understanding, enduring knowledge, and a strengthening of the ability to handle and address real-world issues. Therefore, few of the challenges faced by students can be improved upon to make it as a teaching methodology to be liked by majority of the students. PBL has overall been a great way of learning with enthusiasm for many learners. The key to making future technological developments and providing outstanding health care lies in understanding ways to apply knowledge to difficult issues.

CONCLUSIONS

PBL focuses mainly on adult educational concepts, empowering and motivating the students to identify learning objectives and permitting them the autonomy to make decisions that can influence their own learning. Furthermore, PBL promotes a more dynamic and demanding learning environment with the potential to affect long-lasting behavioral change. PBL helps students to develop confidence, improve presentation skill, communication skills and critical thinking. PBL can be employed as a learning strategy which eventually may result in learners' lifelong learning. The benefits go far beyond disadvantages and demerits. In our study, students' perceptions of PBL sessions were favorable. In order to provide students with an enjoyable place to learn, the focus should be given to student recommendations. It is additionally recommended that additional studies should be done among medical students to explore both the advantages and disadvantages of PBL, as this information would be helpful in integrating PBL into future medical curricula.

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CONFLICT OF INTEREST

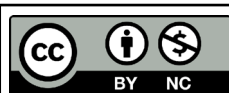
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: SSSH, AS
Acquisition, Analysis or Interpretation of Data: SSSH, AS, RQAO, CWAC, GR, AA
Manuscript Writing & Approval: SSSH, AS, RQAO, CWAC, GR, AA

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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