



# Exploring Pakistani Undergraduate Medical Students, Preferences: A Comparative Analysis of Problem Based Learning vs Lecture Based Learning

Sheh Noor<sup>1</sup>, Maryam Ibrahim<sup>1</sup>, Attia Qaddus<sup>1</sup>, Irsa Ghazal<sup>1</sup>, Urooj Ali<sup>1</sup>

<sup>1</sup>Final Year MBBS student Khyber Girls Medical College Peshawar

## ABSTRACT

**OBJECTIVE:** To investigate and compare the preferences of Pakistani undergraduate medical students regarding problem based learning and lecture based learning.

**METHODOLOGY:** This was a cross-sectional comparative analysis employed with online Google Docs questionnaire distributed to Pakistani medical students via social media platforms. Utilizing non-probability convenience sampling technique, participants were enrolled in data collection.

**RESULTS:** Among the 200 respondents, 29% were from final year, while 8%, 27.5%, 26.5% and 9% were from fourth, third, second and first professional, respectively. Problem based learning was favored by 68% learners and only 32% students like lecture based learning. It was found that 71% participants expressed the view that PBL resulted in an enhanced understanding of lecture content. As reported by 73.5% of participants, PBL leads to improvement of habit of self-learning. Furthermore, 78% students claimed that PBL leads to better analytical approach toward problem solving. In terms of pre-session preparation 65.5% and in terms of developing competencies 82.5% students claimed the superiority of PBL over LBL. Regarding the accessibility of resources for facilitating PBL sessions, only 49% of students expressed satisfaction, while 58.5% of the respondents admitted the availability of trained demonstrators for LBL sessions.

**CONCLUSION:** The results of this study demonstrate that PBL outperforms LBL in enhancing student competencies. Moreover, these findings indicate a strong preference among students for PBL over LBL. However, it is crucial to address the pressing need for enhancing resources dedicated to conducting PBL sessions.

**KEYWORDS:** Problem based learning, Lecture based learning, Teaching, Medical students.

\*For Correspondence

*Dr. Sheh Noor*

Final year MBBS student Khyber Girls, Medical College Peshawar

Email: shehhsartaj@gmail.com

Submission date: 21<sup>st</sup> May, 2023

Acceptance date: 16<sup>th</sup> June, 2024

Publication date: 21<sup>st</sup> June, 2024

## INTRODUCTION

Education has long been based on teaching students to give the correct answer, and so is common in medical education. Teachers may ask students to recite, define, describe or list facts and not to analyze, infer, synthesize, evaluate, think or rethink.<sup>1</sup> PBL entered health education at McMaster University in 1969 and intercalated in a dental educational facility at the Faculty of Odontology in Malmo, Sweden, in 1990. The foundation of PBL<sup>2</sup> is made up of six features: learning is fastened to students, learning is based on discussion in small groups of students, tutors are coordinators or mentors, problems make the main center of focus and instigation for acquiring more learning, problems act as a source for promoting the proficient of problem solving, and new facts and figures are achieved by a process of self-directed learning.<sup>3</sup> Problem based learning is a

scholastic convention employed in many medical institutes. Problem based learning can develop the aptitude for problem solving, abstract thought and consideration, and declamation abilities.

Although many critical appraisal and synthesis of research that compared problem focused learning with traditional modes of learning remained unsuccessful in contributing to out-rival PBL over the other. Although PBL may help in enhancing professional expertise and technical capabilities, the effectiveness of PBL in developing comprehensive understanding is not obvious.<sup>4</sup> After much research, the complication is still puzzling and confusion continues to exist. In the context of greater participation and more interest of learners, PBL is kept in a shelf higher than the traditional mode of learning and much incontrovertible proofs are available in favor of this: Problem centered learners are at the advantage of

This Article may be cited as: Noor S, Ibrahim M, Qaddus A, Ghazal I, Ali U. Exploring Pakistani Undergraduate Medical Students Preferences A Comparative Based Learning Vs Lecture Based Learning. Adv Basic Med Sci. 2024; 8(1):03-07. DOI: <https://doi.org/10.35845/abms.2024.1.279>

being dealt as competent professionals who are developing effective skills and practical study proficiency that give them aptitude forward in their clinical skills.<sup>5</sup> Uncertainty and imprecise awareness of Problem centred learning make it difficult to analyze whether it helps in promoting broad conceptual and professional knowledge or not.<sup>6</sup>

Many researches and meta-analysis has been carried out to correlate conventional learning with problem based learning has a way of different conclusions, the difference in the results is due to many factors such as coordinators and learners, control and experimental group were not the same, and the pattern in which problem focused learning was designed were unrelated and not identical, and so the results were much different.<sup>7</sup>

## METHODOLOGY

This cross-sectional comparative analysis was implemented by learners of Khyber Girls Medical College Peshawar, KPK and was approved by the Institutional Review Board. Data were accumulated from Pakistani undergraduate medical students from 1 June 2022 to 5 August 2022 of all four provinces of Pakistan.

The sample consists of undergraduate medical students currently studying in any medical college in Pakistan. Non probability convenient sampling technique was used to select 200 participants through Raosoft sample size calculator while considering a population size of 10000, a 95% confidence interval and a 5% margin of error.

Data collection was conducted utilizing an online Google Forms structured questionnaire. The Google form link was sent to medical students through WhatsApp, Facebook, and G mail. Participants provided consent and were assured of anonymity and confidentiality of their participation. No incentives were offered to take part in this study. The statistical analysis was executed using SPSS software version 21.

## RESULTS

Among the 200 students, 91 were male and 109 were female. The year-wise distribution of the students is shown in the figure. Among students, a preference for problem-based learning was evident, with 68% expressing a liking for it, while only 32% favored lecture-based learning. Additionally, 71% of learners believed that PBL contributes to a more comprehensive understanding of lectures. Furthermore, 73.5% students acknowledged that PBL fosters an improvement in the habit of self-learning, and 78% claimed that it leads to a better analytical approach to problem-solving. Moreover, a significant 88% of respondents admitted that PBL effectively integrates information from all subjects.

### Year of study

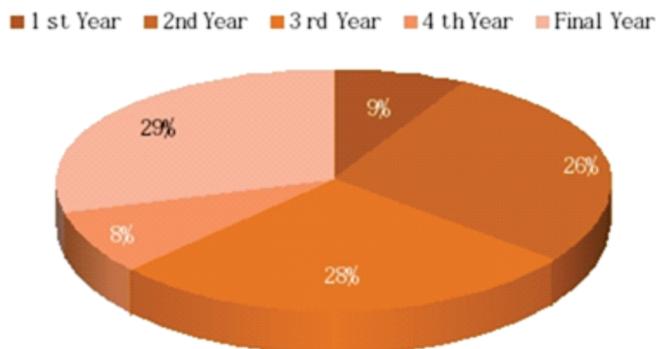


Figure 1: showing the distribution of participants as per the year of study in medical college.

Coverage of sufficient syllabus through PBL session was claimed by only 46% of respondents. Availability of trained facilitators for conducting PBL sessions was claimed by 49% of respondents, while 58.5% of respondents admitted the availability of trained demonstrators for conducting LBL sessions. Majority of respondents (65.5%) claimed that PBL is good at pre session preparation, while 52% respondents admitted that post session workload is more in PBL. When inquired about the level of satisfaction regarding the resources for PBL sessions, a range of responses were received which have been presented in figure 2. Overall, majority of the students belonging to all medical years appeared to be dissatisfied with availability of resources for PBL sessions.

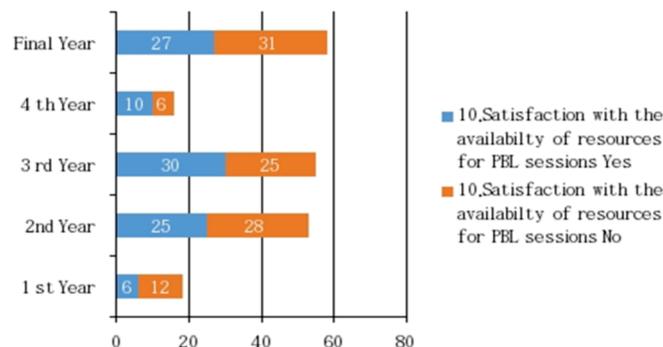


Figure 2: Graphical presentation of year-wise responses of participants in terms of satisfaction level pertaining to the availability of sources for PBL sessions.

Furthermore, the great majority of students suggested that PBL is associated with improvement of competencies (82%) as compared to conventional lecture based learning (18%).

## DISCUSSION

Medical schools around the globe were moving from traditional learning to problem based learning. In this research, medicine

learners go for problem based learning over lecture based learning due to the better understanding of lecture, improved habit of self-learning, and integration of all subjects.

So on the subject of to compare project based learning and traditional learning we have done our study on medical students from all provinces of Pakistan. Both male and female medical students participated in this research, and they had the idea of both project based learning and lecture based learning.

However, bias occurred because most of the colleges the problem based learning was not fully implemented and the student's responses were inclined toward PBL because they have idealized this system of learning as the best method.

Problem based learning was outraging conventional learning in all aspects according to the students exposed to this learning methodology. One study conducted by the students of Army Medical College Rawalpindi in which they found that Problem based learning was favoured by majority of the students. According to them, it gives a better understanding of the topic and students pay more attention. It boosts the confidence of the students and students avail more opportunities to actively participate in all activities. PBL provokes the thinking process of the student and plays a significant role in brainstorming. In our study, students favor the better understanding of the topic, and more students were in favour of having less burden post class in problem based learning as compared to conventional learning. The results of the study by army medical college students showed that problem base learning is favoured by students over conventional learning. This is similar to the results of our study.<sup>8</sup>

Another study conducted among Sudanese students focused on their experience with a single subject, aiming to determine whether students found it easier and more effective to learn through problem based learning or traditional learning. This study adopted a predominantly experimental approach rather than relying on observational methods. Total of 146 students participated in this study, of which 53.4% students were more active during project based learning as compared to lecture based learning. Students were more aware to the learning objectives and used time and resources effectively and efficiently during cooperative learning compared with conventional learning. They have better attention during lectures in cooperative learning than in conventional learning. According to the authors, it is a little difficult to execute cooperative learning in developing countries because of the limited resources, but it is more effective in terms of better understanding, active participation, and adequate attention as compared to conventional methodology of learning.<sup>9</sup>

A study conducted by faculty members in Bangladesh on the students of different institutions, in which they took 117 students from different medical colleges and divided them into small groups and taught the same topic by both methodologies. They wanted to check the end results, and for that they conducted a test after delivering them proper lectures. According to this study, students who have been taught in the PBL methodology managed to score

more than those who have been taught the conventional methodology. Although the approach was different, the results go in parallel with the results of our study that PBL is a more effective way of learning than conventional methodology of learning.<sup>10</sup>

According to the research conducted by the students of Rawalpindi Medical College, majority of the pupils were satisfied with their concepts and skills of analytical approach through problem based learning while appreciable chunk were still in favor of traditional learning because of good coverage of syllabus.<sup>11</sup>

Another study conducted in Iran on medical students, where the comparative study was conducted and the results went in favor of problem based learning because students find themselves more motivated with this method and they were satisfied with the quality of Education provided to them and the retention of knowledge and its practical use through PBL.<sup>7</sup>

A study in Saudi Arabia was conducted in a medical school to evaluate the discernment of medical learners towards PBL in which greater number of pupils reported that the PBL sitting provide better understanding of fundamental sciences and good integration of basic and clinical sciences. The medical students were in favor of PBL sessions because of their motivation for learning, problem solving skills, lifelong self-directed learning, better communication skills, knowing about their pluses and minuses in learning processes, good leadership qualities and development of problem solving skills. The students commented on the structure of PBL cases that they are interesting, clinically attractive, better understandable and realistic. However, some students were not in favor of replacement of lectures by PBL cases.<sup>12</sup>

Another study in Saudi Arabia was conducted on undergraduate medical students in which a total of 147 students participated. The majority of the students like the concept of PBL because the students were motivated for discussion by the teaching process which they find beneficial for their learning. The students were satisfied that their roles were defined in each discussion and every member of the crew is helpful to each other and they get positive remarks at the resolution of each setting. The pupils reported that faculty members and staff also played a major role because of their cooperative behaviour and well organized sessions.<sup>13</sup>

To know about the efficacy of project-based learning in contrast to traditional teaching a study was conducted on psychiatry students in London UK in which it was signified that PBL has better outcome in case of assessment performance. The students on whom the PBL curriculum was applied were good both in their MCQS exam and viva which makes the students satisfied about the PBL because of its better outcome. However, it was reported that better examination performance could be due to effective learning due to the teaching style during the sessions as it has not affected the learning style of students.<sup>14</sup>

A study conducted in Thailand indicated that medical students are affirmative toward PBL however; the extensive concord was that PBL was laborious. Most of them have misconceived that PBL demands knowledge from conventional lectures. Also, most of

pupils concur that the knowledge acquired through PBL is according to the level of medical competency and is better retained than the conventional lectures.<sup>15</sup> Similarly, a study based in Hong Kong concluded that in PBL more stress is given on meaning rather than memorizing. PBL students feel more confident in exploring and seeking new information and they use more extensive approach of learning. Results of this study also showed that PBL students do not perform well in basic science examinations as the students of conventional lectures but they are better or at least as good in clinical examinations.<sup>16</sup>

PBL is a productive motion to ameliorate learning outcomes in medical teaching, an analysis conducted in India. Study results infer that PBL guarantees finer practicable learning, build engrossment and subject apprehension. It is a contemporary educational approach that is powerfully implemented to considerably enhance the knowledge achievement in Medical Teaching. Furthermore, the students appreciated the facilitated team learning; in accordance with that, PBL also boosted their self-confidence.<sup>17</sup>

The implication of this study is that it shows that problem based learning leads to better understanding of lecture and integration of all subjects, it can be implied by both medical students and teachers of medical school.

One limitation of the study is that limited generalizability due to the small sample size of 200 students, which might not accurately represent the broader population of students. Additionally, the study might not adequately control for external variables such as instructor effectiveness, which could impact the results so in future studies instructors should also be involved.

## CONCLUSION

Both teaching methodologies contribute for better understanding and clarification of concepts but PBL is more liked by students because according to them it improves their professional specific skills, computer skills, leadership skills, creativity and analytical approach towards problem solving. There is a dire need to improve facilities for conducting PBL sessions i.e. to provide computer and internet facility to students for taking help from online databases to keep their knowledge up to date.

**CONFLICTS OF INTEREST:** There was no conflict of interest in our study.

**FUNDING:** This research received no specific grant from any funding agency

## REFERENCES

1. Faisal R, Bahadur S, Shinwari L. Problem-based learning in comparison with lecture-based learning among medical students. *JPMA. The Journal of the Pakistan Medical Association.* 2016 Jun 1;66(6):650-3.
2. Barrows HS. Problem-based learning in medicine and beyond: A brief overview. *New directions for teaching and learning.* 1996 Dec;1996(68):3-12.

3. Luke AM, Mathew S, Kuriadom ST, George JM, Karobari MI, Marya A, Pawar AM. Effectiveness of problem-based learning versus traditional teaching methods in improving acquisition of radiographic interpretation skills among dental students—a systematic review and meta-analysis. *BioMed research international.* 2021;2021(1):9630285.
4. Zahid MA, Varghese R, Mohammed AM, Ayed AK. Comparison of the problem based learning-driven with the traditional didactic-lecture-based curricula. *International journal of medical education.* 2016;7:181.
5. Kilroy DA. Problem based learning. *Emergency medicine journal.* 2004 Jul 1;21(4):411-3
6. Allen DE, Donham RS, Bernhardt SA. Problem-based learning. *New directions for teaching and learning.* 2011 Dec;2011(128):21-9.
7. Khoshnevisasl P, Sadeghzadeh M, Mazloomzadeh S, Feshareki RH, Ahmadiafshar A. Comparison of problem-based learning with lecture-based learning. *Iranian Red Crescent Medical Journal.* 2014 May;16(5).
8. Khan, M.A., Qamar, K., Khalid, S., Javed, H., Malik, M., Gondal, A., Zafar, H., Shoaib, A., Aman, R., Khan, A. and Abideen, A.Z.U., 2015. Comparison of case based learning with conventional teaching-students' perspective: CBL vs conventional teaching. *Pakistan Armed Forces Medical Journal,* 65(3), pp.415-419.
9. Alaagib NA, Musa OA, Saeed AM. Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan. *BMC medical education.* 2019 Dec;19:1-8.
10. Jeenia FT, Hoque A, Khanom M, Md S, Jahangir P, Hoque R, Parveen K, Ferdoush J, Ata M, Tanin MJ. Introducing Problem-Based Learning as an Effective Learning Tool to Medical Students: An Approach in Bangladesh. *continuing professional development.* 2021;9(10):11
11. Sultana A, Riaz R, Tehseen I. Comparison of problem based learning with traditional teaching as perceived by the students of Rawalpindi Medical College. *RMJ.* 2010 Jul;35:238-41.
12. Aldayel AA. Problem-based learning: medical students' perception toward their educational environment at Al-Imam Mohammad Ibn Saud Islamic University. *Advances in Medical Education and Practice.* 2019.
13. AlHaqwi Al, Mohamed TA, Al Kabba AF, Alotaibi SS, Al Shehri AM, Abdulghani HM, Badri M. Problem-based learning in undergraduate medical education in Saudi Arabia: time has come to reflect on the experience. *Med Teach.* 2015 Apr;37 Suppl 1:S61-6
14. McParland M, Noble LM, Livingston G. The effectiveness of problem-based learning compared to traditional teaching in undergraduate psychiatry. *Med Educ.* 2004;38(8):859-867.

15. Treesirichod A, Chansakulporn S, Phivthong-ngam L, Kusumaphanyo C, Sangpanich A. The attitudes of medical students towards problem-based learning during the clinical years. South-East Asian Journal of Medical Education. 2018 Aug 24;12(1):41-6.
16. Nandi PL, Chan JN, Chan CP, Chan P, Chan LP. Undergraduate medical education: comparison of problem-based learning and conventional teaching. Hong Kong Medical Journal. 2000 Sep 1;6(3):301.
17. Preeti B, Ashish A, Shriram G. Problem based learning (PBL)-an effective approach to improve learning outcomes in medical teaching. Journal of clinical and diagnostic research: JCDR. 2013 Dec;7(12):2896.

#### CONFLICT OF INTEREST

Author declared no conflict of interest

#### GRANT SUPPORT & FINANCIAL DISCLOSURE

Author declared no specific grant for this research from any funding agency in the public, commercial or non-profit sectors

#### AUTHORS CONTRIBUTIONS

**SN:** Conception, Design of the work, Data collection, and Drafting, Reviewed, Final approval, Agreement to be accountable.

**MI:** Conception, Design of the work, Acquisition, Data Analysis, and Drafting, Reviewed, Final approval, Agreement to be accountable.

**AQ:** Conception, Design of the work, Interpretation of data for the work, and Drafting, Reviewed, Final approval, Agreement to be accountable

**IG:** Conception, Design of the work, Data collection, and Drafting, Reviewed, Final approval, Agreement to be accountable

**UA:** Conception, Design of the work, Data analysis, and Drafting, Reviewed, Final approval, Agreement to be



This is an Open Access article distributed under the terms of the Attribution Non-Commercial 4.0 International