

Comparison Of Performance And Perception Of Undergraduate Medical Students Towards Different Small Group Teaching Strategies

Maryam Habib¹, Ghazala Mudassir², Mahwish Majid Bhatti³, Rifat Nadeem Ahmad⁴

Abstract

Objective: The objective of this study is to evaluate the perception of students towards the effectiveness of small group teaching methods in pathology and to determine their performance in them.

Methods: The perception of 512 medical students on the effectiveness of small group teaching methods which included Problem-Based Learning (PBL), Seminar (Conference style), Case-Based Discussion (CBD) and Team-based learning (TBL) was measured by using a prevalidated questionnaire. Their performance was compared with their perception by using assessment scores achieved in themes covered by small-group teaching strategies.

Results: Participants chose PBL as a medium which increased their understanding of Pathology. They achieved the highest scores in topics covered by PBL with a significant p-value ($p < 0.001$) by using ANOVA.

Conclusion: It was concluded that PBL was the most preferred learning method.

MeSH Keywords: Education, Medical, Undergraduate, Learning, Curriculum, Problem-based..

¹ Assistant Professor, SCM; ² Associate Professor, SCM; ³ Professor, SCM; ⁴ Professor, SCM.

Correspondence: Dr. Maryam Habib, Assistant Professor, SCM. Email: Maryam.scm@stmu.edu.pk

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1. Introduction

Significant progress has been made in medical education in the past century throughout the world, especially in Western countries, with more emphasis on devising effective ways of teaching which can in turn enhance overall students' understanding and increase the core knowledge of the subject. These new teaching strategies are in the process of development in developing countries like Pakistan. In comparison to didactic lectures where the teacher plays the major role and delivers all the content through presentations, many small group teaching strategies have been developed which increase the student-teacher interaction and help students to effectively communicate their ideas and clarify their concepts.^{1,2} Different small-group teaching strategies have been developed which include case-based discussion, team-based learning, and problem-based learning.³⁻⁵ In case-based discussion, different cases are given to students in small groups, and students carry out discussions on these cases and present their cases to the faculty, while team-based learning is usually divided into preclass preparation, (IRAT) individual readiness assurance test, (TRAT) team readiness assurance test, immediate feedback clarification and problem-solving activities. In these sessions, the role of the teacher and students is quite different in contrast to the traditional system of teaching. In comparison to the large group discussions, the students play a key role in the small group discussions. The flipped classroom is the main

concept behind these small group sessions where the students take the main lead and teachers are the facilitators. In flipped classrooms, the students are provided with material for reading. They come prepared for their session and the class time is utilized in active discussion.^{6,7} Through this path of learning they develop the habit of researching, acquiring knowledge and discussing it with their team members which leads to a better understanding of the subject and enables them to get a deeper insight into the subject.⁸⁻¹⁰ Medical colleges across the globe have incorporated various small-group discussions in their curricula. The present study aims to identify the most effective small-group teaching method among the medical students of Shifa College of Medicine. A comparison of student preferences and their curriculum-related performance was performed to determine the most efficient teaching strategy in terms of imparting greater knowledge and promoting student interest. To our knowledge, this is one of the first studies conducted in Pakistan with the main emphasis on finding the most appropriate and effective teaching method for delivery of Pathology curriculum to undergraduate students.

2. Materials & Methods

This descriptive study was conducted at Shifa College of Medicine, Shifa Tameer-e-Millat University, over 5 years. The study was started in 2019 and was completed in 2023. All the data was maintained electronically by the faculty involved in conducting the research. Ethical



approval was obtained from the Institution Review Board with IRB#161-651-2019. A total of 512 students of five consecutive 3rd-year MBBS classes over 5 years were enrolled in the study. We follow a modular system of teaching. The students of each class were randomly divided into seven small groups based on their serial numbers. Each small group contained 16 students. All the students were taught concepts of pathology through different small group teaching strategies including problem-based learning (PBL), case-based discussion (CBD), team-based learning (TBL) and seminar (conference style). Only senior faculty, Assistant Professors and above were involved in teaching small groups. All the faculty involved were subject specialists and had more than 5 years of teaching experience. Equal hours of teaching were given to all the different small-group teaching strategies. All the teaching strategies were conducted in two small group sessions. The topics covered in different small group sessions were related to respiratory pathology and all the sessions were conducted in the Respiratory module of the third year. After completing all the sessions, a prevalidated questionnaire was given to students for their feedback. The questionnaire was developed by subject specialists, who were involved in carrying out the research. After establishing its face validity, it was piloted. Principle component analysis was performed, and Cronbach's Alpha was calculated. Informed consent was obtained from all the participants. Their participation was voluntary, and responses were recorded anonymously. The questionnaire comprised various questions which assessed the session in terms of it being the most engaging, interesting, interactive and knowledgeable for the students. After that, students were tested through formative assessment which included MCQs and SAQs to evaluate their overall understanding of concepts delivered through various small-group teaching strategies. Marks obtained in concepts that were taught through PBL, CBD, TBL and seminar-style were compared. ANOVA test was used to compare and analyze the marks obtained in topics covered by different small-group teaching strategies. The data was analysed by using SPSS software version 23

3. Results

A total of 512 students were recruited in the study from 5 successive 3rd-year MBBS classes. The mean age of students was 21 years. The response of all the students

was recorded by using a prevalidated questionnaire which depicted the extent of their predilection for PBL, CBD, TBL and conference style. The responses of participants to different questions are shown in Figure 1.

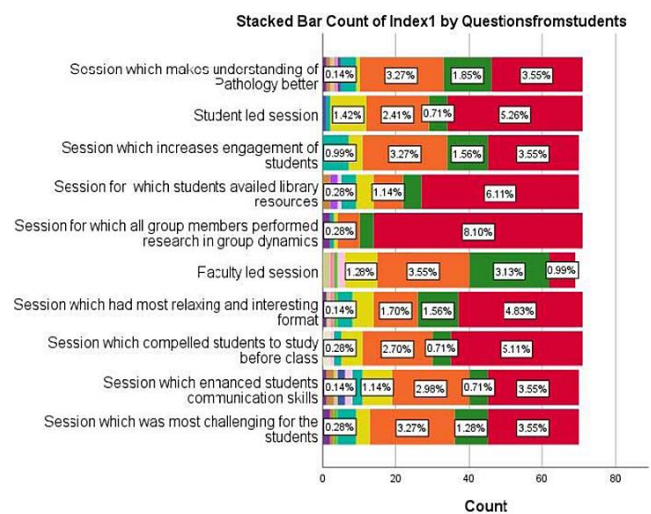


Figure 1: Stacked Bar Chart showing responses of students to different questions

Most of the students chose PBL as the preferred method of small group teaching strategy based on the questionnaire responses. The students were mainly asked to assign a percentage value for PBL for the entire delivery of the curriculum. The students proposed different percentages and various percentages assigned by students for PBL are shown in Figure No. 2.

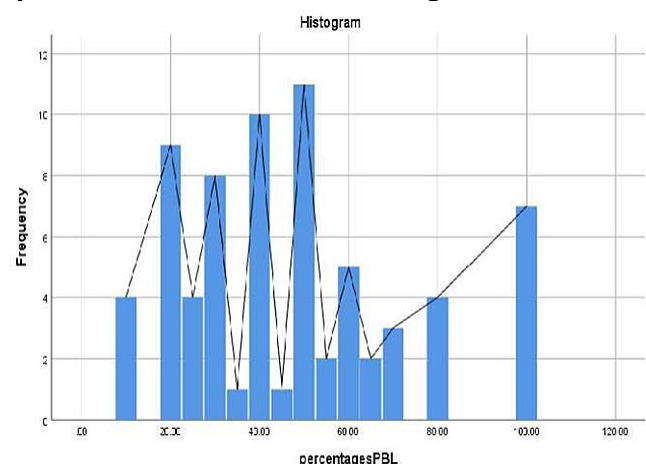


Figure 2: Histogram showing percentages allocated to PBL in the delivery of curriculum

After all the sessions were completed students were tested by formative assessment. ANOVA was used to compare marks obtained in topics covered by different small-group teaching strategies. Students achieved the

highest marks in topics covered by PBL with a statistically significant p-value of <0.001.

4. Discussion

The mode of delivery of medical curriculum has changed significantly in the past few years. In contrast to delivering pedantic lectures, various innovative small-group teaching methods have been devised for teaching medical students. There has been a paradigm shift from teacher-centred long presentations to student-centred teaching modalities.¹¹⁻¹⁷ We compared various small-group teaching strategies in terms of their ability to impart knowledge to students in the most effective way. Our findings indicated that the majority of students chose PBL over other methods for teaching Pathology. Results were similar to a study conducted by Al-Drees AA et al which also revealed PBL as an effective small-group tool for increasing the understanding and knowledge of students.¹⁸ Our students chose PBL as a medium which enhanced their subject-related knowledge in contrast to other small-group teaching modalities. A study conducted by Mehenaz et al emphasized the importance of pathology in medical practice. Their study was conducted on 476 students, approximately 44% of students believed that current teaching methods were inadequate for teaching pathology. The majority of students in their study chose practical sessions as the most effective way to teach pathology.¹⁹ Preference for PBL in terms of better acquisition of knowledge was also shown by studies done by Ibrahim NK et al and Asad MR et al.^{20,21} However, a study conducted by Emerald NM in Malaysia had different results. Their students preferred presentations and lectures over problem-solving learning, as an effective means of teaching pathology.²² Students were asked to assign percentage scores to PBL in the entire curriculum for teaching pathology. Our results depicted that most of the students suggested that at least 50 % of pathology should be taught through PBL whereas some even suggested the possibility of the entire curriculum being delivered through PBL. These findings are in concordance with a study done by Chang BJ et al. The study aims to assess the effectiveness of PBL in medical teaching. His study shows students positive perceptions and insights on teaching through PBL in basic sciences. He mentions that many renowned universities of the world have adopted PBL as a main

teaching strategy for content delivered in medical curriculum.²³

In our study after the delivery of curriculum through different small group methods, students were assessed by assessment, and it was found that they scored high in topics covered by PBL. A positive relationship was found between their preferred small group method of curriculum delivery and their performance in it. A scoping review was conducted by Joan et al,²⁴ on the effectiveness of PBL in teaching medical students. In this review Literature research was done on one hundred and twenty-four articles. They found that most of the studies were single-centered. They concluded that PBL was more effective than other traditional lecture-based methods of teaching for the delivery of the curriculum. They found that PBL was also helpful in improving communication and self-learning skills.

5. Conclusion

Among different small group strategies, PBL is the preferred method for students in terms of acquiring knowledge and improving their overall understanding of the curriculum. There is a significant association between the student perception of PBL as the most effective way of imparting knowledge and their performance, through assessment of topics covered by PBL. Therefore, it is realized that among different small-group teaching methods, a significant proportion of the pathology curriculum should be delivered through PBL. The study provides food for thought; more studies should be conducted in different institutions to confirm PBL as the most effective way of teaching pathology.

INSTITUTIONAL REVIEW BOARD

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References

1. Amir S, Mehboob U, Sethi A, Jamil B. Problem-Based Learning: An Overview Of Its Process And Impact On Learning. *Pak J Physiol* [Internet]. 2022 Mar. 31 [cited 2024 May 29];18(1):68-9. Available from: <https://pjp.pps.org.pk/index.php/PJP/article/view/1381>
2. Van Diggele C, Burgess A, Mellis C. Planning, preparing and structuring a small group teaching session. *BMC Med Educ* 20 (Suppl 2), 462 (2020). <https://doi.org/10.1186/s12909-020-02281>.
3. Alaagib NA, Musa OA, Saeed AM. Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan. *BMC Med Educ* 19, 365 (2019). <https://doi.org/10.1186/s12909-019-1799>
4. Harris N, Bacon CE. Developing cognitive skills through active learning: a systematic review of health care professions. *Athletic Training Education Journal*. 2019 Apr 1;14(2):135-48.
5. Burgess, A., van Diggele, C., Roberts, C. et al. Facilitating small group learning in the health professions. *BMC Med Educ* 20 (Suppl 2), 457 (2020). <https://doi.org/10.1186/s12909-020-02282->
6. Remington TL, Bleske BE, Bartholomew T, Dorsch MP, Guthrie SK, Klein KC, Tingen JM, Wells TD. Qualitative Analysis of Student Perceptions Comparing Team-based Learning and Traditional Lecture in a Pharmacotherapeutics Course. *Am J Pharm Educ*. 2017 Apr;81(3):55. doi: 10.5688/ajpe81355. PMID: 28496275; PMCID: PMC5423071.
7. Campillo-Ferrer, J.M., Miralles-Martínez, P. Effectiveness of the flipped classroom model on students' self-reported motivation and learning during the COVID-19 pandemic. *Humanit Soc Sci Commun* 8, 176 (2021). <https://doi.org/10.1057/s41599-021-00860->
8. Bleske BE, Remington TL, Wells TD, Klein KC, Guthrie SK, Tingen JM, Marshall VD, Dorsch MP. A Randomized Crossover Comparison of Team-based Learning and Lecture Format on Learning Outcomes. *Am J Pharm Educ*. 2016 Sep 25;80(7):120. doi: 10.5688/ajpe807120. PMID: 27756928; PMCID: PMC5066923.
9. Savkar MK, Mariswamy V, Gangadhar M. Comparison between didactic lectures and small group discussions among second-year medical undergraduates in pharmacology. *Int J Basic Clin Pharmacol* [Internet]. 2016 Dec. 21 [cited 2024 May 29];5(6):2542-5. Available from: <https://www.ijbcp.com/index.php/ijbcp/article/view/>
10. Qamar MR, Ahmad A, Niaz K. Learning Through Small Group Discussion Versus Didactic Lectures: Small Group Discussion Vs Didactic Lectures. *Pak Armed Forces Med J* [Internet]. 2015 Jun. 30 [cited 2024 May 29];65(3):386-90. Available from: <https://www.pafmj.org/PAFMJ/article/view>.
11. Sourg HAA, Satti S, Ahmed, N. Impact of flipped classroom model in increasing the achievement for medical students. *BMC Med Educ* 23, 287 (2023). <https://doi.org/10.1186/s12909-023-04276->
12. Addae JJ, Sahu P, Sa B. The relationship between the monitored performance of tutors and students at PBL tutorials and the marked hypotheses generated by students in a hybrid curriculum. *Med Educ Online*. 2017;22(1):1270626. doi: 10.1080/10872981.2017.1270626. PMID: 28178915; PMCID: PMC5328341.
13. Joshi KP, Robins M, Reddy MY. Perception and preferences of teaching and learning methods in community medicine: a cross sectional study. *Int J Community Med Public Health* 2018;5:2821-4. <https://doi.org/10.18203/2394-6040.ijcmph20182597>
14. Abdel Meguid E, Collins M. Students' perceptions of lecturing approaches: traditional versus interactive teaching. *Adv Med Educ Pract*. 2017 Mar 17;8:229-241. doi: 10.2147/AMEP.S131851. PMID: 28360541; PMCID: PMC5364003.
15. Imran M. Analysis of learning and teaching strategies in Surgery Module: A mixed methods study. *J Pak Med Assoc*. 2019 Sep;69(9):1287-1292. PMID: 31511713..
16. Johnson HA, Barrett L. Your teaching strategy matters: how engagement impacts application in health information literacy instruction. *J Med Libr Assoc*. 2017 Jan;105(1):44-48. doi: 10.5195/jmla.2017.8. PMID: 28096745; PMCID: PMC5234460.
17. Bhat SP, Cheriyanath L, Nair M, Nair MM. Perceptions of Medical students about Pathology training. *Journal of Pathology of Nepal*. 2021;11(2): 1830-4. DOI: 10.3126/jpn.v11i2.289.
18. Al-Drees AA, Khalil MS, Irshad M, Abdulghani HM. Students' perception towards the problem based learning tutorial session in a system-based hybrid curriculum. *Saudi Med J*. 2015 Mar;36(3):341-8. doi: 10.15537/smj.2015.3.10216. PMID: 25737178; PMCID: PMC4381020.
19. Hanbazazh M, Khashab RM, Ameen NK, et al. Medical Students' Perception of Pathology in Saudi Arabia. *International Journal of Surgical Pathology*. 2024;. doi:10.1177/10668969241226708
20. Asad MR, Amir K, Tadvi NA, Afzal K, Sami W, Irfan A. Perception of medical undergraduate students about interactive lectures in an outcome-based integrated curriculum: A cross-sectional study. *J Educ Health Promot*. 2017 Dec 4;6:100. doi: 10.4103/jehp.jehp_38_17. PMID: 29296601; PMCID: PMC5747213.
21. Lim WK. Problem Based Learning in Medical Education: Handling Objections and Sustainable Implementation. *Adv Med Educ Pract*. 2023;14:1453-1460. <https://doi.org/10.2147/AMEP>.
22. San Oo. Students' Perception On Effectiveness of Pathology Teaching in Phase 1 Medical Program At UCSI University. *International Journal of Medical Science & Education*. 2016, 3:264-273. <http://eprints.uniswa.edu.my/5091/>
23. Chang BJ. Problem-based learning in medical school: A student's perspective. *Ann Med Surg (Lond)*. 2016 Nov 22;12:88-89. doi: 10.1016/j.amsu.2016.11.011. PMID: 27942381; PMCID: PMC5134085.
24. Trullàs, J.C., Blay, C., Sarri, E. et al. Effectiveness of problem-based learning methodology in undergraduate medical education: a scoping review. *BMC Med Educ* 22, 104 (2022). <https://doi.org/10.1186/s12909-022-03154-8>