

Approach of MBBS Students receiving Modular vs Students receiving Conventional Mode of education towards Health Research: A Comparative Study

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Abstract

Introduction: Health research training is an important component of the medical curriculum. This study was conducted to compare the approach of medical students being taught through an integrated modular curriculum with the students receiving conventional mode of education towards health research.

Materials and Methods: A cross-sectional study was conducted between 3rd-year MBBS students following Lecture Based Learning and Problem Based Learning (groups A and B respectively). A self-designed pretested questionnaire was filled by 153 students of each group (from group A in 2019 and group B in 2020) through a simple randomized sampling technique. Analysis was done using SPSS 21. P-value <0.05 was considered to be significant for all purposes.

Results: Mean knowledge score of PBL students was 50% against a score of 55.5% of LBL students (p-value=0.114). However, the mean attitude score of PBL students was 79.2% against a score of 67.4% of LBL students (p-value< 0.000). Over 49.6% of LBL students and 41.8% of PBL students had satisfactory knowledge. 19.7% of LBL students and 82.3% of PBL students had a satisfactory attitude.

Conclusion: Significantly higher attitude of PBL students was found. However, the level of knowledge was found to be the same in both groups. PBL curriculum has a positive influence on students on their attitudes towards health research.

Keywords: Students, Research, comparative study.

Introduction

Health Research is a principled way of obtaining scientific information and circumstantial evidence to investigate and solve health care problems.¹ Health research an important component of medical education, improves critical thinking, learning skills and provides new information regarding health care problems.² Various successful research projects play an important role in the advancement of the medical field and other fields of science. These developed and improved research skills can help the physicians in better diagnosis and treatment of diseases.³

The educational system of medical institutions, support, and guidance of faculty staff in an effective way plays an important role in the enhancement of students' reasoning skills and possible research interest.^{4,5} The field of health science is changing rapidly, becoming more and more complex every day. In order to synchronize with the rapidly evolving medical field, teaching methodologies are also changing.

In the past, Lecture Based Learning (LBL) was the method of choice. It provides a unidirectional flow of information to students and passively equips them with the knowledge to orient them towards examination via a teacher-directed process.^{6,7} It is being replaced with Problem Based Learning (PBL) system which unifies different subjects and integrates them to provide a creative and active approach to the learning process.^[8] PBL system is useful in enhancing the integration of knowledge, communication skills, and self-directed learning.⁹ It helps in interrelating theory and practice, fills the gap in between them, and helps in better understanding of students.¹⁰ Abstract thinking, acquisition of knowledge and skills are the main objectives of the PBL system.¹¹

RMU has recently shifted towards the PBL method of teaching. The efficiency of any educational system depends on its research quality. Where research leads to the development of significant new therapies and remarkably improves public health care, it also serves as a yardstick to judge critical reasoning and evaluation deduction skills of students. It can therefore serve as a criterion to assess the quality of education among students studying different curricula.

The objective of our study is to compare and correlate the impacts of integrated and conventional learning on the knowledge and attitude of medical students towards health research.

Materials and Methods

A cross-sectional, comparative study was conducted between Third Year MBBS students following the LBL curriculum with Third Year MBBS students following the PBL curriculum in Rawalpindi Medical University. A total of 306 students were included in the study and the whole sample size was divided into 2 groups (A and B). The sample size was calculated by using the WHO calculator. During May-June 2019, data was collected from 153 3rd year MBBS students following the LBL curriculum i.e. Group A, through a simple randomized sampling technique. In the next year May 2020, the survey was repeated on 153 3rd year MBBS students following PBL curriculum i.e. Group B with an identical sampling technique.

Data was collected through a self-designed, pretested questionnaire. Knowledge was assessed by 10 Multiple choice questions, having 4 options for each, out of which only 1 option was correct. A score of '1' was given for the correct answer and a score of '0' for the wrong answer. The maximum knowledge score was 10. The attitude was assessed by 10 questions using a 5-point Likert scale. A numerical value is assigned for scoring purposes i.e. Strongly agree (SAG)=5, Agree (AG)=4, Neutral (N)=3, Disagree (DA)=2, Strongly Disagree (SDA)=1. However, reverse scoring was done in questions no. 4 and 5 i.e. SAG=1, AG=2, N=3, DA=4, SDA=5. The maximum attitude score was 50.

After taking informed verbal consent, a questionnaire was randomly distributed among the students in their lecture hall.

Statistical Package for Social Sciences i.e. SPSS 21 was used for data analysis. Frequency and Percentages were calculated for each variable. For descriptive statistics, mean and standard deviation were calculated for both knowledge and attitude. Pearson Chi-square test was applied to compare the knowledge and attitude of LBL students with PBL students. P-value <0.05 was considered to be statistically significant at a 95% confidence interval.

Results

Out of 153 LBL students, 69.28% were females and 30.72% were males while of the 153 PBL students, 58.82% were females and 41.18% were males. More than 90% of students from both groups were 20-22 years old.

28.6% LBL students and 31.2% PBL students participated in research (p-value;0.618), 17.5% LBL

students and 5.2% PBL students presented their research in scientific conference (p-value;0.001), 3.9% LBL students and 1.3% PBL students published their research articles (p-value;0.152).

10 questions were asked to assess the knowledge of students towards health research (Table 1). The total mean knowledge score of both groups was 5.27±1.99.

10 questions were asked to assess the attitude of students towards health research (Table 2). The total mean attitude score of both groups was 36.76±4.43.

Students who got >mean score considered to have satisfactory knowledge and attitude while students who got ≤mean score considered to have non-satisfactory knowledge and attitude (Table 3).

The attitude of PBL students is statistically significantly higher than LBL students towards health research. However, no statistically significant difference between the knowledge score of both groups was found (Table 4).

Table 1: Percentage of Students' responses to questions assessing their knowledge towards health research

Questions	LBL		PBL	
	True	False	True	False
1) Kap study measures	64.7	35.3	37.9	62.1
2) An idea for something that may be true but has not yet been proved is called	79.7	20.3	76.5	23.5
3) Hypothesis that propose no significant difference between specified population e.g. no difference between Gp A (receiving test drug) and Gp B (receiving sugar pill) is called	74.5	25.5	65.4	34.6
4) In majority of data analysis, what p-value is taken statistically significant	56.9	43.1	38.6	61.4
5) A small statistically significant p-value indicates strong evidence against	34	66	47.7	52.3
6) Incorrect rejection of null hypothesis is	18.3	81.7	20.9	79.1
7) All of these are part of writing a synopsis except	54.2	45.8	46.4	53.6
8) When each member of a population has an equally likely chance of being selected, this is called	50.3	49.7	54.2	45.8
9) Study in which data is gathered from a population at a specific point in time is called	45.1	54.9	23.5	76.5
10) Which of the following is qualitative variable	76.5	23.5	89.5	10.5

Table 2: Percentage of students' responses to questions assessing their attitude towards health research

Questions	LBL					PBL				
	SAG	AG	N	DA	SDA	SAG	AG	N	DA	SDA
1) Undergraduates should participate in research project.	0.7	86.3	7.8	4.6	0.7	58.2	40.5	1.3	0	0
2) I feel confident in interpreting a research paper.	0	31.4	51.6	15.7	1.3	17.6	34	37.9	10.5	0
3) I feel confident in writing a research paper.	0	23.5	57.5	15.7	3.3	10.5	32.7	46.4	9.8	0.7
4) Research at undergraduate level is not beneficial and not useful for an undergraduate student.	2.6	4.6	29.4	62.1	1.3	0	0	4.6	49	46.4
5) Conduction of research is very difficult for an undergraduate student.	2	44.4	36.6	17	0	3.3	17.6	34.6	41.2	3.3
6) Undergraduate students can plan and conduct a research project and write a research paper.	0.7	56.9	34	8.5	0	12.4	74.5	12.4	0.7	0
7) Research improves critical thinking.	0.7	82.4	14.4	2	0.7	45.8	51.6	2	0.7	0

8)	Research improves learning skills and communication skills.	0.7	84.3	11.1	3.3	0.7	37.9	49.7	9.8	2.6	0
9)	Attending a research methodology workshop is beneficial for students to improve their knowledge about health research.	1.3	67.3	24.8	5.9	0.7	43.1	53.6	3.3	0	0
10)	Our mode of education orients us towards health research.	0	35.9	25.5	25.5	13.1	13.7	43.8	26.1	14.4	2

Table 3: Comparison of the level of knowledge and attitude of students with their mode of education

	Knowledge		Attitude	
	Satisfactory (%)	Non-satisfactory (%)	Satisfactory (%)	Non-satisfactory (%)
LBL	49.6	50.4	19.7	80.3
PBL	41.8	58.2	82.3	17.7

Table 4: Mean knowledge and attitude score of LBL and PBL students towards health research

	Knowledge		Attitude	
	Mean±SD	p-value	Mean±SD	p-value
LBL	5.55±1.95	0.114	33.91±2.94	<0.000
PBL	5.00±2.009		39.61±3.80	

Discussion

The study was done to comparatively assess the knowledge and attitude of students regarding health research studying in PBL and LBL systems. A significantly higher number of LBL students (17.5%) as compared to PBL students (5.2%) presented their research at the conference (p-value<0.05). However, participation is significantly similar (p-value>0.05) in both PBL (31.2%) and LBL (28.6%) students. Moreover, a significantly similar (p-value>0.05) number of LBL (3.9%) and PBL (1.3%) students published their research articles. Although the PBL system did not affect students' knowledge regarding health research, it significantly improved their attitudes. Students in the PBL system showed a remarkably better attitude than the students in the LBL system i.e. 79.2% score of PBL students against the score of 67.4% of LBL students (p-value <0.05). However, Knowledge scores were significantly similar in LBL and PBL students (p-value> 0.05).

These results are consistent with a previous study conducted in Pakistan in Aga Khan University in 2007 which concluded that medical students in the PBL

system showed statistically significant attitude towards health research as compared to their LBL counterparts i.e. p-value 0.021; however, no significant difference in knowledge score of both groups was found i.e. p-value 0.630.⁷ A study in 2013 concluded that problem-based learning considerably increases clinical reasoning and problem-solving skills among students i.e. p-value <0.001.¹² In 2016, a study in Iran concluded that students' critical thinking and metacognitive awareness are significantly improved through the PBL system of teaching.¹³ PBL system is found to promote teamwork, communication skills, soft skills, and long-term learning of students.^{9,11,14} PBL system orients students towards self-directed learning which in turn promotes reasoning, problem-solving skills, and information gathering. These qualities form a fertile ground for efficient research conduction. It is because of these skills that students in the PBL system feel more confident in participating in a research project and in interpreting and writing a research paper. Students with a more positive attitude towards health research considered it more beneficial.⁴ This factor is also important for successful research conduction.

Medical students from both curricula attend similar seminars and conferences and are taught the same research material. This may explain the similarity in knowledge among both groups of students in our study. Most of the National and International Literature supports the results of our research. However, some data is contradictory. Research conducted in the Netherlands showed that there was no sizeable difference in both groups with respect to their research conduction.¹⁵ A recent study in Pakistan in 2016 showed not only a statistically significantly higher attitude of PBL students but also showed better knowledge of these students regarding health research as compared to LBL students i.e. p-value <0.001 for both knowledge and attitude.¹⁶ The discrepancy can also be due to differences in analysis and evaluation methods.

Every research has its limitations. In this study, the sample was taken with a gap of one year between LBL and PBL students. The research was conducted in only one institution and although the study standards in RMU are well recognized all over the country, the results cannot be generalized because of the differences in teaching methodologies and standards in various institutions. Furthermore, the study may have been subjected to response set bias from the respondents.

This research suggests that further studies should be done to evaluate the efficacy of PBL and LBL systems. Although students studying in PBL curricula were found to have better attitudes, both systems should focus on the provision of quality education as knowledge was average in both groups.

Conclusion

PBL and LBL students had a similar level of knowledge but PBL students had a significantly higher attitude towards health research. The problem-based learning (PBL) curriculum had a positive influence on the attitude of students towards health research.

References

- Nass SJ, Levit LA, Gostin LO, Institute of Medicine (US) Committee on Health Research and the Privacy of Health Information: The HIPAA Privacy Rule. The value, importance, and oversight of health research. Washington, D.C., DC: National Academies Press; 2009. DOI: 10.17226/12458
- Bilal M, Haseeb A, Mari A, Ahmed S, Sher Khan MA, Saad M. Knowledge, attitudes, and barriers toward research among medical students of Karachi. *Cureus*. 2019;11(9):e5599. doi:10.7759/cureus.5599
- Zehra N, Hassaan A, Mushtaq S. Research amongst junior and senior medical students; comparison of knowledge, attitude and practice. *Professional Med J*. 2015;22(1).
- Meraj L, Gul N, Zubaidazain, Akhter I, Iram F, Khan AS. Perceptions and attitudes towards research amongst medical students at Shifa College of Medicine. *J Pak Med Assoc*. 2016;66(2):165–89.
- Memarpour M, Fard AP, Ghasemi R. Evaluation of attitude to, knowledge of and barriers toward research among medical science students. *Asia Pac Fam Med*. 2015;14(1):1. doi:10.1186/s12930-015-0019-2
- Okoye HC, Meka IA, Ugwu AO, Yahaya IA, Otokunefor O, Ojo OO, et al. Perception of problem based learning versus conventional teaching methods by clinical medical students in Nigeria. *Pan Afr Med J*. 2019;33:311. doi:10.11604/pamj.2019.33.311.19169
- Khan H, Taqui AM, Khawaja MR, Fatmi Z. Problem-based versus conventional curricula: influence on knowledge and attitudes of medical students towards health research. *PLoS One*. 2007;2(7):e632. doi:10.1371/journal.pone.0000632
- Osman T. Medical students' perceptions towards research at a Sudanese University. *BMC Med Educ*. 2016;16(1):253. doi:10.1186/s12909-016-0776-0
- Carrió M, Agell L, Baños JE, Moyano E, Larramona P, Pérez J. Benefits of using a hybrid problem-based learning curriculum to improve long-term learning acquisition in undergraduate biology education. *FEMS Microbiol Lett* [Internet]. 2016;363(15). Available from: <http://dx.doi.org/10.1093/femsle/fnw159>
- Shah V, Jain U. The effectiveness of integrated teaching over traditional teaching in third MBBS students. *Int J Med Sci Public Health*. 2016;5(7):1430. DOI: 10.5455/ijmsph.2016.22052016505
- Ibrahim M, AlShahrani A, Abdalla M, Abubaker I, Mohamed M. The effectiveness of problem-based learning in acquisition of knowledge, soft skills during basic and preclinical sciences: Medical students' points of view. *Acta Inform Med*. 2018;26(2):119. doi:10.5455/aim.2018.26.119-124
- Tayyeb R. Effectiveness of problem based learning as an instructional tool for acquisition of content knowledge and promotion of critical thinking among medical students. *J Coll Physicians Surg Pak*. 2013;23(1):42–6.
- Gholami M, Moghadam PK, Mohammadipoor F, Tarahi MJ, Sak M, Toulabi T, et al. Comparing the effects of problem-based learning and the traditional lecture method on critical thinking skills and metacognitive awareness in nursing students in a critical care nursing course. *Nurse Educ Today*. 2016;45:16–21. doi:10.1016/j.nedt.2016.06.007
- Asad M, Iqbal K, Sabir M. Effectiveness of problem based learning as a strategy to foster problem solving and critical reasoning skills among medical students. *J Ayub Med Coll Abbottabad*. 2015;27(3):604–7.
- Schmidt HG, Vermeulen L, van der Molen HT. Longterm effects of problem-based learning: a comparison of competencies acquired by graduates of a problem-based and a conventional medical school. *Med Educ*. 2006;40(6):562–7. DOI: 10.1111/j.1365-2929.2006.02483.x.
- Haseeb A, Bilal M, Ansari MA, Raheem A, Khan A, Arshad MH, et al. Impact of mode of curriculum on knowledge and attitudes of medical students towards health research. *J Clin Diagn Res*. 2016;10(4):LC15-9. doi:10.7860/JCDR/2016/17419.7647