

Comparison of Peer Assisted Learning with Traditional Lecture-Based Learning in Anatomy for First Phase MBBS Students

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ABSTRACT:

Introduction: In medical education, first MBBS has basic medical sciences subject like anatomy, physiology and biochemistry. Anatomy is one which explain morphology and structure of the human body in medical practice. Anatomy plays critical role in physical examination that leads to diagnosis, communication to patients and guides invasive procedures. Learning through interactions, discussing, clarifying doubts will lead for better understanding subject.

Peer assisted learning may be useful to motivate the students. Peer assisted learning leads to positive and significant influence over communication skills, decision making and socialization. As medical professionals work as a team, group behaviour and interpersonal relations through group interaction is important. These soft skills are fulfilled by Peer assisted learning thus producing better study achievement. As not many studies have been done on comparison of Peer assisted learning and traditional learning of anatomy, we have conducted an interventional study on 150 students in the first year MBBS program.

Aim and objective: To compare peer assisted learning with traditional method in learning anatomy for first phase MBBS students. To compare the learning satisfaction of the students in Peer assisted learning versus traditional teaching methods.

Materials & Method: The study was conducted among 150 Phase I MBBS students, Anatomy department in Medical College for a period of 5 months. The Gross anatomy sessions were taught using both traditional lecture based and Peer assisted learning. Student's performance was assessed by comparing between pretest and post-test marks. Students also filled up post session learning satisfaction questionnaire.

Results: There was significant increment in the post test scores when compared to the pre- test scores in both the participants of the didactic lecture (Pre-test score 5.17 ± 2.5 and post-test score 8.68 ± 1.7); $p = 0.001$) as well as Peer assisted learning (Pre-test score 5.79 ± 2.5 and Post-test score 8.49 ± 2.05 $p = 0.001$). A feedback survey showed lecture was a more satisfactory teaching and learning methodology when compared to peer assisted learning methodology.

Conclusion: Peer assisted learning is an effective learning tool for medical students. As it enhances active learning peer assisted learning can be complimentary to didactic lectures.

Keywords: Peer assisted learning, traditional teaching, anatomy, competency based medical education.

Introduction

As per CBME many new teaching learning methods are introduced in medical curriculum to break the monotony of didactic lectures. Traditional lecture-based learning is lecture of one hour duration taught by faculty expert to the students using PowerPoint or chalk & talk, with or without clinical correlation.¹ PAL is one among them, which includes small group teaching with higher cognitive order to make a competent IMG.

PAL can be defined as procuring knowledge and skill through people from similar social and cognitive congruence,² who are not professionals. In vision of Joseph Joubert "To teach is to learn twice" is true in educational literature. PAL is well known teaching & learning methodology in medical education³ from which both peer tutor & peer tutees are benefitted. PAL enhances student learners cognitive, psychomotor & affective development. It improves the confidence, analytical thinking, decision making, communication skills, motivation, self-perception, co-operative learning & socialisation.⁴ As medical professionals work as a team, group behaviour and interpersonal

relations through group interaction is important.⁴ The benefits of PAL are doubled. In one way it significantly improves student academic performance and on the other hand it overcomes the shortage of qualified faculty in pre-clinical department.^{5,6}

In PAL, a peer tutor need not be more experienced person. Peer tutors prior knowledge which motivates and improves each peer tutees performance, which peer tutees would not have achieved independently.² In PAL activities provide teaching skills to the students which can be used in their future careers and provide rich learning opportunity by preparing them for such roles as earliest.⁷ In PAL peer tutors and peer tutees share same knowledge level and learning experience with similar wavelength, which help peer tutors meet peer tutees demand and makes it easier to understand their explanation.^{8,9} Falchikov categories of PAL are ¹⁰

1. Peer tutoring with same level of experience & attainment.
2. Peer tutoring with high academic achievement but same education level.
3. Peer tutoring with senior students as tutors.

Implementing PAL activity in phase I MBBS students will bring positive attitude towards active small group learning from day one of their medical career.¹¹ Such activities will enhance positive emotional regulation with self-perception of their knowledge and will prepare them for meticulous academic environment of medical profession.¹² In medical education the concept of PAL is known since first century AD.¹³

To organise the PAL sessions, the following are the ideal steps:

- a) Small group setting where peer tutor teaches, discuss and explain difficult concepts to the peer tutor.
- b) Training session for peer tutor by faculty expert as a part of facilitators guide.
- c) Significant component of PAL is evaluation which includes pre-PAL & post PAL assessment²

The combination of social & cognitive congruence makes PAL as a successful teaching learning methodology.⁹ PAL moderates medical students quality of life, help to overcome difficulties in practice of medicine, brings positive impact on their exam preparation.^{8,14} PAL encourage framing objectives, critical thinking and professional identity.² Literature also mentions training of peer tutors, helped them to deal tutees in difficulty, handling group dynamics, keeping students motivated and time management.¹⁵

The lectures by professional cannot be replaced, one can complement with PAL. As not many studies have been done on comparison of PAL & traditional learning of anatomy, we hope to to conduct an interventional study on 150 students in the first year MBBS program.

Objectives of the study:

1. To compare peer assisted learning with traditional method in learning anatomy for first phase MBBS students
2. The study will also compare the learning satisfaction of the students in PAL versus traditional teaching methods.

Materials and Method

A quasi-experimental study design with controls was employed to conduct the study, on 150 Phase I MBBS students, Anatomy department of our Medical College. The duration of study was 5 months. All Phase I MBBS students of more than 18 years and who consent to participate in the study were included in the study. Students who were absent on the day of the study was conducted were excluded from the study. Convenient sampling was Sampling technique used.

Methods: After receiving Institutional Ethical Committee approval, the study proceeded. After receiving written informed consent for participation in the study, 150 students of phase I MBBS were divided by convenient sampling method into two groups of 75 students. The MCQ paper and the learning satisfaction questionnaires were validated by two subject experts from the Anatomy department and one from the Medical Education Unit. The questionnaire contained the sociodemographic profile of the participants and items on learning satisfaction on a five-point Likert scale. Both groups were given pretest MCQ paper of 10 marks on the topic –gross anatomy of kidney.

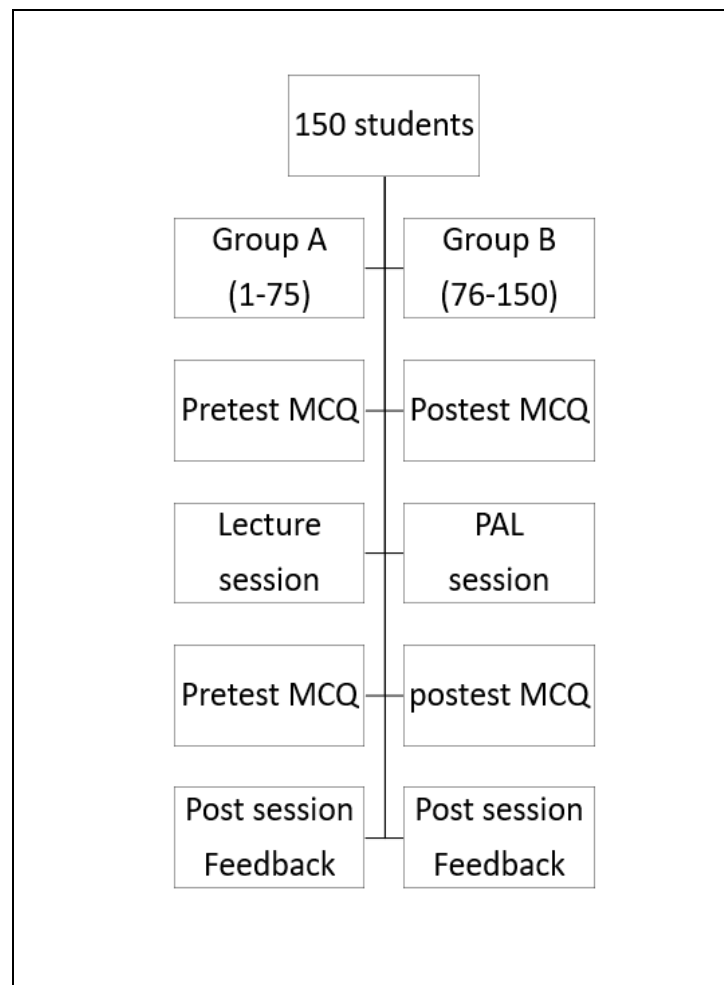
Group A comprising of 75 students were exposed to lecture-based learning method. The lecture on gross anatomy of kidney was conducted using power point presentation. Session was followed by post session MCQ paper of 10 marks that was used in the pre-test. Students also filled up a post session learning satisfaction questionnaire.

Group B comprising of 75 students were exposed to Peer assisted learning on same topic gross anatomy of kidney. Group B were subdivided into 3 small groups of 25 students in each subgroup. Each subgroup had 5 peer tutors who were volunteer for giving seminar using any source of study material with freedom of framing their own learning issues and discussing with peer students. Session facilitated by facilitator for any difficulties. Session was followed by post session MCQ paper of 10 marks that was used in the pre-test. Separate post session learning satisfaction

questionnaire for both peer tutors and peer tutees were collected.

Data on effectiveness of learning were collected by conducting pretest and post-test comprising 10 Multiple choice questions (MCQs) on topic - gross anatomy of kidney. Data on the learning satisfaction of the students were collected using a questionnaire on Google forms.

Data was entered in MS Excel and analysed using SPSS Software Version 25. Marks of pre-test and post-test MCQ were compared within a group and also between the groups. Continuous data were expressed as Mean and Standard Deviation. Paired T-test and independent sample T -test were used to compare continuous variables.



Results

Table 1- Paired T test shows significant increase in mean post test scores.

Lecture	mean±SD	P value
Pre test	5.17±2.5	0.001
Post test	8.68±1.7	
PAL		
Pretest	5.79±2.5	0.001
Post-test	8.49±2.05	

Table 2- Independent sample T test shows no significant difference between post-test marks

	mean $\pm$ SD	p value
Lecture	8.68 $\pm$ 1.7	0.57
PAL	8.49 $\pm$ 2.05	

Table 3- Shows responses of feedback questionnaire on lecture and PAL sessions

	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	lecture	PAL	lecture	PAL	lecture	PAL	lecture	PAL	lecture	PAL
I am satisfied with the session	0	3.84	0	0	10.5	15.38	68.4	55.76	21	25
Do you agree session was helpful to you in better understanding anatomy.	1.75	3.84	0	1.92	8.7	9.61	61.4	63.46	28	23.07
Do you agree session facilitated in gaining new knowledge.	0	1.92	0	0	8.7	19.23	68.4	59.61	24.56	21.15
Do you agree session helped you in gaining ability to answer questions.	1.75	1.92	0	0	12.28	19.23	63.15	59.61	24.56	21.15
Do you agree the topic was dealt in appropriate time management.	0	1.92	1.75	0	12.28	21.15	64.91	50	22.8	26.92
Do you agree that sufficient elaboration of topic was made.	3.5	1.92	0	1.92	17.54	21.15	59.64	57.69	19.29	19.23
Do you agree session emphasized important facts of topic.	0	1.92	1.75	0	8.7	21.15	70.17	57.69	19.29	19.23
Do you agree session aroused interest in learning anatomy.	0	1.92	0	0	15.78	25	61.4	48.07	22.8	23.07

The study comprised one batch of phase I MBBS students in our medical college. The pre and post test scores were compared between those who attended the didactic lecture on the topic gross anatomy of kidney and those who participated in the PAL session. Out of 150 students, group A (1280-1286) 63 attended lecture and in group B (1280-1286) 60 attended PAL session.

There was significant increment in the post test scores when compared to the pre- test scores in both the participants of the didactic lecture (pre-test score 5.17+ 2.5 and post-test score 8.68+1.7; $p= 0.001$) as well as PAL (pre-test score 5.79+ 2.5 and post-test score 8.49+2.05; $p= 0.001$) as seen in Table 1. Post test scores of the lecture (8.68+1.7) was slightly higher than the post-test score of the PAL group (8.49+2.05); $p=0.57$. There is no significant difference between the mean scores of the two methods.

Pretest performance of PAL tutors were same as those of other tutees. But their performance was significantly better in the post test.

Our study shows 89.4% of lecture and 80.76% of PAL sessions students were satisfied with the sessions. 92.96% of lecture and 80.76% of PAL session students agreed session facilitated in

gaining new knowledge. 87.71% of lecture and 76.92% of PAL session students agreed that the topic was dealt in appropriate time. 89.46% of lecture and 76.92% of PAL session students agreed sessions emphasized important facts of the topic. 84.2% of lecture and 71.14% of PAL session students agreed session aroused interest in learning anatomy.

Students of both sessions agreed that sufficient elaboration of topic was made, it was helpful in better understanding anatomy and helped them in gaining ability to answer questions.

All peer tutors agreed that session helped them to learn time management, improved their oral presentation skills, motivated them for self-directed learning and facilitated team learning. All peer tutors agree that their teaching skill improved, were happy and confident to participate in PAL in future.

Discussion

Medical education requires a combination of traditional didactic lecture and newer teaching and learning methodology that can increase students competencies to align with the expected IMG. One of the major objectives for choosing learning tools is their ability to produce best

academic results. The present study compared lecture and PAL, but could not establish any significant difference between the mean scores of the two methods. ($p = 0.57$). However, the study results demonstrated that in terms of academic achievements, there was significant increment in the post test scores when compared to the pre-test scores in both the participants of the didactic lecture as well as PAL. However, the peer tutor's performance in post-test was significantly better than other tutees. Better performance of peer tutors was due to their preparation for seminar of PAL session for teaching the peer tutees.¹⁶

The findings of present study were similar to the results of study conducted by Bentley and Hill ($p = 0.55$) in anatomy, Manzoor ($p = 0.47$) in community medicine and Ten Cate in multidisciplinary course.¹⁶ In contrast to our findings, some studies showed that PAL session had better post test scores than lecture program. Among them were the studies by Abedini et al ($p \leq 0.02$) in a Pharmacology course and Peets et al ($p \leq 0.01$) in Gastroenterology/Haematology course.¹⁶

The peer tutors and peer tutees are more comfortable with less hierarchical teaching environment making learning easier and confident.¹⁷ The success of PAL lies at the academic level of peer tutors. As educational maturity increases, the receptivity of peer tutees increases. Hence the PAL sessions are expected to show better outcome in the successive phases of MBBS curriculum. In order to have expanded access to learning in medical education & to be cost effective information technology can be utilised in PAL activity.¹⁸ PAL sessions induce rich learning environment, there was overall

improvement in academic performance of peer tutors. They learned to fill the knowledge gap by deeper learning approaches.⁶

The present study was conducted to compare the traditional lecture and PAL methods in anatomy. As per Literature, few studies showed PAL as better method and few studies showed lecture as better teaching and learning methodology. One method cannot be better or superior to the other method. PAL can be an effective complimentary tool for developing clinical skills in medical education.

Limitations: The study was conducted on few topics in small sample size. Peer tutees had concern about depth of knowledge and pedagogy skill of peer tutors, which might have influenced the poor outcome of PAL.

Conclusion: With the results of our present study, we conclude that the academic performance of Students of Phase I MBBS were no statistically significant difference between the two methods. PAL cannot replace traditional lecture but can be a supplementary teaching tool with potential outcome when used in appropriate context.

Present study will aid future researchers in producing reliable findings on the same topic with large sample size done longitudinally in successive academic years of medical course.

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ABBREVIATIONS USED:

PAL	Peer Assisted Learning
MCQ	Multiple Choice Questions