

Is Peer assisted learning better? A modern question to answer: A comparative study

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Abstract

Objective: To determine the effectiveness of peer-assisted learning against expert-assisted learning in terms of scores achieved by medical students, and to assess the perceptions of students about peer-assisted learning.

Method: The mixed-method study was conducted at Wah Medical College, Wah Cantonment, Pakistan, from October 2017 to December 2018, and comprised fourth year medical students who were randomised into groups A and B. In the first session the topic 'Data' was taught to group A by a peer and to group B by an expert teacher. In the next session the topic 'Sampling' was taught to group A by an expert teacher and to group B by a peer. Each session was followed by an assessment. Students' views about peer-assisted learning were collected using a predesigned questionnaire. An open-ended question about the role of expert in teaching was also asked from the students. Data was analysed using SPSS 22. Qualitative data was analysed to identify emerging themes.

Results: Of the 80 subjects, 41(51.25%) were group A and 39(48.75%) were in group B. Overall, there were 36(45%) males and 44(55%) females. In the first session, mean group A score was 6.85 ± 1.99 and for group B it was 7.54 ± 1.76 ($p > 0.05$). In the second session, the mean score of group A was 6.12 ± 2.06 and for group B it was 4.82 ± 2.01 ($p = 0.005$).

Conclusion: Peer-assisted learning was found to be a valuable tool that can be incorporated in the curriculum delivery for easy topics. However the significance of expert's assistance, guidance and feedback cannot be negated.

Keywords: Peer-assisted learning, Expert-assisted learning, Independent t-test, Cognition level. (JPMA 71: 1940; 2021)

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Introduction

Medicine is a diverse field of education. New technologies and effective ways of teaching are incorporated into medical teaching every now and then. The General Medical Council (GMC) in the United Kingdom wants that the graduates after passing out from a medical university show effective teaching abilities apart of being a good doctor¹ and it has emphasised that medical learning should shift into more modern, interactive, problem-based and student-centred learning.²

This modern method of teaching has led to the concept of peer-assisted learning (PAL), which is "the development of knowledge and skills through active help and support among status-equals or matched companions."³ Extensive research has shown that PAL gives benefit to students, teachers, universities and, finally, to countries. It is now the right time to incorporate PAL in various domains of health.⁴ PAL can be horizontal or vertical, depending on whether the students supporting one another happen to be of the same year or from a year above.⁵

PAL has an impact on academic scores and students' satisfaction, leading to enhanced professional growth.³ PAL, apart from having an academic focus, has additional

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benefits of providing students with coherence among themselves and their concern about their own and peer understanding about the subject. This brings about meaningful acquisition of knowledge and enhanced confidence.^{6,7}

A study in Lahore showed that there was no significant difference between the results obtained by two learning techniques ($p = 0.468$), with 25% of the students saying that PAL is an effective learning technique.³

The current study was planned to assess the effectiveness of PAL against the expert-assisted learning (EAL) in terms of scores achieved, and to evaluate the perceptions of students about PAL sessions.

Subjects and Methods

The mixed-method study was conducted at the Wah Medical College, Wah Cantonment, Pakistan, from October 2017 to December 2018. After approval from the institutional ethics review board, the sample was raised from among fourth year medical students. After taking informed consent from the subjects, they were divided into two groups A and B by using simple random sampling.

For the quantitative part, a comparative study design was executed and for the qualitative part a questionnaire was used with open-ended questions (Annexure-A). A pilot study was carried out for validation of the questionnaire

before its use.

For the sessions, a student from the class was selected on the basis of past academic record as the peer teacher, and

Annexure-A: Peer assisted learning verses expert assisted learning: Answer the following questions.

S.No.Question	Strongly agree	Neutral	Strongly disagree
1. Do you think that peer assisted learning (PAL):			
a. Is an Effective teaching strategy			
b. Provides safer environment for peers to learn			
c. Make it easy to communicate and solve problems			
2. The PAL session			
a. Covered course effectively			
b. Provided better learning and knowledge retention			
c. Improved understanding of the subject			
d. Was interesting			
3. In your opinion should these PAL sessions be incorporated in the curriculum delivery?			
4. What is the role of an expert in your teaching and learning?			

Annexure B:

- A researcher conducted a research on quality of life of thalasemic patients and summarized the data as good, average and poor quality. The data under consideration can be best categorized as:
a. Discrete b. Continuous c. Nominal d. Ordinal e. Multi-chotomous
- Study participants are asked to indicate their ethnic background from a list of given ethnic groups. This type of variable is classified as:
a. Nominal b. Ordinal c. Discrete d. Continuous e. Dependent
- Weight and height of children are parameters of Growth monitoring which can be categorized as:
a. Continuous b. Dichotomous c. Discrete d. Nominal e. Ordinal
- A researcher studied incubation period of patients of hepatitis admitted in a medical ward. The variable of interest is:
a. Ratio b. Discrete c. Nominal d. Ordinal e. Interval
- A study was conducted on medical students to determine their Hepatitis B vaccination status. Categorize the variable of interest.
a. Ordinal b. Dichotomous c. Multichotomous d. Continuous e. Ratio
- A researcher conducted a research on pain management of cancer patients and summarized the data as mild, moderate & severe pain. The variable under consideration can be best categorized as:
a. Continuous b. Discrete c. Multichotomous d. Ordinal e. Ratio
- The variable of interest in the following table is categorized as:

Cities	Morning	Evening
Lahore	20°C	30°C
Islamabad	00°C	20°C
Karachi	12°C	15°C

- Ratio b. Interval c. Discrete d. Nominal e. Ordinal
- The monthly admission and mortality data at a tertiary care hospital in Rawalpindi were recorded and plotted on the bar chart, as the data was:
a. Nominal b. Categorical c. Ordinal d. Continuous e. Discrete
 - Serum calcium and phosphate levels of 300 patients were measured to diagnose early age osteoporosis. The variable is best categorized as:
a. Continuous b. Discrete c. Multichotomous d. Nominal e. Ordinal
 - A histopathologist gave a report of 30 anaemic patients. The number of patients having microcytic, macrocytic and normocytic anaemia are 20, 6 and 4 respectively. The variable would be best categorized as:
a. Dichotomous b. Continuous c. Multichotomous d. Discrete e. Interval.

an associate professor acted as the expert teacher. The peer teacher was given orientation about PAL, and was taught about conducting the lecture. Biostatistics was taken as the topic for the sessions, and its sub-topics 'Sampling' and 'Data' were selected for one session each. Both groups were assessed at the end of each session by a test comprising multiple-choice questions (MCQs) that were 'one best type' having higher cognition level, pre-hoc and vetted. The total numbers of MCQs were 20; with each assessment having 10 (Annexures B-C). The reliability coefficient of these MCQs was calculated using Cronbach's alpha which was 0.727.

The topic for the first session was 'Data' and its types. It was taught to group A by the peer, and

Annexure C:

- A researcher is interested to find out different types of refractive errors among children aged 5-10 years of Tehsil Taxila. The appropriate sampling technique will be:
a. Systematic b. Simple Random c. Cluster d. Stratified e. Quota
- To determine the knowledge about Birth Preparedness among women of a town, every 3rd household was selected for data collection. The sampling technique adopted was:
a. Simple random b. Systematic random c. Stratified d. Cluster e. Convenient
- A researcher hypothesized that average serum iron levels are lower among Hindus than Muslims. The appropriate sampling technique for the study would be:
a. Cluster b. Purposive c. Simple random d. Stratified. e. Systematic
- A researcher wants to study the attitude of medical graduates of Pakistan about out-migration to other countries. Which sampling technique should be chosen to get representative sample?
a. Simple random b. Stratified c. Systematic d. Cluster e. Purposive
- Suppose a political leader wants to gather a realistic pre-poll information from the population including opinion from various minority groups as well. The sampling technique best suited for this assessment is:
a. Simple random b. Stratified c. Systematic d. Quota e. Convenient
- The survival rate of patients with different stages of lung carcinoma is to be assessed. Which sampling technique would be more suitable for it?
a. Simple random b. Quota c. Cluster d. Stratified e. Purposive
- The students of 4th Year MBBS are interested to do a research on drug abuse among youngsters of Wah cantt. The appropriate sampling technique will be:
a. Systematic Random b. Random c. Cluster d. Snow ball e. Quota
- Suppose from a sampling frame of 1200 medical students of RMC a sample of 100 students has to be taken. If you adopt systematic random sampling then the nth number would be:
a. 11 b. 12 c. 13 d. 14 e. 15
- In a village of 100 houses, a worker visited first 20 houses to collect information about source of water supply. The type of sampling is:
a. Simple random b. Systematic random c. Quota d. Stratified random e. Convenient
- The psychologist assigns each student a number from 0001 to 3960 and uses a computer to randomly generate a list of 300 numbers to select the students for the sample. This sampling technique would be best labeled as:
a. Simple random b. Systematic random c. Quota d. Stratified random e. Convenient

to group B by the expert. In the next session, there was crossover of batches, and the topic was 'Sampling' and its types. Group A was taught by the expert, and group B by the peer. Each session was followed by one set of MCQs. The students' views about PAL were taken using the questionnaire which was scored on a 3-point Likert scale, from 'strongly agree' to 'strongly disagree'.

An open-ended question was also given to the students for assessing their views about the expert's role in teaching, and themes were generated on the basis of this input.

Quantitative data was analysed using SPSS 22. The normality of data was checked using Q-Q plots and the data was found to be normal. Mean scores of the tests were calculated along with standard deviations, and were compared by applying t-test. $P < 0.05$ was taken as significant. Qualitative data was analysed to identify emerging themes. Three independent reviewers compared the results to increase the validity of the findings.

Results

Of the 80 subjects, 41(51.25%) were group A and 39(48.75%) were in group B. Overall, there were 36(45%) males and 44(55%) females. After the first session, the mean score of group A was 6.85 ± 1.99 and for group B it was 7.54 ± 1.76 ($p > 0.05$). After the crossover, group A scored 6.12 ± 2.06 and group B scored 4.82 ± 2.01 ($p = 0.005$) (Table 1).

The groups were also analysed to find out the effect of two learning techniques on overall results (Table 2).

For qualitative analysis, students' responses to open-ended

Table-1: Comparison of multiple-choice-questions (MCQs) score after peer and expert assisted learning.

Group	No. of students	Mean \pm SD	p-value
A= Peer	41	6.85 \pm 1.99	0.373
B= Expert	39	7.54 \pm 1.76	
After cross over			
A= Expert	41	6.12 \pm 2.06	0.005
B= Peer	39	4.82 \pm 2.01	

SD=Standard Deviation.

Table-2: Comparison of multiple-choice-questions (MCQs) scores of each group after application of paired sample t-test.

Group	No. of students	Mean \pm SD	p-value
A= Peer	41	6.85 \pm 1.99	0.015
A= Expert	41	6.12 \pm 2.06	
B= Expert	39	7.54 \pm 1.76	0.000
B= Peer	39	4.82 \pm 2.01	

SD=Standard Deviation.

Table-3: Percentages of responses of the students regarding peer-assisted learning (PAL) and PAL sessions.

S.No.Question	Strongly agree	Neutral	Strongly disagree
1. Do you think that peer assisted learning (PAL):			
a. Is An Effective teaching strategy	68(85%)	8(20%)	4(5%)
b. Provide safer environment for peers to learn	36(45%)	40(50%)	4(5%)
c. Makes it easy to communicate and solve problems	72(90%)	8(20%)	0
2. The PAL session			
a. Covered course effectively	44(55%)	28(35%)	8(10%)
b. Provided better learning and knowledge retention	36(45%)	44(55%)	0
c. Improved understanding of the subject	40(50%)	36(45%)	4(5%)
d. Was interesting	52(65%)	28(35%)	0

questions were analysed thematically (Table 3). Four themes were identified. The first theme was 'appropriate guidance', as evidenced by comments, like: "Expert will guide"; "Expert will help in better understanding of subject"; "Targeted preparation"; "Exam-oriented preparation"; and

"Solving problems become easy by an expert".

The second theme was 'experience', as evidenced by comments, like: "Better view of subject as they have more knowledge"; "Balance of time"; "Students learn better from experts"; "Effective teaching strategy";

"Use more number of resources"; and

"Experienced in delivering lectures". The third theme identified was 'learning environment', as evidenced by comments, like: "Develop interest"; "Encourage participation of all students and creates informative environment"; and "More discipline in class". The final theme was 'concept-building', as was evidenced by comments, like: "Improve concepts";

"Master the concepts"; and

"Expert might correlate the subject with real-life situations".

Discussion

The current study compared the effectiveness of PAL with EAL. The difference in mean scores of students were non-significant in an assessment based on 'data and its types' which means there is no difference in the results of students whether they had been taught through PAL or EAL. In the other session, the topic discussed was 'sampling and its types', and the mean scores showed significant difference, with students taught using EAL gaining more marks compared to those exposed to PAL. The result signified that PAL can be an effective strategy for tutoring easy subjects. The results were comparable with other studies.^{3,8,9}

Another set of studies showed better efficacy of PAL.¹⁰⁻¹⁴

The perceptions of students were also assessed about PAL. About 85-90% students found PAL to be an effective learning strategy and through this strategy communication skills as well as problem-solving skills were enhanced, while only 45% students agreed that the environment was 'safe' during PAL sessions. Similar results were reported by different studies.¹⁵⁻²⁰ There are other studies, however, that showed contradictory results.^{3,18,21}

The current study also asked the students to give their views about the role of experts in teaching. The students gave various responses from which four themes were generated. Faculty's guidance was said to be very important for the preparation of exams because their lectures are exam-oriented. The experienced teachers were said to be more educated and they used multiple resources for teaching, they encouraged all students to participate while teaching and thus create an informative environment. Moreover, EAL was said to be very helpful in improving the concepts of any topic as they relate real-life situations with different contents of the subject.

The findings indicated that inclusion of PAL strategy in teaching programmes and curriculum delivery can be effective, and peers should be trained on comparatively easy topics by the experienced faculty with administrative support. In addition, training sessions should be conducted for the faculty concerning PAL so that they will be convinced and may practise the strategy while delivering the curriculum.

The limitation of the current study is its small sample size and short duration because of which detailed interview of the students could not be held for the qualitative part.

Conclusion

PAL was found to be a valuable strategy that can be incorporated in the curriculum delivery for easy topics. However, the significance of an expert's assistance, guidance and feedback cannot be negated.

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