COMPARISON OF CASE BASED LEARNING WITH CONVENTIONAL TEACHING-STUDENTS' PERSPECTIVE

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ABSTRACT

Objective: To compare case based learning with conventional teaching from student's perspective.
Study Design: Cross sectional comparative study.
Place and Duration of Study: Army Medical College, Rawalpindi from May 2012 to November 2012.
Material and Methods: A closed ended self-administered questionnaire with twelve questions was prepared and distributed to 427 students of 2nd to final year MBBS classes. The responses to the questions were dichotomous either in favour of case based learning or conventional teaching. It included both the genders and all the categories of students from 17 to 23 years of age. Duly filled questionnaires were returned by 397 respondents which were included in the study. Univariate analysis of each question was performed by applying Binomial exact test. Reliability was determined through internal consistency by applying Cronbach's alpha test.
Results: A total of 294 (74%) male and 103 (26%) female students with mean age of 19.83 ± 1.41 years participated in the study. Difference in frequency of respondents was significant for all the questions (*p*-value < 0.05) except question number 1 and 2. Value of Cronbach's alpha was 0.83 showing high reliability.
Conclusion: Case based learning is a preferred instructional strategy as compared to conventional teaching from students' perspective.

Keywords: Case based learning, Critical thinking, Didactic lecturing, Problem based learning.

INTRODUCTION

Traditionally, teaching is viewed, as a process of information transferred from teacher to student[1]. Main objective of teaching had been to produce a student who retains knowledge that is reproduced later in examination. Almost complete emphasis is put on content knowledge of the student ignoring many other 'essential' attributes[2]. Case based learning is an instructional strategy aimed to achieve the objectives which are beyond just instilling the information in the minds of students. Case based learning reversed the orthodox approach to education swapping teaching with learning[3]. In this mode of information transfer students not only acquire knowledge but also develop generic competencies which are essential for a doctor. They develop habits of working in groups, critical thinking, and decision making[4]. They also develop good communication skills and learn the tactics of social interaction. Case based learning follows principles of adult learning giving the students autonomy on their own learning process. It facilitates problem solving through deep learning approach, analytical integration and 'backward-directed' hypothetico-deductive mode of reasoning. It makes medical students lifelong and independent learners; a habit which is indispensable for health care professionals[5].

Spectre of listless students, switched off by information overload and monotonous voice of teacher had been a feature of undergraduate medical education for the last 100 years or so[6]. This conventional 'information gathering' teaching approach directs students towards rote learning, and their main objective becomes just to pass the examination. Knowledge without context is provided leading to difficult retrieval at later use[7]. Case based learning introduced a paradigm shift in learning process making student the controller of his own learning. This makes learning fun and reduces cognitive overload by focusing on relevant and contextual knowledge which facilitates consolidation of information into longterm

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memory. In case based learning, students place more emphasis on meaning than memorizing and use educational resources other than text books[8].

Conventional teaching approach is teacher centered, discipline oriented and information based whereas, case based learning is student centered, integrated and problem based[9]. In traditional teaching students are first taught about rules and principles which they later apply on problems. Whereas, in case based learning the sequence is reversed. A problem or the clinical scenario is a starting point in case based learning and while solving the problem students discover rules and principles by constructing their own knowledge[10]. Case is designed not only as a foundation for learning but also to arouse interest of students in the topic. The romance of learning and excitement of discovery, is provided by the problem scenario[11].

Learning does not end with basic training in the health profession, but continues for life. By developing self-directed learning skills, case based learning facilitates the production of lifelong learners[12]. Despite the fact that complexities of medical care have increased dramatically over the last century, the methods of teaching medicine have changed little. As a matter of fact, medical education should be given the same emphasis as medical research and patient care. Perhaps, medical education is the foundation on which the latter two stand[13]. A point of concern, in this regard, is the development of case based integrated curricula which is need of the hour[14].

Case based learning has been introduced at many medical institutions all over the world. In Pakistan, a few medical colleges have switched over to it completely whereas majority of the colleges are either following a hybrid system or the conventional teaching. At Army Medical College, we are following a hybrid system i.e. case based learning plus the conventional teaching.

The current study was planned to compare case based learning with conventional teaching from the perspective of medical students of Army Medical College, Rawalpindi.

MATERIAL AND METHODS

This was a cross sectional comparative study with post positivist research paradigm. The study was conducted at Army Medical College, Rawalpindi from May 2012 to November 2012. A closed ended self-administered questionnaire having twelve questions was prepared as shown in table-1. The responses to the questions were dichotomous either in favour of case based learning or conventional teaching.

A pilot study, for testing the questionnaire was conducted in which 25 students participated. The questionnaire was well understood by the respondents and was completed easily. Finally, the questionnaires were distributed to 427 students according to convenience non-probability sampling. It included both the genders and all the categories of students from first to final year MBBS classes. Age of the students who participated in the study was from 17 to 23 years. Duly filled questionnaires were returned by 397 respondents which were included in the study, giving a response rate of 93%.

Univariate analysis of each question was performed by applying Binomial exact test. Confidence intervals were calculated by Clopper Pearson test. Reliability was determined through internal consistency by applying Cronbach's alpha test. The alpha value was set at 0.05 for significance.

RESULTS

A total of 294 (74%) male and 103 (26%) female students with mean age of 19.83 ± 1.41 years participated in the study.

Table-1 shows the questionnaire along with percentage of respondents for each question answering in favor of either case based learning or conventional teaching.

Fig-1 shows frequency of respondents in favour of case based or lecture based learning.

Value of Cronbach's alpha was 0.83, showing high reliability.

DISCUSSION

Results of our study show students' perspective regarding the two instructional strategies being practised at Army Medical College, Rawalpindi. The study revealed that students had significantly higher liking for case based learning than conventional lecture based teaching. Difference in the frequency of respondents for question numbers 1 and 2 was not significant. These two questions relate to content and concept of the knowledge respectively. For question numbers 3 to 12, statistical analysis shows significant difference in favour of case based learning. These questions pertain to clinical correlation, self-study, use of educational resources, analytical reasoning, critical thinking, interest in learning activity, generic competencies and system preference.

Table: Comparison of case based learning with conventional teaching.

Q No.	Question	Respondent's percentage with 95% confidence interval		*p*-value
		Case based learning	Conventional teaching	
1	Which teaching method enables you to acquire more knowledge after you have completed a system?	53.9 (0.49-0.59)	46.1 (0.41-0.51)	0.13
2	Which teaching method in your opinion gives you a better concept on the topic being taught?	52.9 (0.48-0.58)	47.1 (0.42-0.52)	0.27
3	Which teaching method enables you to better correlate the basic knowledge with its clinical aspects?	90.2 (0.87-0.93)	9.8 (0.07-0.13)	< 0.001*
4	Which of the teaching system prompts you to look for more detailed literature on the topic using various resources other than text books.	89.2 (0.86-0.92)	10.8 (0.80-0.14)	< 0.001*
5	Which teaching method keeps you alert and interested throughout the session?	87.4 (0.84-0.90)	12.6 (0.09-0.16)	< 0.001*
6	In which teaching method is your thought provoking process / brain storming more active?	88.9 (0.85-0.92)	11.1 (0.08-0.15)	< 0.001*
7	Which teaching method aids in development of your communication skills and self-confidence?	90.7 (0.87-0.93)	9.3 (0.07-0.13)	< 0.001*
8	Which teaching method in your opinion actively engages the students in learning process?	84.9 (0.81-0.88)	15.1 (0.12-0.19)	< 0.001*
9	In which teaching method you feel more easy and comfortable to clarify your queries from instructor?	82.1 (0.78-0.86)	17.9 (0.14-0.22)	< 0.001*
10	Which teaching method, do you think enables the instructor to better answer your queries and pay personal attention to individual needs?	82.6 (0.79-0.86)	17.4 (0.14-0.22)	< 0.001*
11	Which teaching method promotes you to self-study during, before or after the session?	56.2 (0.51-0.61)	43.8 (0.39-0.49)	0.016*
12	Which teaching system do you want to be implemented completely instead of the hybrid system currently in practice in our college?	78.1 (0.74-0.82)	21.9 (0.18-0.26)	< 0.001*

**p*-value significant (< 0.05)

Nair et al carried out a study to compare case based learning with didactic lecturing[15]. Their study included 100 medical students of biochemistry class. They divided the participants into two groups of 50 students each. One group was taught through case based learning whereas the other group was taught by conventional lecturing. A Likert scale questionnaire having eight questions was administered to the students to assess their perception about the two instructional strategies. They reported that 98% of their students found case based learning to be an interesting methodology of teaching whereas 84% were of the idea that case based learning exposed them to logical application of the

knowledge. Significant improvement in performance and motivation of students was observed who were taught through case based learning (*p*-value < 0.001).

Grauer et al, compared student performance after lecture-based and case-based teaching in a large group[16]. They studied 110 students of third year MBBS and randomly assigned them to either case based or lecture based teaching groups. The students had a learning experience for fourteen contact hours after which they were assessed. Results of their study concluded that there was no significant difference between the two groups when they were assessed for simple recall questions. Nevertheless, scores of the students who were exposed to case based learning were significantly higher when the students in two groups were compared for higher difficulty, analytical and integrated questions (*p*-value < 0.05).

Tathe and colleagues conducted a study to compare case based learning with conventional lecturing[17]. Their study included 78 students of 2nd year MBBS class. They taught the students through both the strategies at two different occasions and pretest/posttest assessment was carried out. They also administered a questionnaire to find out perception of the students about the two instructional strategies. They found that the posttest scores and gain in learning was significantly higher with case based learning than conventional lecturing (*p*-value < 0.001). Analysis of questionnaire showed that case based learning was more effective in understanding the topic. Students also reported that case based learning improved their learning skills, independent learning abilities and analytical reasoning abilities. Their study concluded that case based learning was a more effective teaching strategy than conventional lecturing.

Massonetto et al studied the perception of fourth year medical students about case based learning[18]. They compared the perceptions and performance of two, fourth year classes, one which was not exposed to case based learning (group 1) and the other which was taught by this strategy (group 2). Groups 1 and 2 comprised of 108 and 113 students respectively. On comparison, group 2 of their study had significantly better performance as compared to group 1 (*p*-value< 0.05). Significant majority of

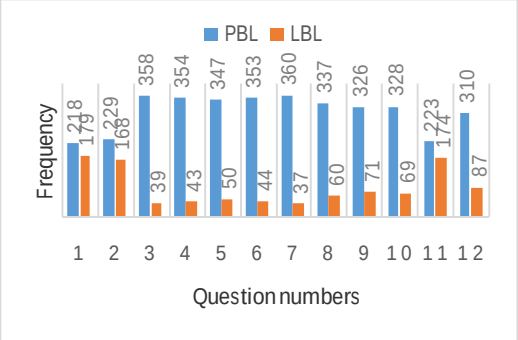

Figure: Frequency of respondents in favour of case based learning or conventional teaching.

the students were of the opinion that case based learning was a better teaching strategy that not only imparted knowledge but also inculcated generic competencies in students (*p*-value < 0.05).

Results of the studies mentioned above including those of ours discuss merits and demerits of the two modes of information transfer under consideration. The research corroborates that case based learning has many advantages over conventional teaching and medical students feel more comfortable, motivated and interested when taught through the former approach.

CONCLUSION

Case based learning is a preferred instructional strategy as compared to conventional teaching from students' perspective. The evidence suggests that case/problem based learning is the choice of the learner. It replaces the conventional teaching with active and self-directed learning process. It not only focuses on contextual knowledge but also on personality building and transforms a raw medical student into a competent health care professional.

Limitations

A qualitative part should have been included in the current study to explore perceptions of students in depth about case

based learning but due to time constraints it could not be done.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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