ASSOCIATION OF DIFFERENT TEACHING METHODOLOGIES WITH THE ACADEMIC PERFORMANCE IN THE ORAL PATHOLOGY DEPARTMENT OF SHARIF MEDICAL AND DENTAL COLLEGE, LAHORE. A RETROSPECTIVE STUDY

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ABSTRACT

Objective: *The objective of this study was to do a five year retrospective analysis of employing different teaching methodologies on the academic performance of Third Year students of Bachelor of Dental Surgery (BDS) in Sharif College of Dentistry, (SMDC), Lahore.*

Materials and Methods: *A five year retrospective analysis was done using the academic records of Third Year students of Bachelor of Dental Surgery (BDS) enrolled in Sharif College of Dentistry, Lahore. Batches were taught using the teacher centered approach, teacher student interactive approach and the student centered approach. The data was analyzed using SPSS version 23 and all nominal data was entered in frequencies and percentages whereas all numerical data was entered as mean with its respective standard deviation. One way ANOVA was used to determine the statistical difference between the scores of the students taught using different teaching methodologies and Chi square test was applied for determining association of different teaching approaches and the academic performance of students. P value i.e., ($p<0.05$) was taken as significant.*

Results: *Academic record of 288 Third Year BDS students of Sharif College of Dentistry was done from the year 2014 to 2018 for the subject of Oral Pathology. There was a statistically significant difference in the academic performance of students who had tutorial and practical sessions along with demonstrations of histopathological diagrams ($p\leq0.001$). There was no significant difference in the academic performance of students who had received either demonstrations of histopathological diagrams or had been engaged in student research assignments on histopathology ($p=0.104$). Furthermore, that the group who had received tutorial, practical and histopathological demonstrations was the only category with students who demonstrated an excellent result. The greatest percentage of students (21.2%) with poor performance in the exam belonged to the batches that were taught using histopathological demonstrations only.*

Conclusion: *According to this study the teacher centered approach of teaching is an approach that the students benefit from the least. In order to improve the academic performance of students and to revive their interest in their studies, promoting and including active learning is of immense importance.*

Keywords: *Retrospective, academic, teaching methodologies, association, critical thinking*

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INTRODUCTION

The aim of medical and dental education is to develop and train health care professionals who are fully equipped with clinical skills, theoretical knowledge and are professionals with high ethical

values.[1] The students in today`s day and age have varying and well developed personalities and are very definite in their approach towards the learning and teaching methodologies they can benefit from. This has presented itself as a great challenge for the teachers.[2] The learning abilities and methods of students differ greatly from each other. A better system of education can be developed if the teaching methodologies are adapted to cater the needs of every student individually.[3, 4]

The academic achievements of students are a direct reflection of the quality and effectiveness of the teaching methodologies employed to teach them.[5] It has been reported in the past that a poor academic performance of students is primarily due to inefficiency of the teachers.[6]

The styles and methods of teaching in medical and dental education have greatly changed over the period of time.[7] In the past the role of a teacher was merely restricted to the dissemination of knowledge and was not even remotely related to devising ways to help the students absorb and learn that information.[8] Internationally the curriculum of Medical and Dental education has undergone reforms which have resulted in incorporation of a greater proportion of research, practical and clinical component in it. This has been done in an effort to train

And help health care professionals develop strong theoretical knowledge, clinical and analytical skills.[9]

Literature supports that one of the major factors influencing the learning outcomes in students is the teacher`s method of teaching. The use of innovative, effective and efficient teaching methods is extremely important for promoting student learning and boosting their academic performance.[10] One of the methods used is the Teacher centered method. This method includes the teacher as the sole dispenser of information without encouraging the students to analyze and think.[11] On the contrary the Student Centered Method does not merely involve the flow of information from the teacher to the student but also actively engages the students and encourages the development of critical thinking skills.[12] The third method mostly used is the Teacher-Student Interactive method which is based on training the students to search for relevant information themselves and then clarify their concepts through discussion with the teachers.[13-15]

Some of the most commonly used pedagogy techniques include Problem Based Learning16, Lecture Tutorials,[17] Peer Review,[18] Process Oriented Guide Inquiry Learning,[19] Peer Led Team Learning,[20] Computer Assisted Learning and Evidence Based Dentistry.[21] The most common out of all these techniques is the Lecture based teaching system because it allows the teacher to interact with a large group of students at one time and also saves innumerable resources as well as time.[22]

A retrospective study was conducted in Sharif Medical and Dental College, SMDC, Lahore by the department of Oral Pathology on the student academic record to find out the effect of different teaching approaches on student academic performance.

Our present study aims to analyze the effect of employing different teaching methodologies on the academic performance of students.

MATERIALS AND METHODS

A retrospective survey was done starting from 2018 to 2014 comprising of 288 students of Third Year BDS of Sharif Medical and Dental College, Lahore. Demographics like name , age and gender were collected. The research was conducted after permission from Sharif Medical Research Centre (SMRC), Sharif Medical and Dental College, Lahore. All the students irrespective of age and gender were included in the research. The students who were unable to attend college on account of an illness for more than six months were excluded from the study.

Three groups were formulated based on the different teaching methodologies used while teaching histopathological analysis of diseases for which a specific time other than the lecture time was allotted as shown in table 123.

Conventional lecture taking was common to all groups. The first group comprised of demonstration of histopathological diagrams by means of schematic drawings. It is labeled as Teacher Centered.

The second group was titled Student Centered comprised in which the students were asked to research and gather material on a histopathology slides provided to them without any input from the teachers. The students were then asked to look into the atlas and books and after obtaining the information gath-

ered through their research were made to discuss it with their batch fellows. Their findings were later corrected by their teacher.

The third group was labeled Teacher-Student interactive which included teaching methodologies used in group 1 and 2 along with the addition of practical and tutorial sessions and power point presentations. In these tutorial and practical sessions the students were assigned presentations on various topics and were helped by the tutor throughout this process. .

The data which was used for comparison with different teaching methodologies was taken from the result of Oral Pathology sendup exam from respective year in the form of percentages. The data was used in the form of percentages.

The analysis was done using SPSS 23. Numerical data was presented as mean and standard deviation whereas nominal data was presented as frequencies and percentages.

Qualitative analysis was done using Chi Square. P value of p=≤0.05 was taken as significant. For this purpose the students were divided into four categories based on their academic performance as shown in table 2

One Way ANOVA was used for the quantitative analysis i.e. to find the statistical difference in the academic performance of students taught using different teaching methodologies. P value of p=≤0.05 was taken as significant.

RESULTS

An analysis of the academic record of 288 Third Year BDS students was done from the year 2014 to 2018 for the subject of Oral Pathology. The mean age of the students was 20.16 ± 2.771 with 28% males and 72% females. The total number of students from the batch of 2014, 2015, 2016, 2017 and 2018 were 62, 71, 53, 53 and 49 respectively. There was a statistically significant difference between groups as determined by one way ANOVA (F=57.496, p≤0.001) Table 3.

A Tukey Post Hoc test revealed that there was a statistically significant variation in the academic performance of students who had tutorial and practical sessions along with demonstrations of histopathological diagrams (Group 3 teacher-student interactive) in comparison to group 1 and 2 (p≤ 0.001).On the other hand there was no significant difference in the academic performance of students who had received either demonstrations of histopathological diagrams (group 1 teacher centered) or had been engaged in student research assignments on histopathology

(group 2 Student centered) (p=0.104)

A significant association was seen between good academic performance of students with that of Teacher student interactive teaching methodology. (p≤ 0.001).

Although students from all three groups predominantly showed an average result ,it was evident that the group who had received tutorial, practical and histopathological demonstrations(Group 3 Teacher Student Interactive) not only had a greater percentage of students (12.5%) with good result but also was the only category with students (4.9%) who demonstrated an excellent result. The greatest percentage of students (21.2%) with a poor performance in the exam belonged to the batch who were taught using histopathological demonstrations only(group 1 Teacher-Centered) . It was also seen that the batch that was taught by assigning research assignments (Group 2 Student

Centered) had 6.6% students who had poor

performance in the send up exam Figure 1.

Table: 1 Various teaching methodologies

Group	Year	Teaching Approach	Teaching modalities
1	2014 2015	Teacher centered	Histopathological diagram demonstration
2	2016	Student centered	Student research assignments on histopathology
3	2017 2018	Teacher-student interactive	Histopathological diagram demonstration, tutorial and practical sessions

Table: 2 Groups based on academic performance

GROUP	PERCENTAGE
>80%	Excellent
70 -79%	Good
50-69%	Average
<50%	Poor

Table: 3 Anova test for difference between the groups

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	19120.217	2	9560.109	57.496	.000
Within Groups	47387.946	285	166.273		
Total	66508.163	287			

Table: 4 Correlation between academic performance and teaching methodologies

MULTIPLE COMPARISONS						
(I)GROUPS	(J)GROUP	MEAN DIFFERENCE (I-J)	STD.ERROR	SIG.	95% CI	
					L.B	U.B
TEACHER CENTERED APPROACH	STUDENT CENTERED	-4.276	2.095	.104	-9.21	.66
	TEACHER STUDENT INTERACTIVE	-17.944	1.697	.000	-21.94	-13.95
STUDENT CENTERED APPROACH	TEACHER CENTERED	4.276	2.095	.104	-.66	9.21
	TEACHER STUDENT INTERACTIVE	-13.668	2.183	.000	-18.81	-8.52
TEACHER STUDENT INTERACTIVE	TEACHER CENTERED	17.944	1.697	.000	13.95	21.94
	STUDENT CENTERED	13.668	2.183	.000	8.52	18.81

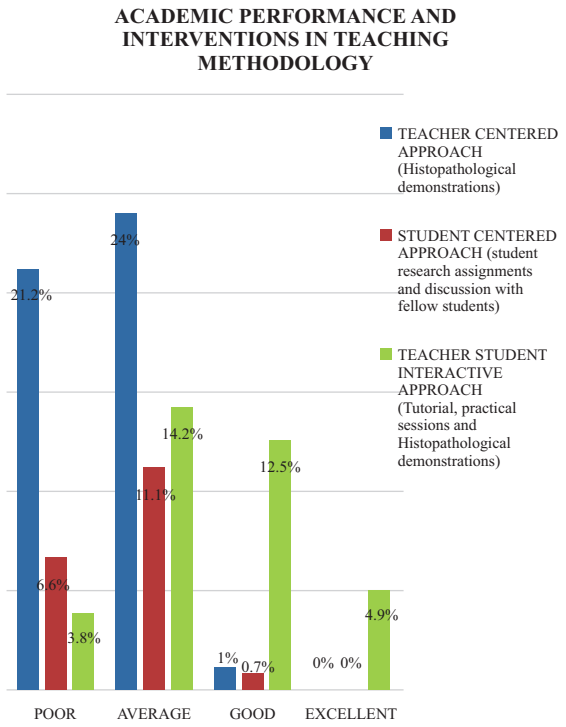

Fig 1: Association between academic performance and interventions through teaching methodologies

DISCUSSION

The basic aim of teaching is to facilitate the process of learning for the students.[24] There exists a large body of literature that contains research on the various teaching methodologies and their effectiveness.[25]

According to one study the academic performance of students who were taught using teacher-centered approach differed significantly from the performance of those who were taught using student-centered and teacher-student interactive approaches. The students who were taught using the teacher-student interactive method had higher mean scores in comparison to the other two approaches.[23] These results are very similar to our study where it was seen that there was a statistically significant difference in the academic performance of group 3 students in comparison to the group 1 and group .[2] On the other hand where, our study reports no significant difference in the academic performance of group 1 students and group 2, the study above[23] states that the students taught using student centered approach although had mean scores lower than teacher-student interactive method but were higher than teacher

centered approach.

The results of the descriptive statistical analysis of our study showed that group 3 students showed the maximum number of students (4.9%) who demonstrated an excellent academic performance in the send up exam while none of the other two groups showed the same result and the maximum number of students with poor performance in the exam were the group 1(21.2%).

There are innumerable studies that support that teacher student interactive method is the most effective methodology of teaching. This method promotes the students to build upon the knowledge and concepts delivered by the teachers by encouraging them to do research on various topics. In this way it engages students and promotes active learning.[26]

It has been reported in the past that student`s prefer active learning a lot more in comparison to traditional teaching methodologies. It is more convenient for the student to comprehend and learn the information by the teacher if it is delivered using an interactive approach between the two.[14, 27]

The student centered approach is considered to be better than the teacher centered approach because it engages students to gather subject information and breaks the monotonous unidirectional flow of information and subject knowledge from the teacher to the student without the involvement of the latter.[28]

CONCLUSION

It was very evident that there was statistically significant difference in the academic performance of students who were taught using teacher-student interactive method in comparison to those who were taught using the teacher centered or student centered approaches with the mean scores being higher for students who were taught using the teacher student interactive method. It was evident that the Teacher Student Interactive group was the only group whose students demonstrated an excellent result and were found to be 4.9 % while 21.2% of the students with a poor performance in the exam belonged to the batch who were taught using the Teacher-Centered approach.

RECOMMENDATIONS

The trend of acquiring higher education is on the rise throughout the world. It is extremely important to analyze and reform the various factors that impact the academic performance of students pursuing higher education and attaining professional degrees. All over the globe the most commonly employed technique of teaching is the teacher centered approach which needs to be replaced by a teacher student interactive approach as the latter involves active learning and student participation. Efforts should be made to make changes that helps incorporate new strategies of teaching and learning into the existing system of education.

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