PILOT STUDY

Impact of the Clinico-pathological Conferences as a teaching modality on medical students' performance in Endocrine Course

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Abstract

Objective: To evaluate the impact of introducing clinico-pathological conferences in the endocrine block on student performance.

Method: The retrospective pilot study was conducted at the College of Medicine, Alfaisal University, Riyadh, Saudi Arabia, and comprised medical students' examination scores in the endocrine course from 2012 to 2016. The 2012 batch was not exposed to clinico-pathological conferences and represented the control group, whereas batches from 2013 to 2016 had consistent exposure. The assessment for each batch had been done annually using a standardised format of multiple-choice questions and short-answer questions. The data collected was analysed using SPSS 19.

Results: Of the 645 students whose records were evaluated, 62(9.6%) were controls in the 2012 batch, while 583(90.3%) were in batches from 2013 to 2016. The intervention group with exposure to clinico-pathological conferences performed better than the controls (p<0.001).

Conclusion: The students who were exposed to clinico-pathological conferences tended to achieve high examination score compared to those who were not exposed.

Keywords: Clinico-pathological conference, Medical students, Endocrine course, Teaching modality. (JPMA 71: 925; 2021)

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Introduction

Adult learning is based on certain assumptions, including the notion that they are more interested in learning with a problem-centred approach rather than subject-centred one.[1] There are various methods to promote problem-centred learning, such as problem-based learning (PBL), team-based learning (TBL) and clinico-pathological conference (CPC) sessions. The Alfaisal University has adapted a spiral curriculum where student-centred approach, such as PBL and TBL, plays a central role. Various themes/topics are together integrated into organ-system courses. Recently, the institution introduced CPCs to improve correlation between basic and clinical characteristics of a disease or problem. CPC has been used in the United States and the United Kingdom at a few places despite its observed benefits.[2] This approach was started at Harvard Medical School in 1900 by Walter B. Cannon, a renowned physiologist.[3,4] While more than a century has passed and although, in most medical schools and hospitals, CPC has gradually diminished in its importance, it still remains a significant part of not only training for medical students, interns and residents, but also serves as a quality-control tool for bedside clinical decision-making.[5]

Problem-solving in the context of a clinical case with laboratory and clinical imaging data and biopsy photomicrographs has been the most reported format. The introduction of this instructional strategy has shown positive impact to integrate morphology with clinical features, and disease processes. The good thing about it is that CPC can be conducted in small groups using TBL formats.[6]

A well-prepared and thoughtfully-presented CPC continues to be a great tool of teaching which not only offers clinico-pathological correlation, but also serves to build clinico-pathological competency.[7] In medical practice, professionals, particularly those involved in teaching roles, never stop learning and exploring new effective ways, and, for them, a carefully-prepared CPC provides a good platform for intellectual interaction with updated information.[8] The pre-requisites of a good CPC include selecting the right case, carefully preparing and thoughtfully presenting the case, engaging the students in the discussion and encouraging them to share their thoughts and reasons, and finally, presenting the ultimate diagnosis with reasons and a closing case discussion.[9] When designed appropriately, students value this strategy and learn from it.[10]

The current study was planned to evaluate the impact of introducing CPC in the endocrine block on student exam scores.

Subjects and Methods

The retrospective pilot study was conducted at the Department of Pathology, College of Medicine, Alfaisal

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University, Riyadh, Saudi Arabia, and comprised medical students' examination scores in the endocrine course from 2012 to 2016. The 2012 batch was not exposed to CPCs and represented the control group, whereas batches from 2013 to 2016 had consistent exposure and together represented the CPC group. After approval from the institutional ethics review board, records of exam scores were retrieved of both male and female students using convenience sampling technique.

While conducting CPC sessions, after segregating boys and girls, the class is further divided into two large groups of about 40 students each. Each class is taken by separate tutors. The CPC sessions are further divided into four small groups of approximately 8-10 students who are required to work in teams. This modified and improved CPC format requires the facilitator to show cases to the students three times. During the first phase, the students are shown 6-8 cases on a large screen, and then each individual student is required to answer the questions by writing an individual readiness assurance test (IRAT) to assess the basic understanding of the facts and concepts related to the objectives. Each case consists of one multiple choice question (MCQ) and 3-4 short-answer questions (SAQs). After completing the IRAT, the questionnaire is collected by the facilitators. In the second phase, on the same cases, a separate set of answer sheet is given to the group. The facilitator again shows the cases one by one, and this time the students are asked to work in group by writing a Group Readiness Assurance Test (GRAT) to resolve the problem after discussing as a team and reaching consensus about each answer. After completing the GRAT, the team reports back its consensus findings to the facilitator. Five to six minutes are given to each team for each case. In the third phase, the group findings of each case are reported by relevant groups, and an open discussion is held. If they are not able to come up with the desired response, as planned by the facilitator, then the facilitator thoroughly explains those important aspects and ensures that they clearly understand those very aspects of the case. In the current study, all the exam scores were noted on a proforma.

The data was analysed using SPSS 19. The findings were expressed as frequencies and percentages, and mean ± standard deviation (SD). Analysis of Variance (ANOVA) was used to compare quantitative variables with a post-hoc Tukey's honestly significant difference (HSD) test. The grade trend was analysed with Jonckheere-Terpstra test. P<0.05 was considered significant.

Table-1: Themes identified through review of full-text papers.

Year	n (%)
2012	62 (9.6)
2013	138 (21.4)
2014	146 (22.6)
2015	151 (23.4)
2016	148 (22.9)
Total	645 (100.0)

Table-2: Analysis of variance (ANOVA) showing difference between students' mean examination scores achieved in intervention groups (Batch 2013-2016) compared to control group (Batch 2012). The number of students is denoted as 'n' and standard deviation is denoted as 'SD'.

Students' Score	Batch (Year)	n	Mean±SD	95% Confidence Interval		*p*-value*
				Lower Bound	Upper Bound	
Total Score (percent)	2012	62	75.28±10.63	72.58	77.98	
	2013	138	71.95±10.84	70.13	73.77	0.13
	2014	146	79.72±9.37	78.18	81.25	0.01
	2015	151	79.90±8.23	78.57	81.22	<0.01
	2016	148	79.94±7.82	78.67	81.21	<0.01
MCQ Score (percent)	2012	62	73.83±11.97	70.79	76.87	
	2013	138	67.05±12.69	64.91	69.19	<0.01
	2014	146	75.42±11.84	73.49	77.36	0.88
	2015	151	74.22±10.37	72.56	75.89	0.99
	2016	148	76.91±9.25	75.40	78.41	0.36
SAQ Score (percent)	2012	62	77.40±12.97	74.11	80.70	
	2013	138	68.35±15.63	65.71	70.98	<0.01
	2014	146	77.58±13.03	75.45	79.71	0.99
	2015	151	81.06±11.80	79.16	82.96	0.36
	2016	148	73.23±12.41	71.21	75.24	0.23

*p-value when compared to corresponding scores in 2012; MCQ: Multiple-choice question; SAQ: Short-answer question.

Results

Of the 645 students whose records were evaluated, 62(9.6%) were controls, and 583(90.3%) were in the CPC group (Table 1). The CPC group performed better than the controls with MCQs, SAQs and overall scores (Table 2). There was a consistent increase in the number of students achieving higher grades in the CPC group batches compared to the control 2012 batch (Figure).

Discussion

CPC is an important learning method that enables understanding of the subject and relationship of various pieces of knowledge in a clinical scenario.[11] The current study explored the role of this important strategy in improving learning of medical students at undergraduate level. Students who underwent CPC sessions performed significantly better in their final assessment compared to the non-CPC group. Among the control group, the mean examination scores varied. The majority fell in grades B or C and there were some students even in grade D. After introducing CPC, students tended to score better, with none falling in grade D. In other words, students who would have fallen in a lower grade improved by crossing

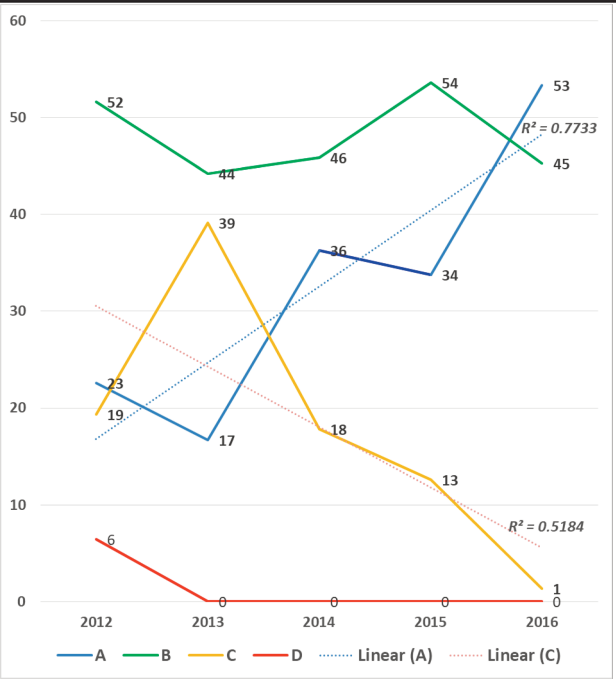

Figure: Line graph showing frequencies and percentages of students achieving various A, B, C and D grades; where A is the highest). They are grouped in batches. The trend lines with significant R2 values are shown.

into a better grade. Also, there was a consistent increase in the number of students getting grade A. Similarly, there was a consistent decrease in the number of students with grade C in the CPC group.

The results are similar to those reported by Koles et al.[12] and Kolluru et al.[13] who found that participation in an activity that correlates clinical and basic sciences would improve command over course content as well as exam scores. The results also support Vasan et al,[14] who found that TBL-based anatomy teaching correlated with consistent pattern of higher national board examination scores than those for lecture-based anatomy. Similarly, another study suggested that TBL-based teaching improved learning and thereby exam performance in cardio-respiratory pathophysiology.[15]

In contrast, some studies report no observed advantage in terms of exam scores between students taught with easy-to-manage traditional lectures and those taught with resource-intense strategies such as seen with TBL or CPCs. For example, it has been reported[16-18] that students taught through integrated teaching approaches, such as TBL sessions, remain at a disadvantage in attempting recall questions, whereas attempting essay-type question or those requiring application of knowledge, yielded no differences between the two groups. One can argue that this lack of advantage may reflect gaps in knowledge, but others argue that adoption of such strategies may improve students' ability in terms of day-to-day preparedness and group problem-solving skills which is an important aspect in clinical practice and patient care, and such skills can be improved with the adoption of integrated teaching methods, such as CPCs.[19]

Conclusion

Supplementing didactic lectures with CPCs has the ability to enhance students' understanding of the subject and better performance in examinations. Based on findings, the institution will implement CPC on a trial basis as a supplement to, and not replacement for, didactic lectures.

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Conflict of Interest: None.

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