Original Research Article

Perceptions of first year dental students on case based learning in Physiology

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International Archives of Integrated Medicine, Vol. 5, Issue 4, April, 2018.

Available online at http://iaimjournal.com/
ISSN: 2394-0026 (P) **ISSN: 2394-0034 (O)**
Received on: 15-03-2018 **Accepted on:** 22-03-2018
Source of support: Nil **Conflict of interest:** None declared.
How to cite this article: Abirami Omprakash, Archana P. Kumar, Padmavathi R. Perceptions of first year dental students on case based learning in Physiology. IAIM, 2018; 5(4): 161-164.

Abstract

Background: Application of basic science knowledge to clinical practice is the aim of first year undergraduate dental curriculum. To bring in application of basic science theory to the clinical dental application, a case based learning (CBL) approach has been tried among first year dental students.

Materials and methods: Randomized control trial was conducted by grouping first year undergraduate dental students (N= 73) into traditional group (N=35) and CBL group (N=38). Conventional lecture was given to traditional group and case based lecture and small group discussion for CBL group facilitated by faculty. Pre and post tests were administered for both the groups. Perceptions on CBL approach were collected using a questionnaire. Results were analyzed using paired and unpaired 't' test.

Results: Test scores were expressed in mean ± SD. deviation. Post-tests scores of traditional - (7.5 ±1.6) and CBL (7.7±1.9) groups were significantly higher than pretest scores of traditional - (5.7 ± 1.4) and CBL (4.9 ± 1.7) groups. Attitude score showed positive perceptions for most of the parameters.

Conclusion: The first time CBL approach for Physiology concept provoked interest among dental students. Participants felt the method involved them in active learning and they recommended this approach to other sessions as well. Recall of factual knowledge did not improve significantly over traditional method, but was equally effective.

Key words

Perceptions on CBL, Active learning, CBL in dental curriculum.

Introduction

Application of basic science knowledge to clinical practice is the aim of first year undergraduate dental curriculum. To relate basic sciences with clinical practice, early exposure to clinical material is essential during learning. DCI also insists on introducing students to clinical integration from year I of dental college. Studies have shown that passive teaching methods like traditional didactic lectures do not facilitate the development of problem solving or reasoning skills among students [1]. Case Based Learning (CBL) is one of the student centered active learning approaches that allows integration of basic science knowledge with clinical application [2]. The present study was conducted to understand the perceptions of dental students on Case Based Learning in Physiology.

Materials and methods

This randomized control trial was conducted among 86 first year dental students of Ramachandra Dental College and Research Institute, Porur, Chennai. Study was approved by Institutional Ethics Committee. On the day of CBL session 73 students reported to lecture class. After getting informed consent from the students, they were divided into 2 groups (traditional, N=35 and CBLN = 38) using simple random technique. Conventional group was given traditional lecture (Duration 1 hour) for the topic 'blood coagulation' in Physiology. For intervention group, the blood coagulation topic was linked to a case on hemostatic disorder hemophilia. The session involved case linked lecture (Duration- 30 min) and small group discussion on case scenarios among students which was facilitated by the faculty (Duration- 30 mins). Pre and post tests were administered for both the groups. Perceptions of dental students on the new approach were collected using a questionnaire. Results were analyzed using paired and unpaired 't' test.

Results

Study sample of 73 consisted of 25males and 48 females. Both traditional and CBL groups had equal number of males and females.

Table - 1 shows the results of pre and post test scores of traditional and CBL groups. Statistically significant (P<0.0) difference was seen between the pretest and post test scores of traditional-and CBL groups. Post test scores of CBL group were found to be same as traditional group.

Table – 1: Comparison of pre and post test scores of traditional and CBL groups.

Student groups	Pre-test	Post test	p value
Traditional group (N=35)	5.7± 1.4	7.5±1.6	0.0
CBL group (N= 38)	4.9±1.7	7.7±1.9	0.0

Table - 2 shows perception score of dental students on CBL in Physiology. All of them agreed that CBL provoked interest to learn the topic and case used was effective to link the basic science concept with clinical application. Most of them agreed that CBL session promoted critical thinking (98%), Clinical reasoning and problem solving (92%) among students. It also provided more interaction among students (90%) and helped them to exchange their ideas (87%). Most of them have agreed that learning through CBL will help in future application of basic science knowledge (95%) and they preferred to have CBL for other topics as well (95%).

Discussion

Case Based Learning (CBL) is an active learning strategy where students are involved in interactive co- learning. The case scenarios stimulate the learning in such a way, not just to memorize the facts but to understand and apply the concept in life long dental practice .This approach has been proven to improve not only the factual knowledge but also critical thinking

and clinical reasoning skills among students. CBL also gives in- depth understanding to the concept learnt as it involves higher order thinking and problem solving during the process of learning [3, 4]. The basic principle of adult education is showing relevance of learning to adult learners. Case based learning provides early clinical exposure through complex, real-life case-scenarios of day- today dental practice which imparts relevance and aids to connect theory to practice. The key aspect of CBL approach is that, it facilitates horizontal and vertical integration of curriculum in medical education [5]. Interactive CBL sessions enhance attention span of students during learning hours and actively engage students in deeper learning of the concept [6]. The small group interaction avoids monotony of passive learning and facilitates effective involvement of the teacher as well as the learner during learning [7, 8]. It is also an important tool to promote communication and reflection among students (horizontal learning). It allows learners to develop collaborative, team based approach for their training and profession [9, 10].

Table – 2: Perceptions of Dental students on Case Based Learning in Physiology.

Perception parameters	Agree	No comments	Disagree
The case linked basic science to clinical application effectively	100 %		
CBL provoked my interest to learn the topic	100%		
Brought in more interaction among students during learning	90%	6%	4%
Provided opportunity to exchange ideas	87%	7%	6%
CBL promoted critical thinking	98%	2%	
Improve student reasoning & problem solving ability	92%	8%	
Provided opportunity to exchange ideas	87%	7%	6%
CBL promoted active learning	89%	11%	
CBL will help in future application of basic science knowledge	95%	5%	
CBL to be used for other topics as well	95%	5%	

Conclusion

Case Based Learning, an active learning approach was perceived as a motivating tool to dental students towards deeper learning by facilitating critical thinking, clinical reasoning and problem solving skills. CBL, a student centered teaching- learning method can be used in a variety of dental fields to link theory to clinical practice.

Acknowledgements

Authors would like to thank 1st year dental students of Sri Ramachandra Dental College and Research Institute, Porur for their participation, SRU management, Faculty and Post graduates of department of Physiology for their immense support during the conduct of study.

References

1. Shubhada Gade, Suresh Chari. Case-based learning in endocrine physiology: an approach toward self-directed learning and the development of soft skills in medical students. Advances in Physiology Education, 2013; 37(4): 356-360.
2. Surapaneni KM. The Effect of Integrated Teaching with Case Based Learning (CBL) In the Biochemistry of Undergraduate Medical Curriculum. Journal of Clinical and Diagnostic Research, 2010 Oct; 5: 3058-3063.
3. Nair SP, Shah T, Seth S, Pandit N, Shah GV. Case Based Learning: A Method for Better Understanding of Biochemistry in

Medical Students. J ClinDiag Res., 2013; 7(8): 1576-8.

4. Majeed F. Effectiveness of case-based teaching of physiology for nursing students. J Taibah University Med Scie., 2014; 9(4): 289e-292.
5. Pearson T, Barker W, Fisher S, et al. Integration of the case-based series in population-orientated prevention into a problem-based medical curriculum. Am J Prev Med., 2003; 24(4): 102–7.
6. Steinert Y, Snell LS. Interactive lecturing: strategies for increasing participation in large group presentations. Med Teach., 1999; 21(1): 37–42.
7. Rao SP, Dicarlo SE. Active learning of respiratory physiology improves performance on respiratory physiology examinations. Adv Physiol Edu., 2001; 25(1–4): 127–33. 9.
8. Chailwant KS. Comparison of two teaching methods, structured interactive lectures and conventional lecture. Biomed Res., 2012; 23(3): 363–6.
9. Schoeman JP, Van Schoor M, van der Merwe LL, Meintjes RA. A case based small group Cooperative learning course in Pre-clinical Veterinary Science aimed at bridging basic science and clinical literacy. JS Afr Vet Assoc., 2009; 80(1): 31-6.
10. Ghosh S. Combination of didactic lectures & case oriented problem solving tutorials towards better learning perception of students from a conventional medical curriculum. Adv Physiology Education, 2007; 31(2): 193-7.