

Modification in clinical teaching for undergraduate curriculum of Dentistry using ‘LD+VD model’

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Abstract:

Computer based learning has changed the way teaching learning (TL) method is approached. Teaching in dentistry was always teacher centered. Though there is a change in traditional classroom teaching by using multimedia, the clinical teaching (CT) remained the same. The basic clinical procedures recommended in the curriculum are demonstrated on the patient to the students in groups followed by the implementation of the same clinical procedure on patients under supervision of the teacher. This article recommends use of multimedia principles and information technology for demonstration of clinical dental procedures. The proposed model is based on the study conducted in Government Dental College & Hospital (GDCH), Nagpur with an aim to study the impact of video demonstration of nerve block technique on dental students’ learning and performance. The study was carried out on 60 students of third year BDS in 3 groups of 20 students each. Group A was given live demonstration; Group B the video demonstration of mandibular nerve block (MNB) and Group C received both demonstrations. They were evaluated by Direct Observation of Practical Skills (DOPS) method. The students with both demonstrations (Group C) performed better than those with only live demonstration or only video demonstration. We conclude that the ‘LD+VD model’ is best for clinical teaching of procedures in Dentistry. This will revolutionize the traditional CT towards effective and student centered T-L method and outcome based education.

Keywords: Clinical teaching (CT), Live demonstration (LD), Video demonstration (VD),

Introduction:

Dental educators should create learning environments that promote critical thinking, decision making and transfer of knowledge from didactic lectures to clinical settings in order to enhance the knowledge, skills and performance of their students. Unlike students in medicine, dental and oral health students are in the position of administering treatment to patients very early in their training. They need to acquire a full range of highly precise manual and technical skills, including excellent hand/eye coordination, to enable them to visualize and understand how to undertake complex tasks such as placing restorations and scaling teeth (1). This requirement brings with it a range of challenges. The dentistry being the art and science, the clinical teaching is always a challenge for all clinical teachers. The cooperation and/ or consent of the patient as a demo case is also one challenge in clinical live demonstration. Dental education is structured in such a way that students learn what teachers choose to teach them. The availability of particular type of case is also one factor. In rotatory postings in all clinical departments, there is always time limitation. Use of multimedia and information technology can revolutionize the traditional clinical teaching (CT). VD has the advantage of demonstrating complete audio-visual of the procedure. The content of video can be made extensive and can be updated. The steps and its sequence can be emphasized. The videos can be handed over to students for reviewing. The opportunity to review the relevance and complete content will increase the ability to recollect all steps leading to increase in the confidence of performing the clinical procedure resulting in satisfaction of learning and increased patient's satisfaction. Several randomized controlled trials have demonstrated that computer-based media offer a range of advantages over self- teaching booklets in terms of skills needed for clinical decision making in dentistry like consistency in the information presented an interactive learning experience which may be more effective than lectures, and close approximation to the clinical situation (1).

With this background, the present study was carried with the following objective:

1. To study the impact of video demonstration on dental students' learning and performance of nerve block technique.

2. To compare video demonstration of nerve block technique with live demonstration on students learning and performance.

Material and Methods:

After getting ethics approval from Institutional Ethical Committee, the study was carried out on 60 undergraduate students. The randomization was done according to odd and even roll numbers. Group A were all odd roll numbers and Group B all even roll numbers. The consent was obtained from students in each group and patients. The control Group A students were given only live demonstration (LD) of mandibular nerve block (MNB) technique. Study Group B students were given only video demonstration (VD) of MNB. Group C students were given both demonstrations. The MNB is the first clinical exercise of III BDS students in Oral & maxillofacial surgery clinics.

LD of MNB included discussion of topic, review of students understanding and demonstration of MNB on selected patients by teacher. VD of MNB included the video of MNB shown on laptop. The video was prepared for the complete topic of MNB including the injection technique for patient. The students were allowed to review it if desired. All students were evaluated by Direct Observation of Procedural Skills (DOPS) method constantly by same teacher.

All Group A students became Group C students after video demonstration. Thus, group C students received both demonstrations. They were again evaluated by DOPS method. A feedback was obtained from the students on eight points and from the patients on the parameters of pain during extraction showing anesthetic effect of MNB, confidence of operator, and satisfaction of the patient.

Results:

Table 1 shows the performance of students by DOPS method in all three groups. From Table 1, in DOPS of MNB the 80% of Group C showed excellent performance; 20% of Group B and

65% of group A gave good performance. Thus the students with both demonstrations performed better than those with only LD or only VD.

Table 1: DOPS performance

Group	Performance					
	Average(Av)		GOOD (Go)		EXCELLENT Ex)	
	Students %		Students %		Students %	
Group A	14	70	6	30	Nil	Nil
Group B	3	15	13	65	4	20
Group C	Nil	Nil	4	20	16	80

Table 2-4 shows the students feedback from Group A, B, and C respectively on eight points as mentioned in tables. It shows that for understanding of steps and ability to recollect, VD received good and excellent remarks. Content of knowledge and relevance of subject is equal in both demonstrations. The LD has the best ability to interact and video gives opportunity to review. Maximum students reviewed it thrice. Group C had more confidence of performance and satisfaction of learning. 80% students mentioned that reviewing helped in improvement of learning and performance both.

Table 2: Students feedback of Group A

Sr. No.	Characteristic	Score poor- 1	score average-2	score good-3	score excellent -4
I	Understanding of all steps	0	7	13	0
II	Ability to recollect	4	6	10	0
III	Relevance of subject	0	0	18	2
IV	Opportunity to review	20	0	0	0
V	Opportunity to interact	0	1	17	2
VI	Content of knowledge	0	1	17	2
VII	Confidence of performing	4	14	2	0
VIII	Satisfaction of learning	0	0	17	3

Table 3: Students' feedback Group B

Group B	Characteristic	Score Poor- 1	Score Average -2	Score Good-3	Score Excellent -4
I	Understanding of all steps	1	1	10	8
II	Ability to recollect	0	3	8	9
III	Relevance of subject	0	0	0	20
IV	Opportunity to review	0	0	2	18
V	Opportunity to interact	20	0	0	0
VI	Content of knowledge	0	0	0	20
VII	Confidence of performing	2	4	7	7
VIII	Satisfaction of learning	0	0	5	15

Table 4: Students' feedback, Group C

Sr. No.	Characteristic	Score Poor- 1	Score Average -2	Score Good-3	Score Excellent -4
1	Understanding of all steps	0	0	13	7
2	Ability to recollect	0	0	14	6
3	Relevance of subject	0	0	7	13
4	Opportunity to review	0	0	4	16
5	Opportunity to interact	0	0	6	14
6	Content of knowledge	0	1	4	15
7	Confidence of performing	0	1	7	12
8	Satisfaction of learning	0	0	8	12

The patients' feedback showed that 90% of Group C patient had pain free procedure as compared to Group A (10%) and Group B (30 %) (Table 5). 45% of Group C students were rated as having excellent confidence and Group A and Group B students were rated as having

40% and 30% respectively (Table 6). Patients rated 50% of Group C students for their satisfaction about the procedure as good and excellent and group A and B patients gave good rating of 50 % and 40 % respectively for their satisfaction (Table 7). Thus the patients treated by Group C students had pain free procedure, they rated the confidence of student as excellent and were satisfied with the procedure.

Table 5: Patients feedback of all groups for pain in percentage of patients

Groups	No pain	Little pain	Painful
Group A	10%	70%	20%
Group B	30%	60%	10%
Group C	90%	10%	0%

Table 6: Patients feedback for confidence of operator

Confidence of operator	Poor	Average	Good	Excellent
GROUP A	0	60%	40%	0%
GROUP B	0	70%	30%	0%
GROUP C	0	5%	50%	45%

Table 7: Patients feedback for his satisfaction

Patients satisfaction	Poor	Average	Good	Excellent
GROUP A	0%	50%	50%	0%
GROUP B	0%	60%	40%	0%
GROUP C	0%	0%	50%	50%

Discussion:

In 2007, the Association of American Medical Colleges' Institute for improving Medical Education (AAMC-IME) issued a report entitled 'Effective use of Educational Technology in Medical Education' (2), which highlighted the importance of multimedia learning (MML) and suggested that medical educators should utilize multimedia learning principles when designing instructional presentations for medical students. MML refers to learning from words and pictures. Words can be seen or heard because they can be communicated in print or through spoken narration, respectively. Pictures can be presented in static forms (illustrations, photographs, diagrams, charts and maps) or in dynamic forms (animation and video) (3).

Information and communications technology (ICT) is a universal term describing the use of technology and media to disseminate and share knowledge and information. Educational media provide a means by which information can be communicated between teacher and learner (3). The use of video based teaching in the form of video demonstration (VD) of clinical procedures is suggested. Dental students are typically fluent with ICT and are eager to use sophisticated tools for learning, particularly when this gives them freedom from traditional methods. The development of computer literacy among dental students and their familiarity with information technology have been identified as attributes of the new graduate from dental school (1). In contrast academic staff members have varying levels of computer literacy and emphasize the quality of learning which occurs with computer based approaches while making learning attractive (1).

There is change in traditional classroom teaching and multimedia teaching is a preferred method whereas the clinical teaching (CT) has remained the same. The basic clinical procedures recommended in the curriculum are demonstrated on the patient to the students in group, followed by the implementation of the same clinical procedure on patients under supervision of the teacher. There are few limitations of the traditional CT. The students have rotating postings in clinical departments for stipulated time. Sometimes, the particular types of patients do not report. The teachers have other responsibilities as well. There is always a

human error or limitations. There are some drawbacks like the accessibility, visibility and understanding is questionable in the group demos. The teacher is engaged more in the procedure rather than teaching and explanation. There is possibility of memory lag on the part of students while implementing the procedure.

The repeat demonstration is a clinical difficulty. There may be reluctance by patients. To overcome these limitations and drawbacks, the ICT can be used by combining the traditional CT that is, live demonstration (LD) and video demonstration (VD) of particular procedure from curriculum (PFC). Some of the PFC, where this combined model of LD+VD can be used are nerve blocks, extraction technique, scaling, gingivectomy, impression making, jaw relations, x-ray shooting, cavity cutting, and few more which are in undergraduate curriculum (UGC).

A video can have a strong effect on the mind and senses. Students can experience the powerful cognitive and emotional impact (2). In a study conducted by Durham et al (5) on the effectiveness of video-based teaching, 64.6% students quoted that watching the video made it easier for them to put theoretical knowledge in clinical action. The use of video was thought to have been useful for improving capabilities to deal with patients in fear or pain, thus attributing to dental education in an effective way. It has been suggested that ICT and online learning will replace many of the traditional methods of teaching. However, it could not replace the physical presence of dental teachers nor should it be seen as a substitute for curriculum content (4). The literature does not show the study on this model of LD-VD for skill development in dental undergraduate clinical teaching.

The combination of LD and VD can be best for CT of various dental procedures in Under Graduate Curriculum (UGC). The patient's reactions and interaction can be appreciated. The interaction with the teacher is the biggest advantage of LD which has no comparison. The initial explanation along with VD to the group of students followed by LD combines all the advantages. With the knowledge and perception from VD, the advantages of LD can be implemented more precisely. The videos can be handed over to the students for reviewing.

The student's anxiety levels can be reduced. They can review the videos before performing the procedure. This will enhance learning and performance skill in dental students resulting in satisfactory patient care.

The most important factor here is procurement of videos of each procedure in UGC of all clinical branches. There are ready made videos available. The validity of each of them needs to be approved by the senior faculties. The videos can be prepared if facilities available. The regular updating and correlation with LD is a must. A critical point is the faculty development programs, this should encourage faculty members to understand change in traditional teaching and implement new 'LD+VD model' for CT. The contribution of faculty is an important factor, which cannot be replaced. Though in LD there is live perception of technique, interaction with patient and teacher, patients' attitude/ reactions and any modification or complication can be observed. There is increased confidence of patient management, as well as decreased fear and apprehension to work on patient.

There are other methods of ICT developed and reported in literature like use of simulators, virtual clinics, e- teaching. The 'LD-VD model' recommended for CT of UGC is feasible and cost effective ICT method which combines advantages of both traditional as well as MML methods. This can achieve the aim to produce a dentist with prescribed packages of knowledge upon graduation and able to practice safe and ethical dentistry for the community can be fulfilled with this revolution in clinical dental teaching.

Conclusion:

The 'LD+VD model' is best for clinical teaching of procedures. This will revolutionize the traditional CT towards effective and student centered T-L method and outcome based education.

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