

**KNOWLEDGE AND ATTITUDE TOWARDS CBCT AMONG DENTAL STUDENTS IN  
WESTERN TAMILNADU - A CROSS SECTIONAL STUDY**

**Dr. Surya Gunasekaran<sup>\*1</sup>, Dr. Nazargi Mahabob<sup>2</sup>, Dr. Elangovan S.<sup>3</sup>, Dr. Suman Jaishankar<sup>4</sup>,  
Dr. Senthil Kumar B.<sup>5</sup> and Dr. Deepika Rajendran<sup>6</sup>**

<sup>1</sup>BDS., Post Graduate Student, Department of Oral Medicine and Radiology, KSR Institute of Dental Science and Research, Tiruchengode.

<sup>2,5</sup>BDS., MDS., Professor., Department of Oral Medicine and radiology, KSR Institute of Dental Science and Research, Tiruchengode.

<sup>3</sup>BDS., MDS., Professor and Head of the Department, Department of Oral Medicine and Radiology, KSR Institute of Dental Science and Research, Tiruchengode.

<sup>4</sup>BDS., MDS., Professor, Department of Oral Medicine and radiology, KSR Institute of Dental Science and Research, Tiruchengode.

<sup>6</sup>BDS., MDS., Senior Lecturer, Department of Oral Medicine and radiology, KSR Institute of Dental Science and Research, Tiruchengode.

**\*Corresponding Author: Dr. Surya Gunasekaran**

BDS., Post Graduate Student, Department of Oral Medicine and Radiology, KSR Institute of Dental Science and Research, Tiruchengode.

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**ABSTRACT**

**Aim:** The aim of this study to evaluate the knowledge and attitude towards this advanced imaging technique CBCT among dental PG students in Western Tamil Nadu **Materials and Methods:** It is a descriptive study. Ethical clearance was obtained from the Institutional Review Board. The questionnaire was designed considering the studies of Kamburoglu et al which were given to students of dental institutions in western part of TamilNadu after obtaining written informed consent. Differences in responses by institution, education level and sex were analysed statistically using SPSS version12. **Results:** Majority of the participants had heard of CBCT. Among 181 students, about 93% (n= 168) are aware of cone beam computed tomography used for dentomaxillofacial region and 91.7% felt CBCT is useful as diagnostic tool in the field of dentistry. 85% said that they wanted a CBCT unit at their institution. 39% gained more knowledge about CBCT through seminar, 33% through lectures by faculty. 79% stated that adequate teaching was not given to the dental undergraduates regarding CBCT. **Conclusion:** Considering the result of our present survey, dental postgraduate students from all institutions want CBCT unit to be available at their dental institution. It is also recommended that appropriate CBCT education should be included in dental UG curriculum and providing additional educational programs to postgraduate students.

**KEYWORDS:** Cone beam computed tomography, dental students, knowledge.

**INTRODUCTION**

Cone beam computed tomography (CBCT) is a newly emerging and effective imaging modality for maxillofacial region.<sup>[1]</sup> It provides an excellent three-dimensional visualization of dental hard tissues as well as osseous structures in the oral cavity.<sup>[2]</sup> With the help of CBCT imaging, the practitioner can limit the anatomical area only to the dentoalveolar arch or may extend to include the entire craniofacial region.<sup>[3]</sup>

When compared to conventional CT scanners, CBCT unit is cost effective, which occupies very less space which is suitable for dental clinical settings with a minimal radiation dose and faster scanning time.<sup>[4,5]</sup> CBCT also has some drawbacks, which include beam hardening, scatter from dental materials and has poor

soft-tissue contrast.<sup>[6]</sup> The most common applications of CBCT in dentistry include assesment of the jaws for implant placement, orthodontic treatment planning, evaluation of temporomandibular disorders, evaluation of impacted teeth and evaluation of bone for signs of any infection, cysts and tumors, detection and characterization of the bony aspects of periodontal disease, and endodontic applications.<sup>[7,8]</sup> Because of increasing availability of CBCT in dental practices, it is necessary to the PG student to know the theoretical as well as the practical knowledge regarding CBCT. The aim of this study is to evaluate the knowledge and attitude towards the advanced imaging technique CBCT among dental PG students in Western Tamil Nadu.

**MATERIALS AND METHODS**

It is a type of descriptive study. Ethical clearance was obtained from the Institutional Review Board (Ref.: 139/KSRIDSR/EC/2016). The questionnaire included a demographic detail (age, sex, year of study, department they belong to and fifteen questions regarding CBCT technology. The questionnaires were given to the Postgraduate students of dental institutions in western part of Tamil Nadu after obtaining written informed consent. This study will be used only for educational purposes of the dental society and will not be used for evaluating PG students and their institutions.

## RESULTS

The completed questionnaires were collected; results were obtained and tabulated. The results obtained were subjected to statistical analysis using SPSS version 12. Chi-square analysis was carried to find out the association between knowledge, attitude of the students and their response to the questions.  $P < 0.05$  were considered as statistically significant.

The current study used a questionnaire to gauge the level of knowledge towards CBCT among dental postgraduate students. In the current study, 37% were males and 63% were females. No differences were found between the response of male and female participants for any questions of all the institutions.

Majority of the participants heard of CBCT used for dentomaxillofacial region (Table 1). Out of 181 students who were aware of CBCT, about 39% gained more knowledge about CBCT through seminars, 33% through lectures by faculty, 21.5% through internet (Chart 1).

Nearly 80% of the PG students stated that adequate teaching was not given to the dental undergraduates regarding CBCT. Differences in responses between the departments were statistically significant ( $p = 0.02$ ) (Chart 2).

53% of the PG students thought that CBCT should be included in IV BDS, whereas 29% felt they should be included in the internship of dental curriculum. Very few students (1.7%) said that there was no need for CBCT education to undergraduate students (Chart 3). Majority of students (85%) said that they wanted a CBCT unit at their institution. 92.7% felt CBCT is useful as a diagnostic tool for the field of dentistry. About 56% of students believed that CBCT will be used only in selected dental applications (Table 1). 78% would prefer CBCT over CT for 3D imaging of head and neck region. The most preferred indication of CBCT in their future career was to evaluate the extent of cysts/ tumor (53%) followed by implant applications. Only 39% of students gave preference for orthodontic applications. Nearly half of the PG students (42%) admitted that CBCT would offer the advantage over CT regarding lower radiation dose, short scanning time, easier maintenance and cost effective. There was statistically

significant difference in student's response by educational level ( $p = 0.02$ ).

Among 181 students, 84% did not attend any courses related to CBCT and nearly 90% were willing to attend courses pertaining to CBCT (Table 2).

## DISCUSSION

CBCT is a recent digital imaging technology. The introduction of a cone-beam computed tomography (CBCT) created a revolution in maxillofacial imaging, facilitating the transition of dental imaging from 2D to 3D images for data acquisition and image reconstruction. The 2-D limitation has been overcome with the development of cone beam computed tomography (CBCT), also called digital volume tomography.<sup>[9]</sup> It expands the role of imaging from diagnosis to image guidance of operative and surgical procedures. Depending on the equipment used and the area scanned, the radiation dose of one cone beam tomography scan may be as little as 3% - 20% that of a conventional CT scan.<sup>[10]</sup> The studies assessing dental practitioner's knowledge about digital systems, radiation protection and CBCT applications. Only very few information appears throughout the literature regarding dental postgraduate student's knowledge and attitude towards CBCT.<sup>[4]</sup>

Majority of participants (84%,  $N = 153$ ) said they wanted a CBCT unit at their institution. There were no statistical differences in response observed by education level, which was similar to the result of K Kamburoglu *et al.*, study.<sup>[11]</sup>

Majority of students (52.5%,  $N = 95$ ) thought that information on CBCT should be included in IV year of undergraduate dental curriculum, whereas (29.3%,  $N = 53$ ) said they should be included in Internship and 16.6% ( $N = 30$ ) in III year of dental curriculum. Very few students (1.7%,  $N = 3$ ) said there was no need for CBCT education, which was similar to Reddy Lavanya *et al.*<sup>[5]</sup>

Majority of the participants gained more knowledge about CBCT through seminars/ workshops/ CDEs was in accordance to Balabhaskaran *et al.*<sup>[9]</sup> Only 24% ( $N = 44$ ) had advised CBCT for diagnosis in their career, but subsequent studies reported a higher percentage.<sup>[10]</sup>

96% were willing to obtain any updated information on CBCT, which was in accordance to Shishir Ram Shetty *et al.*<sup>[4]</sup>

As the result of our survey showed sufficient teaching was not given to the undergraduates and postgraduates students acquired their knowledge through a seminar. Our study highlights the difficulties of acquiring knowledge about a system without practical experience. The lack of a CBCT unit in all institutions seems to have played a significant role in student's knowledge with this technology.

**Questionnaire**

**Instructions:** Tick appropriate answers; give your individual opinion to all questions.

**1) Are you aware of CBCT used specifically for dentomaxillofacial?**

- a) Yes      b) No

**2) How did you gain more information / knowledge about CBCT?**

- a) Seminars / workshops / CDEs  
b) Lectures by faculty  
c) Internet  
d) Others (specify)

**3) Is adequate teaching given to the dental undergraduates regarding CBCT?**

- a) Yes  
b) No

**4) In which year should CBCT be a part of dental curriculum in undergraduate levels?**

- a) III BDS  
b) IV BDS  
c) Interns  
d) Not required

**5) Is it essential for a CBCT unit to be available in your dental institution?**

- a) Yes  
b) No  
c) Don't know

**6) Does CBCT useful as diagnostic tool in the field of dentistry?**

- a) Yes  
b) No  
c) Don't know

**7) To what extent CBCT will be used in routine dental practice in future?**

- a) In all specialties of dentistry  
b) Selected dental applications only  
c) Not at all

**8) Which one do you prefer when you need 3D imaging of head and neck region?**

- a) CT  
b) CBCT

**9) Have you ever advised CBCT for any diagnosis?**

- a) Yes  
b) No

**10) For what cases do you prefer CBCT in your future career?**

(Please number the following from most important (1) to the least important (4))

- a) Orthodontic assessment  
b) Implant dentistry  
c) Evaluation of impacted teeth  
d) Evaluation of cysts / tumors

**11) Will CBCT offer advantage over other diagnostic imaging modalities?**

- a) Lower radiation  
b) Short scanning time  
c) Less expensive  
d) Data reconstruction easier  
e) All the above

**12) Which of the following options given below is true about CBCT compared with CT?**

- a) More contrast  
b) More cost  
c) Higher dose  
d) Lower accuracy for soft tissues

**13) Have you attended any courses regarding CBCT?**

- a) Yes  
b) No

**14) Are you willing to attend courses pertaining to CBCT?**

- a) Yes  
b) No

**15) Are you satisfied with the use of CBCT?**

- a) Yes  
b) No  
c) Don't know

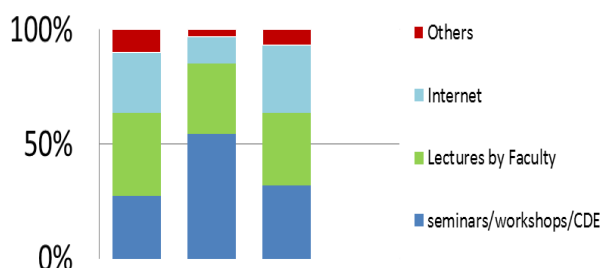
**Table 1: Showing response of the study subjects towards CBCT imaging.**

Questions	Yes	No	Don't know
Are you aware of CBCT used specifically for dentomaxillofacial region?	92.8% (n= 168)	7.2% (n= 31)	-----
Does CBCT useful as diagnostic tool in dentistry?	91.7% (n=168)	6.1% (n=11)	2.2% (n= 4)
Is it essential for a CBCT unit to be available in your dental institution?	84.5% (n=153)	3.9% (n=7)	11.6% (n=21)
Have you ever advised CBCT for any diagnosis?	22.1% (n=40)	75.7% (n=137)	2.2% (n=4)

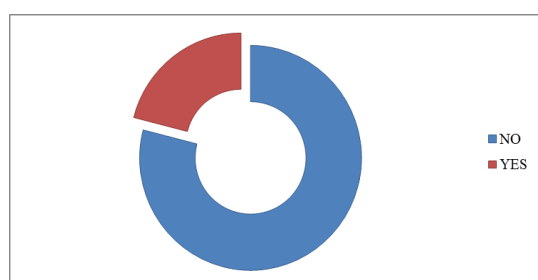
**Table 2: Showing response of the study subjects towards CBCT education.**

QUESTIONS	YES	NO
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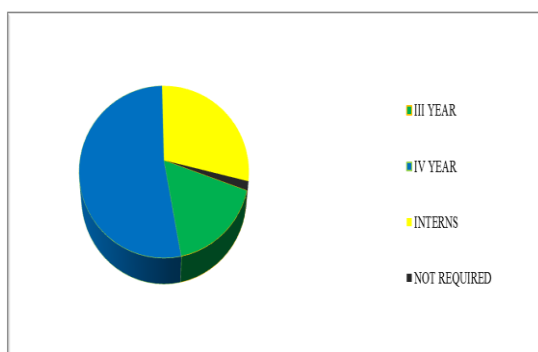
Have you ever attended any courses reading CBCT?	16.0% (n=29)	84.0% (n=152)
Are you willing to attend courses pertaining to CBCT	89.5% (n=162)	10.5% (n=19)



**Chart 1: How did you gain more information / knowledge about CBCT?**



**Chart 2: CBCT in UG Dental Curriculum.**



**Chart 3: In which year should CBCT be a part of dental curriculum in undergraduate levels?**

## CONCLUSION

CBCT is an aborning imaging technology in the field of dentistry. Insufficient curriculum coupled with limited resources leads to decreased practical application. Considering the result of our present survey, dental postgraduate students from all institutions want CBCT unit to be available at their dental institution. It is also recommended that appropriate CBCT education should be included in dental UG curriculum and providing additional educational programs to postgraduate students. Thereby the knowledge on CBCT and its applications can be increased and thus improves the dental health care practices in future.

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