

A Questionnaire-Based Analytical Survey of Dental Students and General Dental Practitioners' Awareness, Knowledge, and Attitudes toward CBCT

¹Mehtaab Singh Bhatia² Pragya Sharma ³ Saerish A.K Amalkhan ⁴ Ashwini Dhopte ⁵Hiroj Bagde ⁶ Ravindra Soni

¹ Senior Lecturer, Department of Prosthodontics and Crown and Bridge, Maitri College of

Dentistry and Research Centre, Anjora, Durg (Chhattisgarh)

drmehtaab.bhatia@gmail.com

² Senior Lecturer, Department of Periodontology, Shree Bankey Bihari Dental College and Research Centre, Masuri, Ghaziabad (U.P)

pragyasw9@gmail.com

³ MPH. BDS, Student at Massachusetts College of Pharmacy and Health Sciences, Boston, Massachusetts.

⁴ Senior Lecturer, Department of Oral medicine and Radiology, New Horizon Dental College and Research Institute, Sakri, Chhattisgarh

ashwinidhopte@gmail.com

⁵ Reader, Department of Periodontology, New Horizon Dental College and Research Institute, Sakri, Chhattisgarh

hiroj.bagde@gmail.com

⁶ Senior Lecturer, Department of Periodontology, New Horizon Dental College and Research Institute, Sakri, Chhattisgarh

ABSTRACT

Background: Cone beam computed tomography which has been recently introduced for dento-maxillofacial imaging is becoming more useful due to its high resolution, low radiation dose and low screening time. The present study was designed to assess awareness, knowledge and attitude of Dental students and General dental practitioners towards CBCT.

Aims and Objective: The study aims to evaluate awareness, knowledge and attitude of Dental students and General dental practitioners of Nagpur towards cone beam Computed Tomography.

Material and Methods: A structured, pre-validated questionnaire was given to 300 participants to assess their knowledge, awareness, and attitude towards CBCT. The obtained data was analysed using statistical software and different tests.

Results: The results showed that Post Graduate students were more aware and knowledgeable, followed by Interns, UGs and General practitioners towards CBCT.

Conclusion: The results indicate low awareness & knowledge about CBCT among general practitioners. Therefore, it is recommended that efforts should be made to improve knowledge and awareness amongst General practitioners by conducting more CDEs and workshops on various applications of CBCT.

Keywords: Awareness, Knowledge, Attitude, CBCT

INTRODUCTION

Cone-beam computed tomography (CBCT) is an three-dimensional (3D) dental and maxillofacial imaging modality¹ It depends on multiplanar reformation process that has distinct advantages such as, reducing the size of the irradiated area, image exactness, fast scan time, unique modes of maxillofacial imaging and reduced image errors.² CBCT is an imaging modality that has recently become useful for dentomaxillofacial imaging. When compared with CT scanners, CBCT units cost less and require less space, have faster scan time, limit the beam to the head and neck with reduction in the radiation doses and have interactive display modes that offer 3D-maxillofacial imaging making them well suitable for use in dental practices.³ The technology involves imaging a volume that allows either the entire maxillofacial skeleton or a restricted dento-alveolar region involving a few teeth to be imaged.⁴ CBCT is indicated for diagnosis and treatment planning in every speciality of dentistry. From nerve tracing in cases of third molar extraction, for implant planning and placement, for maxillofacial surgeries, in sinus pathologies, in endodontics for locating additional roots and accessory canals and in detecting vertical root fracture, orthodontic cases and orthognathic surgeries, in evaluating cysts and tumors, in TMJ disorders, and even used in forensic dentistry.⁵ The information obtained from CBCT imaging also requires a substantial level of expertise for interpretation. This implies that the untrained clinician is likely to have a substantial error rate in the interpretation of CBCT images resulting in a high percentage of missed or false positive diagnoses.⁶ Therefore this study was aimed to assessed the knowledge and attitudes regarding CBCT among dental students and general dentists.

MATERIAL AND METHODS

A validated questionnaire survey was carried among 300 dental professionals, to assess their knowledge on application of CBCT. The study protocol was reviewed and validated. The survey form web link which include validated questionnaire was sent to the participants via email and social media like Facebook, WhatsApp etc. Data collected from electronic questionnaires then coded. Prior consent was obtained from participants and their

confidentiality was maintained. The completed questionnaire was collected and the results were tabulated.

We used Statistical Software package SPSS program for data analysis. The data was assessed using a chi-square test for quantitative data. A significance level was set at $P \leq 0.05$.

I. QUESTIONS REGARDING AWARENESS

1) Have you heard about CBCT/DVT?

YES ☐ NO ☐

2) Have you advised your patients for CBCT imaging?

YES ☐ NO ☐

3) Do you think CBCT should be provided at dental institute?

YES ☐ NO ☐

4) Would you choose to use CBCT as an imaging modality in your clinical practice?

YES ☐ NO ☐

5) Would you choose to use CBCT in your future professional career?

YES ☐ NO ☐

6) What is the reason of not using digital imaging/CBCT?

Lack of awareness ☐

Lack of availability ☐

7) Do you require guidance from a Radiologist for radiological facility design and protection?

YES ☐ NO ☐

II. QUESTIONS REGARDING KNOWLEDGE:

8) Which technology do you prefer when you need 3-D Imaging of the head and neck region?

Computerized Tomography ☐

Dental Volumetric Tomography/CBCT ☐

9) What is the difference between CT and CBCT?

low radiation dose than CT ☐

Same radiation dose as of CT ☐

10) How do you obtain knowledge about CBCT?

Lectures ☐

CDE ☐

11) Have you ever obtained knowledge of CBCT from your faculty?

YES ☐ NO ☐

12) Are you aware that focused FOV/small FOV should be advised in CBCT for endodontic purpose?

YES ☐ NO ☐

13) Are you aware of different sizes of FOV?

YES ☐ NO ☐

III. QUESTIONS REGARDING ATTITUDE

14) Are you satisfied with the use of CBCT?

YES ☐ NO ☐

15) Which session of BDS should include lecture on CBCT?

Pre-clinical ☐

Clinical ☐

16) Should there be guidelines formed for when or when not to take CBCT scan?

YES ☐ NO ☐

17) What is the reason of not using digital imaging/CBCT?

Lack of awareness ☐

Lack of availability ☐

18) Do you feel CDE/ Workshop should be conducted to enhance your knowledge about digital imaging/CBCT?

YES ☐ NO ☐

19) Should patient be referred to an Oral radiologist who is trained to handle or have enough experience in handling CBCT machine?

YES ☐ NO ☐

20) Should an oral Radiologist take regular training/workshop/hands on courses for evaluation of CBCT scan?

YES ☐ NO ☐

RESULTS

TABLE 1: QUESTIONS REGARDING AWARENESS

Q.no	Frequency %				P value
	UG	PG	Intern	General Practitioner	
1.	24.6	23.3	24.7	25.1	NS**
2.	15.0	33.1	30.9	21.0	0.001*
3.	28.2	29.1	28.6	14.1	0.001*
4.	24.9	25.2	23.7	23.7	NS**
5.	24.9	25.1	24.3	23.5	NS**
6.	28.8	34.2	21.1	17.1	0.001*
7.	24.0	25.1	24.2	23.2	NS**
Average	24.3	24.2	25.3	23.9	

*Highly Significant **Non Significant

TABLE 2: QUESTIONS REGARDING KNOWLEDGE

Q.no	Frequency %				P value
	UG	PG	Intern	General Practitioner	
8.	25.0	25.3	24.2	23.2	NS**
9.	24.6	25.1	25.0	24.3	NS**
10.	30.3	16.4	30.8	21.1	0.001*
11.	31.1	27.7	22.1	17.2	0.001*
12.	24.0	40.1	22.3	11.2	0.001*
13.	23.1	41.1	25.1	11.5	0.001*
Average	26.4	29.64	25.87	18.07	Total 100%

*Highly Significant **Non Significant

TABLE 3: QUESTIONS REGARDING ATTITUDE

Q.no	Frequency %				P value
	UG	PG	Intern	General Practitioner	
14.	21.0	31.3	31.2	14.3	0.001*

15.	13.9	32.1	31.1	21.0	0.001*
16.	14.3	33.3	31.5	20.7	0.001*
17.	24.7	25.3	23.7	23.3	NS**
18.	15.1	32.3	31.1	21.0	0.001*
19.	24.4	24.7	23.8	23.3	NS**
20.	25.0	25.1	23.5	23.6	NS**
Average	19.7	29.1	27.9	21.0	Total 100%

*Highly Significant **Non Significant

300 dental professional received the questionnaire to participate in the study. Overall 20 questionnaires were analyzed, which mainly constituted of undergraduates (UGS) Postgraduates (PGS), Interns and General Practitioner.

The majority of participants had awareness about CBCT and it was nearly similar among UGS (24.3%), PGS (24.2%), Interns (25.3%) and general practitioner (23.9%) with no significant difference. The highest percentage of all participants (33.2%) PGs were more concerned about advising patients for CBCT. There was no significant difference between Students and dental professional answers ($P = 0.001^*$) for using CBCT as imaging modality in clinical practice and for answer using CBCT in future professional career. While there was highly significant difference between UGS, PGS, Interns and general practitioner for not using digital imaging due to lack of awareness and availability amongst them where PGs found to be more aware about CBCT. While non significant difference was seen among all groups answer on requiring guidance from a Radiologist for radiological facility design and protection (Table 1).

According to questions regarding knowledge as shown in table 2, there was non significant difference between students and general practitioner regarding using advanced technology in 3-D Imaging of the head and neck region. While there was also non significant difference between knowledge regarding CT and CBCT among students and general practitioner. Furthermore, a highly significant difference was seen among UGS, PGS, Interns and general practitioners in obtaining knowledge about CBCT through lectures and cde.

General practitioner had not obtained knowledge about CBCT from faculty while students specially PGs (41.1%) had seek help from their faculty. There was statistically significant difference between their responses.

The majority of applicants selected specially PGs (41.1%) preferred that the focused FOV/small FOV should be advised in CBCT for endodontic purpose and result was found to be highly significant among all groups.

As shown in table 3 regarding attitude it was found that there was highly significant difference between use of CBCT among students and general practitioner where PGs were found to be more satisfied in using CBCT. UGs and general practitioners were not more of concerned about use of guidelines for CBCT than PGs.

PGs and interns feel CDE/ Workshop should be conducted to enhance knowledge about digital imaging/CBCT than UGs and general practitioner. Highly significant differences was seen among there responses. While there was a non significant difference among answers in all groups regarding referring patients to oral radiologist for CBCT amongst UGS, PGS, Interns and general practitioners. .All groups agreed that there should be an oral Radiologist to take regular training/workshop/hands on courses for evaluation of CBCT scan.

DISCUSSION

Several radiographic imaging techniques are available for diagnosis and treatment planning of patients visiting dental office for various dental procedures.⁷ This study used a questionnaire to gauge the awareness about CBCT among dental students& general dental practitioners. It also assesses the knowledge and attitude of dentists about CBCT and their opinions on the implications of increased use of CBCT in their practices.

In the present study, it is found that there is more awareness amongst the Post Graduate students, followed by Interns, Under Graduate students, and General Practitioners (Table 1). This is in accordance with the study by Mahdizadeh et al (2012)⁸ wherein they found that specialists including budding specialists are more aware about the CBCT and also they often advise CBCT for the patients. The dental institute must have CBCT and it must be used by all specialities in their daily clinical practice. In this study it has been observed that General practitioners are not very well acquainted with the advanced technologies, thus, they should be made more aware of it. General Practitioner are only aware of implant planning but not of other uses of CBCT. Most of the General practitioner agreed that lack of availability could be the reason.

There is a notable difference about the knowledge of CBCT obtained amongst Students, Interns and General Practitioner, in this study. The Post Graduate students, have more knowledge of CBCT, followed by UGs, Interns, and then followed by General Practitioner (Table 2). This observation is also in concordance with a study conducted by Reddy et al(2012).⁹ Also PGs are more aware about the Field of view(FOV), and their different sizes as compared to undergraduate Students, Interns and General practitioners.

In the present study, the positive attitude for CBCT is reflected in post graduate students, followed by Interns, General practitioners and Under Graduate students (Table 3). This finding is in concordance with study conducted by Balabaskaran et al (2013).¹⁰ Most of the Under Graduate students expressed that the knowledge of CBCT should be provided to them in the pre-clinical session for updating their knowledge.

The results indicate low awareness about CBCT among practicing dentists and need enhancement of knowledge toward this promising new technology. Similar findings were reported in another study done in Turkey by Kamburoglu et al(2011).¹¹ Thus, CDEs should be conducted by Oral and Maxillofacial Radiologists regularly to enhance the knowledge of the other specialities and General practitioners.

CONCLUSION

At student level, introduction of training in CBCT at undergraduate and PG level shall ensure that dental specialists use this technique in an efficient way. Awareness of CBCT in dental fraternity and necessity to include it in the curriculum is the need of the hour. □ It is further recommended that OMR departments in different dental colleges should actively participate and organize special qualification programs for dentists to increase their awareness, knowledge and attitude toward different imaging modalities. General dental practitioners including specialists from other specialties must gain more knowledge about indications and applications of digital imaging and CBCT for accurate diagnosis and better management of patients.

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