

Awareness & Knowledge of CBCT Among Dental Undergraduates: A Questionnaire Study

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ABSTRACT

Aim: Study of awareness and knowledge of CBCT among dental undergraduates.

Materials and Methods: A cross-sectional study was carried out among interns and final year students. The data in a valid, reliable questionnaire were completely filled by 120 participants including final years and interns. It consisted of multiple-choice questions on CBCT. Overall assessment of answers obtained was analyzed.

Results: When participants were asked whether they were aware of CBCT 80% were aware while 20% did not know about it. Our study results showed that 75% know the advantage of lower radiation dose of CBCT over CT. Majority of the participants 67% showed positive response to choose CBCT as a carrier option and 88% are interested to advice CBCT in future practice. Terminology like FOV 75% were unaware, 74% never attended CDE on CBCT. 56% never felt to need to search online information about CBCT, 70% never advised and guided about CBCT to their patients, 62% participants have never attended lecture on CBCT neither discussed on CBCT with faculty. 77% were interested to obtain current information on CBCT.

Conclusion: It is found that there is lack of knowledge and awareness among the participants. Positive response to learn about CBCT was reported. Participants had also shown interest to advice CBCT in future dental practice. Participants also shown a positive response to see CBCT as a career. Also felt urgent need to start the training on CBCT very early **stage** which will help the upcoming dentist in their future practice to attain a significant decision-making skill in the patient welfare.

Keywords: CBCT, interns, final year.

INTRODUCTION

Radiological investigation is essential to dentists for determining the presence and extent of dental disease in the patients. It also has a vital role in treatment planning, monitoring disease progression and in assessing treatment efficacy. Today new technologies like nuclear medicine, positron emission tomography, CT and MRI are becoming

readily available in the field of dentistry. One of the most important developments in dental radiology today is Cone beam computed tomography (CBCT). [1]

Cone-beam computed tomography (CBCT) is an outstanding three-dimensional (3D) dental and

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maxillofacial imaging modality that developed in recent years [2]. 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 [3]. The main indications of CBCT are in planning dental implants in 3rd molar impaction to see the relationship to the adjacent teeth and nearby vital structures, in endodontics for assessment of the number, position, course of the canals, in detecting fractures of the root, or in orthodontic for 3D cephalometric analysis. It also has applications in temporomandibular joint assessment to detect osseous changes. However, it cannot be used for pathologies of the articular disc. It has limited usefulness in evaluation of bone for signs of cyst, tumor. [3] Further CBCT machines occupy a smaller foot print and hence easily positioned in the dental office, providing rapid scan times and multiplanar visualization of the structures concerned. [4,5]

When compared with conventional 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 maxillofacial imaging making them well suitable for use in dental practices [6]. The principal drawbacks of this technology are limited soft tissue contrast, scatter artefacts from metallic crowns and restorations and beam hardening artefacts.

With the increasing usage of dental implants, the need for CBCT is increasing as CBCT plays a vital role in implant planning. With the increasing availability of CBCT, the dental students should be well aware of the advantages and disadvantages of this piece of technology. The inclusion of CBCT in the oral radiology curriculum is an absolute requirement to formulate future dental practitioners to apply three-dimensional imaging appropriately for diagnosis and treatment planning.

Dental students will be future dentists who should be acquainted with the modern digitized radiological techniques including CBCT, taking into consideration the increased implication of CBCT in dental practice; it appears that the assessment of dental students' awareness for CBCT is essential. There are only very few studies reported in the literature regarding the knowledge and awareness

of dental students toward new oral radiographic imaging [7,8]. Thus, there is an urgent need to conduct studies measuring the level of knowledge and create awareness towards CBCT among dental students [9]. With the above objective in mind, a closed ended questionnaire survey was carried out among the interns and final year graduate students.

MATERIALS AND METHODS

A cross-sectional study was carried out among final year students and interns. Prior to the conduct of study ethical approval was taken from the ethical committee. All students of final year and interns who were willing to participate were included in the study. Unwilling participants were excluded from the study. A sample of 120 students was taken for the study. A valid, reliable, self-administered close ended questionnaire of 15 questions was given to the interns and final year BDS students. Before the administration of the questionnaire, an informed consent was obtained from the participants. A total of 120 students participated. The questionnaire was given to the participants who took approximately 20 minutes for completion. The two sections of the questionnaire consisted of questions related to demographic data such as gender and academic level and questions related to awareness and knowledge of CBCT in second section.

Statistical Analysis

Data obtained was entered in Microsoft Excel. Statistical product and service solution (SPSS) version 21 software was used to analyses data. Descriptive nominal data was expressed in percentage/proportions.

RESULTS

In the present study, 60 final year students and 60 interns participated out of which (54%) participants were females and (46%) participants were male. Knowledge of CBCT was obtained by (38%) participants by attending lecture, (44%) searched online information and (38%) discussed with faculty about CBCT and (80%) participants have heard and came across term CBCT. Full form of CBCT was correctly answered by (83%) participants and (68%) know the use of CBCT for dentomaxillofacial region. Majority of the participants (77%) were interested to obtain current information about CBCT. [Fig 1]

Majority of the respondents (67%) would like to prefer CBCT as their professional career. CBCT upcoming reliable modern imaging technology will be preferably chosen by 88% participants in their future clinical practice. Very few (25%) of participants were aware of term like FOV. Low radiation dose was identified as the most significant advantage of CBCT by (75%) of participants. The majority participants (70%) said they never advised and guided CBCT imaging for their patients only (30%) reported positive response. CDE based on CBCT was attended by very less participants i.e (26%) only [Fig 2]

Majority respondents (90%) reported that CBCT will be first choice of imaging modality [Fig 3] for hard tissue examination (66%) then CT.[Fig4]

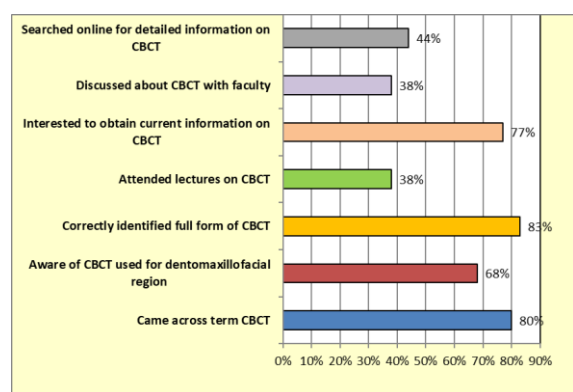


Fig 1: Information about CBCT.

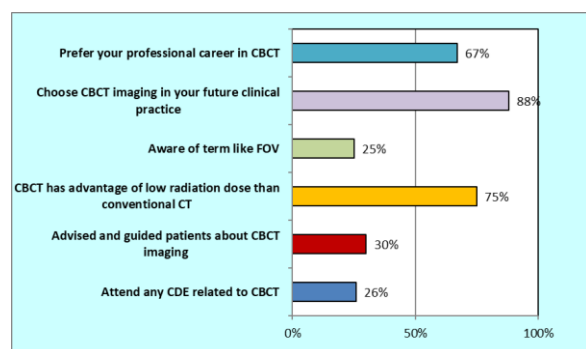


Fig 2: CDE based on CBCT.

DISCUSSION

Cone beam computed tomography imaging has emerged as a pivotal application in 3-dimensional reconstruction for dental imaging. Though it has emerged as an innovation in dental imaging there still remains a lot of grey area regarding the application of this piece of technology. CBCT has its

applications in all areas of dentistry as well it is most widely accepted imaging modality. Lavanya R et.al [10]. The present study was conducted to assess awareness and knowledge of CBCT among dental undergraduates.

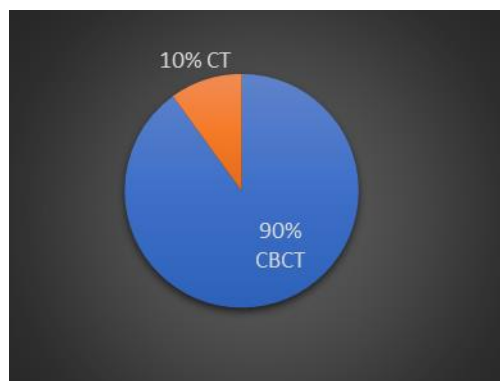


Fig 3:

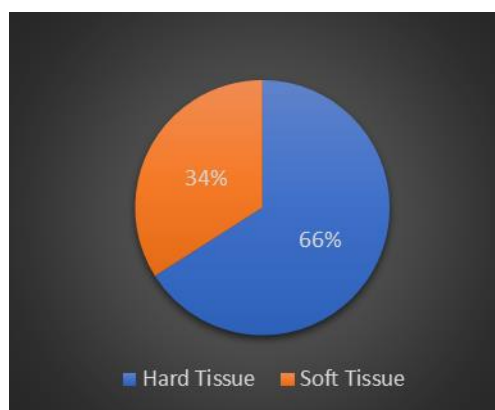


Fig 4:

In present study, total 60 final year students and 60 interns participated in study. The majority of respondents were females.

In present study, when participants were questioned whether they know term CBCT :80% participants gave positive response similar results were seen in Almohiy and Alsharani study [11], Gunasekaran et.al. [12] study.

Regarding use of this modern technology in dentomaxillofacial region 68%participants given positive response, such similar results were found in Venkata et.al. study [13]. Majority of participants knew full form of CBCT. CBCT is introduced for hard tissue imaging majority had knowledge and very few were unaware. Majority of participants didn't attended lecture on CBCT which shows need to focus on conducting more lectures. In this study

majority of participants were willing to obtain current information of CBCT which was accordance to Shishir Ram Shetty et.al. [14]. There was lack of discussion with faculty regarding CBCT showed sufficient teaching was not given to undergraduates' similar results were seen in Gunasekaran et.al. [12]. Among total participants very few have searched online information regarding CBCT showing lack of alertness about CBCT, among total participants only 26% participants attended CDEs on CBCT show more need to conduct and focus on CDEs based on CBCT. This shows that very few participants got information through CDEs therefore there is urgent need to focus on CDEs which was not in accordance to Balabhaskaran et.al. results [15].

Majority of participants never advised patient CBCT imaging due to lack of knowledge of this novel technology. In this present study, Majority participants shown interest to choose CBCT as 3D imaging technique rather than CT. In the present study, lower radiation dose was given as the most important advantage of CBCT over CT. This similar results were seen in Dolekoglu [16] and Yalcinkaya [17] study. Term like FOV majority of participants were not aware similar finding were reported by Ramhari Sathawane et.al[18]. In present study, participants shown interest to use cbct in future clinical practice. CBCT as professional career participants positively responded similar results were seen kamburoglu study [19] , Almohiy and Alsharani study [11].

The results indicate low awareness about CBCT among interns and final year and need enhancement of knowledge towards this modern promising technology.

CONCLUSION

It is found from the study that there is a low awareness about the imaging modality as well lack of knowledge among participants. At few points noted urgent need to start the training on CBCT at early stage, CDE program should be conducted to enhance the knowledge and awareness of CBCT also curriculum upgradations for CBCT are need of hour so that the upcoming future dentist will be able to attain significant decision making skills for accurate diagnosis and better management of patients to enhance more healthy dental practice to the society.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

- 1.White SC, Pharaoh MJ (2008) Oral radiology: Principles and interpretation. Mosby, St Louis, pp: 205-256.
- 2.Parashar V, Whaites E, Monsour P, Chaudhry J, Geist JR. Cone beam computed tomography in dental education: A survey of US, UK, and Australian dental schools. Journal of Dental Education. 2012;76(11):1443-7.
3. Scarfe WC, Farman AG, Sukovic P. Clinical applications of Cone Beam Computed Tomography in dental practice. J. Can Dent Assoc 2006; 72:75-80.
4. Stuart C White, Michael J Pharaoh. Oral Radiology: Principles and Interpretation. 7th ed.Canada: Elsevier: 2014. 5. David Sarment. Cone Beam Computed Tomography: Oral and Maxillofacial Diagnosis and Applications. 1st ed. UK: Wiley: 2014
- 6.Scarfe WC, Farman AG. What is cone-beam CT and how does it work? Dent Clin North Am. 2008; 52: 707-730.
7. Reham F. Al Noaman, and Sara M. El Khateeb Knowledge and Attitude of Cone Beam CT- A Questionnaire Based Study among Saudi Dental Students BJMMR, 2017; 19(4): 1-10.
- 8.Roshene. R , Jayanth kumar.V. Awareness of CBCT among the Final Years and Interns- A Pilot Study. JMSCR;May 2016 04(05):10375-10380.
- 9.Adibi S, Zhang W, Servos T, O'Neill PN. Cone beam computed tomography in dentistry: What dental educators and learners should know. Journal of dental education. 2012;76(11):1437-4
10. Lavanya Reddy et al. A Questionnaire CrossSectional Study on Application of CBCT in Dental Postgraduate Students Pol J Radiol, 2016; 81: 181-189.
11. Hussain Almohiy, Ibrahim Alshahrani. Cone beam computed (CBCT)in dentistry -students and internsperspective in Abha , Saudi Arabia.Ann Trop

Med & Public Health;22(v):SP162.2019
Sep;vol.22(v).

12.Gunasekaran etal. Knowledge and attitude
towards cbct among dental students in western
tamilnadu - a cross sectional study. Wjpmr,
2018,4(3), 230 - 233

13.Venkata etal.The knowledge and awareness
about CBCT amongst dental students at various
levels of education in Telangana region: A cross
sectional survey. International journal of current
research.2020 April;12(4).11197-11202.

14.Shirshir R S, Renita LC, Subhas G, Prasanna,
Anusha R L and Roopashri k. Knowledge and
attitude of dentists towards cone beam computed
tomography in Mangalore. Austin journal of
radiology.2(2).

15.Balabaskaran K, Srinivasan AL. Awareness and
attitude among dental professional towards CBCT.
Journal of Dental and Medical Sciences
2013;10(5):55-9.

16.Dölekoglu S, Fisekçioğlu E, Ilgü M, Ilgü D. 2011.
The usage of digital radiography and cone beam
computed tomography among Turkish dentists.
Dento maxillofac Radiol., 40:379-84.

17.Yalcinkaya SE, Berker YG, Peker S, Basturk FB.
2014. Knowledge and attitudes of Turkish
endodontists towards digital radiology and cone
beam computed tomography. Niger J Clin Pract.,
17:471-8.

18.Ramhari S, Kshitija B, Rakhi C , Ashish L ,Lajri B.
Awareness ,Knowledge and attitude of dental
students and general dental practitioners of Nagpur
towards CBCT:A Questionnaire based analytical
study.International journal of research and review
.2020 june; vol.7(6):398-403.

19.K Kamburoglu, SKursun, ZZ Akarslan. Dental
students' knowledge and attitude towards cone
beam tomography in Turkey. Dentomaxillofacial
Radiology:2011(40);439-443.

QUESTIONNAIRE

- Category: INTERN() FINAL YEAR STUDENT()
Age: Gender:
1. Have you come across term CBCT?
(a) Yes (b) No
 2. Are you aware of CBCT used for dentomaxillofacial region?
(a) Yes (b) No
 3. Full form of CBCT is
(a) Cone Beam Computed Tomography.
(b) Computerized Beam Cone Tomography.
 4. CBCT system is introduced for imaging following-
(a) Hard tissue (b) Soft tissue
 5. Have you attended lectures on CBCT?
(a) Yes (b) NO
 6. Are you interested to obtain current information about CBCT?
(a) Yes (b) No
 7. Have you discussed about CBCT with your faculty?
(a) Yes (b) No
 8. Have you ever searched online for detail information about CBCT?
(a) Yes (b) No
 9. Did you attend any CDE related to CBCT?
(a) Yes (b) No
 10. Have you ever advised and guided patients about CBCT imaging?
(a) Yes (b) No
 11. Which imaging technique would you prefer for 3 dimensional imaging of head neck region?
(a) CBCT (b) Conventional CT
 12. Does CBCT has advantage of low radiation dose than conventional CT?
(a) Yes (b) NO
 13. Are you aware of term like FOV – Field of view ,used to take CBCT scans?
(a) Yes (b) No
 14. Would you choose CBCT imaging in your future clinical practice?
(a) Yes (b) No
 15. Would you prefer your future professional career in CBCT?
(a) Yes (b) No