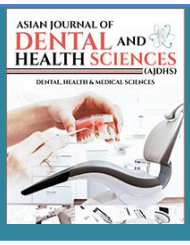

Available online at ajdhs.com

Asian Journal of Dental and Health Sciences

Open Access to Dental and Medical Research

Open Access Research Article

Knowledge and Awareness of Post Graduate and Undergraduate Dental Students About CBCT: A Questionnaire Study

Sarah Samsu Nisha. K *[1], Dr. Aravind Swamy R M [2], Dr. Thalaimalai Saravanan [3]

[1] CRRI, Karpaga Vinayaga Institute of Dental Sciences, Padalam, Tamil Nadu 603308, India

[2] Assistant Professor, Department of Oral Medicine and Radiology, Karpaga vinayaga Institute of Dental Sciences, Padalam, Tamil Nadu 603308, India

[3] Professor, Department of Oral medicine and Radiology, Karpaga Vinayaga Institute of Dental Sciences, Padalam, Tamil Nadu 603308, India

Article Info:

Article History:

Received 19 December 2023
Reviewed 02 January 2024
Accepted 17 January 2024
Published 15 March 2024

Cite this article as:

Nisha KSS, Swamy RMA, Saravanan T, Knowledge and Awareness of Post Graduate and Undergraduate Dental Students About CBCT: A Questionnaire Study, Asian Journal of Dental and Health Sciences. 2024; 4(1):9-15

DOI: http://dx.doi.org/10.22270/ajdhs.v4i1.65

*Address for Correspondence:

Sarah Samsu Nisha K, CRRI, Karpaga Vinayaga Institute of Dental Sciences, Padalam, Tamil Nadu 603308, India

Abstract

Aim: To assess the precise knowledge and awareness of the Cone beam computed tomography (CBCT) among post graduate and undergraduate dental students.

Materials and Methods: The data in questionnaire were obtained through the completely filled 200 google forms which includes undergraduate and postgraduate dental students. The obtained data was analysed category wise.

Results: A definite gap exists between undergraduate students and postgraduates in awareness, knowledge and handling capacity. Postgraduate has better knowledge on interpretation than undergraduates. The right CBCT education should be given to dental students, backed by real-world experience and the advice of oral and maxillofacial radiologists.

Conclusion: To guarantee greater understanding among dentists, further efforts should be made to raise awareness of this imaging modality. These efforts could include adding CBCT to the BDS curriculum and holding lectures or Continuing Dental Education (CDE) sessions.

Keywords: CBCT, dental students, awareness, knowledge, CDE

INTRODUCTION

Selection of pertinent imaging or diagnostic technique is an important step in the management of diseases and shield the patient from deleterious effects of ionizing radiations. Continual research is focused toward better image acquirement with emphasis over minimum harmful effects of radiation. Cone beam computed tomography (CBCT) in our country has obtained popularity among dentists and is most preferable imaging modality in recent times. However, lack of inclusion of CBCT in undergraduate curriculum is a matter of concern[1].

CBCT uses a diverse cone shaped or pyramid shaped source of ionizing. The two-dimensional area detector fixed on a rotating gantry to offer multiple sequential transmission images that are incorporated directly forming volumetric or three-dimensional information. The complex computed algorithm was performed on this data set, allowing the operator to extract multiplanar reconstructions of various thickness in any plane and to provide precise three-dimensional image. The introduction of CBCT imaging had shifted the dentists from a 2D to a volumetric approach in maxillofacial imaging. Hence it is important for every undergraduate dental student to obtain knowledge about CBCT[2].This survey study aims to assess the exact awareness and knowledge of CBCT in dental fraternity.

MATERIALS AND METHODS

A cross sectional study was conducted with a randomly selected sample. Data were obtained in the form of integrated, close-ended, validated, predesigned, self-administered questionnaire which was approved by the institutional ethical committee. The questionnaire was verified after results acquired from pilot study. The questionnaire was given to 200 participants including undergraduate and post graduate students of oral medicine and radiology and other department. The study was carried out from march 2023 to October 2023. The questionnaire consists of multiple-choice questions on CBCT. The questionnaire consists of 22 questions and categorised based on knowledge, awareness, future applications, reason for CBCT prescription and basics of CBCT. Overall assessment of answers obtained for each part were analysed category-wise into two category undergraduates and post graduates. Statistical analysis was done. Software used is SPSS software version 21.0 (IBM, USA). Mean percentage was calculated and data were arranged in percentage for all questions. Chi-square test was employed to compare percentages in different variables.

QUESTIONNAIRE FORM

TABLE 1

1.What is the difference between CT and CBCT? a) Low radiation dose than CT b) High radiation dose than CT c) Same radiation dose as CT
2. Do you think CBCT is oral medicine and radiology (OMR) domain and should be present in OMR department only? a) Yes b) No
3.Do you think CBCT should be provided at dental institute? a) Yes b) No
4.Which session of BDS should include lecture on CBCT? a) Preclinical b) clinical c) Internship d) Not required

TABLE 2

5.Which technology do you prefer when you need three-dimensional imaging of the neck and head region? a) Computerized Tomography (CT) b) Dental Volumetric tomography (DVT) /CBCT
6.Have you ever advised CBCT imaging for your patients? a) Yes b) No
7. For what case would you refer your patient to CBCT? a) Trauma b) Cyst or Tumour c) Implant planning d) Orthodontic and endodontic evaluation e) all of the above

TABLE 3

8.Have you ever obtained knowledge of CBCT from your faculty? a) Yes b) No
9.Should there be guidelines formed for when or when not to take CBCT scan? a) Yes b) No
10.Do you want to update your information about digital imaging/CBCT? a) Yes b) No
11. Do you feel CDE/workshop should be conducted to enhance your knowledge about digital imaging/CBCT? a) Yes

b) No
12.Do you require guidance from a radiologist for radiological facility design and protection? a) Yes b) No
13. Should patient be referred to an oral radiologist who is trained to handle or have enough experience in handling CBCT machine? a) Yes b) No
14. Should all CBCT scan be interpreted by oral radiologist and all reports be signed by oral and maxillofacial radiologist? a) Yes b) No
15. Should an oral radiologist take regular training/workshop/hands-on course for evaluation of CBCT scan? a) Yes b) No
16.Do you think CBCT is oral medicine and radiology (OMR) domain and should be present in OMR department only? a) Yes b) No

TABLE 4

17.Have you heard about CBCT/DVT? a) Yes b) No
18.What is the reason of not using digital imaging/CBCT in your dental practice? a) Lack of awareness b) Lack of availability c)Lack of knowledge d)Tough to perform
19. Are you aware of different sizes of field of view (FOV) used to take CBCT scan? a) Yes b) No
20. Are you aware that focused FOV/small FOV should be advised in CBCT for endodontic purpose? a) Yes b) No

TABLE 5

21.Would you choose to use CBCT as an imaging modality in your clinical practice? a) Yes b) No
22. Would you choose to use CBCT in your future professional career? a) Yes b) No

RESULT:

A fundamental tool for symptomatic and beneficial introduction in the field of oral and dental surgery is dental imaging. Presentation of preparation at the student level in Undergraduate and graduate-level CBCT should ensure that dental masters apply this technique effectively.

Analysing the results, a total of 200 completely filled google forms were received among which 100 undergraduates and 100 post graduates were included. Among 200 participants ,68 under graduate and 70 post graduate agreed that CBCT delivers the lowest radiation dose to the organs whereas spiral multi slice delivers the highest dose. On analysing the results 69 post graduates and 60 undergraduates prefers CBCT to be present only in the OMR department. On overviewing the results, 95 undergraduate students and 86 post graduate students thinks that CBCT should present in every dental institutes.

Among 200 participants, 57 students from under graduate and 38 students from post graduate prefers CBCT to be included in the clinical session of the BDS and 25 under graduate and 47 postgraduate prefers CBCT to be included in internship of the BDS. Out of 200 participants 62 undergraduate and 58 post graduate and advised CBCT for the three dimensional imaging of the head and neck region.

On Analyzing the results, 74 post graduate and 70 undergraduates prefer CBCT for trauma, cyst or tumour, implant planning, orthodontic and endodontic evaluation. Among 200 participants, 76 under graduate and 74 post graduate said that they obtained knowledge from their faculty.

Out of 200 participants, 84 post graduate and 90 undergraduate students said that guidelines should be formed for when or when not to take CBCT scan. 93 post graduates and 85 undergraduates said that CDE or workshop should be conducted to enhance their knowledge about CBCT.94 undergraduate and 74 post graduate students requires guidance from the radiologists for radiological facility design and protection.90 under graduate and 84 post graduate refer patient to the oral radiologist who is well trained to handle the CBCT machine.

90 post graduate and 87 undergraduate students heard about a CBCT or DVT. Among 200 participants,41 undergraduate and 28 post graduates were not using CBCT due to lack of awareness. However, Aditya et al[3] discovered in their investigation that CBCT is still not widely utilized by dental specialists because of the technique's limited availability, high cost, or dentist's incapacity to select cases for CBCT.

TABLE 6

S.NO	Questions	UG (Total 100)	PG (Total 100)	Chi square value	p value
1	What is the difference between CT and CBCT?				
	a) Low radiation dose than CT	68	73		
	b) High radiation dose than CT	12	11		
	c) Same radiation dose as CT	20	16	0.665	0.717
2	Do you think CBCT is oral medicine and radiology (OMR) domain and should be present in OMR department only?				
	a) Yes	50	69		
	b) No	50	31	7.490	**0.006***
3	Do you think CBCT should be provided at dental institute?				
	a) Yes	95	86		
	b) No	5	14	4.711	**0.030***
4	Which session of BDS should include lecture on CBCT?				
	a) Preclinical	16	14		
	b) clinical	57	38	10.989	**0.012***
	c) Internship	25	47		
	d) Not required	2	1		
5	Which technology do you prefer when you need three-dimensional imaging of the neck and head region?				
	a) Computerized Tomography (CT)	31	26		
	b) Dental Volumetric tomography (DVT) /CBCT	69	74	.613	.434
6	Have you ever advised CBCT imaging for your patients?				
	a) Yes	62	58	.333	.564
	b) No	38	42		

7	For what case would you refer your patient to CBCT? a) Trauma b) Cyst or Tumour c) Implant planning d) Orthodontic and endodontic evaluation e) all of the above	 5 12 9 4 70	 9 11 5 1 74	4.240	.374
8	Have you ever obtained knowledge of CBCT from your faculty? a) Yes b) No	 76 24	 73 27	.237	.626
9	Should there be guidelines formed for when or when not to take CBCT scan? a) Yes b) No	 94 6	 76 24	12.706	**.000***
10	Do you want to update your information about digital imaging/CBCT? a) Yes b) No	 89 11	 85 15	.707	.400
11	Do you feel CDE/workshop should be conducted to enhance your knowledge about digital imaging/CBCT? a) Yes b) No	 93 7	 85 15	3.269	.071
12	Do you require guidance from a radiologist for radiological facility design and protection? a) Yes b) No	 97 3	 82 18	11.971	**.001***
13	Should patient be referred to an oral radiologist who is trained to handle or have enough experience in handling CBCT machine? a) Yes b) No	 90 10	 84 16	1.592	.207
14	Should all CBCT scan be interpreted by oral radiologist and all reports be signed by oral and maxillofacial radiologist? a) Yes b) No	 86 14	 74 26	4.500	**.034***
15	Should an oral radiologist take regular training/workshop/hands-on course for evaluation of CBCT scan? a) Yes b) No	 89 11	 83 17	1.495	.221
16	Do you think CBCT is oral medicine and radiology (OMR) domain and should be present in OMR department only? a) Yes b) No	 60 40	 69 41	1.769	.184

17	Have you heard about CBCT/DVT? a) Yes b) No	 87 13	 90 10	1.233	.540
18	What is the reason of not using digital imaging/CBCT in your dental practice? a) Lack of awareness b) Lack of availability c)Lack of knowledge d)Tough to perform	 41 22 30 7	 28 29 33 10	4.082	.253
19	Are you aware of different sizes of field of view (FOV) used to take CBCT scan? a) Yes b) No	 49 51	 65 34	6.646	.036
20	Are you aware that focused FOV/small FOV should be advised in CBCT for endodontic purpose? a) Yes b)No	 54 46	 56 44	1.009	.604
21	Would you choose to use CBCT as an imaging modality in your clinical practice? a) Yes b) No	 92 8	 79 21	6.816	.009
22	Would you choose to use CBCT in your future professional career? a) Yes b) No	 95 5	 83 17	7.354	.007

DISCUSSION

This study used a questionnaire to measure the awareness, knowledge and attitude about CBCT among undergraduates and postgraduates. Patients visiting dental clinic for different dental procedures were diagnosed and treated using different imaging technique. Undergraduate dental students must realise the importance of CBCT and should have atleast basic knowledge of dental radiographs to arrive at an accurate diagnosis. This study helped us to understand primarily how effectively dentists follow principles and practices of traditional and modern oral radiology. It also helps to measure the knowledge of about CBCT and their opinions on the implementation of increased use of CBCT in their practices.

From the results obtained most of the undergraduates said that lack of awareness as the major reason for not using. And most of them were not aware of the different sizes of field of view in CBCT. Very few participants find tough to perform. The results are consistent with a study carried out in South India by sowmiya et al[2] and Reddy et al [4]. Similar findings were reported in another study done in Turkey by Kamburoglu et al[5].

Based on the results obtained, most of the undergraduates and post graduates agrees that they obtain knowledge from their faculty through lectures, CDE /workshops conducted at the institutes. The results were in line with a research by Reddy et al and Tofangchicha M et al[6], evaluated the dental fraternity's knowledge and attitudes toward CBCT in South India.

CBCT should be included both in Under graduates and post graduates of other department where CBCT is used to provide detail root morphology and it contributes to optimal diagnosis and treatment planning in endodontics, used in the assessment of anomalies of impaction, ectopic teeth and treatment planning in orthodontics. CBCT is used in tracing of inferior alveolar canal, evaluation of cyst and tumour, fracture diagnosis, orthognathic surgical planning in department of oral and maxillofacial surgery. CBCT plays major role in prosthodontics that it guides for precision implant placement, which ensures the final implant alignment. Hence, CBCT should be included in other department post graduates, so that it may help to deliver a quality treatment to the patients. Knowledge about radiation dose of CBCT was similar among undergraduate and post graduates as most of them said that CBCT emits low radiation dose when compared to CT and there is no statistically significant difference between them. Both under graduates and post graduates have satisfactory knowledge regarding radiation dose. The findings were similar to a study conducted by Chau and Fung[7]. They reported that CBCT delivers the lowest radiation dose to the organs, whereas spiral multislice CT delivers the highest dose. Among 200 participants, most of them prefer CBCT for diagnosing tumour/ cysts, or implant placement, orthodontic purposes and for trauma cases. The findings were in accordance with Balabaskaran K et al [8]and Shetty et al[9] who conducted a research to assess dentist attitudes about CBCT discovered that dental professionals only favour CBCT imaging when they

anticipate that the diagnostic yield will materially improve clinical results, patient safety, or patient care.

Since CBCT is present only in the oral medicine and radiology domain, Majority of the undergraduates requires guidance from the radiologist for radiological facility design and protection. This may be due to lack of availability of CBCT in the UG curriculum. Lack of inclusion of CBCT in several institutes may be due to the expenditure. Hence CBCT should be included both in Under graduates and post graduates of other department during their clinical session/internship. Most of the undergraduates refer patient to the oral radiologist for taking CBCT because of their poor handling whereas post graduates had better handling when compared to undergraduates.

On analysing the future applicatory response, most of them choose to use CBCT as an imaging modality in their future clinical practice. Hence postgraduates had better knowledge in radiological protection, handling, interpretation and awareness about CBCT.

CONCLUSION

From this study, it is evident that undergraduate students have less knowledge in radiological protection, interpretation and handling capacity.

Given the necessity, the dental fraternity should place a greater emphasis on technique and interpretation in the curriculum of the moment. The Organizations ought to carry out talks or continuous education in dentistry (CDE) to guarantee increased proficiency in oral radiology among students in college. Oral radiology significance ought must be emphasized to the pupils throughout their undergraduate program due to its extensive utilization in the diagnosis and planning of care. Dental students need to learn more about improving clinical practice in oral radiology. In order to raise dentists' awareness of various imaging modalities, it is also advised that OMR departments at various dental institutions actively participate in and set up special qualifying programs for them[9]. Dental professionals will be able to employ CBCT more effectively to increase the precision and dependability of oral and maxillofacial diagnosis, treatment planning, and results if the method is made available to them through undergraduate training[1].

Financial Support and Sponsorship

Nil

Conflicts of Interest

There are no conflicts of interest

REFERENCES

1. Rai S, Misra D, Dhawan A, Tyagi K, Prabhat M, Khatri M. Knowledge, Awareness, and Aptitude of General Dentists Toward Dental Radiology and CBCT: A Questionnaire Study - Journal of Indian Academy of Oral Medicine and Radiology 2018; 30(2): 110-115 https://doi.org/10.4103/jiaomr.jiaomr_115_17

2. Dr. Sowmiya G, Dr.AravindhSwamy R M, Dr. Thalaimalai Saravanan, Awareness and Knowledge of Oral Radiology among Dental Undergraduates - A Cross Sectional Study - International Journal Dental and Medical Sciences Research 2022;4(6): 287-291

3. Aditya A, Lele S, Aditya P. Current status of knowledge, attitude, and perspective of dental practitioners toward cone beam computed tomography: A survey. J Oral Maxillofac Radiol 2015; 13:54 7 https://doi.org/10.4103/2321-3841.157524

4. Reddy RS, Kiran CS, Ramesh T, Kumar BN, Naik RM, Ramya K. Knowledge and attitude of dental fraternity towards cone beam computed tomography in south India - A questionnaire study. Indian JDent 2013; 4:88 94 https://doi.org/10.1016/j.ijd.2012.10.003

5. Kamburoglu K, Kursun S, Akarsala ZZ. Dental students' knowledge and attitudes towards cone beam computed tomography in Turkey. Dentomaxillofac Radiol 2011; 40:439 43. https://doi.org/10.1259/dmfr/21915689 PMid:21960402 PMCid:PMC3528136

6. Tofangchiha M, Arianfar F, Bakhshi M, Khorasani M. The assessment of dentists' knowledge regarding indications of cone beam computed tomography in Qazvin, Iran. Biotech Health Science 2015; 2:1 5. https://doi.org/10.17795/bhs-25815

7. Chau ACM, Fung K. Comparison of radiation dose for implant imaging using conventional spiral tomography, computed tomography, and cone beam computed tomography. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009; 107:559e565. https://doi.org/10.1016/j.tripleo.2008.11.009 PMid:19168378

8. Balabaskaran K, Srinivasan AL. Awareness and attitude among dental professional towards CBCT. IOSR J Dent Med Sci 2013; 10:55 9. https://doi.org/10.9790/0853-1055559

9. Aditya A, Lele S, Aditya P. Current status of knowledge, attitude, and perspective of dental practitioners toward cone beam computed tomography: A survey. J Oral Maxillofac Radiol 2015; 13:54 7 https://doi.org/10.4103/2321-3841.157524

10. Shetty SR, Castelino RL, Babu SG, Prasanna, Laxmana AR, Roopassri K. Knowledge and attitude of dentists towards cone beam computed tomography in Mangalore - A questionnaire survey. Austin J Radiol 2015; 2:1 5