

Research Article

Knowledge and Attitude of Dentists towards Cone Beam Computed Tomography in Mangalore – A Questionnaire Survey

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Abstract

Aims and Objectives: The purpose of this study was to determine the knowledge and attitude of dentists towards CBCT in Mangalore, Karnataka, India and to assess the awareness of CBCT among dentists.

Materials and Methods: A self-administered questionnaire of 23 multiple choice questions was given to 200 dentists working in reputed institutions in and around Mangalore. The questionnaire was given to the participants which took approximately 20 minutes for completion. Descriptive statistics was calculated in terms of frequencies and percentages.

Results: All the participants of the survey were aware of CBCT and considered it to be a useful diagnostic tool in dentistry. The participants also believed CBCT had lower radiation dose compared to medical CT and data reconstruction could be performed easily in CBCT. The majority of the participants also reported that adequate teaching was not imparted regarding CBCT in educational institutions but were willing to attend courses and update knowledge on CBCT if provided with opportunities.

Conclusion: CBCT has an important role in the diagnosis of oral and maxillofacial pathologies with reduction in radiation dose. The information obtained from the study highlighted the need for adapting to new technologies like CBCT and regular continuing education programmes, post graduate education courses, meetings and seminars are required to update dentists' knowledge. The study also highlighted majority of participants believed CBCT are the ultimate diagnostic tool in dentistry and research.

Keywords: CBCT; Knowledge; Attitude

Introduction

Cone Beam CT (CBCT) is an imaging modality that has recently become useful for dento-maxillofacial imaging. 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 [1,2]. CBCT has wide applications in dentistry [3]. In view of the increasing availability of CBCT in dental practices and the importance of dentist's attitudes towards new technologies, this survey assessed the knowledge and attitudes regarding CBCT among dentists (practitioners and academicians) in and around Mangalore.

Material and Methods

A self administered questionnaire of 23 multiple choice questions was given to 200 dentists working in reputed institutions in and around Mangalore (Table 1). The questionnaire was given to the participants who took approximately 20 minutes for completion. Descriptive statistics was calculated in terms of frequencies and percentages using the SPSS software.

Results

The present study used a questionnaire to gauge the level of knowledge regarding CBCT among dental practitioners (Table 1). In the present study, 41.5% were females, 8.4% were bachelors in dental surgery 91.6% had a master's degree and 58.5% were males, 16.2% were bachelor in dental surgery and 83.8% had master's degree (Table 2).

Among 200 dentists surveyed, 83.5% use digital radiography for making radiographs and 16.5% did not use digital radiography for making radiographs (Table 3).

100% felt the necessity of having CBCT in dental institutions and 83.5% wished to use CBCT in their future professional career. 53.5% felt lower radiation dose compared to medical CT as the main advantage which was in accordance with study conducted on endodontists [8] by Yalcinkaya SE et al. 38% felt data reconstruction as the advantage (Table 3)

85.5% felt frequent CDES/ workshops should be conducted to acquire more knowledge on CBCT which was in accordance to Balabaskaran k et al [11]. 96% were willing to obtain any updated

Table 1: Questionnaire used in the study.

Questionnaire:	
1)	Gender:
	a) Male b) female
2)	Qualification:
	a) BDS b) MDS (specify department)..... c) Intern
3)	Do you use digital imaging modalities to make radiographs?
	a) yes b) no
4)	Please specify your reasons to use digital imaging?
	a) less radiation dose
	b) short time
	c) easy to store data
	d) no developing required
	e) adjustments and measurements can be made
	f) Any other specify
5)	Are you satisfied with the digital imaging modality available to you?
	a) not at all b) a little c) no idea d) satisfied
6)	Please check the reasons of not using digital imaging
	a) expensive b) do not know how to use computer c) no idea d)hard to perform
7)	Are you aware of CBCT in dental radiology?
	a) Yes b) no
8)	How did you come across the term CBCT
	a) Seminars/workshops/CDE
	b) Lessons by faculty
	c) Internet
	d) Seniors
	e) Others (specify)
9)	Do you feel CBCT is a useful diagnostic tool in dentistry
	a) Yes b) no
10)	Do you feel CBCT will be the ultimate tool in future dentistry and research?
	a) Yes b) no
11)	To what extent do you believe CBCT will be used in routine dental practice in the future?
	a) It will not be used
	b) In all specialties of dentistry
	c) Limited use
	d) Selected dental applications only
	e) No idea
12)	In which year of under graduate dental education should CBCT be included?
	a) III BDS b) IV BDS C) post graduation d) not required
13)	Do you feel frequent CDE/workshop should be conducted to acquire more knowledge on CBCT?
	a) Yes b) no c) maybe
14)	Do you feel the necessity of having CBCT in the dental institution?
	a) Yes b) no
15)	Would you like to use CBCT in your future professional career?
	a) Yes b) no c) maybe d) no idea
16)	What advantages do you feel will a CBCT offer over other diagnostic imaging modalities?
	a) Lower radiation dose compared to medical CT
	b) Short scanning time
	c) Image processing easier due to limited beam
	d) Less expensive
	e) Data reconstruction can be performed on a personal computer
	f) No idea
17)	For what cases would you like to use CBCT in your future professional career?
	a) Orthodontic assessment
	b) Implant dentistry
	c) Evaluation of cysts and tumors
	d) Evaluation of impacted teeth

e)	Trauma cases
f)	Any other(specify)
18)	Is adequate teaching given to the dental under graduate students regarding CBCT by the faculty? a) Yes b) no
19)	Have you attended any courses related to CBCT? a) Yes b) No
20)	Are you willing to attend courses pertaining to CBCT? a) Yes b) no c) maybe if within budget
21)	Which one do you prefer when you need 3D imaging of head and neck region? a) CT b)CBCT if available
22)	Have you ever advised CBCT for any diagnosis? a) Yes b) no
23)	Are you willing to obtain any updated information regarding CBCT? a) Yes b)no c) maybe

Table 2: Table showing gender (M/F) and qualification (B: Bachelor’s degree; M: Master’s degree) of study subjects.

Gender	Qualification		Total
	B	M	
F	7(8.4%)	76(91.6%)	83(41.5%)
M	19(16.2%)	98(83.8%)	117(58.5%)
Total	26(13.0%)	174(87.0%)	200(100.0%)

Table 3: Showing opinion of the study subjects towards the necessity of CBCT.

	Yes	No
Use digital imaging modalities to make radiographs	167(83.5%)	33(16.5%)
Aware of CBCT in dental radiology	200(100.0%)	0
CBCT useful diagnostic tool	200(100.0%)	0
CBCT ultimate tool in future dentistry and research	54(27.0%)	146(73.0%)
Necessity of having CBCT in dental institutions	200(100.0%)	0
Adequate teaching given at under graduate students	153(76.5%)	47(23.5%)
Attended any courses related to CBCT	95(47.5%)	105(52.5%)
Advised CBCT for any diagnosis	82(41.0%)	118(59.0%)

Table 4: Showing response of the study subjects towards updating their knowledge about CBCT.

	Y	N	Maybe
Frequent CDES should be conducted	171(85.5%)	0	29(14.5%)
CBCT in future career	167(83.5%)	0	33(16.5%)
Willingness to obtain updated information	192(96.0%)	0	8(4.0%)

information on CBCT.53.5% of the participants did not attend any courses related to CBCT and 69% were willing to attend courses pertaining to CBCT (Table 4).

The reasons to use digital imaging were as follows: 42.5% believed less radiation dose, 23%-short time required to obtain images, 26%-easy to store data, 22%-no developing required, 6.5%- adjustments and measurements can be made. The reasons of not using digital imaging were CBCT being expensive in 98.5%. 100% of the participants were aware of CBCT in dental radiology 73.0% came across the term CBCT through seminars/workshops/CDE’S .100% of the participants felt CBCT is a useful diagnostic tool in dentistry. 27% felt CBCT will be the ultimate tool in future dentistry and researchwhereas73% felt it will not be the the ultimate tool. 42.5% believed CBCT will be used in routine dental practice in the future in all specialties of dentistry,

41.5% felt CBCT will be used in selected dental specialties only. 52.5% felt education regarding CBCT should be included in IV BDS, 41.5% in post graduation (Table 5).

44.5% felt CBCT is useful in implant dentistrythe question regarding teaching in dental schools 76.5% felt adequate teaching was not given to the dental under graduate students regarding CBCT. 90% of the participants would prefer CBCT over CT for 3D imaging of head and neck region (Table 6).

Discussion

The studies assessing dental practitioner’s knowledge about dental radiology have focused mainly on digital systems and radiation protection in the past. The literature includes one study that evaluates the effectiveness of web-based instruction in the interpretation of anatomy using CBCT images. Little information appears in the literature regarding dental practitioner’s knowledge and attitudes about CBCT [4-7]. The present study used a questionnaire to gauge the level of knowledge regarding CBCT among dental practitioners. Several studies have evaluated the popularity of digital imaging since the adoption of digital radiology in dental offices. One study reported that 14% of dental practitioners chose using digital radiography, but subsequent studies reported a higher percentage [8]. The questionnaire was developed with guidance of previous studies [9,10]. Among 200 dentists surveyed, 83.5% use digital radiography for making radiographs and 16.5% did not use digital radiography for making radiographs. The reasons of not using digital imaging were CBCT being expensive which was similar to the study done by Yalcinkaya SE et al. [8]. 100% of the participants were aware of CBCT in dental radiology similar to study done by Yalcinkaya SE et al. [8]. Majority of the participants came across the term CBCT through seminars/workshops/CDE’S was in accordance to Balabaskaran k et al. [11]. All of the participants felt CBCT is a useful diagnostic tool in dentistry.in the present study, 96% were willing to obtain any updated information on CBCT which was similar to study by Balabaskaran k et al. [11]. In a similar study done by Brian and Williamson, no developing process was stated as an most important factor to choose digital imaging [8]. In our study less radiation dose was the most important reason stated.

Conclusion

CBCT has an important role in the diagnosis of oral and maxillofacial pathologies with reduction in radiation dose. The

Table 5: Showing response of the study subjects towards digital imaging.

		N(%)
Reason to use digital imaging (Q4)	Less radiation dose	85(42.5%)
	Short time	46(23.0%)
	Easy to store data	52(26.0%)
	No developing required	44(22.0%)
	Adjustments and measurements can be made	13(6.5%)
Satisfied with digital modality available (Q5)	Not at all	11(5.5%)
	Little	48(24.0%)
	No idea	2(1%)
	Satisfied	139(69.5%)
Reason for not using digital imaging(Q6)	Expensive	197(98.5%)
	Do not know to use computer	1(0.5%)
	No idea	2(1.0%)
The term CBCT came across (Q8)	Seminar/workshop/CDE	146(73.0%)
	Lessons by faculty	24(12%)
	Internet	15(7.5%)
	Seniors	13(6.5%)
	Others	20(10.0%)
To what extent CBCT will be used in routine practice (Q11)	Will not be used	2(1.0%)
	In all specialities	85(42.5%)
	Limited use	29(14.5%)
	Selected field	83(41.5%)
	No idea	1(0.5%)
Total		200(100%)

Table 6: Showing response of the study subjects towards applications of CBCT.

		N(%)
Preference when 3D imaging required (Q21)	CT	20(10.0%)
	CBCT if available	180(90.0%)
Teaching of CBCT at under graduate level (Q12)	III BDS	16(8.0%)
	IV BDS	105(52.5%)
	PG	83(41.5%)
Advantages of CBCT over other modalities (Q16)	Lower radiation than CT	106(53.0%)
	Short scan time	16(8.0%)
	Processing easy	30(15.0%)
	Less expensive	9(4.5%)
	Data reconstruction can be performed	76(38.0%)
	No idea	2(1.0%)
Cases to use CBCT (Q17)	Orthodontic Assessment	30(15.0%)
	Implant dentistry	89(44.5%)
	Evaluation of cysts and tumors	52(26.0%)
	Evaluation of impacted teeth	47(23.5%)
	Trauma cases	15(7.5%)
	others	13(6.5%)

information obtained from the study highlighted the need for adapting to new technologies like CBCT and regular continuing education programmes, post graduate education courses, meetings and seminars are required to update dentists' knowledge. The study also highlighted majority of participants believed CBCT is a useful diagnostic tool in dentistry and research. The study also highlighted

that adequate teaching was not imparted regarding CBCT in educational institutions but were willing to attend courses and update knowledge on CBCT if provided with opportunities. Dental practitioners should prescribe CBCT imaging only when they expect that diagnostic yield will benefit patient care, enhance patient safety or improve clinical outcomes significantly.

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References

1. Scarfe WC, Farman AG, Sukovic P. Clinical applications of cone-beam computed tomography in dental practice. *J Can Dent Assoc.* 2006; 72: 75-80.
2. Scarfe WC, Farman AG. What is cone-beam CT and how does it work? *Dent Clin North Am.* 2008; 52: 707-730.
3. White SC. Cone-beam imaging in dentistry. *Health Phys.* 2008; 95: 628-637.
4. Wenzel A, Moystad A. Experience of Norwegian general dental practitioners with solid state and storage phosphor detectors. *Dentomaxillofac Radiol.* 2001; 30: 203-208.
5. Aps JK. Flemish general dental practitioners' knowledge of dental radiology. *Dentomaxillofac Radiol.* 2010; 39: 113-118.
6. Jacobs R, Vanderstappen M, Bogaerts R, Gijbels F. Attitude of the Belgian dentist population towards radiation protection. *Dentomaxillofac Radiol.* 2004; 33: 334-339.
7. Davies C, Grange S, Trevor MM. Radiation protection practices and related continuing professional education in dental radiography: A survey of practitioners in the North east of England. *Radiography.* 2005; 11: 255-261.
8. Yalcinkaya SE, Berker YG, Peker S, Basturk FB. Knowledge and attitudes of Turkish endodontists towards digital radiology and cone beam computed tomography. *Niger J Clin Pract.* 2014; 17: 471-478.
9. Ilgüy D, Ilguy M, Dincer S, Bayirli G. Survey of dental radiological practice in Turkey. *Dentomaxillofac Radiol.* 2005; 34: 222-227.
10. Wenzel A, Kirkevang LL. Students' attitudes to digital radiography and measurement accuracy of two digital systems in connection with root canal treatment. *Eur J Dent Educ.* 2004; 8: 167-171.
11. Balabaskaran k, Arathy Srinivasan L. Awareness and Attitude among Dental Professional towards CBCT. *IOSR-JDMS.* 2013; 55-59.