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Knowledge and clinical practices of general dentists and specialists regarding cone-beam computed tomography: a cross-sectional study

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ABSTRACT

Aims: This study aimed to evaluate cone-beam computed tomography (CBCT) usage patterns, knowledge levels, and clinical approaches among general dentists and specialists, and to examine the effect of professional status on CBCT referral behavior, image interpretation practices, and awareness of incidental findings.

Methods: This cross-sectional descriptive study included 275 dentists, comprising 155 specialists and 120 general dentists. Data were collected using an 18-item questionnaire assessing CBCT referral frequency, clinical indications, educational background, image evaluation habits, radiation awareness, and attitudes toward incidental findings. Data were presented as frequencies and percentages. Comparisons between specialists and general dentists were performed using the Pearson Chi-square test. Binary logistic regression analysis was conducted to identify factors associated with CBCT referral behavior.

Results: Overall, 64.7% of participants reported referring patients for CBCT imaging, with implant planning being the most common indication (59.1%). Most respondents (81.8%) had not received formal CBCT interpretation training. Specialists reported encountering incidental findings significantly more frequently than general dentists (52.9% vs. 31.7%, $p<0.001$). In total, 82.9% believed that the entire CBCT volume should be evaluated by a qualified specialist, 90.2% preferred a radiologist-prepared CBCT report, and 88% were willing to attend a structured CBCT course. Logistic regression showed that specialist status, private-sector practice, and previous CBCT interpretation training were significantly associated with CBCT referral behavior.

Conclusion: Although CBCT is widely used in dental practice, important gaps remain in interpretation training, volumetric assessment, and management of incidental findings. Structured CBCT education and multidisciplinary reporting practices should be strengthened.

Keywords: Cone-beam computed tomography, dentistry, CBCT awareness, dental radiology

INTRODUCTION

Cone-beam computed tomography (CBCT) has become an integral component of contemporary diagnostic imaging in dental and maxillofacial practice. It provides superior three-dimensional visualization compared with conventional two-dimensional radiography in various clinical situations, including implant planning, assessment of endodontic anatomy, localization of impacted teeth, evaluation of temporomandibular joint pathologies, and analysis of maxillofacial trauma.[1,2] Because CBCT scans encompass a relatively large anatomical field, a high prevalence of incidental findings in the head and neck region has been reported.[3-5] These findings may include pathologies of the paranasal sinuses or airways, odontogenic and non-odontogenic cystic or neoplastic lesions, and various soft tissue calcifications.[6] Furthermore, the ability of CBCT to generate high-resolution three-dimensional images without geometric distortion and superimposition of anatomical structures constitutes one of its principal diagnostic advantages.[7]

Despite these benefits, concerns remain regarding its rational use. Compared with conventional dental imaging modalities, CBCT is associated with higher radiation exposure, increased cost, interpretative challenges, and the risk of inappropriate indications.[8,9] For this reason, several international organizations recommend that CBCT be prescribed only when clinically justified and that practitioners requesting or interpreting CBCT scans possess adequate knowledge and training.[10,11]

The professional responsibilities and educational requirements of dentists who prescribe, acquire, or interpret CBCT scans have been clearly defined in international guidelines.[8] Numerous professional bodies emphasize that

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the entire CBCT volume—not only the region of interest (ROI)—should be systematically evaluated by an oral and maxillofacial radiologist or a practitioner with appropriate training and competence in CBCT interpretation, and that a comprehensive radiologic report should be generated.[12-14] Nevertheless, despite the widespread integration of CBCT into clinical practice, it has been reported that many dentists did not receive sufficient CBCT training during their undergraduate education.

The existing literature indicates substantial variability in knowledge levels regarding CBCT indications, radiation safety, and image interpretation among both general dentists and specialists.[15,16] Postgraduate education, clinical experience, and case diversity encountered in practice may directly influence CBCT prescription frequency and the appropriateness of such referrals.[17] In this context, evaluating dentists' knowledge, attitudes, and clinical practices concerning CBCT is crucial for minimizing unnecessary radiation exposure and improving diagnostic accuracy.

Therefore, the aim of the present study was to assess the knowledge levels and clinical practices related to CBCT among general dentists and specialists, and to investigate the influence of professional status and prior clinical experience on CBCT prescription behavior. The study hypothesis was that a considerable proportion of dentists continue to demonstrate significant knowledge gaps regarding CBCT indications, radiation safety, and image interpretation.

METHODS

Ethics

The study protocol was approved by the Clinical Researches Ethics Committee of Tokat Gaziosmanpaşa University (Date: 21.11.2025, Decision No: 25-MOBAEK-405). All participants voluntarily agreed to participate and provided informed consent prior to inclusion in the study. The research was conducted in accordance with the principles of the Declaration of Helsinki.

Study Design

This study was designed as a cross-sectional, descriptive survey aimed at evaluating dentists' knowledge, attitudes, and clinical practices regarding the use of CBCT.

Sample and Participants

The study included general dentists and dental specialists from multiple disciplines, including orthodontics, oral and maxillofacial surgery, pediatric dentistry, oral and maxillofacial radiology, endodontics, and periodontology. A total of 275 participants with professional experience ranging from 1 year to more than 20 years were included. Data were collected over a three-month period between November 2025 and February 2026. Participants were recruited using convenience sampling via e-mail from public and private dental settings during this period.

The inclusion criteria were as follows:

- Active dental practice in Turkiye
- Being either a general dentist or a dental specialist
- Voluntary agreement to participate in the survey

The exclusion criteria were as follows:

- Not actively practicing dentistry
- Refusal or absence of consent to participate
- Incomplete or inconsistent questionnaire responses

Questionnaire Development and Content

As this study was designed as a descriptive cross-sectional survey, the questionnaire was developed based on a review of previous studies evaluating dentists' CBCT-related knowledge, clinical practices, referral patterns, image interpretation approaches, educational background, radiation awareness, and attitudes toward incidental findings.[13] The draft questionnaire was reviewed by a multidisciplinary expert panel consisting of two oral and maxillofacial surgeons, one oral and maxillofacial radiologist, and one orthodontist, all of whom were familiar with the clinical use of CBCT. The experts evaluated the items in terms of content relevance, clarity, comprehensibility, and coverage of the study objectives. Based on their feedback, necessary linguistic and structural revisions were made, and the questionnaire was finalized before distribution. However, no formal pilot testing or comprehensive psychometric validation was performed prior to the main survey. Cronbach's alpha was not calculated because the questionnaire was not designed to produce a single psychometric total score. The items assessed heterogeneous domains, including sociodemographic characteristics, CBCT referral patterns, clinical indications, imaging output preferences, training status, image interpretation practices, incidental findings, professional expectations, and CBCT-related knowledge.

The final questionnaire consisted of 18 items related to CBCT use and oral and maxillofacial radiology. The first section included sociodemographic variables such as age, gender, years of professional experience as a dentist, and years of experience as a specialist. The second section included clinical practice-related questions addressing CBCT referral frequency, indications for CBCT use, preferred imaging outputs, history of CBCT training, habits of evaluating the entire CBCT volume, frequency of encountering incidental findings, and the need for specialist consultation. In this study, incidental findings were defined as clinically relevant head and neck findings outside the primary indication for imaging. The third section evaluated CBCT-related technical knowledge and radiological terminology, including awareness of radiation dose and knowledge of terms such as FOV and ROI. The fourth section focused on professional expectations and responsibilities, including responsibility for evaluating the entire CBCT volume, the need for a radiologist-prepared CBCT report, and opinions regarding CBCT competency and training requirements.

Data Collection

The questionnaire was distributed electronically via e-mail to dentists working in public and private dental settings.

Participation was voluntary. All responses were collected anonymously, and no personally identifiable information was recorded. Because the survey link was disseminated through professional mailing lists, the exact number of individuals who received the invitation could not be determined; therefore, the response rate could not be calculated.

Statistical Analysis

All analyzed variables were categorical in nature. Descriptive statistics were presented as frequencies (n) and percentages (%). Comparisons between specialists and general dentists were performed using IBM SPSS Statistics (Version 27). Associations between professional status (specialist/general dentist) and dichotomous categorical variables (e.g., yes/no responses) were analyzed using cross-tabulations and the Pearson Chi-square test. Binary logistic regression analysis was performed to identify factors associated with CBCT referral behavior. CBCT referral status was used as the dependent variable, while professional status, age group, professional experience group, workplace setting, and CBCT interpretation training status were included as independent variables. Results were reported as odds ratios (ORs) with 95% confidence intervals (CIs), with statistical significance set at $p<0.05$.

Sample size estimation was performed using G*Power version 3.1.9.7 for the Chi-square test. Based on an effect size of 0.25, a significance level (α) of 0.05, and a statistical power (1–β) of 95%, the minimum required sample size was calculated as 175 participants. Considering a potential 20% data loss rate, the target sample size was increased to at least 210 participants. Ultimately, 275 dentists were included in the study.

RESULTS

Demographic Characteristics

A total of 275 dentists participated in the study. Of these, 53.8% were female (n=148) and 46.2% were male (n=127). The majority of participants were aged 22-30 years (78.5%, n=216), followed by 31-40 years (18.5%, n=51) and 41-50 years (2.9%, n=8). Regarding professional experience, 74.9% had 0-5 years of experience, 18.2% had 6-10 years, 4.4% had 11-15 years, 1.5% had 16-20 years, and 1.1% had more than 21 years of experience. Among participants, 56.4% were specialists and 43.6% were general dentists. Among specialists, 91.6% had 0-5 years of specialist experience. In terms of workplace distribution, 73.5% were employed in the public sector and 26.5% in the private sector.

CBCT Utilization Patterns

Overall, 64.7% (n=178) reported referring patients for CBCT imaging. The most common indication for referral was implant planning (59.1%), followed by impacted tooth evaluation (16.5%), bone pathologies (9.7%), orthognathic surgery (9.1%), and endodontic assessment (5.7%). Regarding requested imaging outputs, 45.6% requested all outputs, 30.8% requested DICOM data, 20.3% requested serial images, and 3.3% requested a detailed radiologic report. DICOM data were primarily used for both implant planning and imaging software (67.9%).

Evaluation of CBCT Volumes

When asked about evaluating the entire CBCT volume, 25.3% reported doing so in most cases, 20.9% in approximately half of cases, 33.5% in one-quarter of cases, 13.2% never, and 7.1% always.

CBCT Training

A large majority (81.8%) reported not receiving formal CBCT interpretation training. Among those who received training, 49% received both serial image and software training, 38.8% received serial image training, and 12.2% received software training. Training sources included academic institutions (65.3%), government institutions (12.2%), sales representatives (12.2%), and online courses (10.2%).

Incidental Findings

A total of 43.6% reported encountering incidental findings during CBCT evaluation. Localization of incidental findings was reported as bone tissue in 60%, both bone and soft tissue in 38.3%, and soft tissue only in 1.7% of cases. Referral specialties included oral and maxillofacial surgery (63.9%), otorhinolaryngology (20.2%), radiology (11.8%), and endodontics (3.4%).

Knowledge Level Regarding CBCT

A total of 68% correctly identified that radiation dose depends on scanning volume. Regarding image identification, 63.6% correctly identified cross-sectional images, 17.8% selected sagittal images, and 17.1% were unsure. Additionally, 74.2% correctly stated that cross-sectional images do not represent the entire volume (**Figure**). Regarding FOV and ROI knowledge, 48% correctly stated that FOV is larger than ROI, and 31.6% indicated that FOV is three-dimensional whereas ROI is two-dimensional.

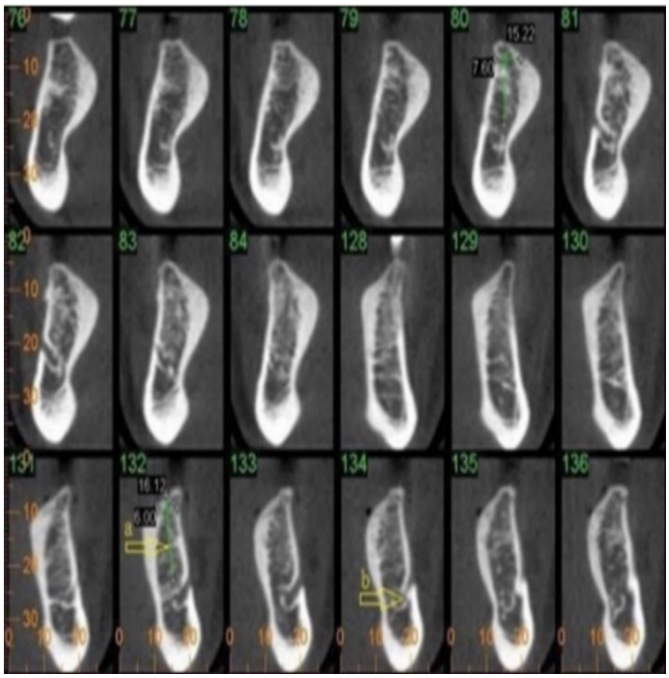

Figure. Representative cross-sectional CBCT image. The image was presented to participants as an example in the radiological terminology question and does not contain any personally identifiable information.
CBCT: Cone-beam computed tomography

Attitudes Toward Reporting and Education

A total of 82.9% believed that the entire CBCT volume should be evaluated by a specialist, 90.2% preferred having a radiologist-prepared report, 88% expressed willingness to attend a CBCT course, 74.9% supported mandatory training prior to purchasing a CBCT device, and 91.3% were aware that incidental findings may occur.

Comparison Between Specialists and General Dentists

No significant difference was observed in CBCT interpretation training between specialists (21.9%) and general dentists (13.3%) (χ^2=3.364, p=0.067) (Table 1). However, specialists reported significantly higher rates of encountering incidental findings (52.9%) compared with general dentists (31.7%) (χ^2=12.402, p<0.001) (Table 2). No statistically significant differences were found between groups regarding belief that the entire volume should be evaluated (p=0.259) (Table 3), preference for a radiologist-prepared report (p=0.188) (Table 4), willingness to attend a CBCT course (p=0.100), support for mandatory training before device purchase (p=0.249), or awareness of possible incidental findings (p=0.839) (Table 5).

Table 1. Distribution of CBCT interpretation training according to professional status

Professional status	Received training n (%)	No training n (%)	Total	χ^2	p-value
Specialist (n=155)	34 (21.9)	121 (78.1)	155		
General dentist (n=120)	16 (13.3)	104 (86.7)	120	3.364	0.067
Total	50 (18.2)	225 (81.8)	275		

CBCT: Cone-beam computed tomography. Comparisons were performed using the Pearson Chi-square test. A p-value < 0.05 was considered statistically significant.

Table 2. Distribution of encountering incidental findings during CBCT evaluation according to professional status

Professional status	Yes n (%)	No n (%)	Total	χ^2	p-value
Specialist (n=155)	82 (52.9)	73 (47.1)	155		
General dentist (n=120)	38 (31.7)	82 (68.3)	120	12.402	<0.001
Total	120 (43.6)	155 (56.4)	275		

CBCT: Cone-beam computed tomography. Comparisons were performed using the Pearson Chi-square test. A p-value < 0.05 was considered statistically significant.

Table 3. Distribution of opinions regarding who should evaluate the entire CBCT volume according to professional status

Professional status	Specialist should evaluate n (%)	Clinician should evaluate n (%)	Total	χ^2	p-value
Specialist (n=155)	132 (85.2)	23 (14.8)	155		
General dentist (n=120)	96 (80.0)	24 (20.0)	120	1.272	0.259
Total	228 (82.9)	47 (17.1)	275		

CBCT: Cone-beam computed tomography. Comparisons were performed using the Pearson Chi-square test. A p-value < 0.05 was considered statistically significant.

Table 4. Distribution of preference for a radiologist-prepared CBCT report according to professional status

Professional status	Yes n (%)	No n (%)	Total	χ^2	p-value
Specialist (n=155)	143 (92.3)	12 (7.7)	155		
General dentist (n=120)	105 (87.5)	15 (12.5)	120	1.729	0.188
Total	248 (90.2)	27 (9.8)	275		

CBCT: Cone-beam computed tomography. Comparisons were performed using the Pearson Chi-square test. A p-value < 0.05 was considered statistically significant.

Table 5. Distribution of awareness of clinically significant incidental findings beyond dental structures in CBCT scans according to professional status

Professional status	Yes n (%)	No n (%)	Total	χ^2	p-value
Specialist (n=155)	141 (91.0)	14 (9.0)	155		
General dentist (n=120)	110 (91.7)	10 (8.3)	120	0.041	0.839
Total	251 (91.3)	24 (8.7)	275		

CBCT: Cone-beam computed tomography. Comparisons were performed using the Pearson Chi-square test. A p-value < 0.05 was considered statistically significant.

Direct comparisons between specialists and general dentists showed that specialists referred patients for CBCT significantly more frequently than general dentists (76.1% vs. 50.0%, p<0.001). However, referral indications did not differ significantly between the two groups (p=0.396), and implant planning remained the most common indication in both groups. Preferred imaging outputs were also similar between specialists and general dentists (p=0.994). In contrast, the purpose of DICOM use differed significantly between groups (p=0.013), with specialists more frequently reporting the use of DICOM files for both implant-planning and viewing software.

Factors Associated with CBCT Referral Behavior

Binary logistic regression analysis was performed to identify factors associated with CBCT referral behavior. The overall model was statistically significant (p<0.001) and showed acceptable fit according to the Hosmer–Lemeshow test (p=0.222). After adjustment for age group, professional experience group, workplace setting, and CBCT interpretation training status, professional status was significantly associated with CBCT referral behavior. Specialists had higher odds of referring patients for CBCT than general dentists (aOR=3.38, 95% CI: 1.90-6.01, p<0.001).

Working in the private sector (aOR=4.06, 95% CI: 1.94-8.48, p<0.001) and having received CBCT interpretation training (aOR=5.57, 95% CI: 2.01-15.40, p<0.001) were also significantly associated with CBCT referral. Age group (aOR=2.26, 95% CI: 0.64-8.05, p=0.207) and professional experience group (aOR=0.99, 95% CI: 0.44–2.23, p=0.983) were not significantly associated with referral behavior.

DISCUSSION

Although CBCT is widely utilized across various dental indications, considerable variability persists among dentists regarding appropriate prescription practices, indication

selection, and image interpretation. The present study comprehensively evaluated CBCT usage patterns, educational background, image assessment approaches, and awareness of incidental findings among general dentists and specialists. The findings demonstrate persistent gaps in CBCT interpretation training and volumetric evaluation practices.

CBCT has become a standard imaging modality in contemporary dentistry owing to its accessibility, its relatively lower radiation exposure compared with conventional computed tomography, and its capacity to provide high-resolution three-dimensional images. Its clinical value is particularly evident in implant planning, localization of impacted third molars, and the evaluation of maxillofacial osseous pathologies.[14,18-21] In agreement with the existing literature, implant planning emerged as the most frequent indication for CBCT referral in the present study. This trend reflects the growing demand for precise three-dimensional anatomical assessment aimed at minimizing surgical risk and optimizing treatment outcomes. Nevertheless, CBCT indications may vary according to clinical setting and specialty; for instance, Ertem et al.[22] reported that CBCT requests in an oral surgery department were most commonly associated with the assessment of impacted mandibular third molars, odontogenic cysts and benign tumors, and implant evaluation.

Previous national studies from Turkiye provide important context for interpreting the present findings. Dölekoğlu et al.[21] reported that 56% of Turkish dentists had general knowledge about CBCT, with higher awareness among academicians; only 30% had referred patients for CBCT imaging, mainly for implant planning and cyst-tumor diagnosis. Later, Temur and Hatipoğlu[23] reported high CBCT awareness among Turkish dentists (91.4%), although only 55.2% stated that they could interpret CBCT images and 66.7% considered their undergraduate CBCT education insufficient. Implant planning was also the most common indication in their study. Similarly, Temur et al.[24] showed that 84.8% of Turkish pediatric dentists needed further CBCT training and emphasized the importance of small FOV selection in pediatric patients. Together with the present findings, these national data suggest that CBCT prescription patterns may vary according to specialty, clinical setting, and patient population, while the need for structured, indication-specific, and radiation-conscious CBCT education remains a common national concern. Overall, these findings further support the need for structured CBCT education and standardized referral criteria in Turkiye.

Despite its routine use, CBCT education at the undergraduate level remains insufficient, particularly regarding advanced interpretation skills.[25] Similarly, other studies have reported that many clinicians use CBCT images without adequate radiological training.[21] In line with these reports, the majority of participants in the present study indicated that they had not received formal CBCT interpretation training. Although specialists reported higher training rates than general dentists, the difference did not reach statistical significance. This suggests that CBCT education gaps may also affect specialist training pathways.

Professional status emerged as an important factor influencing CBCT referral behavior in the present study. After adjustment for age group, professional experience, workplace setting, and CBCT interpretation training status, specialists had significantly higher odds of referring patients for CBCT than general dentists. This finding echoes previous survey-based studies reporting greater CBCT awareness and use among academicians, specialists, or clinicians with postgraduate training.[21,23,24] Such an association may reflect differences in case complexity, clinical responsibilities, and exposure to procedures requiring three-dimensional imaging, such as implant planning, impacted tooth assessment, and maxillofacial pathology evaluation. In addition, working in the private sector and having received CBCT interpretation training were also significantly associated with CBCT referral behavior. These findings support competency-based training for dentists who prescribe or interpret CBCT scans.[17]

Direct comparisons further clarified the differences between specialists and general dentists. Although specialists referred patients for CBCT considerably more frequently than general dentists, the distribution of referral indications and the preferred imaging outputs were comparable between the two groups. This suggests that professional status may influence the frequency of CBCT prescription rather than its clinical rationale. The only notable difference concerned the intended use of DICOM data: specialists more frequently employed DICOM files for both implant planning and viewing software, which may reflect their greater engagement in three-dimensional treatment planning.

Evaluation habits regarding the entire CBCT volume revealed an important discrepancy between awareness and practice. Only a small proportion of participants reported consistently evaluating the entire scan volume, while a considerable number limited their assessment to specific regions. Interestingly, both specialists and general dentists largely agreed that the responsibility for evaluating the entire CBCT volume should belong to a qualified specialist. This indicates a recognition of professional responsibility; however, such recognition does not necessarily translate into consistent clinical behavior.

Incidental findings represent a critical component of CBCT interpretation. International guidelines emphasize that CBCT interpretation should include the entire scanned volume, not only the ROI.[8,10,14] Failure to assess the full volume may result in overlooked pathologies and potential medico-legal implications. Approximately half of the participants in this study reported encountering incidental findings during CBCT evaluation. This prevalence aligns with previous reports indicating that incidental findings in the head and neck region may range from 17% to 93%, depending on patient population and imaging indication.[3,26] Most incidental findings in the present study were localized in bone structures, mirroring previous research that reported frequent maxillary sinus alterations, temporomandibular joint changes, and osseous pathologies in CBCT scans.[26] The high referral rates to oral and maxillofacial surgeons and otorhinolaryngologists

further highlight the multidisciplinary implications of CBCT findings. Notably, specialists reported significantly higher rates of encountering incidental findings compared with general dentists. This may be associated with more comprehensive and systematic image evaluation rather than a true difference in prevalence.

Another important finding was the strong preference for radiologist-prepared CBCT reports. The literature consistently supports comprehensive interpretation by an oral and maxillofacial radiologist or a clinician with adequate training, as this approach enhances diagnostic accuracy and reduces the likelihood of missed incidental findings.[16] Ploussi and Efstathopoulos[27] have further emphasized that the involvement of radiologists in CBCT workflows strengthens radiation safety culture and reduces unnecessary exposure. Participants' willingness to attend CBCT training programs and their support for mandatory training before device acquisition are in line with international recommendations.

Regarding technical knowledge, while a considerable proportion of participants correctly identified fundamental concepts such as the relationship between radiation dose and scanning volume, knowledge distribution was not homogeneous. Inconsistent understanding of FOV, ROI, and radiation optimization principles may have implications for radiation safety and justification practices. These findings highlight the need to improve training in radiation protection and imaging protocol optimization.

Limitations

This study has several limitations. First, the voluntary nature of participation and the use of convenience sampling may have introduced selection bias. In addition, the inclusion of the term "CBCT usage survey" in the questionnaire title may have discouraged participation from clinicians who were less familiar with CBCT, potentially leading to an overestimation of CBCT-related knowledge and awareness levels. Therefore, the study sample may not fully represent the overall dentist population in Turkiye, and the findings should be generalized to the broader dental community with caution. Second, the data were collected through self-reporting, which is inherently subject to response bias. Participants may have overestimated their clinical behaviors, image evaluation practices, or awareness levels. Third, no formal pilot testing or comprehensive psychometric validation was performed before the main survey. Although the questionnaire was developed based on previous literature and reviewed by a multidisciplinary expert panel for content relevance, clarity, comprehensibility, and clinical appropriateness, the absence of pilot testing may have limited the preliminary assessment of item clarity, feasibility, and response consistency. Furthermore, internal consistency analysis was not performed because the questionnaire items assessed heterogeneous domains and were not intended to generate a single psychometric scale score. Another limitation is that the study population predominantly consisted of early-career dentists, which may limit the applicability of the findings to more experienced practitioners. Furthermore, the cross-sectional design precludes causal inferences between professional status and CBCT-related knowledge or clinical practices. Finally, because the survey was distributed via e-mail using convenience sampling and the total number of recipients was unknown, the response rate could not be calculated, which may have further affected the representativeness of the sample.

Future studies including larger, more heterogeneous, and multicenter samples encompassing clinicians with varying levels of professional experience would provide more comprehensive insights into CBCT interpretation practices and educational needs. Prospective interventional studies evaluating the effectiveness of structured CBCT training programs may further clarify optimal educational strategies.

CONCLUSION

This study indicates that CBCT is widely used in dental practice; however, important gaps persist in image interpretation, systematic full-volume evaluation, and the management of incidental findings. The lower rate of incidental finding recognition among general dentists highlights the need for clinically oriented continuing education. Greater emphasis on theoretical and practical CBCT training in undergraduate curricula, together with multidisciplinary reporting practices, may improve diagnostic accuracy and patient safety.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study protocol was approved by the Clinical Researches Ethics Committee of Tokat Gaziosmanpaşa University (Date: 21.11.2025, Decision No: 25-MOBAEK-405).

Informed Consent

Written informed consent was obtained from all individual participants prior to their inclusion in the study. Participants were fully informed about the study's aims, procedures, potential risks and benefits, and their rights—including the right to withdraw at any time without consequence. All participants voluntarily signed a written informed consent form.

Peer Review Process

This manuscript was subject to external peer review.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

Financial Disclosure

The authors received no financial support for the conduct or publication of this research.

Author Contributions

Concept: GK, MKK, SÇ; Design: GK, MKK, SÇ; Control: GK, MKK, SÇ; Data Collection and/or Processing: GK, MKK, SÇ; Analysis and/or Interpretation: GK, MKK, SÇ; Literature Review: GK, MKK, SÇ; Article Writing: GK, MKK, SÇ; Critical Review: GK, MKK, SÇ.

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