Research Article

# Awareness and Acceptance of AI In Dental Radiology Among Undergraduate Dental Students in Telangana

Dr. Jayasri Vanapalli[1], Dr. K. Vinay Kumar Reddy[2], Dr. Hema gopalaiah[3], Dr. Salma S[4], Dr. K.V.Lokesh[5], Dr.Balaji Rathod[6]

[1]Assistant professor ,Oral Medicine and Radiology , MNR dental college and hospital Fasalwadi, Sangareddy email. drjvanapalli@gmail.com.
[2]Head & Professor, Oral Medicine and Radiology ,MNR dental college and hospital ,Fasalwadi,Sangareddy ,vinayomr73@gmail.com,
[3]Professor, MNR dental college and hospital, Fasalwadi, Sangareddy, hemagop30@gmail.com.
[4]Post graduate, Oral Medicine and Radiology, MNR dental college and hospital, Fasalwadi, Sangareddy, salma.sanjamala1987@gmail.com.
[5]Associate Professor, Oral Medicine and Radiology, Anil Neerukonda institute of Dental sciences, Sangivalasa, Visakhapatnam lokesh.kosuri123@gmail.com.
[6] Assistant professor, MNR dental college and hospital, Fasalwadi, Sangareddy , balajirathod19@gmail.com.

Corresponding author:Dr. K. Vinay Kumar Reddy.

**ABSTRACT**

**Aim** : This study was done to know the awareness and acceptance of AI in dental radiology among undergraduate dental students in Telangana.

**Objectives :**To assess the awareness, perception, acceptance, knowledge of the benefits and limitations, and willingness to adopt artificial intelligence (AI) in future dental practice among undergraduate dental students.

**Materials and Methods**: A structured questionnaire of 15 questions was made, online google form were circulated to all the dental colleges in Telangana, students were asked to fill the forms and the responses were recorded, the questions are categorized in to 3 sections under knowledge, Attitude/ Acceptance and Future.

**Results**: After the survey the total number of responses were 293, among them number of Third year students were 115, Final year students were 94, Internship students were 84.

**Conclusion:** This study concluded that dental students have good awareness and a generally positive attitude towards Artificial Intelligence in dental radiology among undergraduate dental students.

**KEYWORDS:** Artificial intelligence , Dental radiology, Future, Acceptance.

## Introduction

Artificial Intelligence (AI) was first proposed by John McCarthy in 1956 in the field of computer science and technology. According to him, artificial intelligence (AI) is defined as "The science and engineering of making intelligent machines, especially intelligent computer programs; it is related to the task of using computers to understand human intelligence, but AI does not have to confined itself to the methods that are biologically observable.[1] Artificial intelligence (AI) is one of the most widely recognized technologies among healthcare professionals today. It is increasingly being used to assist in various healthcare tasks that traditionally relied on human expertise and decision-making. In the modern world, AI is developing rapidly and is being used for tasks such as image interpretation, treatment planning, and providing treatment options to patients, often with greater speed than conventional methods. AI is gradually becoming an integral part of t he medical field, with increasing acceptance and successful applications, including robotic surgeries. Similarly, dental radiology is advancing to the next level with the integration of AI, not only for the interpretation of radiographs but also for treatment planning and clinical decision-making.

AI has been used in the diagnosis of various oral diseases, such as dental caries, maxillary sinus diseases, periodontal diseases, salivary gland diseases, TMJ disorders, and oral cancer through clinical data and diagnostic images. Larger data sets would enable AI to predict the occurrence of precancerous conditions. They can aid in population-wide surveillance and decide on referrals to specialists. AI can efficiently detect microfeatures beyond the human eye and augment its predictive power in critical diagnosis.[8]

AI will definitely bring significant changes in the future, particularly by enabling the diagnosis of radiographs over a large volume of cases in less time and with reduced manpower. However, AI cannot replace radiologists, as errors can occur and human expertise is still essential. AI cannot replace the human touch, clinical judgment, and the ability of radiologists to understand and consider the patient's symptoms and overall clinical condition. However this study was for undergraduate students, because students are the future of AI .understanding of AI is essential in the future not only the dental but medical field is far more advance than us in AI , however AI cant not replace dentist it always aids us in reducing the time and quick assessment of the patient which will be helpful for the dentist.

## Materials and methods

The survey was conducted with 15 questions based on

Knowledge:

1. Can AI help identify pathologies missed by clinicians ?
2. AI can improve the accuracy of dental radiographic diagnosis
3. Can AI improve patient care in dentistry.
4. AI-generated diagnoses may not always be reliable.
5. Lack of training is a major barrier to adopt AI in dentistry.

Acceptance :

6. AI can serve as a useful decision-support tool for dentists.
7. AI-generated diagnoses should always be verified by a dentist.
8. I would trust AI recommendations when interpreting dental radiographs.

Future :

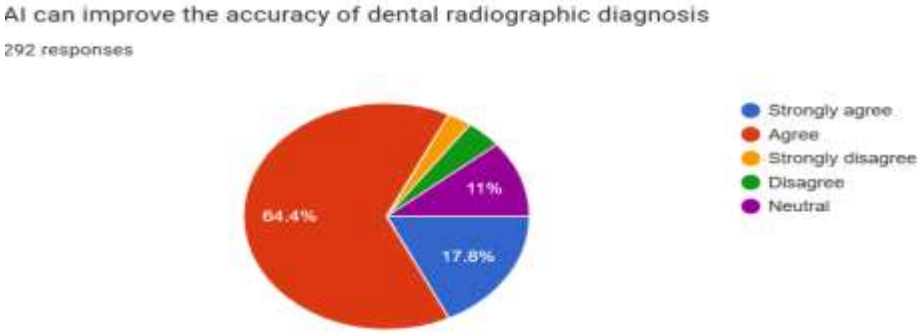
9. Learning about AI is important for future dental professionals.
10. Do you believe AI will significantly influence dental radiology in the next 10 years?
11. AI will become an essential part of future dental practice.
12. Do you think AI will play a significant role in the future of dental radiology
13. Are you willing to use AI-assisted radiographic tools in future practice
14. Would you be interested in attending AI-related workshops or training programs?
15. Recommendation for AI eductation in undergraduate curriculum.

Options of strongly agree, agree, disagree, strongly disagree and neutral were given as options for the questionare.

## Results

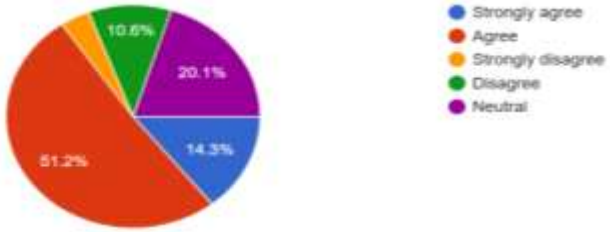
Total of 293 undergraduate BDS students among which 115 were third year students , 94 were final year students , 84 were internship students .The results showed questions categorized under knowledge were 60.8% of students agree and 13.7% strongly agree that AI can help identify pathologies missed by clinicians. 64.4% agree and 17.8% strongly agree AI can improve accurency of dental radiolographic diagnosis. 51.2% agree and 14.3% strongly agree that AI can improve patient care in dentistry. 58.6% agree and 19.9% strongly agree that AI generated diagnosis may not always be reliable and 53.4% agree and 21.2% strongly agree lack of traning is major barrier to adaptability AI.



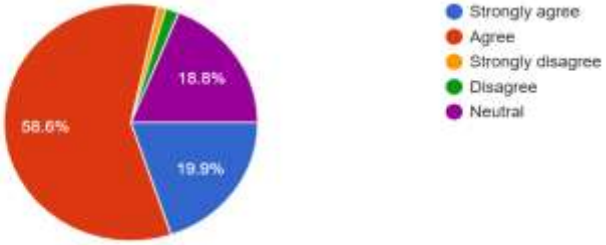
Can AI improve patient care in dentistry.

293 responses



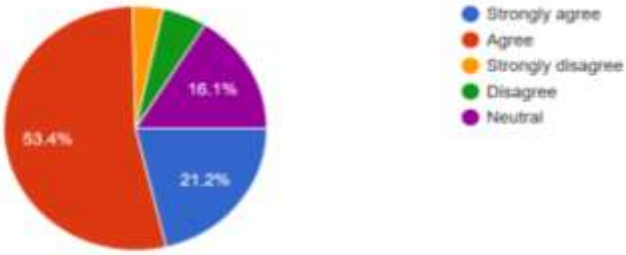

AI-generated diagnoses may not always be reliable.

292 responses




Lack of training is a major barrier to adopt AI in dentistry.

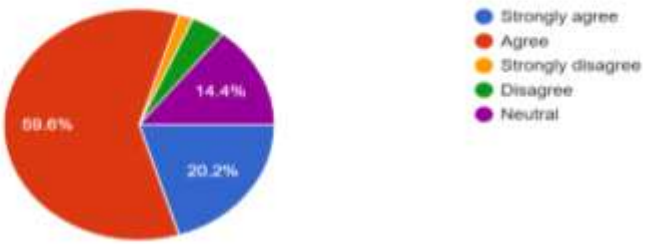
292 responses




However the results under the acceptance category showed 59.6% agree and 20.2% strongly agree that AI can serve as useful decisions support tool for dentist, 43.8% agree and 45.2 % strongly agree AI generated diagnosis should always be verified by a dentist and 45.2% strongly agree about the same stating that the acceptance of AI for the diagnosis. 39.3% agree and 35.2% were opted for neutral in trusting AI recommendation when interpreting dental radiograph.

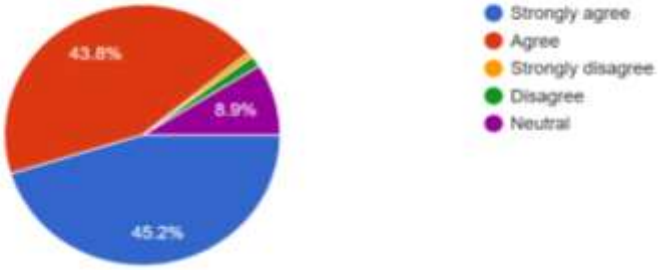
AI can serve as a useful decision-support tool for dentists.

292 responses



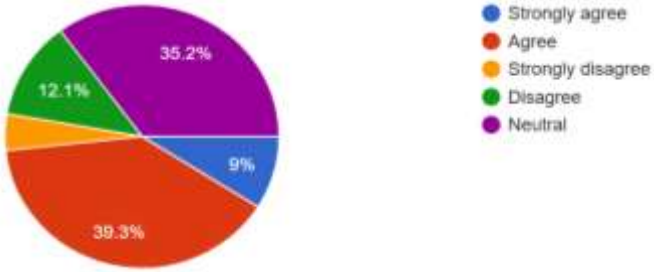
AI-generated diagnoses should always be verified by a dentist.

292 responses




I would trust AI recommendations when interpreting dental radiographs.

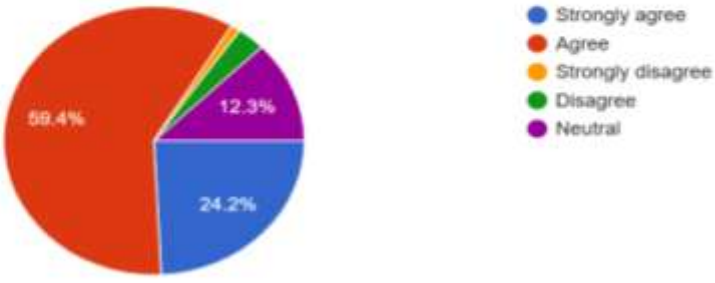
290 responses




The future of dental radiology showed 59.4% agree and 24.2% strongly agree learning about AI is important fro furture dental professionals, 55.6% agree and 24.9% strongly agree AI will significantly influence dental radiology in next 10 years, 54.8% agree and 19.9% strongly agree AI will become an essential part of future dental practice, 57.7% agree and 30% strongly agree AI will play a significant role in future of dental radiology, 57.9% agree and 16.4% strongly agree willingness to use AI assisted radiographic tools in future practice . 43.7% strongly agree and 23.9% agree that students are interested in attending AI related workshops and training. 57.7% agree and 30% strongly agree recommendation for AI education in undergraduate curriculum. This survey showed that AI can aid in radiological diagnoses.

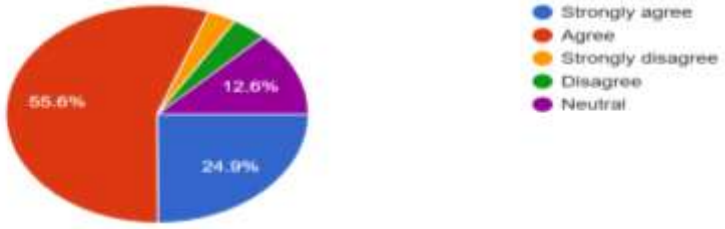
Learning about AI is important for future dental professionals.

293 responses



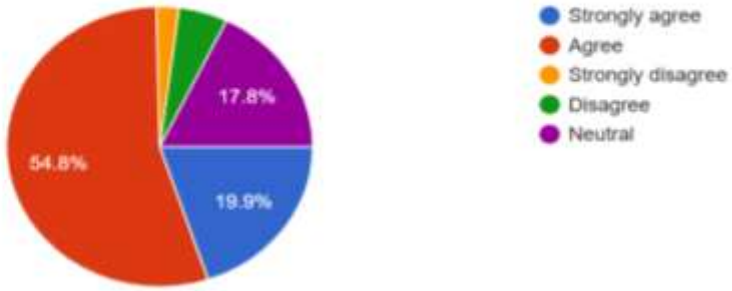
Do you believe AI will significantly influence dental radiology in the next 10 years?

293 responses



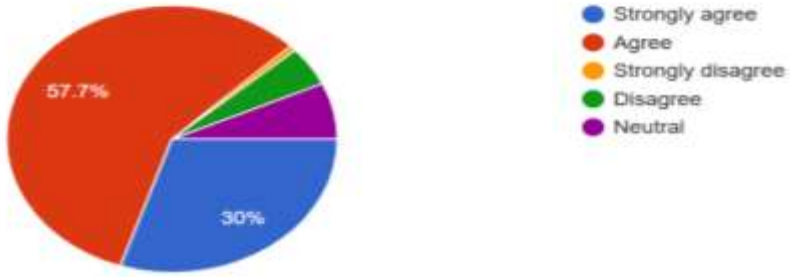

AI will become an essential part of future dental practice.

292 responses



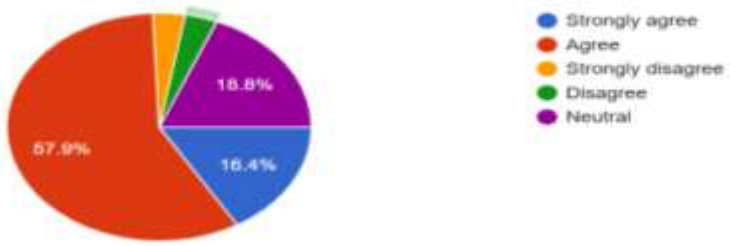

Do you think AI will play a significant role in the future of dental radiology

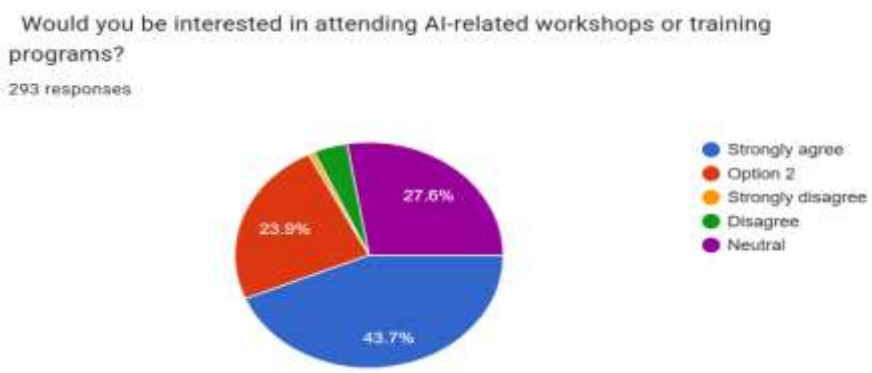
293 responses

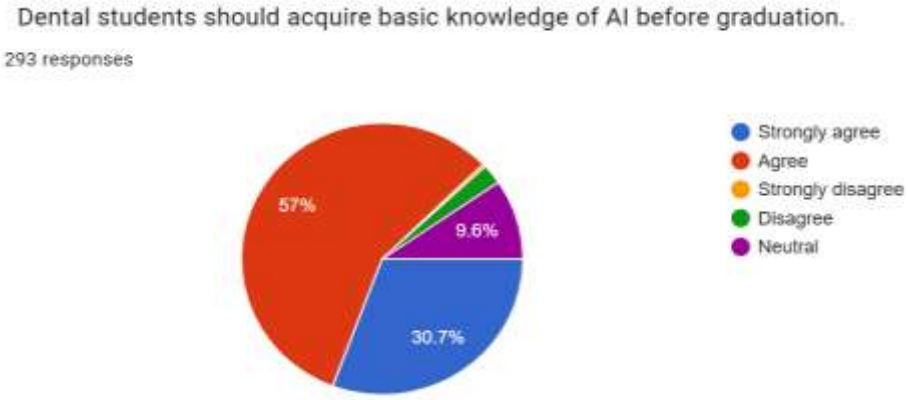



Are you willing to use AI-assisted radiographic tools in future practice

292 responses






## Discussion

This was the first survey-based study awareness and acceptance of AI in dental radiology among undergraduate dental students in Telangana. Similar study was conducted by Jaideep Sur et al on dental graduates among India showed that 68% were already familiar with the AI framework, 72% accepted that AI has useful medical applications, 42% had a basic understanding of how to integrate AI into their dental practice, 55% of dentists accepted that AI can speed up the healthcare system and minimize errors and can provide a large quantity of high-quality data without emotional or physical fatigue in a timely manner.[4]A. Subha et al conducted a study were 1256 dental students responded to the survey and there was a predominantly positive view towards AI in Dentistry. 94 % believed AI would lead to significant advances in dentistry, with 79 % finding it exciting. AI's diagnostic capabilities were high, with 89 % agreeing it can be used definitively and 85 % for prognostic purposes. Over 90 % supported AI for radiographic diagnosis of dental caries, periodontal disease, jaw pathologies, and soft tissue lesions. However, 59 % disagreed that AI could replace dentists.[2]Inderjit Murugendrappa Gowdar et al conducted similar study on 100 dental students and showed that 33% of study participants were aware of the working principle of AI; 68% of study subjects are aware of uses of AI in the dental field. 87% thinks AI helps in radiological diagnosis; 56.5% thinks AI helps in cancer detection.[3] Similar studies also showed that AI has a promising role in oral radiological diagnosis.[5,6] Psychologically, we have become familiar with AI in our day to day lives, from mobile phone voice assistants to autonomous driving. Therefore it is reasonable that radiologists try incorporating AI into their workflow.[10]Undergraduates at advanced levels of a dentistry course have more study content than students at initial levels. Therefore, it is expected that the more advanced the student level, the better their knowledge of course content. [12]Numerous research studies have been carried out over the past decade that have assessed the role of Machine learning (ML) and artificial intelligence in dentistry.[14]

In the current study, undergraduate dental students demonstrated a high level of acceptance of artificial intelligence (AI) and agreed that AI has an important role in the future of dental radiology. Similar studies have also reported that AI is increasingly being accepted as a useful tool in dental radiology, particularly for improving the speed and efficiency of diagnosis. Therefore, AI-related courses and training should be incorporated into the undergraduate dental curriculum to equip future dental professionals with the necessary knowledge and skills to effectively use AI in clinical practice. The integration of AI may facilitate faster diagnosis, support dentists in clinical decision-making, and improve patients'

understanding and overall well-being. The findings of the present study suggest that AI is likely to play an important role in the coming generation by enhancing the efficiency and speed of diagnostic procedures while continuing to support, rather than replace, the role of dental professionals.

## REFERENCES


1. Sheela Kumari Ka , Murugesan Kb , Naveen Gokul Rc , Priya M V. Awareness about Artificial Intelligence among Dental Practitioners and Dental Students – A Cross-sectional online survey.J Clin Prosth Impl 2024;6(2):60-66.

2. A. Subha , R. Poornima , M. Varshini .Exploring knowledge gaps: A mixed-method cross-sectional study on Indian dental students' perspectives and ethical awareness on artificial intelligence in dentistry.Journal of Oral Biology and Craniofacial Research 15 (2025) 1274–1278.

3.Inderjit Murugendrappa Gowdar, Abdulaziz Abdulsalam Alateeq, Asim Mohammed Abdullah Alnawfal, Abdulaziz Fahd Abdullah Alharbi, Abdulaziz Mohammed Shaya Alhabshan, Saleh Mohammed Salem Aldawsari, Nawaf Abdullah Hussein AlHarbi.Artificial Intelligence and its Awareness and Utilization among Dental Students and Private Dental Practitioners at Alkharj, Saudi Arabia.JOurnal Of Pharmacy And Bioallined Science.Volume 16. Supplement 3 July 2024.

4.Jaideep Sur ,Sourav Bose , Fatima Khan , Deeplaxmi Dewangan , Ekta Sawriya , Ayesha Roul.Knowledge, attitudes, and perceptions regarding the future of artificial intelligence in oral
radiology in India: A survey.Imaging Science in Dentistry 2020; 50: 193-8

5. Ashish Choudhary , Samreen Jaral , Azhar Malik, Rudra Kaul, Aditi Sharma. Assessment of knowledge and awareness of artificial intelligence and its uses in dentistry among dental students in Jammu and Kashmir: A questionnaire based Survey. IP Indian Journal of Conservative and Endodontics 2023;8(4):210–214.

6. Gaye Keser , Filiz Namdar Pekiner.Attitudes, Perceptions and Knowledge Regarding the Future of Artificial Intelligence in Oral Radiology Among a Group of Dental Students in Turkey: A Survey.Clin Exp Health Sci 2021; 11: 637-641.

7.F. Schwendicke, W. Samek , and J. Krois.Artificial Intelligence in Dentistry:
Chances and Challenges.Journal of Dental Research 99(7)

8.Shankargouda Patil 1,* , Sarah Albogami 2 , Jagadish Hosmani 3 , Sheetal Mujoo 4 , Mona Awad Kamil 5 ,
Manawar Ahmad Mansour 6 , Hina Naim Abdul 6 , Shilpa Bhandi 7 and Shiek S. S. J. Ahmed 8.Artificial Intelligence in the Diagnosis of Oral Diseases: Applications and Pitfalls.Diagnostics 2022, 12, 1029.
https://doi.org/10.3390/diagnostics12051029.

9.Amelia Surdu 1 , Dana Gabriela Budala 2 , Ionut Luchian 3,* , Liliana Georgeta Foia 4,5 ,
Gina Eosefina Botnariu 6,7 and Monica Mihaela Scutariu .Using AI in Optimizing Oral and Dental Diagnoses—A Narrative Review.Diagnostics 2024, 14, 2804. https://doi.org/10.3390/diagnostics14242804.

10. S. H. Wong1 & H. Al-Hasani2 & Z. Alam3 & A. Alam3. Artificial intelligence in radiology: how will we be affected?Eur Radiol (2019) 29:141–143.

11.Muneeba Ali, BDSa , Memoona Irfan, BDSa , Tooba Ali, MBBSb , Calvin R. Wei, PhDc , Aymar Akilimali, BSc, MDd,e.Artificial intelligence in dental radiology: a narrative review.Annals of Medicine & Surgery (2025) 87:2212–2217

12.Sergio Lins de-Azevedo-Vaz1 , Karla de Faria Vasconcelos2 , Karla Rovaris2 , Naiara de Paula Ferreira3 , Francisco Haiter Neto.A survey on dental undergraduates' knowledge of oral radiology.Braz J Oral Sci. 12(2):109-113.

13. D.Shahanaz,R. Somasundaram, Vinay joshi, N.Sriram choudary, Arun Kharavela. Revolutionising Dental Care Through Artificial Intelligence: Applications in Oral Surgery and Diagnostics. European Journal of Prosthodontics and Restorative Dentistry (2026) 34(4s), 448-455.

14.Faiza Ali1 , Fizzah Ikram1 , Zahra Masood1 , Dinaz Ghandhi2 and Rashna Hoshang Sukhia1.Knowledge and awareness of dental residents regarding the applications of artificial intelligence for diagnosis and treatment planning- a cross-sectional survey.BMC Oral Health (2026) 26:368 .