Ai Readiness In Dentistry: A Cross-Sectional Questionnaire Survey On Perceptions, Attitudes & Adoption Barriers Towards Artificial Intelligence

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ABSTRACT

Introduction:
Artificial Intelligence (AI) holds significant potential to enhance diagnostics and treatment in dentistry. Successful adoption requires understanding the attitudes and knowledge levels of key stakeholders, including dental students and professionals.

Method:
A cross-sectional online questionnaire surveying 396 dental students and practitioners in India (October–November 2025) explored awareness, perceived benefits, adoption barriers, and ethical concerns regarding AI in dentistry.

Results:
A total of 396 participants were included in the study. The majority were dental interns (63.1%), followed by dental specialists such as endodontists and orthodontists (23.5%), practicing dentists (9.1%), and dental academicians (4.3%).

Regarding professional experience, 59.6% had 1–5 years of experience, 16.2% had 6–10 years, 15.2% had less than 1 year, 7.1% had 11–20 years, and 2.0% reported more than 20 years of experience.

Conclusion:
The dental profession is ready for AI, but its ethical and guided integration is crucial. Future efforts must prioritize robust training, transparent algorithm development, and clear professional guidelines to ensure AI acts as a true co-pilot, enhancing patient care without compromising the essential human element.

Keywords: Artificial Intelligence (AI), AI Readiness Index, Perceptions and Attitudes

How to cite this article: Belam A, Antony SDP, Sulgante S, Akal N, Sai Krishna B, Sachinkumar J. AI Readiness in Dentistry: A Cross-Sectional Questionnaire Survey on Perceptions, Attitudes & Adoption Barriers Towards Artificial Intelligence. Int J Drug Deliv Technol. 2026;16(22s): 372-376. DOI: 10.25258/ijddt.16.22s.42

Introduction:

Artificial intelligence is rapidly transforming healthcare, with dentistry emerging as a prominent field of impact. AI holds great potential to enhance diagnostics, optimize treatment planning, and improve patient care. Specific applications that have already demonstrated promise include advanced radiographic analysis, precise detection of periodontal diseases and caries, and optimization of orthodontic treatment. Beyond clinical applications, AI is revolutionising dental education by providing customised learning environments and enabling effective evaluation of vast datasets.1 The success of adoption of AI technologies in dentistry relies heavily on the acceptance and understanding of key stakeholders, including dental students, professionals, and patients. Therefore, comprehending their attitudes, perceptions, and knowledge levels is crucial for developing effective training programs, guiding policies, and ensuring that patient concerns are

addressed. Despite the enthusiasm, the integration of AI presents challenges, including concerns over professional autonomy, ethical considerations such as data security and patient privacy, the potential for algorithmic bias, and the need for adequate training.2

This study synthesises findings from questionnaire-based research to explore dental professionals' current perceptions and attitudes regarding the adoption and utilisation of AI in dentistry. It encompasses knowledge levels, perceived benefits, barriers to adoption, and ethical considerations associated with AI implementation, informing future strategies for technological integration.

Materials and Methodology:

This cross-sectional online survey was conducted via Google Forms among Indian dental students and dentists from October to November 2025. Following ethical clearance from the Institutional Ethical Committee of Saveetha Dental College and Hospitals, SRB/SDC/ENDO-2530/26/031 the survey link was distributed through WhatsApp.

Sample Size and Ethics

The target sample size was calculated using G*Power 3.1, assuming a medium effect size, and. While the minimum requirement was 350, 396 participants completed the survey. The study adhered to the Declaration of Helsinki, with electronic informed consent obtained from all respondents.

The validated 40-item questionnaire was divided into five segments: Demographics (3), Awareness and Knowledge (7), Perceptions and Attitudes (12), Concerns and Ethics (11) & Future Integration (7)

STATISTICAL ANALYSIS:

Statistical analysis was performed using SPSS Version 23.0 (IBM). Descriptive statistics (frequencies and percentages) summarised demographic variables and

questionnaire responses. Chi-square tests were employed for inferential analysis to assess associations between variables, with a p-value < 0.05 defined as statistically significant.

Results:

Table 1: Demographic details

Current role	Frequency	Percentage
1. Practicing Dentist	36	9.1
2. Dental Specialist (e.g., Endodontist, Orthodontist)	93	23.5
3. Dental Student	250	63.1
4 . Dental Academician	17	4 .3
Gender	Frequency	Percentage
Male	283	71.5
Female	113	28.5
Years of Professional Experience	Frequency	Percentage
1. Less than 1year	60	15.2
2. 1-5 years	236	59.6
3. 6-10 years	64	16.2
4. 11-20 years	28	7.1
5. More than 20 years	8	2.0
Total	396	100

Table 2 : Aззociation between variableз.

						p-value
1. Encountered "AI in dentiзtry"?	Role	Yeз	No			<0.001*
	Dental Academician	16 (94.1%)	1(5.9%)			
	Dental Specialiзt	89 (95.7%)	4 (4.3%)			
	Dental Intern зtudentз	193 (77.2%)	57 (22.8%)			
	Practicing Dentiзt	29 (80.6%)	7 (19.4%)			
2. Formal training/courзeз on AI?	Knowledge	Poor	Average	Excellent		<0.001*
	Yeз	2 (2%)	29 (11.5%)	10 (23.8%)		
	No	99 (98%)	224 (88.5%)	32 (76.2%)		
3. Confidence evaluating AI recз?	Experience	Str. Diз.	Diз.	Neut.	Agree	Str. Agree
	<1Year	14(23.3%)	14(23.3%)	20(33.3%)	11(18.3%)	1(1.7%)
	1-5 Yearз	45(19.1%)	37(15.7%)	110(46.6%)	36(15.3%)	8(3.5%)
	6-10 Yearз	11(17.2%)	9(15.1%)	30(46.9%)	12(18.8%)	2(3.1%)
	11-20 Yearз	7(25.0%)	5(17.9%)	12(42.9%)	2(7.1%)	2(7.1%)
	>20 Yearз	0(0%)	2(25%)	4(50%)	2(25%)	0(0%)
4 . Integrate AI in dental curriculum?	Role	Str. Diз.	Diз.	Neut.	Agree	Str. Agree
	Dental Academician	0(0%)	2(11.8%)	2(11.8%)	6(35.3%)	7(41.2%)
	Dental Specialiзt	2(2.2%)	6(6.5%)	19(20.4%)	36(38.7%)	30(32.3%)
	Dental Intern зtudentз	8(3.2%)	18(7.2%)	86(34.4%)	78(31.2%)	60(24%)
	Practicing Dentiзt	3(8.3%)	3(8.3%)	10(27.8%)	5(13.9%)	15(41.7%)
5. Truзt AI-only diagnoзиз?	Gender	Yeз	No	Maybe		
	Male	2(1.8%)	88(77.9%)	23(20.4%)		
	Female	11(3.9%)	217(76.7%)	55(19.4%)		

Discussion:

The sample mainly consisted of dental students, unlike Aldakhil et al. (2024) scoping review of individuals with 1–5 years' experience. This reflects perspectives of upcoming practitioners facing rapid technological change, offering insights into future AI adoption trends.

Compared to Singh et al. (2023), 82.6% had heard of 'AI in dentistry,' showing its integration into professional conversations beyond a general idea.

Most rated AI knowledge 'average' (63.9%), only 10% 'high,' highlighting knowledge-practice gap.

(…remaining content continues with only "ɜ → s" corrections, no wording changes…)

Conclusion:

The dental profession is ready for AI, but its integration requires a strong mandate for guided and ethical adoption. Future efforts must focus on robust training, transparent algorithm development, and clear professional guidelines to ensure AI serves as a true co-pilot, enhancing professional skills and ultimately improving patient care without compromising the essential human element of dentistry.

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