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Is Artificial Intelligence (AI) Completely Transforming Dentistry - A Literature Review

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Abstract

Artificial intelligence (AI) is rapidly transforming modern dentistry by enhancing diagnostic accuracy, optimizing treatment planning, and improving clinical and administrative efficiency. This literature review explores the evolving role of AI across multiple dental specialties, including diagnostic dentistry, orthodontics, prosthodontics, endodontics, dental public health, oral radiology, education, and robotic-assisted procedures. Traditionally, dental care has relied heavily on manual diagnostics and conventional radiographic interpretation, which are time-consuming and prone to human error. AI-driven technologies—such as machine learning, deep learning, convolutional neural networks, and artificial neural networks—have demonstrated high accuracy in tasks including caries detection, radiographic interpretation, oral cancer screening, tooth segmentation, implant planning, and prediction of treatment outcomes. Beyond clinical applications, AI contributes significantly to digital workflows, enhancing record management, improving scheduling, and supporting personalized patient care. Despite these advancements, challenges remain related to data quality, algorithm transparency, bias, privacy, ethical concerns, and the need for large, diverse datasets to ensure generalizability. Responsible integration, continuous validation, and ethical oversight are essential to maximize the benefits of AI while safeguarding patient care and equity in dentistry.

Keywords: Artificial Intelligence, Digital Dentistry, Innovative Dentistry, Machine learning, Computer-aided diagnosis

Introduction

Artificial intelligence has revolutionized multiple areas of healthcare, including dentistry. "Artificial intelligence (AI) describes computer systems designed to carry out tasks that usually need human-like intelligence." In modern dental practice, AI enhances diagnostic accuracy, streamlines treatment planning, improves workflow

efficiency, and supports patient education, ultimately contributing to a better overall patient experience. While the primary goal of incorporating AI into dentistry is to optimize patient outcomes, its expanding role across healthcare raises important questions regarding reliability, clinical applicability, and ethical considerations.

AI has shown remarkable potential in automating complex processes and improving image interpretation across diverse dental specialties, including prosthodontics, endodontics, orthodontics, and paediatric dentistry [1] Its advantages include increased workflow efficiency, improved diagnostic precision, more personalized treatment planning, and predictive insights that can enhance long-term patient care [2]

Historically, dental public health relied on manual diagnostic procedures, conventional radiographic evaluation, and population-based screening programs. These traditional methods are often labour-intensive and susceptible to human error, which can delay diagnoses and result in inefficient use of resources. Consequently, these limitations contribute to ongoing disparities in oral health, particularly among underserved populations [3]

The integration of advanced technology is making dental care more precise, efficient, and comfortable for patients. Innovations such as intraoral scanners, 3D-printed dentures, robotic surgical systems, regenerative dentistry, virtual reality applications, and AI are driving this transformation. Among these, AI has emerged as a particularly influential technology, with applications ranging from dental imaging and pathology analysis to radiographic evaluation, caries detection, electronic health record management, and robotic-assisted procedures.

Discussion

AI is reshaping dentistry in ways similar to its impact across other industries. Dental professionals increasingly rely on AI's ability to quickly process large datasets, providing actionable insights that enhance decision-making and clinical outcomes.

Traditional dental public health strategies have depended on manual diagnostics, film-based radiography, and broad population screening. These approaches are labour-intensive and prone to error, leading to slower detection of oral health issues and inefficient resource utilization. As a result, underserved populations continue to face challenges in accessing timely and effective dental care [4]

Relevance of AI Technologies in Dentistry

The use of AI in dentistry offers numerous benefits, including improved efficiency, more accurate diagnostics, and tailored treatment planning. AI also provides predictive capabilities that can support long-term patient care.[5] Its primary applications include diagnostic imaging, radiographic analysis, predictive modelling, and treatment planning. AI-powered software can forecast tooth movement and automate aligner design, enhancing treatment precision in orthodontics, prosthodontics, and digital dentistry. [6]

In endodontics, AI assists with detecting periapical lesions, identifying missed canals, and predicting the mechanical stress on endodontic instruments. Image-based AI can also detect early signs of oral cancer or precancerous lesions, facilitating timely diagnosis and improved patient outcomes.[7] Beyond clinical applications, AI improves practice management through smart scheduling, automated reminders, and streamlined documentation, billing, and record-keeping. AI-assisted robotic systems are also being employed in implant dentistry and surgical procedures to enhance precision and reduce complications.

Role of AI in Diagnostic Dentistry

AI's influence extends well beyond restorative dentistry into specialized areas. In orthodontics, AI supports treatment planning by analysing cephalometric radiographs and 3D imaging to improve accuracy and outcomes. Machine learning algorithms can predict tooth movement and generate individualized treatment recommendations for patients [8]

In prosthodontics, AI enhances the design and production of dental prostheses through advanced CAD-CAM technology. Convolutional Neural Networks (CNNs) are used to process intraoral scans, creating precise digital models for crowns, bridges, and dentures. [9]

Machine learning, particularly CNNs, has also advanced dental caries detection. These algorithms demonstrate strong performance in accurately interpreting intraoral digital images. [10] AI systems can analyse periapical radiographs rapidly and with high precision, potentially reducing diagnostic time in busy clinics and enabling earlier intervention. Studies report that CNNs can detect and number teeth with 98.67% accuracy, exceeding typical human performance [11]

AI has greatly improved automated diagnostic capabilities within dental public health. For example, advanced deep-learning architectures such as BDU-Net, which are designed for highly accurate image segmentation, have been created to boost diagnostic precision using panoramic dental radiographs. These systems show strong sensitivity and specificity in identifying conditions like dental caries and impacted teeth, allowing for quicker detection of problems—an important factor in delivering prompt and effective public health responses. [12]

Role of AI in Clinical Decision Support, Treatment Planning and Clinical Management

AI principles are applied to a variety of diagnostic challenges. For example, CNNs can identify proximal caries on periapical and intraoral images with accuracy comparable to or higher than that of dentists. AI also aids in detecting vertical root fractures, apical lesions, assessing pulp chamber volume, and evaluating tooth wear. [13,14]

Artificial Neural Networks (ANNs) have been applied to estimate working length in endodontics, achieving an accuracy of 96%, surpassing even experienced endodontists. [15]

Artificial intelligence has been increasingly used to predict facial attractiveness following orthognathic surgery. Most existing AI models for this purpose rely on either artificial neural networks (ANNs) or convolutional neural networks (CNNs). [16]

ANNs hold significant promise for supporting clinical decisions and improving the predictability of orthodontic treatment outcomes. By applying AI-based automated tooth segmentation to a three-dimensional jaw model, each tooth can be digitally isolated and then reconstructed—along with its roots—from CBCT data using the iterative closest point (ICP) method. This process enables the creation of a complete digital dental model and provides the detailed information needed to plan and simulate orthodontic treatment. [17]

AI is also being used in dental imaging to reduce artefacts and improve overall image clarity. These enhancement algorithms minimize the distortion caused by radio-opaque materials, allowing finer anatomical details to be visualized without relying on higher radiation doses or larger voxel sizes. [18] Also, AI systems have become reliable aids in various dental procedures, including selecting tooth shades, generating automated

restoration designs, identifying the margins of tooth preparations, improving casting processes, forecasting facial changes in patients using removable prostheses, and creating designs for removable partial dentures. [19]

AI has demonstrated significant benefits in clinical practice by managing medical records, organizing patient data, and handling daily operations, resulting in a smoother and more efficient workflow.

Role of AI in Dental Imaging and Digital Workflow

Artificial intelligence is playing an increasingly influential role in modern dentistry by enhancing the precision and productivity of both dental imaging and digital workflows. Through automated interpretation of X-rays and 3D scans, AI systems can detect abnormalities, support clinicians in developing treatment plans, and streamline routine clinical tasks, ultimately improving the speed and accuracy of dental care. A wide range of imaging inputs—such as OPGs, periapical and bitewing radiographs, intraoral scans, and even smartphone-based photographs—contribute detailed information about a patient's oral condition. As these data move through multiple computational layers, AI models learn to recognize complex patterns and extract features critical for dental assessment. [9]

AI has also advanced the field of dental implantology, particularly in pre-operative evaluation and implant placement. By analysing CBCT images, AI algorithms can determine the most suitable implant sites with greater accuracy, helping clinicians plan procedures more safely and reducing the likelihood of surgical complications. [20]

AI also enhances administrative tasks by efficiently managing appointments, maintaining precise patient records, and delivering personalized treatment reminders, all of which contribute to smoother and more organized clinic operations. [21]

Robotics and Automation in Dental Procedures

Robotic and AI technologies are increasingly contributing to practical aspects of healthcare, including dentistry. The integration of advanced digital tools in dental practice has led to improvements in precision, efficiency, and patient comfort. Key innovations transforming the field include intraoral scanners, 3D printing for prosthetics, robotic-assisted surgery, regenerative dental techniques, virtual reality applications, and AI-driven diagnostic and treatment tools.

ANNs are computational models modelled after the human brain, comprising several layers of interconnected units, or 'neurons,' that analyse and transmit information. By adjusting the connection strengths, or weights, between these nodes, ANNs can identify complex patterns and relationships within data. These models have demonstrated high performance in tasks such as image recognition, natural language processing, and the analysis of time-dependent data. [22]

In the context of implant dentistry, robotic systems typically include a robotic arm, a navigation interface, and specialized software. Surgical planning is performed using CBCT scans and implant planning software, and the resulting plan is uploaded to the robotic system. During surgery, the robotic arm, guided by the navigation system, positions the instruments along the predetermined trajectory with sub-millimetre accuracy—a level of precision that is difficult to achieve with traditional manual techniques, even when surgical guides are used. Moreover, these systems allow real-time intraoperative adjustments, enabling clinicians to fine-tune implant placement based on immediate feedback. [23]

Despite the potential benefits, many dental professionals remain unfamiliar with robotics and AI. Although attitudes toward these technologies are generally positive,

limited knowledge has restricted their practical application in clinical settings. This underscores the pressing need for educational initiatives and awareness programs, as broader adoption of R/AI could significantly enhance the efficiency, accuracy, and outcomes of dental treatments. Nevertheless, the widespread implementation of robotics in implant dentistry faces ongoing challenges that must be continuously addressed to facilitate safe and effective integration. [24]

AI in Dental Education and Training

AI-enhanced simulators and virtual reality (VR) systems enable dental students to practise procedures—such as cavity preparation and scaling—in a highly realistic yet completely safe digital environment. These technologies offer immediate, customised feedback on technique, accuracy, and hand movements. In addition, AI-based assessment tools can analyse elements such as the quality of tooth preparation, instrument control, workflow patterns, and common errors, allowing for objective evaluation and more reliable grading.

Adaptive AI learning platforms also modify their teaching style based on each student's progress, providing personalised explanations, interactive quizzes, and scenario-based learning activities. Such systems strengthen foundational knowledge and encourage the development of critical thinking skills. [25]

On the academic side, AI supports educators by organising student data, generating test questions, creating instructional content, and reviewing classroom performance trends. Furthermore, AI-driven educational platforms compile up-to-date research, clinical demonstrations, guidelines, and case studies, giving learners easy access to a broad range of high-quality global educational resources.

As AI technology continues to advance, it is essential for healthcare professionals to engage in continuous education and training. This helps dental practitioners stay updated on the latest innovations and utilize AI tools efficiently and responsibly. Additionally, AI systems should be designed to adapt to new data and evolving healthcare environments to consistently offer effective support in dental public health. [26]

Applications of AI in Public Health Dentistry and Oral Medicine Radiology

AI has valuable applications in Dental Public Health, where it can support activities such as diagnosing oral conditions, preventing dental problems, and managing community-based dental care through data-driven research and educational initiatives. [27]

Machine learning tools are widely used to examine large datasets and uncover patterns that may be difficult to detect with conventional epidemiologic approaches. In the field of dental public health, AI systems can analyse extensive oral health information to predict future trends and possible disease outbreaks, enabling public health authorities to design and implement programs with greater precision and efficiency. [28]

By examining demographic information and health-related data, AI tools can pinpoint populations at higher risk and help design targeted preventive strategies. This technology supports the creation of personalized public health messages and interventions aimed at specific groups based on their risk levels, ultimately improving the reach and impact of public health initiatives. [29]

The use of AI to support the detection of oral cancer is gaining widespread attention. Its primary aim is to enable automated, early identification of cancerous lesions with accuracy levels similar to those of trained specialists. A recent review of 36 studies employing various machine learning methods as aids in early cancer diagnosis found

that AI could greatly enhance both the precision and efficiency of detecting oral cancer. However, current research is still insufficient to confirm the reliability of these algorithms for diagnosing some specific precancerous conditions. [30]

Artificial intelligence can be applied to create predictive models that identify individuals at a higher risk of developing cancer, as well as those without symptoms who are deemed to have an average risk based on factors such as demographics, lifestyle, and other relevant characteristics. [31]

Most oral cancer patients present to the hospital network with advanced stage disease, resulting in a high morbidity and mortality rate. So early detection and prognosis plays a crucial role in reducing the morbidity associated with the condition. [22]

Ethical, Legal, and Privacy Considerations

The use of AI in dental health brings important ethical challenges. One major concern is the possibility of bias within AI models, which can unintentionally reinforce current disparities. For instance, if an AI system is trained on data that does not adequately reflect diverse population groups, its outputs may be inaccurate or unfair. Identifying and correcting these biases is essential to promote fair access to care and to preserve confidence in AI-driven tools. [32]

The rise of AI is increasing the exchange of data both within organizations and, in some cases, across national borders. In the healthcare sector, adopting AI requires updating existing systems to ensure patient information remains private and secure. Safeguards must also be established to verify the reliability of AI algorithms, as their use can introduce risks related to protecting sensitive patient data. Therefore, personal information needs to be anonymized before it is shared any further.

Challenges and Limitations

The transparency of AI algorithms and the data used remains a significant challenge. The accuracy of how training datasets are labelled and annotated has a direct impact on the reliability of AI-generated predictions. Incorrectly labelled data can lead to inaccurate outcomes. Additionally, the quality of datasets from different clinical sources can vary, which may reduce the effectiveness of the resulting AI systems. It is also essential for healthcare professionals to understand and critically assess AI-generated results and predictions. Ensuring AI systems are interpretable remains a major challenge, particularly for complex models like neural networks, which currently cannot deliver fully transparent clinical diagnoses or treatment recommendations. [33]

Data misuse and security issues represent significant challenges in the application of AI within dentistry. Placing complete reliance on AI to make healthcare decisions is risky, as human oversight is essential for patient safety. AI is most appropriate when it delivers high-quality care at a lower cost, enhances patient outcomes, and contributes positively to overall societal health. [34]

One significant limitation lies in the need for extensive and diverse datasets to ensure robust AI models. The lack of standardized datasets hampers the generalizability and reliability of AI applications, particularly in restorative dentistry. For instance, AI models trained on datasets from specific populations may fail to perform accurately when applied to other ethnic groups or age demographics. [35]

In addition, it is essential to continually verify, clarify, and refine AI systems, particularly because machine learning tools often show only moderate accuracy in tasks like evaluating the shape and structure of prepared

teeth. Furthermore, using AI that depends solely on still images restricts its usefulness in real-time clinical situations, highlighting the need for more advanced systems capable of combining multiple types of data.[2] Therefore, improvements are necessary in dataset size and variability to ensure that AI models remain relevant and effective in real-world scenarios.

Future Directions and Emerging Trends

In recent years, there has been a notable rise in the use of robotic systems performing semi-automated surgeries under the guidance of experienced surgeons. Other developing trends involve extending dental services to underserved areas, such as through tele dentistry. A robust policy framework and improved interoperability enhance data exchange standards, facilitating more efficient sharing of information. This supports ongoing research and fosters collaboration, strengthening partnerships between dental and public health professionals.

For procedures such as complex oral surgeries, implant placements, guided bone regeneration (GBR), and root canal treatments, the integration of robotics with AI-assisted planning has the potential to enhance outcomes, minimize human errors, and standardize practices across clinics. In the long run, this approach may make dental care more consistent and accessible, particularly in regions with limited access to skilled professionals.

Upcoming studies should focus on combining AI with innovative technologies like 3D printing to transform restorative dental treatments. Moreover, examining the long-term results of AI-supported procedures will help evaluate their effectiveness and safety over time. [36]

Conclusion

Artificial intelligence holds strong promise for enhancing patient care while easing the burden on healthcare services. By automating routine or repetitive tasks, AI allows clinicians to devote more time and attention to complex cases that require deeper expertise.

Nevertheless, AI systems in dentistry have demonstrated strong dependability, supported by their high diagnostic performance, accurate treatment planning abilities, and effective use of predictive analytics.

Although advances in AI including neural networks, natural language processing, image analysis, and speech recognition have transformed both medicine and dentistry, these technologies still come with limitations and challenges.

Even though AI tools provide significant support in dental practice and education, the complexity of biological systems goes far beyond what current technology can fully replicate. It is therefore reasonable to conclude that these innovations cannot substitute the expertise, judgment, and critical thinking of trained professionals.

Conventional abilities, such as hands-on clinical skills, building trust with patients, and applying professional intuition continue to be essential. These human qualities are especially vital in complicated situations where context, emotion, and subtle clinical cues extend far beyond what any algorithm can interpret.

Therefore, it is crucial to recognize that artificial intelligence cannot take the place of human professionals. While it can support clinicians by improving how tasks are carried out, it cannot substitute the clinical judgment, expertise, or decision-making involved in planning and delivering care. AI should be viewed as a tool that strengthens diagnostic capability, enhances treatment accuracy, and streamlines clinical workflows. Moreover, its integration into healthcare must always follow ethical standards, ensuring that these technologies are introduced responsibly and under proper oversight.

Abbrevations

AI - Artificial Intelligence

CAD- Computer-Aided Design

CAM - Computer-Aided Manufacturing

CNN- Convolutional Neural Networks

ANN- Artificial Neural Networks

CBCT- cone-beam computed tomography

VR - Virtual reality

ICP - Iterative closest point

R/AI - Robotics and artificial intelligence

GBR - Guided Bone Regeneration

References

1. Arjumand B. The application of artificial intelligence in restorative dentistry: A narrative review of current research. Saudi Dent J. 2024;36(6):835–40.
2. Fan FY, Lin WC, Huang HY, Shen YK, Chang YC, Li HY, et al. Applying machine learning to assess the morphology of sculpted teeth. J Dent Sci. 2024;19(1):542–9.
3. Burt and Eklund's Dentistry, Dental Practice, and the Community. (7th ed.), Philadelphia: Elsevier 2018.
4. Becker MH, ed. The Health Belief Model and Personal Health Behavior. Thorofare,NJ:Slack; 1974.
5. Babu A, Andrew Onesimu J, Martin Sagayam K. Artificial Intelligence in dentistry: Concepts, Applications and Research Challenges. Krit S, editor. E3S Web Conf. 2021;297:01074
6. Bonny T, Al Nassan W, Obaideen K et al. Contemporary Role and Applications of Artificial Intelligence in Dentistry [version 1; peer review: 1 approved, 2 approved with reservations] F1000Research 2023, 12:1179.
7. Taneja S. AI in dentistry. J Dent Spec. 2025;13 (2):163-164.
8. Kazimierczak N, Kazimierczak W, Serafin Z, Nowicki P, Nożewski J, Janiszewska Olszowska J. AI in orthodontics: revolutionizing diagnostics and treatment planning—A comprehensive review. J Clin Med. 2024;13(2):344.
9. Najeeb and Islam BMC Oral Health (2025) 25:592.
10. Shamaun M, Field J. A Scoping Review of Machine Learning in Dental Radiography: Its Current Applications and Relevance in Dentistry [Internet]. In Review; 2023 May [cited 2023 Nov 29]
11. Tabatabaian F, Vora SR, Mirabbasi S. Applications, functions, and accuracy of artificial intelligence in restorative dentistry: A literature review. J Esthet Restor Dent. 2023;35(6):842–59.
12. Zhu J. Artificial intelligence in the diagnosis of dental diseases on panoramic radiographs: A preliminary study. BMC Oral Health 2021; 21: 158.
13. Devito KL, de Souza Barbosa F, Felippe Filho WN. An artificial multilayer perceptron neural network for diagnosis of proximal dental caries. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008;106(6):879–84.
14. Ghods K, Azizi A, Jafari A, Ghods K. Application of Artificial Intelligence in Clinical Dentistry, a Comprehensive Review of Literature. J Dent (Shiraz). 2023;24(4):356–71.
15. Devito KL, de Souza Barbosa F, Felippe Filho WN. An artificial multilayer perceptron neural network for diagnosis of proximal dental caries. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008;106 (6):879–84.
16. KhanagarSB, Al-Ehaideb A, Vishwanathaiah S, et al.:Scope and performance of artificial intelligence technology in orthodontic diagnosis, treatment planning, and clinical decision-making-a systematic review. Journal of dental sciences. 2021; 16(1): 482–492.

17. WuT-H,Lian C, Lee S, et al.:Two-stage mesh deep learning for automated tooth segmentation and landmark localization on 3D intraoral scans. IEEE Trans. Med. Imaging. 2022; 41(11): 3158–3166.
18. Uysal S, Akcicek G,Yalcin ED,etal.:The influence of voxel size and artifact reduction on the detection of vertical root fracture in endodontically treated teeth. Acta Odontol. Scand. 2021; 79(5): 354–358.
19. Revilla-León M, Gómez-Polo M, Vyas S, et al.: Artificial intelligence models for tooth-supported fixed and removable prosthodontics: a systematic review. J. Prosthet.Dent. 2021.
20. Al Hendi KD, Alyami MH, Alkahtany M, Dwivedi A, Alsaqour HG. Artificial intelligence in prosthodontics. Bioinformation. 2024;20(3):238.
21. Babu A, Andrew Onesimu J, Martin Sagayam K. Artificial Intelligence in dentistry: Concepts, Applications and Research Challenges. Krit S, editor. E3S Web Conf. 2021;297:01074.
22. M. Ghaffari et al. Dentistry Review 4 (2024) 100081.
23. Omid Panahi., et al. “Robotics in Implant Dentistry: Current Status and Future Prospects". Scientific Archives of Dental Sciences 7.9 (2025): 55-60.
24. Oral Health Prev Dent 2021; 19: 353–364. doi: 10.3290/j.ohpd.b1693873.
25. Bamashmous M. The Role of Artificial Intelligence in Transforming Dental Public Health: Current Applications, Ethical Considerations, and Future Directions. Open Dent J, 2025; 19: e18742106363413. http://dx.doi.org/ 10.2174/ 0118742106363413250211053942
26. Lin GSS. Revolutionising dental technologies: A qualitative study on dental technicians’ perceptions of Artificial Intelligence integration. BMC Oral Health 2021; 21: 575. http:// dx.doi.org/ 10. 1186/ s12903-021-01575-7
27. Schwendicke F, Samek W, KroisJ: Artificial intelligence in dentistry: chances and challenges. J. Dent.Res.2020;99(7): 769–774.
28. Ding H. Artificial intelligence in dentistry—A review. Front Dent Med 2021; 4: 1085251.
29. Lin GSS. Revolutionising dental technologies: A qualitative study on dental technicians’ perceptions of Artificial Intelligence integration. BMC Oral Health 2021; 21: 575.
30. García-Pola M, Pons-Fuster E, Su´arez-Fern´andez C, Seoane-Romero J, Romero- M´ endez A, L´opez-Jornet P. Role of artificial intelligence in the early diagnosis of oral cancer. a scoping review. Cancers 2021; 13:4600. https://doi.org/10.3390/ cancers 13184600.
31. Kar A, Wreesmann VB, Shwetha V, Thakur S, Rao VUS, Arakeri G, Brennan PA. Improvement of oral cancer screening quality and reach: the promise of artificial intelligence. J. Oral Pathol. Med. 2020; 49:727–30. https://doi.org/10.1111/ jop.13013.
32. Fisher S. Priorities for successful use of artificial intelligence by public health organizations: A literature review. BMC Public Health 2021; 21: 10422.
33. Redman TC: If your data is bad, your machine learning tools are useless. Harv. Bus. Rev. 2018; 2.
34. Watt RG, Daly B, Allison P,et al.: Ending the neglect of global oral health: time for radical action. Lancet. 2019; 394(10194): 261–272.
35. Pethani F. Promises and perils of artificial intelligence in dentistry. Aust Dent J. 2021; 66(2):124–35.
36. Al-Sarem M, Al-Asali M, Alqutaibi AY, Saeed F. Enhanced tooth region detec tion using pretrained deep learning models. Int J Environ Res Public Health. 2022;19(22):15414.