

Smarter Smiles: Revolutionizing Oral Health with Artificial Intelligence (AI) Gadgets

Fizza Sahar Anwar¹

Copyright © 2024 The Author(s). Published by Foundation University Journal of Dentistry.

In the ever-changing landscape of healthcare, technology continues to shake traditional practices, offering solutions that make healthcare more accessible, efficient, and personalized. Oral health, a cornerstone of overall well-being, is no exception. A new era is dawning in the realm of oral care—one driven by artificial intelligence (AI) and its integration into smart gadgets that promise to transform how we maintain our smiles.¹ AI-powered oral health devices are not just enhancing the daily brushing routine but also revolutionizing diagnostics, treatment, and prevention.² This editorial aims to explore how these advancements are changing the way we approach oral health.

Gone are the days when a toothbrush was merely a manual tool used to scrub away plaque.² Today, AI-driven electric toothbrushes are becoming essential companions in the pursuit of optimal oral hygiene. These smart devices come equipped with sensors and algorithms that monitor brushing techniques, detect areas of neglect, and provide real-time feedback to users via mobile apps.³ Renowned Brands have integrated AI into their toothbrushes, offering features such as pressure sensors that alert users when they're brushing too hard, timers that ensure each quadrant of the mouth receives equal attention, and motion-tracking technology that guides users toward better brushing habits.

The beauty of AI-powered toothbrushes lies in their ability to personalize the brushing experience. They collect data on brushing patterns and can suggest improvements tailored to an individual's specific needs. Over time, this consistent feedback helps users improve their oral hygiene habits, leading to a significant reduction in plaque buildup and gingivitis.⁴ What was once a routine task, has now become a data-driven, performance-enhancing activity that actively promotes better long-term oral health.

¹Assistant Professor, Department of Dental Education & Research, Foundation University College of Dentistry, Foundation University Islamabad, Islamabad, Pakistan.

Email: drfizza.fucd@fui.edu.pk

DOI: 10.33897/fujd.v5i1.468

Another exciting application of AI in oral health lies in diagnostics. Traditionally, identifying issues such as cavities, gum disease, or oral cancer required manual examinations, X-rays, and patient reports. While these methods are effective, they are often reactive, identifying problems only after they have become visible or symptomatic.⁵ AI-powered diagnostic tools have now been introduced that can analyze images from dental scans, X-rays, and even intraoral cameras with unparalleled precision. AI algorithms can be trained to detect early signs of cavities, gum recession, and even oral cancer with an accuracy level that rivals or surpasses that of human dentists. Using deep learning, AI systems can review dental images and highlight areas of concern for further investigation. The result is not only a more precise diagnosis but also a more proactive approach to oral health.⁶ With AI gadgets capable of detecting potential issues at their early stages, patients can receive timely treatment and avoid more complex and expensive procedures down the road.

In addition to this, Smartphones have already become indispensable in our daily lives, and now, they're also playing an increasingly vital role in managing our oral health. AI-powered oral health apps are revolutionizing how patients interact with their dental care routine.⁷ These apps sync with smart toothbrushes, intraoral cameras, and other AI devices, collecting real-time data and offering insights into a person's oral health. By creating a direct line of communication between patients and their oral health data, AI apps ensure that individuals take a proactive role in maintaining their smiles.

Moreover, AI is also enhancing remote consultations. Some tele-dentistry platforms now leverage AI to perform preliminary examinations, analyze dental images submitted by patients, and assist in making preliminary diagnoses.⁸

Orthodontics is another area where AI gadgets are making waves. Smart aligners, which have already replaced traditional braces for many patients, are becoming more personalized and data-driven thanks to AI.⁹ Companies

like Invisalign have incorporated AI algorithms into their aligner technology, enabling better treatment planning and monitoring. These smart aligners can track the patient's progress through embedded sensors and provide real-time feedback. The use of AI in orthodontics not only improves outcomes but also enhances patient satisfaction by reducing treatment time and discomfort.¹⁰

AI-powered gadgets can also predict potential oral health risks by analyzing a patient's habits, genetic predispositions, and medical history. Moreover, these gadgets can offer continuous feedback, making it easier for individuals to stay on top of their oral hygiene routines.

AI-powered gadgets are not just a passing trend; they represent a transformative shift in the way we approach oral health. By combining data-driven insights with personalized care, these smart devices are helping individuals maintain healthier smiles and giving dental professionals the tools they need to offer better diagnoses and treatments. As AI continues to advance, the potential for even more sophisticated, intuitive oral health tools will only grow, offering the promise of a future where oral health is not just reactive but proactive, personalized, and smarter than ever before.⁹ Through the integration of AI in dental care, we are witnessing the beginning of a new age in which technology and oral health are linked, empowering people to take control of their oral health and smiles.

DISCLAIMER

None.

CONFLICT OF INTEREST

None to declare.

ETHICAL STATEMENT

Not applicable.

FUNDING DISCLOSURE

The author received no financial support for the research, authorship, and/or publication of this article.

AUTHORS' CONTRIBUTION

Conception and design, drafting, critical review, and approval of the final version of the manuscript to be published: F. S. Anwar

REFERENCES

1. Ducret M, Mörch CM, Karteva T, Fisher J, Schwendicke F. Artificial intelligence for sustainable oral healthcare. *J. Dent.* 2022 Dec 1;127:104344.
2. Shan T, Tay FR, Gu L. Application of artificial intelligence in dentistry. *J. Dent. Res.* 2021 Mar;100(3):232-44.
3. Scquizzato T, Gazzato A. Adopting a smart toothbrush with artificial intelligence may improve oral care in patients admitted to the intensive care unit. *Crit. Care.* 2019 Jun 18;23(1):223-6.
4. Chau RC, Thu KM, Hsung RT, McGrath C, Lam WY. Self-monitoring of Oral Health Using Smartphone Selfie Powered by Artificial Intelligence: Implications for Preventive Dentistry. *Oral Health Prev Dent.* 2024 Jul 23;22:5758200.
5. Patil S, Albogami S, Hosmani J, Mujoo S, Kamil MA, Mansour MA, Abdul HN, Bhandi S, Ahmed SS. Artificial intelligence in the diagnosis of oral diseases: applications and pitfalls. *Diagnos.* 2022 Apr 19;12(5):1029-34.
6. Kabir T, Lee CT, Chen L, Jiang X, Shams S. A comprehensive artificial intelligence framework for dental diagnosis and charting. *BMC Oral Health.* 2022 Nov 9;22(1):480-6.
7. Batra P, Tagra H, Katyal S. Artificial intelligence in teledentistry. *Discoveries.* 2022 Jul;10(3):21-7.
8. Monill-González A, Rovira-Calatayud L, d'Oliveira NG, Ustrell-Torrent JM. Artificial intelligence in orthodontics: Where are we now? A scoping review. *J Orthod Craniofac Res.* 2021 Dec;24:6-15.
9. Mourgues T, González-Olmo MJ, Huanca Ghislanzoni L, Peñacoba C, Romero-Maroto M. Artificial Intelligence in Aesthetic Dentistry: Is Treatment with Aligners Clinically Realistic? *J. Clin. Med.* 2024 Oct 12;13(20):6074-8.

10. Ossowska A, Kusiak A, Świetlik D. Artificial intelligence in dentistry—Narrative review. *Int. J. Environ. Res. Public Health.* 2022 Mar 15;19(6):3449-53.

How to cite this Article:

Anwar FS. Editorial: Smarter Smiles: Revolutionizing Oral Health with AI Gadgets. *Found Univ J Dent.* 2025;5(1):1-3