



A Review on Artificial Intelligence and Dentistry

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Introduction

- AI in dentistry is rapidly evolving.
- Improves diagnostics, treatment planning, and patient monitoring.
- Emphasis on ethical integration and sustainability.

What is Artificial Intelligence (AI)?

- Artificial intelligence (AI) refers to the ability of machines to perform tasks that typically require human intelligence, such as learning, problem-solving, and decision-making.
- It encompasses a wide range of technologies, including machine learning and natural language processing, that enable computers to analyze data, understand language, and even create content.

Applications of AI in Dentistry

- Periodontology: Bone loss detection
- Endodontics: Caries and fracture diagnosis
- Orthodontics: Treatment planning, cephalometric landmark detection
- Restorative Dentistry: Caries detection, implant planning
- Oral Pathology: TMJ, oral cancer detection

Benefits or advantages of AI Integration

- Enhances accuracy and reduces human error.
- Saves time and increases diagnostic efficiency.
- Supports personalized treatment.
- Assists in educational simulations and patient communication.

Disadvantages and Challenges of AI Integration

- Data privacy concerns.
- Technological and financial barriers in resource-limited settings.
- Lack of clinician training and ethical regulation.
- Environmental impact due to high computational needs.

Ethical Concerns in AI Dentistry

- Data privacy and security.
- Bias in training datasets.
- Erosion of human judgment.
- Lack of transparency in AI decisions.



Learning Outcomes

- Gained expertise in conducting literature reviews on technology in healthcare.
- Developed understanding of various AI models in clinical use.
- Understood the intersection of AI, ethics, and sustainability in dentistry.
- Improved skills in academic writing, thematic analysis, and critical evaluation.



Future Directions

- Augment human expertise, not replace it.
- Use cross-center training to improve generalization.
- Incorporate Augmented representation/Virtual representation in clinical and educational settings.
- Ensure ethical training for clinicians.



Conclusion

- AI offers transformative potential in dentistry.
- Needs structured ethical frameworks and training.
- Must balance innovation with humanistic care and environmental responsibility.

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Thank You