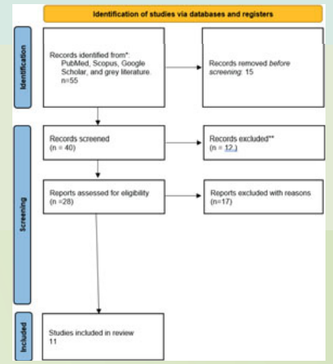
# ROLE OF ARTIFICIAL INTELLIGENCE IN DENTAL AGE ESTIMATION – SYSTEMATIC REVIEW

FOPO35

**INTRODUCTION:** Dental age estimation (DEA) is a technique-sensitive process. The advent of artificial intelligence has changed the imaging landscape. AI in age estimation, though highly favourable, is still in the inceptive stage. The aim of the present review the is current status of AI in dental age estimation.

**METHODS:** The review was conducted by using search words like "artificial intelligence", "dental age estimation", and "neural networks" from various databases including PubMed, Scopus, Google Scholar, and grey databases from the period of 2017 to 2023.
Only studies conducted on humans and published in English were included.




**RESULTS & DISCUSSION:**

## Types of studies performed for AE

| Sno | Study | Sample | Result |
|---|---|---|---|
| 1 | Wang et al (2023) | 9586 OPG | Convolutional network like VGG16 outperformd ResNet. |
| 2 | Kim et al (2021) | 1586 OPG | CNNs focus more on differential parameters and are more accurate. |
| 3 | Kim et al (2023) | 10, 023 OPG | Deep neural network was helpful in estimating age when precise age was unknown. |
| 4 | Bui et al (2023) | 530 OPG | Deep learning along with topological approach is feasible for age estimation. |
| 5 | Maryam et al (2019) | 300 CBCT | Neural model is better than regression model to study pulp-to-tooth ratio. |
| 6 | Tobel et al (2017) | 30 OPG | Deep neural networks performed well with new Demirjian's method. |
| 7 | Patil et al (2023) | 1000 OPG | Deep learning models outperformed machine learning models for age estimation. |
| 8 | Wu et al (2022) | 2431 healthy and 99 growth delayed OPG | CNNs image extraction model helped in estimating delay in growth. |
| 9 | Galibourg et al (2020) | 3605 OPG | Machine learning methods outmatched reference Demirjian's reference method. |
| 10 | Aljameel S et al (2023) | 529 OPG | Out of the various deep learning model used Xception surpassed other deep learning models in accuracy. |
| 11 | Blanco et al (2020) | 2289 OPG | DASNet accurately predicted the dental age especially in developing dentition. |

### Commonly used AI

AI types

- Deep convolutional network
- Machine Learning
- Deep Learning

### Advantages of AI-based AE

- Accurate
- Clinical potential for large population

**CONCLUSION:** AI is an exceptionally powerful tool that has the capacity to solve numerous human problems. With proper algorithmic architecture, it can help perform outstanding oral care and overcome other standard limitations. Further large-scale studies using other imaging modalities can further strengthen the application of AI in forensic odontology.


**REFERENCES:** Vila-Blanco N, Varas-Quintana P, Tomás I, Carreira MJ. A systematic overview of dental methods for age assessment in living individuals: from traditional to artificial intelligence-based approaches. International Journal of Legal Medicine. 2023 Apr 14:1-30.
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