

Artificial Intelligence in Prosthodontics: A Literature Review

M. Benhenni *

Faculty of Medecine, Oran, Algeria

Y. Karres

Faculty of Medecine, Oran, Algeria

H. Houari

Faculty of Medecine, Oran, Algeria

A. Fellague Chebra

Faculty of Medecine, Oran, Algeria

A. Akacem

Faculty of Medecine, Oran, Algeria

Abstract

Artificial intelligence (AI) has emerged today as a major revolution, capable of analyzing complex data and providing precise solutions. In prosthodontics, this discipline has long relied on the practitioner's manual expertise and on artisanal methods, before evolving through digital technologies (CAD/CAM, optical impressions, 3D printing). Today, it stands at the crossroads of tradition and technology, seeking to reconcile precision with aesthetic demands.

AI now opens up new perspectives: improving the reliability of restorations, enhancing adaptation to anatomical specificities, and optimizing aesthetic and functional outcomes. It promises a future generation of prostheses that are more predictable, personalized, and consistent, thereby strengthening the overall quality of care.

To what extent do technical and clinical parameters particularly precision, stability, automation, ergonomics, and patient satisfaction—determine the reliability and relevance of artificial intelligence applied to the design and fabrication of removable, fixed, and implant-supported prostheses?

This literature review synthesised 35 recent studies across removable, fixed, implant-supported, and maxillofacial prostheses to assess five core dimensions : accuracy reliability, stability/longevity, automation/speed, ergonomics/clinical comfort, and patient

The main objective of our study is to determine the influence of the following technical and clinical parameters on the reliability of artificial intelligence applied to the design and fabrication of removable, fixed, and implant-supported prostheses.

Through our research and the analysis of several articles, we were able to highlight the contribution of artificial intelligence in various aspects of prosthodontics.

Artificial intelligence is a promising tool for transforming prosthodontic practice, while improving precision, stability, satisfaction, and ergonomics, and paving the way for a more predictive, personalized, and patient-centered dentistry.

Keywords

Artificial intelligence, Prosthodontics, Digital Workflow, Accuracy.