

Artificial intelligence in healthcare

Artificial intelligence (AI) has become a buzzword these days.^{1,2} AI represents the simulation of human intelligence in machines designed and programmed to think and learn like people.² In essence, AI refers to the ability of computers to perform tasks that typically require human intelligence, such as reasoning, problem-solving, and learning.¹ The World Health Organization (WHO) has proposed that AI be seen as the performance by computer programmes of tasks that are commonly associated with intelligent being.³

AI has found applications across various sectors, including academia, government, industry, social, and economic service organizations.¹ The healthcare field is no exception to the application of AI with the rapid development of algorithms and computational models that enable machines and systems to perform tasks such as natural language processing, pattern recognition, problem-solving, and decision-making.¹ Hence, it can be opined that AI is a powerful and disruptive area of computer science, with the potential to fundamentally transform the practice of medicine and the delivery of healthcare.⁴

The term artificial intelligence (AI) was first used by John McCarthy at the Dartmouth Conference in 1956,^{5,6} and since then the field has been constantly explored and AI has now become an all-pervading influencer on how we do things, from the very simple to the most complex.⁵

Healthcare systems around the globe face significant challenges in achieving the 'quadruple aim' for healthcare which are to improve population health, improve the patient's experience of care, enhance caregiver experience and reduce the rising cost of care.⁴

AI has had profound impact on diagnosis, treatment and healthcare delivery. The applications in healthcare include transformative diagnostics, personalized treatment strategies and enhanced patient care among others.¹⁻⁶

In the area of transformative diagnostics, AI leverages on machine learning algorithms to analyze vast data sets quickly and accurately.¹⁻⁶

In this regard, it has found its place in imaging and radiology demonstrating remarkable proficiency in image interpretation as well as enhancing the early detection of cancers.¹⁻⁶ AI has also made substantial strides in pathology and laboratory medicine as it accelerates the diagnostic process and reduces the likelihood of human error.¹⁻⁶

In personalized treatment strategies, AI has been at the forefront. Through the utilization of big data and predictive analytics, AI can analyze individual patient data to tailor treatment plans that are more effective with fewer adverse effects.¹⁻⁶ AI has accelerated the drug discovery and development process, allowing researchers to target specific biological mechanisms with better precision.¹⁻⁶ AI has contributed to the optimization of therapeutic approaches with AI systems having the capability to adapt treatment plans in real time.¹⁻⁶

AI has also enhanced patient care experience. It has been utilized in remote patient monitoring enabling early intervention in case of deteriorating health, reducing hospital readmissions and enhancing overall patient wellbeing.¹⁻⁶ Through predictive analytics, AI can anticipate potential risks, predict likelihood of future health issues, enabling healthcare professionals to implement preventive measures.¹⁻⁶

Despite these applications, concerns have been raised as it relates to the adoption and deployment of AI in the healthcare sector. These include ethical and privacy, social sustainability, governance, technical, unreliability and trustworthiness as well as healthcare providers and professional liability challenges among others.¹⁻⁶

In this issue, Akadiri and Yarhere⁷ through a narrative review compared the development and implementation of AI in dental practice across major global regions with a view to identifying strategic priorities for accelerating responsible and equitable AI adoption with a focus on Africa and the West African subregion. They note that West Africa remains at an early stage of adoption, characterized by significant oral health needs, limited digital infrastructure,

scarce research, and minimal clinical deployment in contrast to high-income regions. They conclude that bridging this gap will require investment in digital infrastructure, context-appropriate AI applications, local data development, capacity building, and ethical governance frameworks. It is hoped that the outlook will change over time.

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