



Review Article

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USES AND RELEVANCE OF ARTIFICIAL INTELLIGENCE (AI) IN AYURVEDA

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Abstract

Artificial Intelligence (AI) has emerged as one of the most influential technological advancements in modern healthcare and biomedical sciences. In recent years, its applications have expanded beyond conventional medicine to include traditional healthcare systems, such as *Ayurveda*. *Ayurveda* is an individualised system of medicine that emphasises maintaining health through personalised treatment approaches based on *Prakriti*, *Dosha*, *Agni*, *Dhatu*, and lifestyle factors. The integration of AI into *Ayurveda* offers new possibilities for enhancing diagnostic precision, disease prediction, treatment standardisation, educational methodologies, herbal research, and healthcare accessibility. AI technologies such as machine learning, natural language processing, predictive analytics, and expert systems can process complex clinical data and support evidence-based *Ayurvedic* practice. Furthermore, AI-assisted digitisation and interpretation of classical Ayurvedic literature may

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contribute significantly to the preservation and global dissemination of traditional knowledge. AI-based healthcare systems can also strengthen telemedicine services and support remote patient monitoring, thereby improving healthcare delivery in underserved areas. Despite these advancements, challenges such as a lack of standardised datasets, ethical concerns, limited interdisciplinary collaboration, and difficulties in quantifying subjective *Ayurvedic* parameters continue to hinder large-scale implementation. The present review article discusses the major applications, relevance, opportunities, limitations, and future prospects of Artificial Intelligence in *Ayurveda*.

Keywords:

Artificial intelligence, *Ayurveda*, Machine learning, Personalised medicine, Digital healthcare, Ayurvedic research.

1. Introduction

Artificial Intelligence refers to the ability of computer systems and software technologies to imitate human cognitive functions such as reasoning, learning, problem-solving, and decision-making. AI has rapidly transformed various sectors, including education, finance, engineering, and healthcare. In medicine, AI-based technologies are increasingly used for disease prediction, radiological interpretation, clinical decision-making, patient monitoring, and healthcare data management. The growing importance of AI in healthcare is mainly attributed to its ability to analyse large datasets efficiently and generate precise predictions with minimal human error.

Ayurveda, the ancient system of medicine originating in India, is based upon a holistic understanding of the human body, mind, and environment. *Ayurvedic* diagnosis and treatment depend upon individualised assessment of factors such as *Dosha*, *Dhatu*, *Mala*, *Agni*, *Prakriti*, and *Srotasa*. Unlike modern medicine, *Ayurveda* emphasises preventive healthcare and correction of lifestyle-related disturbances before the manifestation of disease. However, the personalised and multidimensional nature of *Ayurvedic* diagnosis often creates challenges in standardisation and reproducibility.

The integration of AI into *Ayurveda* has gained increasing attention due to the possibility of combining traditional knowledge with advanced computational methods. AI technologies may assist in standardising *Ayurvedic* assessments, preserving classical literature, improving clinical research methodologies, and promoting evidence-based *Ayurveda*.^[1]

2. Material and Method

The present work is a narrative review article prepared through a detailed analysis of published scientific literature related to Artificial Intelligence and *Ayurveda*. Information was collected from *Ayurvedic* classical texts, peer-reviewed journals, electronic databases, digital healthcare reports, and review articles discussing AI applications in healthcare and traditional medicine systems.

Relevant literature focusing on AI-assisted diagnosis, Prakriti assessment, machine learning applications, *Ayurvedic* clinical decision systems, digital preservation of manuscripts, herbal drug research, telemedicine, and educational technologies was critically reviewed. The collected information was systematically categorised into thematic areas according to the major applications of AI in *Ayurveda*.

3. Results

The review revealed that Artificial Intelligence possesses significant utility in multiple domains of *Ayurvedic* healthcare, education, and research. AI-based technologies are increasingly being explored for the standardisation of diagnostic procedures, prediction of disease susceptibility, enhancement of herbal drug research, and preservation of classical knowledge.^[2]

One of the major applications of AI in *Ayurveda* is *Prakriti* assessment. Traditional *Prakriti* analysis depends largely upon the physician's observation and interpretation. AI-assisted systems can analyse patient data obtained through questionnaires, facial recognition tools, speech analysis, and physiological parameters to identify constitutional dominance more objectively.^[3] Machine learning algorithms may help reduce observer variability and improve the reproducibility of *Ayurvedic* assessments.

Another important application is disease prediction and preventive healthcare. AI models can analyse patient history, dietary habits, behavioural patterns, laboratory findings, and *Ayurvedic* parameters to identify disease susceptibility at an early stage.^[4] Such predictive approaches are especially useful in chronic lifestyle disorders such as obesity, diabetes mellitus, hypertension, and metabolic syndrome.

Clinical Decision Support Systems have also emerged as valuable tools in *Ayurvedic* practice. AI-enabled systems can assist physicians in identifying probable diagnoses, recommending

suitable classical formulations, suggesting *Panchakarma* procedures, and monitoring treatment outcomes.^[5]

The review also identified important applications of AI in the digitisation and preservation of *Ayurvedic* literature. Natural Language Processing technologies can facilitate digitisation, translation, indexing, and retrieval of information from classical *Ayurvedic* literature.^[6]

In *Ayurvedic* pharmaceutical research, AI technologies are increasingly utilised for phytochemical analysis, toxicity prediction, herb-drug interaction studies, and identification of bioactive compounds.

Educational applications of AI were also identified as highly relevant in *Ayurveda*. AI-based learning platforms, virtual simulations, intelligent tutoring systems, and automated assessments can improve understanding of complex *Ayurvedic* concepts and provide personalised learning experiences for students and practitioners.^[7]

4. Discussion

The integration of Artificial Intelligence into *Ayurveda* represents an important step toward modernisation and scientific advancement of traditional healthcare systems. *Ayurveda* has always emphasised individualised treatment and holistic understanding of disease processes. However, one of the major criticisms directed toward *Ayurveda* has been the lack of standardisation and reproducibility in diagnosis and treatment planning. AI technologies may help overcome some of these limitations by providing structured data analysis and decision-support mechanisms.

Prakriti assessment is one of the areas where AI demonstrates significant relevance.^[8] Since constitutional analysis forms the basis of preventive and personalised treatment in *Ayurveda*, standardisation of *Prakriti* determination is essential. AI-assisted assessment tools may improve consistency and reduce subjective variability among practitioners.^[9]

AI also plays a significant role in strengthening evidence-based *Ayurveda*. Clinical research in *Ayurveda* often faces methodological challenges due to variability in patient characteristics and individualised treatment protocols. AI-assisted analytics and machine learning models can improve the interpretation of clinical data and facilitate large-scale analysis of treatment outcomes.^[10]

Digitisation of *Ayurvedic* literature is another area of considerable importance. Classical *Ayurvedic* texts contain vast amounts of valuable medical knowledge that remain

inaccessible to many researchers due to language barriers and a lack of digital documentation. AI-based Natural Language Processing systems can support translation, indexing, and classification of *Ayurvedic* concepts.

AI-supported telemedicine platforms are also becoming increasingly relevant in healthcare delivery. Remote consultation systems, virtual patient monitoring, and AI-driven health applications may improve accessibility of *Ayurvedic* healthcare services, particularly in rural and underserved areas.

Despite these advantages, several challenges continue to limit the widespread implementation of AI in *Ayurveda*. One of the major limitations is the lack of standardised clinical datasets suitable for machine learning analysis. Ethical concerns regarding patient privacy, data security, and overdependence on technology also require careful consideration.

It is important to understand that AI should function as a supportive tool rather than a replacement for the knowledge and clinical judgment of *Ayurvedic* physicians.

5. Conclusion

Artificial Intelligence has emerged as a promising technological tool with significant applications in *Ayurveda*. AI-assisted systems can improve Prakriti assessment, disease prediction, clinical decision-making, herbal research, digital preservation of literature, educational methodologies, and telemedicine services. The integration of AI into *Ayurveda* may contribute substantially toward standardisation, evidence generation, and global acceptance of *Ayurvedic* healthcare practices.

Successful implementation requires the development of reliable datasets, interdisciplinary collaboration, ethical regulation, and preservation of the holistic philosophy of *Ayurveda*. AI should be utilised to support and enhance *Ayurvedic* practice rather than replace traditional clinical wisdom.

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Conflict of Interest

The authors reports no conflict of interest related to this work.

Abbreviations

AI – Artificial Intelligence

NLP – Natural Language Processing

CDSS – Clinical Decision Support System

SI – System International

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