

Application of Artificial Intelligence in Ayurveda: A Contemporary Review

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Abstract: *The integration of Artificial Intelligence (AI) into healthcare has created transformative possibilities across diagnostics, treatment, and research. Ayurveda, the traditional Indian system of medicine with its holistic and individualized approach, is increasingly exploring AI for evidence generation, clinical decision - making, and personalized care. This review presents a systematic analysis of how AI can support Ayurvedic practice, including disease diagnosis, prakriti (constitution) analysis, drug discovery, treatment planning, and data mining from classical texts. It also highlights challenges such as data standardization, ethical considerations, and interdisciplinary collaboration.*

Keywords: Artificial Intelligence, Ayurveda, Prakriti Analysis, Machine Learning, Predictive Modelling, Integrative Medicine

1. Introduction

Ayurveda, with its time - tested principles and individual - centric treatments, remains a cornerstone of traditional Indian healthcare. However, the demand for reproducibility, validation, and scalability has opened avenues for AI integration. Artificial Intelligence—defined as the simulation of human intelligence processes by machines—offers tools such as machine learning (ML), natural language processing (NLP), and predictive analytics that can complement Ayurvedic diagnostics and therapeutics.

2. Materials and Methods

This review was conducted using a systematic and integrative approach to identify, analyze, and synthesize literature and digital innovations related to the application of Artificial Intelligence (AI) in the field of Ayurveda.

3. Discussion

Areas of AI Application in Ayurveda are;

Prakriti (Constitution) Analysis

Problem: Subjective and inconsistent prakriti assessment across practitioners.

AI Solution: Use of ML models and decision trees to predict prakriti types based on structured questionnaires and biometric inputs.

Examples:

Mobile apps using AI to assess prakriti via facial recognition and pulse reading.

Use of Support Vector Machines (SVMs) and neural networks for classification of prakriti types.

Disease Diagnosis and Risk Prediction

AI - based tools can help in early detection of diseases by analyzing dosha imbalances from symptoms.

Predictive modeling in diseases like Amavata (RA), Prameha (Diabetes) using patient history and lab parameters.

Real - time decision support for Nadi Pariksha using sensor integration and AI analysis.

Treatment Planning and Personalization

Ayurveda thrives on tailored treatment plans.

AI can process vast historical clinical data to suggest personalized therapies, including: Drug selection, Anupana (vehicle), Dietary advice (Pathya - Apathya)

Drug Discovery and Herb - Mineral Analysis

AI in reverse pharmacology: extracting potential leads from classical formulations and matching them with modern databases.

Use of molecular docking simulations with AI to understand the bioactivity of herbs.

Network pharmacology - based models using AI for polyherbal combinations.

Classical Text Mining and NLP

Challenge: Vast knowledge is embedded in Sanskrit verses.

AI - powered NLP tools can help translate, categorize, and interpret classical shlokas.

Creation of searchable Ayurvedic knowledge databases using ontologies and semantic web technology.

Notable Projects and Research in this area

Institution / Initiative	Focus Area	AI Tool Used
CCRAS & IITs	Prakriti analysis system	ML Algorithms, ANN
AYUSH Grid	National AYUSH digital infrastructure	NLP, Data Mining
Nadi Tarangini	Digital pulse diagnosis device	Signal processing + ML
CSIR - TKDL	TKDL	Patent Text Mining

Benefits of AI in Ayurveda

Objective validation of subjective parameters.

Enhances diagnostic precision and treatment consistency.

Facilitates clinical research and large - scale trials.

Promotes global acceptance of Ayurveda through scientific modeling.

4. Future Directions

Creation of national Ayurvedic databases for AI training.

Development of Ayurveda - specific ontologies and semantic web tools.

Establishing AI - powered clinical decision support systems (CDSS).

Designing wearable devices for real - time dosha monitoring and therapy adjustment.

5. Conclusion

Artificial Intelligence holds immense promise to bridge the ancient wisdom of Ayurveda with modern technological advancements. While not a substitute for human clinical acumen, AI can act as a supportive tool to enhance precision, efficiency, and global credibility of Ayurvedic healthcare. Interdisciplinary collaboration, ethical frameworks, and context - specific AI models are essential for its meaningful and culturally respectful integration.

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