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From Technology to Organizational Readiness: A Web of Science Bibliometric Analysis of Healthcare 5.0 Implementation Research

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Backgrounds

As information technology develops in healthcare, attention to Healthcare 5.0 has increased (1). Healthcare 5.0 is recognized as a paradigm shift in medical systems . Its implementation requires attention to both organizational readiness and technical aspects Despite rapid growth, research on Healthcare 5.0 implementation remains scattered across technologies, applications, and organizational dimensions. Accordingly, this study aimed to map the knowledge structure and evolution of Healthcare 5.0 implementation research, identify major topics, influential works, and research gaps.

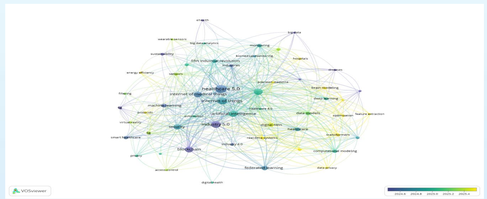
Methods

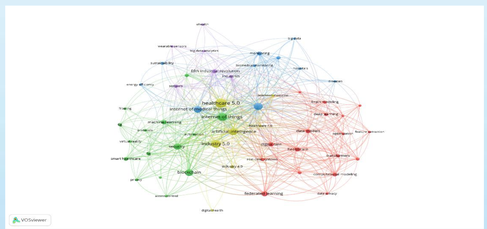
Data were extracted from the Web of Science database on August 28, 2026, and 152 records were identified. Bibliometric analysis was conducted using VOSviewer through citation and keyword co-occurrence analyses. Network, density, and overlay maps were used to identify thematic structures and research trends.

Findings

Citation analysis demonstrated the central role of Maddikunta et al (2) and Adel (3). King Saud University and India were prominent contributors at the organizational and country levels.

The main research gap is the limited connection between Healthcare 5.0 technologies and organizational implementation requirements, highlighting the need to examine organizational readiness, digital capabilities, workforce skills, data governance, interoperability, and implementation requirements.





Keyword co-occurrence analysis identified five major clusters: AI and digital twins, infrastructure and security, data and sustainable healthcare services, personalized medicine, and health monitoring and wearable technologies.

Cluster 1 was the largest and focused on AI, digital twins, deep learning, federated learning, and predictive models for healthcare monitoring, diagnosis, and prediction.

Cluster 2 emphasized infrastructure and security, including 5G/6G, IoT, edge computing, wireless communication, blockchain, privacy, and access control.

Cluster 3 focused on big data, IoMT, cloud computing, biomedical monitoring, and sustainable healthcare services, highlighting the importance of effective data management and sustainability.

Cluster 4 addressed the transition from Healthcare 4.0 and Industry 4.0 toward Healthcare 5.0, emphasizing AI, digital health, Industry 5.0, and precision medicine and personalized healthcare.

Cluster 5 focused on wearable sensors, e-health, big data analytics, and continuous health monitoring, representing the human- and individual-centered dimension of Healthcare 5.0.

Conclusion

This study analyzed Healthcare 5.0 implementation research and organizational readiness using bibliometric analysis of the Web of Science database and VOSviewer. Five main themes were identified: AI and digital twins, smart infrastructure and security, sustainable health data and services, personalized medicine, and wearable technologies. The findings show that research has mainly focused on enabling technologies, while organizational readiness and implementation have received less attention. Future research should adopt an organizational perspective and examine infrastructure, data, security, human resources, organizational capabilities, and work processes in Healthcare 5.0 implementation.

References

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