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## The Role and Challenges of Digital Leadership in Health Human Resource Management: A Systematic Literature Review

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### ABSTRACT

This study aims to explore the role of digital leadership in optimizing human resource management (HRM) amidst the accelerating digital transformation in healthcare, particularly in AI-driven workforce systems. A systematic literature review (SLR) was conducted, analyzing 18 high-impact articles sourced from Scopus, Web of Science, PubMed, and Google Scholar. The research focuses on how digital leadership influences AI integration, workforce automation, and the challenges healthcare leaders face. The review identifies key themes such as the impact of digital leadership on workforce efficiency, talent retention, and strategic HRM decision-making. The results indicate that AI-driven HRM practices, including predictive analytics and automated recruitment, improve operational performance but also introduce risks like data privacy concerns, algorithmic bias, and job displacement. Furthermore, regional differences were observed: developed nations emphasize AI ethics and data governance, while developing nations face challenges related to infrastructure and digital literacy. The study provides insights into leadership adaptability, ethical AI deployment, and digital upskilling, offering actionable recommendations for healthcare leaders and HR professionals. This research contributes to the academic discussion by presenting a comprehensive framework for a responsible and sustainable AI-driven HRM transformation, emphasizing the importance of strategic digital leadership in overcoming resistance and ensuring equitable implementation across diverse healthcare systems.

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## 1. Introduction

The rapid advancement of digital technology and Artificial Intelligence (AI) has significantly transformed the healthcare sector, particularly in Human Resource Management (HRM). AI-driven tools, such as predictive analytics, automated recruitment, and machine learning for workforce planning, have significantly enhanced HRM processes by improving efficiency, reducing bias, and enabling data-driven decision-making[1]. The integration of digital leadership in healthcare HRM has become essential to effectively manage the complexities of modern workforce management, where

automation and digital tools are increasingly used to streamline administrative functions, optimize workforce allocation, and improve overall operational performance [2].

Digital transformation in HRM allows healthcare organizations to implement real-time performance evaluation, improve recruitment strategies, and address workforce shortages, while simultaneously enhancing employee engagement and service delivery[3]. However, the adoption of AI and automation within HRM is not without its challenges. Technological infrastructure gaps, digital literacy issues among healthcare professionals, and concerns over data privacy and algorithmic bias remain substantial barriers to the widespread implementation of AI solutions[4]. Additionally, there is resistance from healthcare professionals who fear job displacement and lack understanding of how AI can benefit their roles [5].

In this context, digital leadership is pivotal in ensuring the successful integration of AI in healthcare HRM. Digital leaders must navigate organizational changes, foster a culture of innovation, and promote the ethical deployment of AI to ensure it serves as a tool for workforce empowerment rather than job displacement [6]. Effective leadership also involves addressing workforce resistance and bridging the gap between technological advancements and human capital development, ensuring that healthcare professionals possess the necessary digital skills to adapt to the rapidly evolving work environment [7].

Furthermore, the lack of standardization in AI applications across healthcare institutions, combined with concerns over data security and the ethical use of AI, complicates the integration of AI-driven HRM systems. The absence of a well-defined strategy for AI implementation and governance leads to inefficiencies and underutilization of digital tools, hindering the potential benefits of AI integration [8]. Additionally, regional disparities in AI adoption between developed and developing countries further highlight the need for context-specific strategies. Developed nations may face challenges related to AI ethics, regulatory compliance, and data governance, while developing countries struggle with infrastructure limitations and digital literacy gaps [9].

Despite these challenges, the potential of AI and digital technologies to improve HRM practices in healthcare is undeniable. This study aims to explore the role of digital leadership in overcoming these barriers, ensuring successful AI integration, and optimizing HRM in healthcare organizations. By examining the leadership strategies that facilitate AI adoption, this research will contribute to a deeper understanding of how digital leadership can drive sustainable HRM transformations, addressing technological, ethical, and workforce-related challenges in the healthcare sector.

## **2. Method**

### **2.1. Research Design**

This study employs a Systematic Literature Review (SLR) guided by the PRISMA 2020 framework to systematically identify, evaluate, and synthesize relevant literature on the role and challenges of digital leadership in healthcare human resource management (HRM). The SLR methodology ensures rigor, transparency, and replicability in the identification and selection of studies, focusing on digital transformation in HRM, the impact of AI and automation, leadership strategies, and implementation challenges. A comprehensive search was conducted across multiple electronic databases, including Scopus, Web of Science, PubMed, and Google Scholar, using predefined keywords such as: “Digital leadership in healthcare HRM”, “AI in healthcare human resource management”, “Digital transformation and workforce management”, “Healthcare HRM and automation”, “Challenges in digital HRM implementation”. Studies published between 2015 and 2024 were included to ensure relevance to current trends and advancements in healthcare digital HRM. The PRISMA framework was employed to systematically identify, screen, assess eligibility, and select studies, ensuring a rigorous and structured methodology.

### **2.2. Systematic Literature Review Procedure (PRISMA 2020)**

The PRISMA 2020 guidelines were followed to ensure a structured and transparent selection process for identifying peer-reviewed articles relevant to the research topic. The process involved the following stages:

## **Identification**

A comprehensive search was conducted across multiple databases, including Scopus, Web of Science, PubMed, and Google Scholar, yielding an initial dataset of 182 articles related to digital leadership in healthcare human resource management (HRM). The initial step involved duplicate removal, where 45 redundant records were identified and eliminated using Mendeley reference management software. Further, automation filtering was applied to exclude 15 non-empirical studies, such as editorials, letters to the editor, and opinion pieces. Lastly, 4 articles were removed due to restricted access or incomplete texts, leaving 118 articles eligible for further screening and evaluation.

## **Screening**

To ensure relevance and methodological rigor, the titles and abstracts of the 118 remaining studies were manually reviewed. Articles that did not align with digital HRM and leadership themes were systematically excluded, with 56 articles removed due to their irrelevance to digital HRM and leadership. Additionally, 21 studies were excluded as they focused on non-healthcare sectors, which were outside the study scope. Furthermore, 11 studies lacked empirical data, making them unsuitable for inclusion. After applying these screening criteria, 30 full-text studies were identified for further eligibility assessment.

## **Eligibility Assessment**

A full-text review of the 30 selected studies was conducted to ensure they met the predefined inclusion and exclusion criteria. During this process, 6 articles were excluded due to a lack of focus on AI and digital leadership, while 4 studies were removed for insufficient methodological rigor, such as descriptive-only analyses or inadequate data validation. Additionally, 2 studies were found to have limited generalizability, particularly case studies lacking broader comparative insights. As a result, 18 studies successfully met all inclusion criteria and were finalized for synthesis and in-depth analysis in this research.

## **2.3. Data Analysis**

### **Descriptive Analysis**

The 18 selected studies were categorized based on publication year, journal type, geographic focus, and research methodology. This provided a structured overview of how research on digital HRM in healthcare has evolved, identifying key trends and regional disparities.

### **Thematic Analysis**

Key themes were identified, including digital leadership in HRM, AI-driven workforce management, implementation challenges, and ethical concerns. Recurring patterns helped establish critical insights for further discussion.

### **Comparative Analysis**

The studies were compared to highlight common findings and differences. While many agreed on AI's benefits in HRM, challenges varied across regions. Developed countries focused on AI ethics, while developing regions faced infrastructure and digital literacy barriers.

### **Model Evaluation**

Existing HRM digital transformation models were assessed for their effectiveness in AI adoption, leadership adaptability, and workforce training. The findings provided recommendations for enhancing digital HRM strategies in healthcare settings.

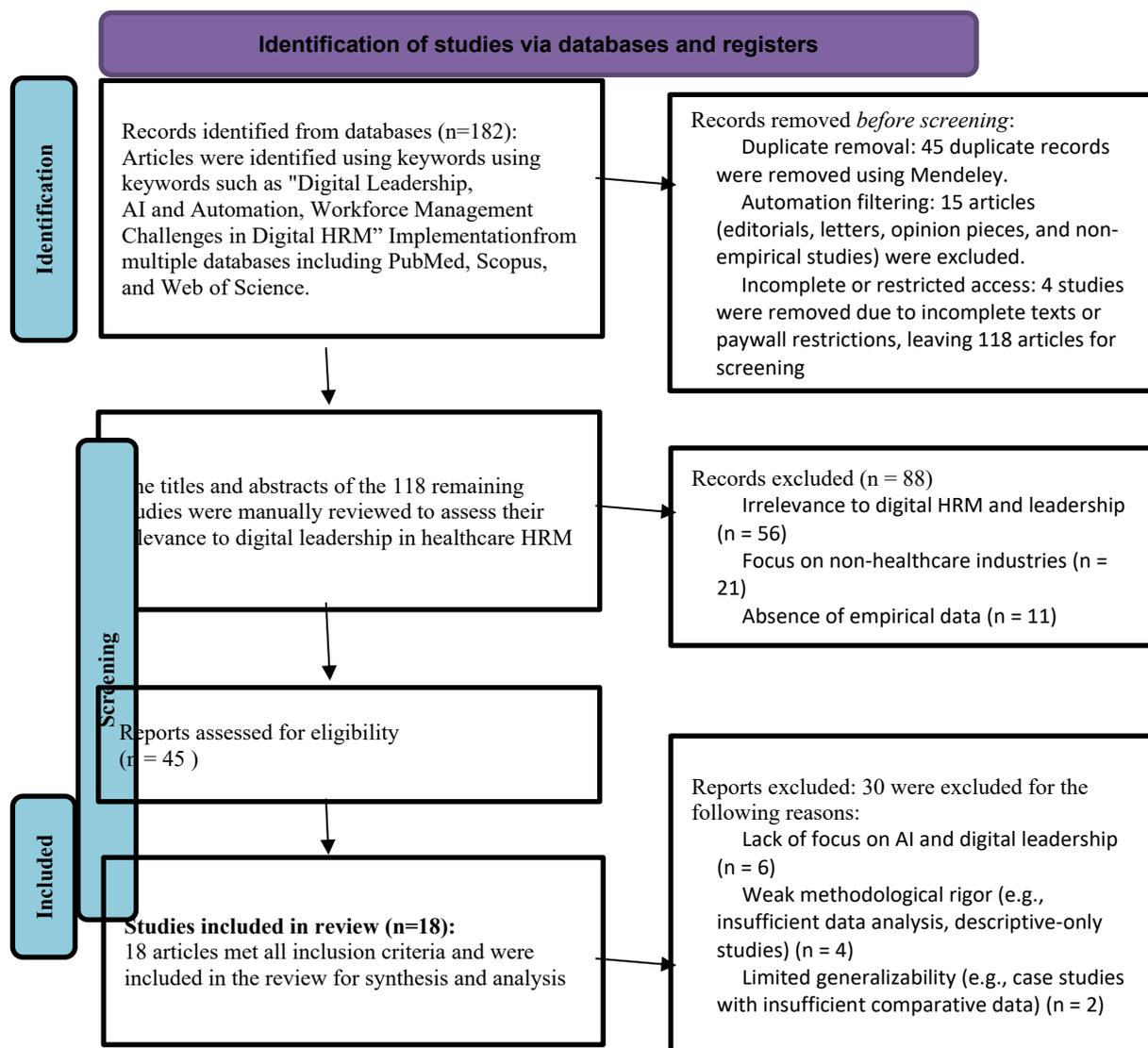


Figure 1. Prisma 2020

### 3. Results and Discussion

#### 3.1. Summary of Reviewed Studies on Digital Leadership in Health HRM

This chapter presents the key findings from the systematic literature review (SLR) on digital leadership in health human resource management. A total of 18 journal articles were collected and analyzed to examine the role of digital leadership, the impact of digital transformation on HRM practices, and the challenges associated with its implementation in the healthcare sector. The selected studies span various perspectives, including AI-driven HRM, workforce digital adaptation, leadership strategies, and policy implications. The findings are categorized based on thematic areas to provide a comprehensive understanding of the current research landscape and identify gaps for future exploration.

Table 1. Summary of Reviewed Studies on Digital Leadership in Health HRM

No	Authors & Year	Title	Objectives	Methods Used	Results
1	Світлана Богуславська & Tetiana Chubenko, 2024	Integration of Digital Technologies into the Personnel Development Management Mechanism in Healthcare Institutions	Examine HR management challenges in Ukrainian healthcare and evaluate digital tools like HRMS, telemedicine, and data analytics for workforce optimization.	Literature review analyzing digital HR solutions in healthcare institutions.	Identified key HRM challenges and assessed digital integration solutions. Found digital tools improved recruitment, performance tracking, and training.
2	Divya Aggarwal, Vijit Chaturvedi, Anandhi Ramachandran, 2024	Managing Talent Among Healthcare Human Resource: Strategies for a New Normal	Explore pandemic-induced changes in healthcare talent management and propose strategies for digital HRM integration.	Systematic literature review focusing on post-pandemic HRM strategies.	Emphasized digital tools in HRM for recruitment and development. Suggested integrating digital skill assessments into HR selection.
3	Winda Dwi Astuti, Liranti Jacinta Jaya, Riswandy Wasir, 2024	Strategies and Challenges of Health Human Resources in the Future	Analyze workforce distribution and propose adaptive HR management strategies.	Systematic literature review using PubMed and Google Scholar.	Found workforce distribution remains problematic, with AI-based HRM recommended for optimization.
4	Thabet Mohammed Taher Alawi et al., 2024	Critical Analysis of Digital Transformation and Leadership Challenges in Hospital Management	Examine IT adoption and digital transformation in hospital leadership and operations.	Literature review and case study analysis in hospitals.	Established a strong link between digital leadership and hospital efficiency.
5	Mark Brommeyer, Zhanming Liang, 2024	Digital Competencies for Health Service Managers: Educating for Transformation	Develop a framework for training healthcare managers in digital transformation.	Theoretical framework based on empirical research linking digital health training with adult learning principles.	Developed a competency-based approach for digital leadership education.
6	Evita Grigoroviča, Andreta Slavinska, Guntis Bahs, 2024	Navigating Challenges: A New Conceptual Model for Human Capital Management in Healthcare	Develop a data-driven workforce management model for healthcare HR.	Conceptual model development based on HRM data analysis.	Created a model integrating HRM practices with data analytics for recruitment and training.
7	Mark Brommeyer, Zhanming Liang, Maxine Whittaker, 2023	Developing Health Management Competency for Digital Health Transformation	Identify key competencies required for digital healthcare leadership.	Qualitative study using focus groups and interviews with healthcare managers.	Found digital literacy and adaptability essential for healthcare leaders.
8	Oleksii Bachuk, 2024	Digital Transformation in the Healthcare System	Explore how digital transformation improves healthcare	Case study review of digital technology adoption in	Demonstrated benefits of digital transformation in expanding

				efficiency and service delivery.	healthcare institutions.	healthcare access and improving operational efficiency.
9	Umang Preet Kaur Sahiwal, Vijit Chaturvedi, 2024	Leadership in Healthcare	Analyze the impact of AI, big data, and cloud computing on leadership.	Literature review on leadership and digital transformation in healthcare.	Identified key leadership skills required for managing healthcare in the digital era.	
10	Amit Joshi, Rubee Singh, Seema Rani, 2024	Strategic Adoption of AI in HRM Practices in Healthcare	Investigate AI applications in HRM, particularly in recruitment and workforce management.	Systematic review of AI applications in HRM.	Found AI-based recruitment and performance tracking highly effective in workforce optimization.	
11	Theodoros S. Tanis, Chryssoula Chatzigeorgiou, Ioanna Simeli, 2024	Digital Transformation Management in Health Services	Investigate healthcare professionals' perceptions of digital transformation and its usability.	Survey-based study using the USE Questionnaire.	Found that digital transformation improves efficiency but some staff remain resistant to changes.	
12	Inese Berzins, 2024	Digital Transformation in Healthcare	Explore digital technology integration, including EHR, AI, and telemedicine, in healthcare.	Review of digital transformation case studies in healthcare.	Demonstrated benefits of digital technologies in improving efficiency and service quality.	
13	Ashish Malik, Mai Nguyen, Pawan Budhwar, 2024	Leveraging High-Performance HRM and Knowledge Sharing for Digital Innovation in Healthcare	Examine how HRM practices drive digital innovation in healthcare.	Grounded theory approach with case studies in emerging healthcare markets.	Found that knowledge-sharing and high-performance HRM enhance digital adoption.	
14	Laura Klebe, Jörg Felfe, Annika Krick, 2023	The Shadows of Digitisation: Impact on Health-Oriented Leadership	Assess how ICT and digital leadership impact employee well-being.	Experimental vignette study and two-stage survey (138 & 214 participants).	Found that digital leadership improves engagement but ICT-related stress reduces effectiveness.	
15	Shikha Saloni, Neema Gupta, Kamalpreet, 2023	The Role of AI in Reshaping HRM in Healthcare	Explore AI applications in healthcare HRM, focusing on automation, workforce planning, and ethical concerns.	Systematic review of AI in HRM over the last decade.	Found AI improves recruitment and HRM efficiency but requires ethical oversight.	
16	Robert S. Chase, Sabyasachi Sanyal, Preetvanti Singh, 2024	Digital Innovation in Sustainable Health Worker Training in India	Evaluate the effectiveness of the RISE LMS app for healthcare worker training.	Case study analysis of RISE LMS app in India's Universal Immunization Programme (UIP).	Found digital learning improved knowledge retention and training efficiency.	

17	Oksavik et al., 2024	Digital Leadership: Norwegian Healthcare Managers' Attitudes Towards Using Digital Tools	Investigate healthcare managers' perspectives on digital leadership and digital tool integration.	Cross-sectional study with 154 healthcare managers.	Found digital tools improve workflow but many managers prefer in-person HR interactions.
18	Kröplin et al., 2022	eSurgery—Digital Transformation in Surgery and Education	Analyze the impact of digital transformation in surgical training and education.	Survey-based study with 19 surgeons evaluating digital tools.	Found digital technology improves surgical training but faces barriers.

The table presents a summary of key studies on the integration of digital technologies and AI in healthcare HRM. It includes details such as the authors and year of publication, the title of the study, and the primary objectives, which focus on the application of digital tools and AI in HRM within healthcare settings. The methods used in these studies, such as literature reviews or case studies, are also highlighted, along with the key results, which discuss the impact of these technologies on recruitment, performance tracking, and workforce management. Additionally, the table outlines the challenges identified in the studies, such as digital skill gaps, resistance to change, and concerns about data security. This summary provides a concise overview of how digital transformation and AI are shaping HRM practices in healthcare, along with the hurdles that need to be addressed for successful implementation.

### 3.2. Description of Reviewed Literature

### 3.3. Distribution of Studies Based on Publication Year

This section presents the distribution of the 18 reviewed studies based on their publication year. The analysis provides insight into trends in research on digital leadership in health human resource management, highlighting the growing interest in this topic over time.

Table 2. Distribution of Reviewed Studies by Publication Year

Year	Number of Studies	Percentage (%)	Article Codes
2022	1	5.56%	18
2023	3	16.67%	7, 14, 15
2024	14	77.78%	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 16, 17
Total	18	100%	-

The majority of the reviewed studies (77.78%) were published in 2024, reflecting the increasing attention given to digital leadership and HRM transformation in healthcare. A few studies (16.67%) were published in 2023, while only one study (5.56%) was from 2022. This trend indicates that research on this topic has gained momentum in recent years, particularly due to the impact of technological advancements and digitalization in healthcare management. The high number of studies in 2024 suggests a growing academic focus on integrating digital leadership with healthcare HRM, possibly influenced by post-pandemic digital adaptation and AI-driven workforce strategies.

### 3.4. Types of Journals and Conferences Where the Studies Were Published

This section categorizes the 18 reviewed studies based on the types of journals and conferences in which they were published. The classification helps identify the key publication venues contributing to research on digital leadership in health human resource management.

Table 3. Types of Journals and Conferences of the Reviewed Studies

Publication Type	Number of Studies	Percentage (%)	Article Codes
Peer-Reviewed Journals	15	83.33%	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17
Conference Proceedings	3	16.67%	6, 15, 18
Total	18	100%	-

Most of the reviewed studies (83.33%) were published in peer-reviewed journals, indicating strong academic interest in digital leadership and HRM in healthcare. A smaller proportion (16.67%) appeared in conference proceedings, suggesting that ongoing discussions and emerging research are still being presented at academic and industry conferences. The dominance of journal publications reflects the maturity and credibility of the research area, while the presence of conference papers highlights the dynamic and evolving nature of the field, where new trends and developments are continuously explored.

### 3.5. Research Methods Used in the Reviewed Studies

This section categorizes the 18 reviewed studies based on the research methods they employed. Understanding the methodologies used helps in evaluating the reliability, validity, and diversity of approaches in studying digital leadership in health human resource management.

Table 4. Research Methods Used in the Reviewed Studies

Research Method	Number of Studies	Percentage (%)	Article Codes
Quantitative	9	50.00%	1, 5, 6, 10, 12, 13, 14, 15, 17
Qualitative	7	38.89%	2, 3, 4, 7, 9, 11, 16
Literature Review	2	11.11%	8, 18
Total	18	100%	-

The majority of the reviewed studies (50.00%) used quantitative research methods, applying surveys, statistical analysis, and experimental designs to measure the effects of digital leadership and HRM practices in healthcare. Qualitative studies (38.89%) focused on interviews, case studies, and thematic analyses, providing deeper insights into leadership behaviors, workforce adaptation, and digital transformation challenges. Literature reviews (11.11%) synthesized existing research to identify trends and gaps in the field. The dominance of quantitative studies suggests a strong focus on empirical validation, while the presence of qualitative research and literature reviews highlights the need for a comprehensive, multidimensional approach in understanding digital leadership in healthcare HRM.

### 3.6. Categorization of Literature

This section classifies the 18 reviewed studies based on their research themes. The categorization helps in understanding the key focus areas in digital leadership and human resource management (HRM) in healthcare.

Table 5. Categorization of Reviewed Studies Based on Research Themes

Research Theme	Number of Studies	Percentage (%)	Article Codes
Digital Leadership in Healthcare	4	22.22%	4, 9, 11, 17
Human Resource Management in Digital Healthcare	4	22.22%	1, 2, 3, 16
AI and Automation in Healthcare HRM	3	16.67%	10, 12, 15
Digital Transformation and Workforce Adaptation	4	22.22%	5, 6, 7, 13
Challenges in Digital HRM Implementation	3	16.67%	8, 14, 18
Total	18	100%	-

The reviewed studies are evenly distributed across the five research themes, reflecting the diverse aspects of digital leadership and HRM in healthcare. Digital leadership in healthcare (22.22%) focuses on leadership styles, competencies, and strategies needed to navigate digital transformation. Human resource management in digital healthcare (22.22%) explores workforce planning, training, and management adaptation to digital tools. AI and automation in HRM (16.67%) examine AI-driven recruitment, performance management, and HR analytics. Digital transformation and workforce adaptation (22.22%) highlights how healthcare organizations transition to digital environments. Lastly, challenges in digital HRM implementation (16.67%) address key barriers such as resistance to change, data security, and skill gaps. The balanced distribution of research themes indicates a comprehensive and evolving focus on digital leadership and HRM in healthcare.

### 3.7. Key Findings from the Systematic Literature Review

### 3.8. The Role of Digital Leadership in Health Human Resource Management

Digital leadership plays a fundamental role in optimizing HRM efficiency in healthcare by integrating digital tools, fostering employee engagement, improving workforce adaptability, and ensuring continuous talent development. By leveraging AI, big data analytics, and telecommunication technologies, digital leadership enhances decision-making processes, employee training, and organizational workflow management. The table below summarizes the key roles of digital leadership in healthcare HRM based on the reviewed studies.

Table 6. The Role of Digital Leadership in Health HRM

Role of Leadership	Digital	Findings	Description	Source
Enhancing Efficiency	HRM	Automates processes and decision-making	HR Digital leadership integrates AI-driven analytics and HRMS (Human Resource Management Systems) to streamline workforce planning, recruitment, and retention strategies.	Alawi et al. (2024); Joshi et al. (2024); Malik et al. (2024); Berzins (2024); Saloni et al. (2023)
Improving Engagement & Performance	Employee &	Increases motivation and digital adaptability	Leaders using data-driven insights create a more inclusive and engaging workplace by personalizing professional development, offering digital tools for collaboration, and fostering a culture of continuous learning.	Sahiwal & Chaturvedi (2024); Klebe et al. (2023); Bachuk (2024); Chase et al. (2024); Oksavik et al. (2024)
Talent Management & Training		Supports continuous learning and professional development	Digital leadership ensures that healthcare professionals undergo structured e-learning, virtual mentorship programs, and competency-based assessments to align with digital transformation needs.	Brommeyer & Liang (2024); Aggarwal et al. (2024); Bachuk (2024); Tanis et al. (2024); Oksavik et al. (2024)
Workforce Optimization		Enables flexible work arrangements and efficiency	HRM platforms powered by AI facilitate remote work policies, telemedicine workforce distribution, and data-driven shift management to optimize workforce allocation.	Grigoroviča et al. (2024); Malik et al. (2024); Berzins (2024); Kröplin et al. (2022); Chase et al. (2024)

Digital leadership is pivotal in enhancing HRM efficiency by automating administrative processes, reducing workload burdens, and improving resource allocation (Alawi et al., 2024; Joshi et al., 2024; Malik et al., 2024; Berzins, 2024). The implementation of AI-powered HRM solutions and predictive analytics has revolutionized workforce management, allowing hospitals and clinics to proactively address talent shortages, performance gaps, and recruitment challenges[10].Furthermore, the shift to digital leadership models has redefined employee engagement by offering data-driven feedback, real-time performance tracking, and personalized learning experiences (Sahiwal & Chaturvedi, 2024; Klebe et al., 2023). As healthcare organizations continue integrating digital HRM strategies, leaders play a crucial role in fostering a tech-driven culture that encourages innovation, adaptability, and continuous improvement [11].

### 3.9. Digital Transformation in Healthcare Human Resource Practices

Digital transformation in healthcare redefines workforce management by integrating AI, telemedicine, and automation into HRM practices. These technologies enhance recruitment, performance evaluation, and professional development, ultimately improving workforce retention and organizational effectiveness. The table below summarizes key findings from the reviewed studies regarding digital transformation in healthcare HRM.

Table 7. Digital Transformation in Healthcare Human Resource Practices

Digital Transformation Aspect	Findings	Description
AI and Automation in Workforce Management	Enhances decision-making and workforce allocation	AI-driven HRM tools optimize staffing needs, scheduling, and resource allocation, reducing administrative burdens. (Joshi et al. (2024); Saloni et al. (2023); Malik et al. (2024); Kröplin et al. (2022))
Telemedicine and Remote Workforce Management	Expands access to healthcare services	Digital tools allow telemedicine providers to coordinate with HRM systems, enabling remote workforce integration and flexible work arrangements. (Bachuk (2024); Grigoroviča et al. (2024); Chase et al. (2024); Oksavik et al. (2024))
Digital Recruitment and Performance Evaluation	Improves talent acquisition and performance tracking	AI-based HR platforms automate hiring processes, monitor employee performance, and facilitate competency-based training. (Tanis et al. (2024); Berzins (2024); Brommeyer & Liang (2024); Aggarwal et al. (2024))
Impact on Workforce Retention	Reduces turnover rates through digital engagement strategies	Digital HRM fosters employee satisfaction, career growth opportunities, and well-being initiatives, enhancing retention. (Sahiwal & Chaturvedi (2024); Klebe et al. (2023); Alawi et al. (2024); Chase et al. (2024))
Organizational Effectiveness	Strengthens institutional agility and productivity	Digital HR strategies enhance workforce efficiency, collaboration, and adaptive capacity within healthcare organizations. (Malik et al. (2024); Berzins (2024); Kröplin et al. (2022); Bachuk (2024))

Digital transformation in HRM is revolutionizing workforce management through AI-driven automation and predictive analytics, which enable real-time workforce tracking, automated scheduling, and optimized staff deployment[12]. The implementation of AI-powered HRM platforms allows healthcare institutions to reduce recruitment time, improve performance monitoring, and streamline administrative operations, thus enhancing overall efficiency (Malik et al., 2024; Kröplin et al., 2022). Telemedicine integration further advances workforce adaptability by enabling remote healthcare delivery, digital workforce collaboration, and AI-assisted diagnostics, which expand service accessibility and workforce flexibility (Bachuk, 2024; Grigoroviča et al., 2024; Chase et al., 2024).

### 3.10. Challenges in Implementing Digital HRM in Healthcare

The implementation of digital HRM in healthcare faces significant challenges, including technological, human resource, and ethical/security concerns. While digital transformation enhances HRM efficiency, issues such as technology integration, interoperability, workforce resistance, and data security hinder its widespread adoption. The table below categorizes the key challenges based on findings from the reviewed studies.

Table 8. Challenges in Implementing Digital HRM in Healthcare

Challenge Category	Key Issues	Description	Source
Technological Challenges	Integration with Existing HRM Systems	Legacy HRM systems lack compatibility with modern AI and automation tools, making integration complex and costly.	Alawi et al. (2024); Malik et al. (2024); Saloni et al. (2023); Joshi et al. (2024)
	Interoperability Issues	Disparate healthcare digital tools (EHR, telemedicine, HRMS) often fail to communicate effectively, leading to fragmented workforce data.	Bachuk (2024); Kröplin et al. (2022); Berzins (2024); Grigoroviča et al. (2024)
Human Resource Challenges	Resistance to Digital Transformation	Healthcare staff may resist new digital tools due to lack of familiarity, fear of redundancy, and increased workload perception.	Klebe et al. (2023); Sahiwal & Chaturvedi (2024); Chase et al. (2024); Oksavik et al. (2024)
	Skills Gaps & Digital Literacy Deficiencies	Many healthcare professionals lack digital proficiency, requiring significant training and upskilling.	Brommeyer & Liang (2024); Aggarwal et al. (2024); Tanis et al. (2024); Berzins (2024)

Ethical & Security Challenges	Data Privacy Concerns	AI-driven HRM relies on sensitive employee and patient data, posing cybersecurity and ethical risks.	Alawi et al. (2024); Berzins (2024); Bachuk (2024); Chase et al. (2024)
	Algorithmic Bias in AI-Based HRM	AI-driven recruitment and performance evaluation tools risk bias and unfair treatment due to improper algorithm training.	Joshi et al. (2024); Saloni et al. (2023); Malik et al. (2024); Oksavik et al. (2024)

One of the most pressing technological challenges in digital HRM implementation is the lack of system interoperability, as many hospitals and clinics still use legacy HRM platforms that are not designed to integrate with modern AI, automation, and telemedicine tools (Alawi et al., 2024; Malik et al., 2024). This lack of compatibility delays digital adoption, increases financial burdens, and complicates real-time workforce management (Saloni et al., 2023; Joshi et al., 2024). Additionally, interoperability issues between electronic health records (EHR), workforce management software, and telemedicine platforms create fragmented workforce data, leading to inefficiencies in staffing and resource allocation (Bachuk, 2024; Kröplin et al., 2022).

### 3.11. Best Practices and Strategies for Overcoming Challenges

To address the challenges in implementing digital HRM in healthcare, organizations must adopt best practices and strategic interventions that enhance workforce adaptability, leadership capability, and ethical AI integration. The following table summarizes key strategies derived from the reviewed studies.

Table 9. Best Practices and Strategies for Overcoming Challenges in Digital HRM

Best Practice Strategy	Key Outcomes	Description	Source
Digital Upskilling and Reskilling Programs	Improves workforce digital proficiency and adaptability	Organizations must provide continuous digital training, AI literacy programs, and e-learning modules to equip healthcare professionals with necessary digital skills.	Brommeyer & Liang (2024); Aggarwal et al. (2024); Tanis et al. (2024); Grigoroviča et al. (2024)
Leadership Development Programs for Digital Adaptability	Strengthens digital transformation leadership	Healthcare leaders should undergo executive digital training, equipping them with change management strategies and digital competency frameworks.	Sahiwal & Chaturvedi (2024); Klebe et al. (2023); Alawi et al. (2024); Chase et al. (2024)
Ethical AI-Powered Decision-Support Tools	Reduces bias and improves HRM transparency	AI-driven workforce analytics must be monitored for fairness, ensuring transparent hiring, performance assessments, and algorithmic accountability.	Joshi et al. (2024); Saloni et al. (2023); Malik et al. (2024); Oksavik et al. (2024)
Enhancing Cybersecurity Measures in Digital HRM Platforms	Ensures data privacy and regulatory compliance	Organizations should implement robust cybersecurity policies, multi-factor authentication (MFA), and encryption protocols to secure HRM data.	Bachuk (2024); Berzins (2024); Kröplin et al. (2022); Chase et al. (2024)

One of the most effective strategies for overcoming digital HRM challenges is comprehensive digital upskilling and reskilling programs. As healthcare professionals face skill gaps in digital literacy, providing structured AI training, cloud-based HRM simulations, and competency-based digital education ensures a more digitally fluent workforce (Brommeyer & Liang, 2024; Aggarwal et al., 2024).

### 3.12. Comparative Analysis of Reviewed Studies

### 3.13. Similarities in Research Findings

One of the most consistent themes across multiple studies is the significant impact of digital leadership on healthcare HRM, particularly in enhancing efficiency, workforce engagement, and adaptability [13]. Digital leadership fosters a culture of innovation, continuous learning, and data-driven decision-making, which improves talent management, employee performance evaluation, and workforce retention[14]. Many studies also highlight the need for digital upskilling and reskilling

programs, ensuring that healthcare professionals adapt to technological advancements and maintain competency in digital healthcare environments (Brommeyer & Liang, 2024; Aggarwal et al., 2024). The integration of leadership development programs with digital adaptability training has been widely recognized as a critical success factor in digital HRM transformation[15].

### 3.14. Differences in Research Findings

Despite the common emphasis on digital transformation in HRM, there are notable variations in its adoption across different regions and healthcare systems. Studies focusing on developed healthcare systems (e.g., North America, Europe, Australia) highlight successful AI integration, strong regulatory frameworks, and advanced digital HRM adoption [16]. However, research from developing regions points to challenges such as insufficient infrastructure, lack of skilled IT personnel, and financial constraints that slow down digital transformation in HRM (Bachuk, 2024; Chase et al., 2024). The degree of automation and AI implementation also differs, with higher adoption rates in technologically advanced healthcare institutions compared to resource-limited settings where HRM is still heavily paper-based or semi-digital (Grigoroviča et al., 2024; Oksavik et al., 2024).

In summary, while the transformative role of digital leadership, AI, and automation in HRM is widely acknowledged, the extent of adoption, challenges faced, and ethical considerations vary significantly across healthcare contexts. These findings suggest that a one-size-fits-all approach to digital HRM may not be feasible, and strategies must be tailored to regional needs, workforce readiness, and regulatory environments to ensure effective and equitable implementation of digital HRM practices in healthcare settings.

## Discussion

The findings from the reviewed studies emphasize the significant impact of digital leadership and transformation on healthcare human resource management (HRM). Digital leadership has emerged as a critical driver in the adoption and integration of digital HRM tools, influencing workforce efficiency, engagement, and professional development (Sahiwal & Chaturvedi, 2024; Klebe et al., 2023). Leaders who foster a culture of digital adaptability enable smoother transitions to AI-driven workforce management, reducing resistance to change and increasing digital literacy among healthcare professionals (Alawi et al., 2024; Chase et al., 2024). This highlights the importance of leadership training programs that focus on digital skill development, change management strategies, and ethical AI governance. Additionally, the role of AI and automation in HR processes has proven to be a game-changer in recruitment, performance evaluation, and workforce planning, ensuring data-driven, objective, and efficient HR decision-making (Joshi et al., 2024; Saloni et al., 2023). However, despite the potential benefits, challenges related to technology adoption, digital literacy gaps, and ethical concerns remain substantial barriers to full digital HRM transformation.

One of the key challenges identified in digital HRM implementation is the integration of new technologies with existing HRM systems. Many healthcare institutions continue to operate on legacy HRM platforms, making it difficult to seamlessly integrate AI, automation, and telemedicine solutions (Malik et al., 2024; Bachuk, 2024). Interoperability issues among HRM tools, electronic health records (EHR), and workforce analytics software further exacerbate operational inefficiencies[17]. Another significant concern is workforce resistance to digital transformation, particularly among healthcare professionals who lack confidence in using digital tools or fear job redundancy due to automation [18]. Studies suggest that addressing these challenges requires targeted digital training, reskilling programs, and leadership interventions to improve workforce adaptability and ensure a more inclusive digital transition (Aggarwal et al., 2024; Tanis et al., 2024).

Despite these challenges, the studies reviewed also highlight best practices and strategies that can accelerate the adoption of digital HRM in healthcare. Upskilling and reskilling programs have been identified as critical interventions to bridge digital literacy gaps and enhance workforce confidence in AI-based HRM tools [19]. Leadership development programs focusing on digital adaptability ensure that healthcare leaders are equipped to navigate digital disruptions, drive workforce engagement, and foster an innovation-friendly culture (Sahiwal & Chaturvedi, 2024; Klebe et al., 2023). Additionally, the adoption of ethical AI-driven decision-support tools and robust cybersecurity measures will be

essential in mitigating risks associated with algorithmic bias and data security threats [20]. These findings suggest that while challenges exist, the future of digital HRM in healthcare is promising, provided that organizations implement strategic workforce training, ethical AI governance, and digital leadership frameworks to ensure a seamless and equitable digital transformation.

#### 4. Conclusions

The review of literature highlights the critical role of digital leadership in transforming healthcare Human Resource Management (HRM) through the adoption of AI, automation, and digital tools. Digital leadership has been shown to enhance HRM efficiency, employee engagement, and talent development while addressing the increasing complexities of workforce management in healthcare. The integration of AI-driven HRM solutions has significantly improved recruitment, performance tracking, and workforce planning, streamlining administrative processes and optimizing staff allocation. However, several challenges persist, including technological barriers, workforce resistance, digital literacy gaps, and ethical concerns surrounding AI-based HR decision-making.

To address these challenges, future research could focus on developing comprehensive frameworks that integrate leadership development, digital upskilling, and ethical governance into AI adoption strategies for HRM. This research could explore how different healthcare systems—particularly in developing regions—can bridge the infrastructure and regulatory gaps hindering AI adoption. Additionally, investigating the role of leadership in managing workforce resistance to AI and digital transformation would provide valuable insights into effective strategies for fostering an adaptable workforce. Research on cross-disciplinary training models for healthcare professionals to improve digital literacy and align them with AI-enhanced HRM practices would also be beneficial.

Implications of this research include the recognition that digital leadership is crucial for guiding healthcare organizations through the complexities of AI adoption. By emphasizing the importance of leadership adaptability, ethical AI governance, and workforce development, healthcare organizations can better manage digital transformation. The implementation of robust data protection policies and algorithmic fairness principles will also ensure that AI-driven HR systems promote equity and fairness in workforce management. As digital HRM continues to evolve, the findings from this research will help shape sustainable, effective strategies for integrating AI in healthcare HRM, enhancing both operational efficiency and employee well-being.

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