

A Phenomenological Exploration of Hospital Human Resource Managers' Perspectives About Requiring AI Skills as an Essential Skill: PROs & CONs

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Submitted to: Journal of Medical Internet Research
on: March 22, 2025

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Abstract

Background: The rapid integration of artificial intelligence (AI) in healthcare is transforming hospital operations and administrative processes. In this context, hospital human resource (HR) managers are increasingly challenged to incorporate AI skills into workforce competencies to support both clinical and administrative functions. However, investigation into HR managers' subjective perspectives remains lacking.

Objective: To explore hospital HR managers' perspectives on mandating AI skills as essential competencies, with a focus on identifying perceived benefits, challenges, and strategic approaches for effective implementation.

Methods: A qualitative, phenomenological research design was employed across two tertiary hospitals in Beijing and Sichuan. Purposively sampled HR managers participated in semi-structured telephone interviews, which were audio-recorded, transcribed, and analyzed using Colaizzi's method to extract core themes and subthemes regarding AI competency requirements.

Results: Fifteen HR managers participated between January 15 and February 9, 2025, including 8 from Beijing and 7 from Sichuan. The participants were aged 34-52 years (mean=42.3). The interviews were 33.9 minutes on average (range: 25-49 minutes). Findings reveal a dual perspective among HR managers: while they recognize the inevitability of AI adoption and its potential to future-proof the workforce and enhance patient care, significant systemic barriers exist. Challenges such as outdated infrastructure and varying levels of workforce readiness were identified. Participants advocated for role-specific, phased training pathways and collaborative approaches to integrating AI skills, rather than enforcing a uniform competency mandate.

Conclusions: From the perspectives of hospital HR managers, there is a tension between recognizing AI's inevitable role in healthcare's future and acknowledging significant systemic barriers to immediate implementation of universal competency requirements. HR managers advocate for strategic, phased approaches that account for infrastructure limitations, workforce readiness disparities, and the need for role-specific skill development. Successful integration of AI competencies requires balancing technological advancement with organizational readiness, where skill development should evolve alongside infrastructure capabilities.

(JMIR Preprints 22/03/2025:74339)

DOI: <https://doi.org/10.2196/preprints.74339>

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Original Manuscript

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Abstract

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The rapid integration of artificial intelligence (AI) in healthcare is transforming hospital operations and administrative processes. In this context, hospital human resource (HR) managers are increasingly challenged to incorporate AI skills into workforce competencies to support both clinical and administrative functions. However, investigation into HR managers' subjective perspectives remains lacking.

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Fifteen HR managers participated between January 15 and February 9, 2025, including 8 from Beijing and 7 from Sichuan. The participants were aged 34-52 years (mean=42.3). The interviews were 33.9 minutes on average (range: 25-49 minutes). Findings reveal a dual perspective among HR managers: while they recognize the inevitability of AI adoption and its potential to future-proof the workforce and enhance patient care, significant systemic barriers exist. Challenges such as outdated infrastructure and varying levels of workforce readiness were identified. Participants advocated for role-specific, phased training pathways and collaborative approaches to integrating AI skills, rather than enforcing a uniform competency mandate.

Conclusions:

From the perspectives of hospital HR managers, there is a tension between recognizing AI's inevitable role in healthcare's future and acknowledging significant systemic barriers to immediate implementation of universal competency requirements. HR managers advocate for strategic, phased approaches that account for infrastructure limitations, workforce readiness disparities, and the need for role-specific skill development. Successful integration of AI competencies requires balancing technological advancement with organizational readiness, where skill development should evolve alongside infrastructure capabilities.

Keywords: AI competency; artificial intelligence; hospital administration; human resource management; phenomenology; qualitative study; workforce development.

Introduction

The healthcare sector is undergoing a profound transformation driven by the rapid integration of

artificial intelligence (AI) into hospital operations, patient care, and administrative workflows [1,2]. AI applications now span diagnostic enhancements, personalized treatment plans, workflow optimization, and administrative automation, with demonstrated capabilities in interpreting medical imaging, predicting staffing needs, and guiding clinical decisions [3,4]. Concurrently, human resource (HR) management in hospitals has evolved into a strategic function, tasked with navigating workforce shortages, skill gaps, and the integration of AI-driven tools [5,6]. This dual evolution creates a critical juncture. As hospitals increasingly adopt AI to improve efficiency and outcomes, HR departments face unprecedented demands to cultivate AI competencies within their own teams to support both clinical and administrative staff.

Existing literature emphasizes the growing necessity for AI literacy across healthcare professions, proposing competency frameworks that include foundational AI knowledge, ethical considerations, data management, and communication skills [7-9]. For clinical staff, these competencies enable critical appraisal of AI tools and their integration into medical decision-making [10,11]. Within HR specifically, AI adoption has shown potential to enhance talent acquisition, reduce hiring biases, optimize workforce planning, and automate administrative tasks such as scheduling and payroll [12-14]. However, significant challenges persist, including substantial training investments, algorithmic bias risks, data privacy concerns, and the potential erosion of human-centric HR practices [15-18]. While studies have examined AI competencies for clinicians and general hospital staff, scant attention has been paid to the perspectives of hospital HR managers regarding mandatory AI skill requirements for their own personnel. This oversight is particularly notable given HR's pivotal role in bridging technological adoption with workforce readiness across both clinical and administrative domains.

A critical research gap exists in understanding how hospital HR managers conceptualize the necessity of AI skills for hospital human resources. Current scholarship focuses predominantly on technical implementation rather than strategic human resource implications. The absence of

phenomenological insights into HR managers' subjective perspectives leaves unanswered questions about their perceived advantages, reservations, and implementation considerations when mandating AI competencies. This gap hinders the development of targeted training programs and evidence-based policies for healthcare HR professionals operating in AI-augmented environments.

This study aims to phenomenologically explore hospital HR managers' perspectives on requiring AI skills as essential competencies for all human resource staff. Specific objectives include: (1) identifying perceived advantages and disadvantages of mandatory AI skill requirements, (2) elucidating the rationale behind HR leaders' viewpoints, and (3) uncovering implementation challenges and strategic considerations specific to hospital environments.

The study finds potential to inform hospital workforce strategies during an era of accelerated AI adoption. By capturing HR managers' perspectives, the findings may guide the development of competency frameworks tailored to healthcare HR professionals, addressing both technical AI proficiencies and essential human skills. Practically, the research outcomes may enable healthcare organizations to design targeted recruitment strategies, training initiatives, and change management protocols. Ultimately, this investigation could contribute to optimizing hospital HR functions' capacity to support improved patient outcomes, operational efficiency, and organizational adaptability in an increasingly AI-driven healthcare landscape.

Methods

A phenomenological qualitative research design was employed to explore hospital human resource managers' perspectives on requiring AI skills as essential competencies for hospital staff [19].

Conducted across two tertiary care hospitals in Beijing and Sichuan provinces between January 15 and February 9, 2025, the study adhered to Husserlian descriptive phenomenology to minimize researcher bias while capturing participants' lived experiences [20].

Study setting and participant selection

The research was conducted at two tertiary hospitals selected for their contrasting geographic

locations and varying stages of AI integration in HR practices. The Beijing hospital is a public geriatric specialty hospital. The Sichuan facility is the largest regional healthcare center. Participants were purposively sampled from HR departments and met specific criteria: they had a minimum of one year's experience in hospital HR management, were directly involved in competency framework development, and had oversight of both clinical and/or administrative staff. Exclusion criteria included interim HR managers or those exclusively handling non-competency-related HR functions.

Data Collection

Data were collected through semi-structured, telephone interviews using an open-ended guide developed through pilot testing with two HR managers (excluded from final analysis) [21-23]. The interview protocol focused on four domains: perceived advantages and limitations of mandatory AI competencies, anticipated implementation challenges, ethical and operational concerns, and strategic recommendations for skill integration. Interviews were conducted by phone call and audio-recorded with consent. The recordings were transcribed verbatim within 48 hours. Field notes captured non-verbal cues, such as sudden changes in participant's tone of speaking and emotions. Data saturation was deemed achieved when two consecutive interviews failed to yield new analytic information and themes [24,25].

Data Analysis

Transcripts were analyzed using Colaizzi's phenomenological method [26]. Initially, researchers engaged in repeated reading of transcripts while listening to audio recordings to become familiar with the data. Significant statements were then extracted and condensed to formulate meanings, which were further grouped into subthemes through constant comparative analysis. The subthemes were synthesized into core themes. To validate the findings, member checking was conducted with participants to confirm accuracy. Finally, the essence of participants' experiences was identified through team debriefing. An audit trail documented analytical decisions, while peer debriefing with two qualitative research experts addressed potential bias.

Rigor and Trustworthiness

Credibility was ensured through triangulation of interview data with policy documents from both hospitals. Dependability was established through stepwise audit trails reviewed by an external qualitative methodologist. Confirmability was strengthened by bracketing exercises and reflexivity memos addressing researchers' assumptions about AI in healthcare [27,28].

Ethical Approval and Informed Consenting

The study was exempted for ethical approval as it does not involve patients or sensitive clinical data according to the institutional academic ethics policy. Participants provided verbal informed consent before interviews, after receiving detailed information sheets explaining study objectives, voluntary participation, and confidentiality safeguards. All data were anonymized using alphanumeric codes (e.g., BJ-HR01 for Beijing-Human Resource Manager 01, SC-HR01 for Sichuan-Human Resource Manager 01). Recordings and demographic data were stored on two password-protected flash drives, one kept by the lead researcher in Beijing and the other by the leader researcher in Chengdu, accessible only to the research team [29].

Results

Fifteen HR managers participated, including 8 from Beijing and 7 from Sichuan. The sample comprised 10 female and 5 male participants aged 34-52 years (mean=42.3), representing diverse educational backgrounds in healthcare administration (n=6), human resources (n=5), and clinical fields (n=4). The interviews were 33.9 minutes on average (range: 25-49 minutes).

Main themes

Theme 1: Inevitable shift toward AI competency requirements

Participants universally acknowledged that AI literacy will become a non-negotiable skill for healthcare professionals due to rapid technological advancements and evolving patient-care standards. However, they emphasized that current infrastructure, workforce readiness, and ethical frameworks are insufficient for immediate implementation:

“AI is inevitable. AI is gaining popularity but staff only use AI apps randomly. There is efficiency improvements but not the mainstream... As HR managers, we should recognize the inevitability of AI and have a proactive strategic consideration.” (BJ-HR04)

Subtheme 1.1: Future-proofing the workforce

As AI technologies rapidly evolve and integrate into various aspects of healthcare, there is an urgent need to prepare the workforce for this shift. The inability to interpret AI outputs, as highlighted by the HR manager's statement, underscores a significant skills gap that could hinder the effective use of AI-driven tools in clinical settings. This proactive approach to skill development is essential to ensure that healthcare professionals can effectively leverage AI technologies to improve patient care and operational efficiency:

“If we delay training (of AI skills) until tools are mainstream, it'd be too later. For instance, our new AI-driven diagnostics require staff to interpret probabilistic outputs, which most clinicians currently can't do.” (BJ-HR04)

Subtheme 1.2: Patient care imperatives

This subtheme underscores the critical role of AI in enhancing patient outcomes and driving the urgency for AI skill development in healthcare. The integration of AI in healthcare workflows is reshaping patient care by enabling faster, more accurate diagnoses and personalized treatment plans:

“AI-driven algorithms in medical imaging enhance diagnostic accuracy, providing rapid and precise assessments. This technology is not just speeding up our work; it's helping us catch diseases earlier and develop more effective treatment plans.” (SC-HR01)

Theme 2: Systemic barriers to immediate implementation

While the inevitability of AI in healthcare is widely acknowledged, participants reported structural and cultural obstacles that impede immediate implementation of AI competency mandates. These barriers highlight the complex interplay between technological advancements and the existing healthcare infrastructure and workforce.

Subtheme 2.1: Infrastructure and resource gaps

Healthcare facilities face technical limitations in adopting AI technologies. The example of outdated hardware illustrates how inadequate infrastructure can render AI implementation ineffective or even impossible. This gap in resources can be particularly pronounced in rural or underfunded healthcare settings, potentially exacerbating healthcare disparities:

“We're asked to implement AI charting, but 70% of our nurses work on decade-old PCs.

Mandating skills without upgrading hardware is such as teaching swimming without water.” (SC-HR05)

Subtheme 2.2: Workforce readiness disparities

The levels of AI readiness varies across different roles and generations in the healthcare workforce. The failure of a one-size-fits-all approach to AI training, as exemplified by participant's experience, underscores the need for tailored, role-specific training programs. This disparity in workforce readiness poses a significant challenge to the uniform implementation of AI competencies across healthcare organizations:

“Our AI tutorials are few and failed because we treated 25-year-old doctors and 40-year-old administrators the same. The doctors' completion rate was up to 70%, the administrators couldn't see why or how to use AI. They needed role-specific modules.”
(BJ-HR03)

These barriers necessitate strategic, phased approaches rather than abrupt mandates.

Theme 3: Strategic approaches for phased adoption

Gradual, context-sensitive strategies are needed to integrate AI competencies in healthcare. It is acknowledged that while AI adoption is inevitable, the path to full integration must be carefully planned and executed to address the identified barriers and ensure successful implementation.

Subtheme 3.1: Role-specific skill pathways

It is vital to tailor AI training to specific roles in healthcare organizations. The success of the tiered

approach with radiologists and doctors demonstrates how role-specific training can significantly improve compliance and effectiveness. This strategy recognizes that different healthcare professionals require different levels and types of AI competencies to effectively integrate AI into their work:

“AI skills should be tiered: basic data literacy for beginners, advanced analytics for doctors with experience using AI. We piloted this with radiologists, first teaching them to formulate prompts and validate outputs, not build models. Most doctors and radiologists found the training programs useful.” (SC-HR07)

Subtheme 3.2: Collaborative AI-human workflow design

Healthcare professionals should be involved in the design and implementation of AI applications. The example of nurses contributing to the development of patient education AI agents demonstrates how collaborative design can lead to more effective and accepted AI tools. This approach ensures that AI systems complement rather than disrupt existing workflows, balancing the benefits of automation with the need for human oversight and intervention:

“Some nurses and physicians in hospital worked together to develop AI agents for patient education. They saw what IT engineers couldn't see. Now, the tools are very popular with patients.” (SC-HR03)

Such collaboration mitigates resistance by balancing automation with professional autonomy. The findings reveal a tension between AI's unavoidable role in healthcare's future and the systemic unpreparedness to mandate universal competencies. While participants agreed AI skills will soon be essential, they stressed that premature mandates risk exacerbating inequities and workflow disruptions. Strategic, phased approaches, prioritizing infrastructure upgrades, role-specific training, and participatory design, are crucial to navigate this transition. This progression from inevitability to barriers to solutions creates a roadmap for healthcare institutions, emphasizing that AI competency mandates must evolve alongside technological and organizational readiness.

Discussion

In this phenomenological study, we explored hospital HR managers' perspectives on requiring AI skills as essential competencies for hospital staff. The findings revealed a complex landscape characterized by tension between the recognized inevitability of AI integration in healthcare and significant systemic barriers to immediate implementation. HR managers acknowledged AI's transformative potential while advocating for strategic, phased approaches to competency development that account for existing limitations in infrastructure and workforce readiness. Our findings reveal a fundamental duality in HR managers' perspectives that shapes their approach to AI skill requirements. While participants unanimously recognized AI as an inevitable component of healthcare's future, they simultaneously identified substantial barriers preventing immediate universal implementation. The duality is consistent with prior reports on adoption of AI in healthcare [30-32]. This tension creates a complex decision-making environment for HR leaders tasked with workforce development in rapidly evolving technological landscapes. The theme "Inevitable shift toward AI competency requirements" demonstrates HR managers' forward-looking perspective, with participants such as BJ-HR04 acknowledging that "AI is inevitable" despite current random and non-mainstream usage patterns. This inevitability is driven by two primary factors: the need for future-proofing the workforce and enhancing patient care. The warning that "if we delay training until (AI) tools are mainstream, it'd be too late" reflects a proactive approach to skill development that aligns with emerging literature on healthcare workforce preparation for technological disruption [33,34]. However, this recognition of inevitability exists in direct tension with the identified systemic barriers. The infrastructure limitations exemplified by SC-HR05's observation that "70% of our nurses work on decade-old PCs" creates a situation where mandating skills becomes impractical without corresponding resource allocation. This metaphorical comparison to "teaching swimming without water" aptly captures the frustration HR managers experience when attempting to implement

AI training without adequate technological infrastructure.

Another significant finding emerging from this study is the inadequacy of universal approaches to AI skill development in healthcare settings. The marked disparity in training completion rates between younger physicians and older administrators highlights the differential readiness across workforce segments. This finding challenges generalized competency frameworks that often fail to account for the diverse roles and varied digital literacy levels within healthcare organizations [35,36].

The success of tiered, role-specific approaches demonstrated with radiologists suggests that AI skill development must be tailored to specific professional contexts rather than broadly mandated.

Beginning with practical skills such as prompt formulation and output validation before advancing to more complex applications provides a pragmatic pathway that acknowledges varying baseline competencies [37]. This graduated approach allows healthcare professionals to develop contextually relevant AI skills that directly enhance their specific functions rather than acquiring generalized knowledge with unclear practical applications.

The "Collaborative AI-human workflow design" subtheme reveals HR managers' recognition that successful AI implementation requires active participation from end-users. The example of nurses and physicians developing AI agents for patient education demonstrates how involving healthcare professionals in AI design leads to greater acceptance and utility. This collaborative approach represents a significant departure from top-down implementation strategies often employed with new technologies in healthcare settings.

This finding suggests that HR managers conceptualize their role not merely as implementing predetermined competency requirements but as facilitating participatory processes that balance technological advancement with professional autonomy. By involving healthcare professionals in AI development, HR departments can help ensure that resulting tools complement existing workflows rather than disrupting established practices. This collaborative approach may also mitigate resistance by preserving professional agency while advancing technological integration.

Implications

Our findings may contribute to theoretical understandings of AI integration in healthcare by highlighting the often-overlooked human resource dimensions of technological change. While existing literature focuses predominantly on technical implementation and clinical applications, this study illuminates the crucial intermediary role of HR departments in balancing technological imperatives with workforce realities. This perspective expands current conceptualizations by positioning HR not merely as a support function but as a strategic bridge between technical innovation and healthcare delivery.

The tension between inevitability and readiness identified in this study challenges linear models of technology adoption that assume uniform progression through adoption stages. Instead, our findings suggest a more complex, multi-faceted process where various organizational elements (infrastructure, workforce demographics, professional roles) advance at different rates, creating implementation challenges that require sophisticated management. This understanding may inform more realistic theoretical frameworks for technological change in healthcare settings.

Several practical implications can guide hospital HR departments navigating AI integration. First, HR managers should adopt phased, strategic approaches to AI skill development rather than implementing universal mandates. This requires careful assessment of existing infrastructure, workforce demographics, and role-specific needs before designing competency frameworks.

Second, HR departments should develop tiered, role-specific AI training pathways that acknowledge varying baseline competencies and job requirements. As demonstrated by the successful pilot with radiologists, beginning with practical applications directly relevant to specific roles improves engagement and effectiveness. This differentiated approach allows for gradual skill building that respects professional contexts and varying digital literacy levels.

Third, HR managers should position themselves as facilitators of collaborative AI development rather than merely implementing pre-developed systems. By creating opportunities for healthcare

professionals to participate in AI design, HR can ensure resulting tools address genuine clinical needs and complement existing workflows. This participatory approach may also reduce resistance by preserving professional autonomy while advancing technological integration.

Finally, our findings suggest HR departments should advocate for synchronized infrastructure development alongside competency building. The metaphorical comparison of mandating AI skills without adequate technology to "teaching swimming without water" aptly captures the futility of skill development without corresponding resource allocation. HR professionals must therefore expand their role to include technology resource advocacy, ensuring physical infrastructure supports the skills being developed.

A central challenge revealed in this study is determining the appropriate timing for introducing AI skill requirements. The cautionary perspective that delaying training until tools become mainstream would be "too late" suggests proactive skill development is necessary. However, premature mandates risk creating frustration when infrastructure limitations prevent practical application of newly acquired skills.

This timing dilemma reflects broader questions about change management in healthcare organizations. HR managers must balance preparing the workforce for future technological shifts while acknowledging current operational realities. The finding that AI skill development should be phased rather than immediate suggests HR managers favor evolutionary rather than revolutionary approaches to technological change. This measured perspective may reflect healthcare's inherently conservative organizational culture, where changes affecting patient care require careful consideration and validation.

The identified workforce readiness disparities raise important equity considerations regarding AI skill mandates. The stark contrast in training completion rates between different staff segments suggests universal requirements may disproportionately disadvantage certain workforce groups, particularly older employees or those in non-clinical roles. This finding indicates that HR managers

must consider fairness and accessibility when designing AI training initiatives.

Equitable approaches to AI skill development might include providing additional support resources for less technologically confident employees, developing age-appropriate training methodologies, and ensuring skill requirements directly relate to job functions rather than imposing uniform standards across diverse roles. These considerations align with HR's fundamental responsibility to promote workplace fairness while advancing organizational capabilities.

Limitations and future research directions

This study has several limitations that should be considered when interpreting the findings. The research was conducted in two tertiary hospitals in China, potentially limiting transferability to other healthcare settings or regions with different technological infrastructures and cultural contexts.

Future research should explore these perspectives across diverse healthcare environments, including rural and community hospitals, to capture a broader range of experiences.

Additionally, our study focused exclusively on HR managers' perspectives, which may differ from those of frontline healthcare workers or hospital administrators. Future studies should incorporate multiple stakeholder viewpoints to develop more comprehensive understandings of AI skill requirements and implementation challenges. Particularly valuable would be comparative analyses of how HR managers' perceptions align with or diverge from those of the staff they support.

Conclusions

From the perspectives of hospital HR managers, there is a tension between recognizing AI's inevitable role in healthcare's future and acknowledging significant systemic barriers to immediate implementation of universal competency requirements. HR managers advocate for strategic, phased approaches that account for infrastructure limitations, workforce readiness disparities, and the need for role-specific skill development. Successful integration of AI competencies requires balancing technological advancement with organizational readiness, where skill development should evolve alongside infrastructure capabilities.

Acknowledgments

Not applicable.

Data Availability

Desensitized data analyzed in this study can be provided on reasonable request to the correspondence author. The original interview recordings and transcripts cannot be provided for privacy protection considerations.

Conflicts of Interest

None declared.

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Abbreviations

AI: artificial intelligence
HR: human resource