International Journal of Finance and Management (IJFM), Volume 8, Issue 2, November 2026
ISSN: 2976-307X

Artificial Intelligence Adoption and Medication Equipment Supply Systems in Healthcare: A Systematic Literature Review of Readiness Behavior, Implementation Challenges, and Utilization

ALZAHRANI, AHMED ABDULLAH J

[1] **Faculty of Finance and Administrative Science, Al Madinah International University, Taman Desa Petaling, 57100 Kuala Lumpur, Malaysia**
ahm1717@hotmail.com

Abdoulrahman Aljounaidi

[2]**Faculty of Finance and Administrative Science, Al Madinah International University, Kuala Lumpur, Malaysia**
abdulrahman.ramez@mediu.edu.my

Alharath Ateik

[3]**Faculty of Finance and Administrative Science, Al Madinah International University, Kuala Lumpur, Malaysia**
alharath.ateik@mediu.edu.my

Mukhtar Idris Abu Baker Adam

[4] **Faculty of Finance and Administrative Science, Al Madinah International University, Taman Desa Petaling, 57100 Kuala Lumpur, Malaysia**
mukhtar.adam@mediu.edu.my

Siti Maisara Binti Mohd Jafre

[5] **Faculty of Finance and Administrative Science, Al Madinah International University, Taman Desa Petaling, 57100 Kuala Lumpur, Malaysia**
maisara.jafre@mediu.edu.my

Abstract

Artificial Intelligence (AI) has permeated the healthcare industry, revolutionizing the functioning of hospitals, especially with respect to medication management, medical equipment supply, inventory management, and healthcare supply chain management. Although AI-based technologies are being adopted, there are still a number of technological, organizational and behavioural factors that affect the effective use of Medication Equipment Supply Systems (MESS). Healthcare staff readiness behavior is one of the significant factors to consider for the successful adoption and use of AI-driven system. The purpose of this study is to review the existing literature on AI adoption and Medication Equipment Supply Systems in healthcare systematically, focusing on the readiness behavior, challenges in implementation and use of the system. The aim of the review is to understand the use of AI in the healthcare supply system, the factors that affect the adoption of the technology, understand how employee readiness behavior impacts on the ability to effectively use the supply system and identify gaps in existing research. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines will be used in conjunction with a Systematic Literature Review (SLR) methodology to search, screen and assess the retrieved, peer-reviewed relevant literature from the major academic databases. Selected literature will be analysed using thematic synthesis to find common themes, relationships, barriers to implementation and

new research directions. The review is anticipated to assist in advancing the knowledge base of healthcare technology adoption by building a unified conceptualization of the connection between AI system adoption, readiness behavior, and the use of the AI system. Additionally, the results will be valuable for hospital administrators, healthcare policymakers, and technology implementation teams aiming to enhance organizational readiness and effectively leverage AI-powered medication and medical equipment procurement systems, especially in the context of Saudi Arabia's hospitals.

Keywords: Artificial Intelligence Adoption; Medication Equipment Supply Systems; Healthcare Technology; Readiness Behavior; System Utilization; Healthcare Supply Chain Management; Systematic Literature Review; Saudi Arabia..

1. Introduction

Artificial Intelligence (AI) has emerged as a game-changer in the healthcare industry, offering a wide range of opportunities to streamline operations, especially within the hospital supply chain, medication management and medical equipment distribution. AI can be leveraged in various ways, such as through machine learning models, predictive analytics, and intelligent automation, to assist with inventory forecasting, resource allocation, procurement planning, and operational efficiency. However, several factors, ranging from technological, organizational, to individual, interfere with the adoption of AI in healthcare institutions (Roppelt et al., 2024). A hospital's medication and medical equipment management is a vital part of its operations since having the right medications and equipment ensure the delivery of health care and patient safety. AI can be implemented in Medication Equipment Supply Systems (MESS) to aid in inventory management, minimize shortages, optimize resource distribution, and facilitate timely decision-making. However, the use of AI in healthcare supply chains is still in its early stages, and there is scope for more research (Mani & Goniewicz, 2024; Roppelt et al., 2024). Aside from technology, there are employees who can't be technologically ready for the implementation and use of AI. Readiness behavior refers to the employees' willingness, commitment and preparedness to embrace technological changes and integrate new systems into their work routines. Recent healthcare research emphasizes the need for organizational readiness as enabler of new practices, and the differences in how readiness is defined and quantified (Caci et al., 2025). This is a critical challenge in Saudi Arabia, as digital transformation in the healthcare sector is a key agenda item of Vision 2030. The transformation agenda focuses on innovation, skills, better health infrastructure and streamlining operations (Mani & Goniewicz, 2024). But, in addition to the investment of technology, the right organizational support and employee training is necessary for effective use of the systems and to realize the benefits of AI. Although the adoption of AI and the digital transformation of healthcare have been a growing area of research, there is a need to incorporate the concepts of AI adoption, readiness with the healthcare's medication and medical equipment supply system into a single research perspective. Thus, this study intends to systematically review the current literature to analyze AI implementation in healthcare supply systems, understand the role of readiness behavior, discuss implementation challenges, and identify factors that affect the use of MESS. The study is anticipated to make a significant contribution to the literature by providing a broad idea of the major research themes, gaps in theory and areas for further research. It will also suggest a conceptual framework of how the adoption of AI is related to readiness behavior and MESS utilization to help hospital administrators, healthcare policymakers and technology implementation professionals.

2. literature review

2.1 Artificial Intelligence Adoption in Healthcare

Artificial Intelligence (AI) is a crucial technology in the healthcare sector, playing a significant role in clinical decision support, operational management, resource allocation, and supply chain optimization. AI can revolutionize health care supply chain management by enhancing demand forecasting, inventory management, procurement, and distribution processes through machine learning, predictive analytics, and intelligent automation. While there are numerous theoretical models and

simulations of AI applications in healthcare supply chains, few studies have explored the practical use of AI in actual supply chain environments (Espinosa et al., 2026). It suggests that the organizational factors that affect the successful uptake of AI in hospital operations need to be explored.

2.2 Medication Equipment Supply Systems (MESS) Utilization

The supply of medicines and medical equipment is crucial for the availability, monitoring and distribution of healthcare resources. The use of these systems can help to enhance inventory accuracy, prevent supply shortages, cut down on waste, and boost hospital efficiency. Utilizing AI technologies can help boost these capabilities by predicting inventory levels, automating monitoring, and making data-informed supply choices. Still, AI's potential in healthcare supply chains continues to be a nascent field of study, especially when it comes to real-world application and efficiency. (Espinosa et al., 2026; Jawab et al., 2025).

2.3 Readiness Behavior in Healthcare Organizations

The readiness behavior is a crucial element in the adoption of technological innovations in health-care organizations. It demonstrates the willingness, commitment and readiness of employees to change and accept new technology. Staff's engagement with digital systems, involvement in implementation and adjustment to new ways of working can be affected by their readiness. Caci et al. (2025) conducted a systematic review that underscores the significance of organizational readiness in health care implementation and points to the lack of consistency in the conceptualization and measurement of organizational readiness. Thus, it's crucial to grasp the readiness behavior if one wants to understand the reaction of the healthcare personnel to the AI adoption program.

2.4 Implementation Challenges and Research Gaps

While AI has the potential to offer significant advantages in healthcare, there are several challenges to consider when implementing it, such as the lack of digital infrastructure, limited staff capabilities, data governance issues, cost constraints, and organizational change resistance. There is recent evidence that AI applications in healthcare supply chains are not yet fully realised in the real-world, indicating a gap between the potential and the actual application of the technology (Espinosa et al., 2026). In addition, the literature already published often focuses on the adoption of AI, organizational readiness, or healthcare supply management individually. Therefore, more research is needed to understand the relationship between readiness behavior and the effective use of medication and medical equipment supply systems in the context of AI adoption.

3. Research questions

Based on the research objectives and identified literature gaps, this study addresses the following research questions:

RQ1: What are the current applications of Artificial Intelligence (AI) in medication and medical equipment supply systems within healthcare organizations?

RQ2: What technological, organizational, and behavioral factors influence AI adoption in healthcare supply systems?

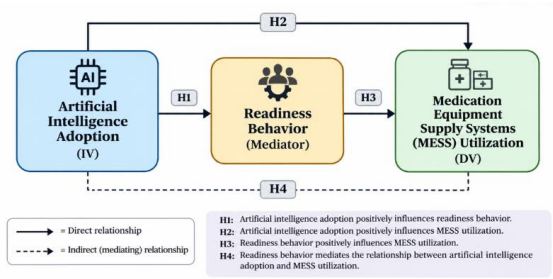
RQ3: How does readiness behavior contribute to the effective utilization of AI-enabled medication and medical equipment supply systems?

RQ4: What are the major challenges and barriers affecting the adoption and utilization of AI in hospital medication and medical equipment supply systems?

RQ5: What are the existing research gaps and future research directions concerning the relationship between AI adoption, readiness behavior, and MESS utilization?

4. Conceptual framework

The figure 1 lustrates the three main variables, their direct relationships (H1–H3), and the mediating relationship (H4) through Readiness Behavior.



5. Research Gap

Although Artificial Intelligence (AI) is being widely used in the health care sector, there are still several research gaps in relation to the integration of AI with medication and medical devices supply systems, including employee readiness behavior and effective use of the system. The first technological and operational gap is the existing literature which have investigated the use of AI in the healthcare supply chain management, such as demand forecasting, supplier selection, logistics, and supply chain inventory optimisation. But, according to Espinosa et al. (2026), the available evidence is still limited, with numerous applications being based on theoretical models and simulations, rather than implementation in a healthcare organisation. It underscores the importance of exploring more in-depth the potential applications of AI in hospital medicine and medical equipment management systems. Secondly, readiness of the employees: While the significance of AI implementation in healthcare is becoming evident, employee readiness and behavior change are also key factors to consider. In a 195-healthcare worker sample, Boyacı and Söyük (2025) found a positive correlation between readiness for medical AI and willingness to change in their organization. However, more studies are required to gain a better understanding of the role readiness behavior plays specifically in the actual use of AI-enabled hospital supply systems. Thirdly, medication and equipment management gap: Although there is a gap in management of medicines and equipment in hospitals, the challenge is still considerable. In the systematic review of 72 publications from 20 countries, Yap et al. (2026) found that the following were important factors influencing hospital inventory management: skill gaps among staff, infrastructure constraints and systemic constraints. But there is a need to investigate the relationship between the adoption of AI, employee readiness and use of integrated medication and medical equipment supply systems. Fourth, the geographical and contextual gap: The study of the adoption of AI in Saudi healthcare institutions has started to grow, but practical implementation challenges exist. Bayer and Eisawi (2025) noted some challenges in using AI in Saudi hospitals and called for enhancing the capacities of the institutes and improving technology development. Thus, deeper research is required to explore the impact of employee preparedness and organizational factors on the utilization of the AI-powered supply system in hospitals in Saudi Arabia. Fifth, theoretical integration gap: Prior research has explored the issues of adoption of AI, technology readiness in health care, and supply chain management, in varying theoretical frameworks. There is, however, a lack of focus on how these concepts can be applied in one overall framework to explain how AI adoption will lead to effective MESS utilization via readiness behavior. This is a chance to create a more holistic conceptualization of the connections between these constructs. Taking into account the gaps identified, the present study aims to explore the relationship between AI adoption, readiness behavior, implementation challenges and the use of MESS through a systematic literature review. The review is designed to provide a synthesis of current academic research, highlight theory and practice gaps, and propose a comprehensive theoretical framework to support further empirical studies, especially in the context of hospitals in Saudi Arabia.

6. Hypothesis discussion

6.1 H1: Artificial Intelligence Adoption and Readiness Behavior

Employee working methods can be impacted by the use of AI, which can bring in new technologies, automated workflows, and data-informed operational processes. AI applications in hospital supply management will demand new skills from staff, as well as adapting to technology shifts and growing in digital working environments. Dingel et al. (2024) concluded that trust, positive attitudes, and facilitating conditions are key factors that contribute to the intent of using AI-based systems

among healthcare professionals. Likewise, Boyacı and Söyük (2025) discovered a positive correlation between the willingness of healthcare professionals to embrace medical AI and their willingness to change in their organizations. The results indicated that AI implementation projects can be used to promote positive attitudes and adaptive behaviors among employees towards technological change.

Therefore, the following hypothesis is proposed:

H1: Artificial Intelligence adoption positively influences readiness behavior among healthcare employees.

6.2 H2: Artificial Intelligence Adoption and MESS Utilization

AI technologies can enhance the effectiveness of hospital medicine and equipment supply systems, and optimize the use of resources, by using predictive analytics, automated inventory monitoring, demand forecasting, and better resource allocation. The use of AI-powered technologies can help with more accurate operations decisions, and also minimize inefficiencies involved in conventional supply management procedures. Roppelt et al. (2024) noted that technological, organizational, and user-related factors are crucial for determining the adoption of AI in healthcare institutions. In addition, Espinosa et al. (2026) pointed to the potential of AI applications in healthcare supply chain management, such as inventory optimization and logistics. They found a lack of evidence of implementation in the real world, however. This indicates that the study of the relationship between AI implementation and its use in systems needs to be further explored empirically.

Therefore, the following hypothesis is proposed:

H2: Artificial Intelligence adoption positively influences Medication Equipment Supply Systems (MESS) utilization.

6.3 H3: Readiness Behavior and MESS Utilization

Readiness behavior is an important variable that needs to be assessed in determining the ability of employees to perform effectively when using new technologies in their daily task. Willingness to embrace and commit to AI-enabled systems, along with technological confidence and adaptability on the part of employees, fosters their engagement with and willingness to use these tools in their work. In their systematic review and meta-analysis of digital health technology adoption, Wang et al. (2025) identified facilitating conditions as positively related to real-world use of the technology by healthcare workers. Furthermore, Boyacı and Söyük (2025) highlighted the necessity of employees' readiness and awareness to facilitate the implementation of medical AI. These results suggest that the readiness and preparedness of employees can help to maximize the use of healthcare technology systems. Therefore, the following hypothesis is proposed:

H3: Readiness behavior positively influences Medication Equipment Supply Systems (MESS) utilization.

6.4 H4: The Mediating Role of Readiness Behavior

While there are benefits to be gained from AI usage in health care supply management, the deployment of technology does not necessarily mean an effective use of the system. All employees need to be ready and eager to learn and embrace new technologies and integrate them into their work. Readiness behaviour can thus be seen as a promising link between the adoption of artificial intelligence and the use of the system. Dingel et al. (2024) showed that individual and organizational determinants, such as trust, attitudes, and facilitating conditions, impact healthcare professionals' intention to adopt AI-powered systems. In a similar vein, Wang et al. (2025) highlighted the significance of supportive infrastructure and factors related to the workforce in the development of digital health into real-world technology adoption. The results of this study offer a theoretical foundation for exploring readiness behavior as a mediating variable between adoption of AI and utilization of MESS.

Therefore, the following hypothesis is proposed:

H4: Readiness behavior mediates the relationship between Artificial Intelligence adoption and Medication Equipment Supply Systems (MESS) utilization.

7. Conclusion and findings

As innovative Artificial Intelligence (AI) technologies are increasingly embraced in healthcare, there are immense possibilities to enhance hospital operations, from medication management to medical equipment supply, inventory monitoring and healthcare supply chain efficiency. The adoption of AI-powered systems is not just about the technology; it's also about the readiness and willingness of employees to embrace change in the technological landscape. The present study aims to carry out a systematic literature review and analyze the linkage of AI adoption, readiness behavior with Medication Equipment Supply Systems (MESS) utilization in the healthcare sector. Understanding technological, organisational and behavioural aspects that influence the effective implementation and use of AI supported supply systems is important, as underlined in the proposed review. The proposed conceptual framework indicates that readiness behavior is a mediator between the adoption of AI and better utilization of MESS. It also highlights the need to tackle implementation hurdles such as lack of digital infrastructure, staff skills, organizational resistance, and data security. This research aims to synthesize the current body of literature on the factors influencing the adoption of AI, organizational readiness, and the use of technology in healthcare from a theoretical standpoint. On a practical level, it can offer valuable guidance to hospital administrators, healthcare policymakers, and supply chain managers in crafting strategies to enhance employee preparedness and optimize the use of AI-powered supply chains. The focus is on Saudi Arabia, where the healthcare digital transformation is significant nationally, as per Vision 2030. The review could help healthcare institutions recognize areas for enhancing medication and medical equipment supply management by leveraging technology and training.

8. Recommendation and future research

To address the issues found in this systematic literature review, several recommendations are proposed to enhance AI adoption and use in Medication Equipment Supply Systems (MESS) in hospitals based on the proposed focus of this systematic literature review.

8.1 Strengthening Organizational Readiness

Preparing for the organization and during the process of implementing AI in hospitals. This involves defining clear implementation plans, securing buy-in from management, providing adequate financial support, and informing staff of the goals and advantages of AI-driven systems. Hospital management should also urge the participation of the employees in the process of implementation to prevent resistance to technological changes.

8.2 Enhancing Employee Training and Readiness Behavior

It is essential for healthcare workers, especially pharmacists, procurement staff, inventory managers, and medical equipment personnel, to undergo regular training on AI-powered systems. Education needs to be aligned with the skill sets required by employees in order to embrace new processes, troubleshoot issues, pass down knowledge, and apply AI-generated information in their daily work. Cultivating positive readiness behavior can facilitate how well AI is utilised in the system.

8.3 Improving Technological Infrastructure and Data Management

Hospitals should have a good digital infrastructure, systems that integrate information, a good database, and systems that manage information safely. The AI-driven MESS should integrate with existing hospital information systems, facilitating information sharing, inventory management, demand predictions, and timely equipment restocking. To ensure the security of sensitive hospital data, robust cybersecurity and data governance policies are also crucial.

8.4 Promoting Effective AI Utilization in Medication and Equipment Management

To promote their practical applications in various operational aspects of the hospitals, AI technologies can be implemented in the following practical activities in the hospital: Forecasting medical supply demand, optimizing medical supplies, monitoring stock levels, managing medical supplies' expiry date, planning medical supply purchasing, and tracking and management of medical equipment. Applications such as these should be assessed on a regular basis to see if they enhance the efficiency of operations, cut wastage, avoid stock-outs and ensure the continuity of patient care.

8.5 Strengthening Policies and Governance in Saudi Arabian Hospitals

Saudi Arabia's healthcare policy-makers and hospital administrators should set guidelines for responsible use of AI in hospitals' supply systems. This should include guidelines on Data Privacy, Cybersecurity, Accountability, System Reliability, Employee Responsibilities, and Ethics in AI Usage. The investment of hospitals, technology solutions providers, universities and relevant government institutions could further contribute to the implementation of AI in alignment with Saudi Vision 2030.

Empirical studies are needed to explore the relationships between AI uptake, readiness behavior and MESS utilization in hospitals in the future. A quantitative study employing Structural Equation Modelling (SEM) specifically PLS-SEM could be carried out to examine the mediating effect of readiness behavior. Researchers also should include data for various categories of hospitals and regions in Saudi Arabia to enhance generalizability. In addition, further research could explore other factors, such as: management support, technological infrastructure, employee digital competence, organizational culture, perceived usefulness of the system. A broader understanding may stem from comparative studies of the factors that influence successful AI implementation between public and private hospitals. In conclusion, the successful implementation of AI in hospital medication and equipment supply systems is not merely a matter of technology but also a process that needs careful consideration and management. It relies on embedding the right infrastructure, support, workforce capacities, good governance and ongoing monitoring. The recommendations offer a baseline for enhancing the use of AI and making better use of MESS within hospitals in Saudi Arabia.

Reference

Caci, L., Nyantakyi, E., Blum, K., Sonpar, A., Schultes, M.-T., Albers, B., & Clack, L. (2025). Organizational readiness for change: A systematic review of the healthcare literature. Implementation Research and Practice, 6. https://doi.org/10.1177/26334895251334536

Bayer, M., & Eisawi, A. (2025). Exploring the landscape of artificial intelligence in Saudi Arabia's healthcare sector: Current trends and challenges. Cureus, 17(5), Article e84163. https://doi.org/10.7759/cureus.84163

Boyacı, H., & Söyük, S. (2025). Healthcare workers' readiness for artificial intelligence and organizational change: A quantitative study in a university hospital. BMC Health Services Research, 25, Article 813. https://doi.org/10.1186/s12913-025-12846-y

Espinosa, O., Basto, S., Ordóñez, A., Arias, M.-L., Sepúlveda, D., & Bhutta, M. F. (2026). A review of artificial intelligence in healthcare supply chains: Untapped potential? BMC Health Services Research, 26, Article 742. https://doi.org/10.1186/s12913-026-14559-2

Yap, W. S., Cheong, W. L., & Yeap, L. L. (2026). Pharmacy inventory management practices and constraints in Asia-Pacific hospitals: A systematic review and qualitative synthesis. Journal of Pharmaceutical Policy and Practice, 19(1), Article 2701922. https://doi.org/10.1080/20523211.2026.2701922

Mani, Z. A., & Goniewicz, K. (2024). Transforming healthcare in Saudi Arabia: A

Caci, L., Nyantakyi, E., Blum, K., Sonpar, A., Schultes, M.-T., Albers, B., & Clack, L. (2025). Organizational readiness for change: A systematic review of the healthcare literature. Implementation Research and Practice, 6, 1–33. https://doi.org/10.1177/26334895251334536

Espinosa, O., Basto, S., Ordóñez, A., Arias, M.-L., Sepúlveda, D., & Bhutta, M. F. (2026). A review of artificial intelligence in healthcare supply chains: Untapped potential? BMC Health Services Research, 26, Article 742. https://doi.org/10.1186/s12913-026-14559-2

Jawab, F., & Chokshi, H. (2025). Application of artificial intelligence in revolutionizing healthcare supply chains: Past literature, current debate and future pathways. Production Planning & Control, 853–884. https://doi.org/10.1080/09537287.2025.2591891

comprehensive evaluation of Vision 2030's impact. Sustainability, 16(8), 3277. https://doi.org/10.3390/su16083277

Roppelt, J. S., Kanbach, D. K., & Kraus, S. (2024). Artificial intelligence in healthcare institutions: A systematic literature review on influencing factors. Technology in Society, 76, 102443. https://doi.org/10.1016/j.techsoc.2023.102443