

Artificial Intelligence and the Transformation of Management Models: Governance Challenges and Sustainability Opportunities in Healthcare Organizations

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Abstract

The article examines artificial intelligence as a driver of management model transformation in healthcare organizations. It analyzes how AI influences strategic planning, operational coordination, resource allocation, performance monitoring, and decision support. Particular attention is paid to governance conditions, including data governance, accountability, transparency, workforce readiness, and institutional oversight. The article argues that AI contributes to sustainable organizational development only when embedded in coherent management models supported by responsible governance. A conceptual framework linking AI capabilities, governance conditions, transformation processes, organizational outcomes, and sustainability outcomes is proposed.

Keywords: artificial intelligence; management model transformation; healthcare organizations; governance; sustainability

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Introduction

Artificial intelligence (AI) is increasingly recognized as a transformative organizational capability that affects management, decision-making, and institutional performance in healthcare (OECD, 2025b; World Health Organization [WHO], 2025a). Earlier debates in the field focused mainly on diagnostic accuracy, clinical decision support, and health data analytics. Recent evidence, however, shifts attention to systemic issues: governance models, legal and ethical frameworks, workforce readiness, data

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management, stakeholder engagement, and implementation capacity (WHO, 2025a). Therefore, the relevance of AI for healthcare organizations lies not merely in the availability of digital tools, but in the way these tools reshape planning, coordination, monitoring, and adaptation over time.

This shift is particularly important for healthcare organizations, where management operates in extremely complex environments characterized by limited resources, increasing service demands, regulatory pressure, and rising expectations for quality, safety, transparency, and accountability. The WHO European Region State of Preparedness Report highlights that AI is already changing approaches to planning, delivery, and management of healthcare systems, and reveals important gaps in governance capacity, national strategies, workforce readiness, and data management (WHO, 2025a). These developments demonstrate that the significance of AI in healthcare extends far beyond clinical innovation and must increasingly be considered in terms of organizational management and institutional sustainability.

Despite this growing relevance, the managerial consequences of AI remain less systematically examined than its clinical and technical applications. Research still gives substantial attention to algorithmic performance, diagnostic use cases, and patient-facing ethical concerns, whereas AI-driven changes in strategic planning, resource allocation, personnel management, performance monitoring, and risk forecasting are discussed less coherently. This gap is important because such functions determine whether AI leads to isolated administrative improvements or to a more data-driven, predictive, and adaptive management model (OECD, 2025b; Papagiannidis et al., 2025).

However, the transformative potential of AI does not automatically guarantee sustainable organizational outcomes. Without clear governance mechanisms, robust data management, leadership capacity, staff readiness, and accountability mechanisms, AI can reproduce bias, weaken trust, increase operational opacity, or introduce new forms of institutional risk. Recent research in healthcare governance argues that effective AI adoption depends not only on technological sophistication but also on organizational structures capable of overseeing implementation throughout the lifecycle of AI systems (Hassan et al., 2025). More broadly, responsible AI governance is viewed as a combination of structural, relational, and procedural practices that determine how organizations balance innovation with control, legitimacy, and long-term institutional effectiveness (Papagiannidis et al., 2025). Thus, healthcare organizations represent a particularly valuable context for exploring the relationship between AI, governance, and

sustainability, as they combine high societal value with stringent regulatory constraints and significant managerial interdependencies.

For the purposes of this article, sustainability is interpreted broadly: it includes financial and environmental responsibility, but also continuity of services, workforce resilience, institutional learning, adaptive capacity, and public legitimacy. AI can support these dimensions by improving forecasting, coordination, responsiveness, and organizational learning. Yet these benefits depend on whether AI is embedded in management models that are strategically governed, ethically sound, and institutionally sustainable (OECD, 2025b; WHO, 2025a).

Against this backdrop, the article examines how AI reshapes management processes in healthcare organizations and identifies the governance conditions under which such transformation can strengthen sustainable and resilient institutional development. The analysis is guided by three research questions: How is AI transforming management models in healthcare organizations? Which governance issues most significantly affect its implementation? Under what conditions can AI contribute to organizational sustainability and resilience?

Literature Review

The growing role of artificial intelligence in modern organizations has expanded the concept of digital transformation beyond automation and technological modernization. AI increasingly functions as a strategic organizational capability that supports information processing, workflow coordination, resource allocation, and decision-making. This broader view is especially relevant for complex institutions, where management effectiveness depends on the ability to integrate data, anticipate change, and respond adaptively to internal and external pressures (OECD, 2025b; Papagiannidis et al., 2025).

From a management perspective, AI-driven transformation is associated with a shift from fragmented and reactive management to more predictive, data-driven, and coordinated models of organizational control. OECD analyses highlight that AI can improve productivity, responsiveness, policy implementation, and accountability, but only if it is integrated into appropriate management mechanisms and supported by organizational factors such as digital capacity, leadership, data infrastructure, and responsible oversight (OECD, 2025b). In this sense, AI does not simply optimize existing management functions; it can change the underlying governance logic, altering how organizations set priorities, manage risks,

and evaluate results. This approach directly links AI with the literature on management model transformation, organizational agility, and strategic decision support.

This challenge is particularly pressing in healthcare organizations, where digital transformation occurs under conditions of high complexity, regulatory oversight, and operational interdependence. AI is increasingly connected with planning, performance monitoring, patient-flow coordination, administrative burden reduction, resource planning, and operational forecasting (WHO, 2025a; Wells et al., 2025). Contemporary implementation concepts therefore suggest that AI should be considered within a broader management ecosystem, rather than treated as an isolated technical intervention (Wells et al., 2025).

At the same time, the rapid spread of AI has increased scholarly attention to management issues. AI governance has become an important area of research, as the implementation of AI in organizations raises issues that cannot be addressed through technical design alone. These issues relate to accountability, transparency, fairness, oversight, legal compliance, human oversight, and the institutional mechanisms needed to manage risks throughout the lifecycle of AI systems (Papagiannidis et al., 2025; WHO, 2025a). In a recent review and research framework, Papagiannidis et al. (2025) consider responsible AI governance as a combination of structural, relational, and procedural practices that shape how organizations develop, implement, and manage AI. This perspective is particularly valuable because it shifts the discussion from abstract ethical principles to concrete organizational mechanisms and governance capabilities.

In healthcare, governance issues are even more pressing as AI systems are deployed in environments where decisions impact safety, continuity of care, public trust, and resource allocation. WHO documents highlight that the implementation of AI in health systems depends on legal and ethical frameworks, data governance, workforce readiness, stakeholder engagement, and institutional readiness (WHO, 2025a). Similarly, governance-focused research in health governance argues that organizations need formal implementation pathways, review mechanisms, and internal structures capable of assessing AI systems before and after implementation (Hassan et al., 2025; Kim et al., 2025). Kim et al. (2025), for example, demonstrates that practical AI governance in a large health organization can be structured through the interaction of people, processes, technology, and operations, thereby supporting the idea that AI governance is not an abstract principle but an operational and managerial necessity.

The literature also suggests that AI governance should not be understood solely as a risk-control mechanism. It is equally important as a condition

for fostering sustainable organizational innovation. Without governance, AI adoption may remain fragmented, opportunistic, or unstable; with governance, organizations are better prepared to align innovation with institutional strategy, accountability, and long-term value creation (OECD, 2025b; Papagiannidis et al., 2025). This understanding is particularly relevant to this study, as it links management transformation to the broader issue of sustainability.

The concept of sustainability has also evolved beyond environmental or financial considerations. In organizational studies, it increasingly refers to the long-term capacity of institutions to function effectively, manage resources responsibly, adapt to instability, support human capacity, and maintain legitimacy in changing conditions. This perspective is highly relevant in healthcare, where sustainability is inseparable from continuity of care, quality assurance, public trust, and the capacity to respond to rising demand and systemic uncertainty (WHO, 2025a).

However, the link between AI and resilience in healthcare is not automatic or unambiguously positive. Literature suggests that AI can contribute to organizational sustainability only when its implementation is aligned with management capacity, institutional goals, workforce adaptation, and ethical safeguards (OECD, 2025; Wells et al., 2025). This means that resilience should be approached as an indirect outcome of AI-enabled transformation, rather than as a direct byproduct of digital technology adoption. In practice, AI can improve operational resilience through more efficient resource allocation, institutional resilience through enhanced adaptability and strategic coordination, and staff resilience through decision support and reduced workload. However, these effects remain dependent on how management models are designed and governed.

Taken together, the literature points to three conclusions that structure the remainder of the article. First, AI should be analyzed as an organizational capability that reshapes management processes. Second, governance determines whether this capability becomes a source of value or a source of risk. Third, sustainability in healthcare depends on the degree to which AI is integrated into responsible, strategically coordinated, and institutionally grounded management practices.

Methodological Approach

This study is a theoretical and analytical article based on a structured review of academic and policy literature on artificial intelligence, management model transformation, corporate governance, and

sustainability in healthcare organizations. The chosen approach reflects the exploratory and integrative nature of the problem. Since the aim of the article is not to test a single causal hypothesis, but to synthesize and interpret the key conceptual, organizational, and managerial aspects of AI-enabled management transformation, a structured analytical review is more appropriate than a narrowly empirical or purely technical approach (Papagiannidis et al., 2025; World Health Organization [WHO], 2025a).

The methodological logic of the study is based on the assumption that artificial intelligence should be viewed not only as a technological innovation but also as an organizational and managerial phenomenon embedded in a broader institutional, ethical, and managerial context. For this reason, the analysis combines two categories of sources. The first group includes peer-reviewed academic publications on AI governance, digital transformation, organizational management, and health systems implementation. The second group includes international policy and institutional documents, particularly reports from the World Health Organization and the OECD, which provide up-to-date data on AI readiness, governance conditions, barriers to implementation, and strategic implications for public and health-related organizations (OECD, 2025b; WHO, 2025a). This dual-source strategy allows us to connect conceptual research with policy-relevant and practically relevant perspectives.

The review prioritized publications from 2019 to 2026 because this period reflects the acceleration of AI adoption, the expansion of responsible AI governance debates, and the emergence of institutional implementation frameworks in healthcare and public-sector contexts. Earlier landmark sources were considered selectively when they made a significant conceptual contribution to understanding digital transformation or organizational management.

The search strategy was organized around several interrelated thematic clusters. Key search terms included combinations of “artificial intelligence,” “management transformation,” “management models,” “organizational change,” “AI governance,” “healthcare organizations,” “healthcare systems,” “operational management,” “sustainability,” and “resilience.” Priority was given to studies addressing the intersection of AI implementation, governance mechanisms, operational use, and sustainability-related outcomes (Hassan et al., 2025; Wells et al., 2025).

To ensure analytical consistency, a set of inclusion and exclusion criteria was applied throughout the study. Sources were included if they met at least one of the following conditions:

- they examined AI in the context of organizational governance, management, implementation, or institutional strategy;

- they focused on healthcare organizations or health systems as organizational environments;
- they addressed issues of responsible AI governance, including accountability, oversight, transparency, data management, workforce readiness, or institutional assurance;
- they provided information on sustainability, viability, or long-term organizational effectiveness in the context of AI-driven transformation.

Sources were excluded if they were limited to highly technical descriptions of algorithms, purely clinical diagnostic applications without organizational implications, or general articles without analytical or policy significance. This selection logic helped maintain the article's focus on management model transformation rather than the application of AI in the abstract (Kim et al., 2025; Wells et al., 2025).

Following identification and selection of sources, the selected literature was analyzed using a thematic synthesis. Rather than statistically summarize the results, the study categorized and interpreted the literature according to the main analytical dimensions structuring the article:

- (1) AI as a driver of management model transformation;
- (2) governance challenges of AI-enabled management;
- (3) operational implications of AI implementation; and
- (4) sustainability and resilience outcomes in healthcare organizations.

This thematic approach was chosen because it supports conceptual integration across diverse sources, including scientific reviews, governance frameworks, implementation studies, and policy reports. It also enables the development of a synthetic interpretive model linking AI resources and capabilities to governance conditions, management transformation processes, organizational outcomes, and sustainability effects (Papagiannidis et al., 2025; OECD, 2025b).

The study does not claim to be a formal systematic review in the strict methodological sense. Instead, this article adopts a structured and conceptually oriented review approach, aiming to identify the most relevant analytical models, governance challenges, and institutional implications associated with the application of AI in healthcare management. This approach aligns with the article's goal of clarifying an emerging research area and developing a holistic conceptual framework, rather than focusing on effect size measurements or clinical outcome comparisons. In this regard, the methodology is consistent with recent research in the field of governance and implementation, which emphasizes the need for integrative, organizationally informed, and policy-sensitive approaches to AI implementation in healthcare settings (Hassan et al., 2025; Wells et al., 2025; WHO, 2025a).

Finally, the article's methodological focus is distinctly interdisciplinary. It draws on governance research, digital transformation literature, management studies, and health systems analysis to capture the multidimensional nature of AI-driven organizational change. This approach is particularly relevant for healthcare organizations, where management model transformation cannot be adequately understood through a single disciplinary lens. By combining conceptual synthesis with policy and organizational analysis, this study seeks to lay a solid foundation for examining AI as a driver of management model transformation in the face of institutional complexity, governance constraints, and sustainability pressures (OECD, 2025b; WHO, 2025a).

Artificial Intelligence as a Driving Force in the Transformation of Management Models

Building on this literature, AI can be conceptualized as a force that restructures the internal architecture of organizational management. Its implementation influences how organizations collect and interpret information, set priorities, coordinate activities, allocate resources, and evaluate results (OECD, 2025b; Papagiannidis et al., 2025). Rather than only accelerating individual administrative tasks, AI can enable new forms of organizational intelligence that are more predictive, adaptive, and data-driven.

From a management perspective, one of the most significant effects of AI is the shift from reactive to proactive management. Traditional management models often rely on retrospective reporting, delayed feedback, and fragmented decision-making processes. In contrast, AI-powered systems enable organizations to process large volumes of real-time and historical data, identify patterns, anticipate emerging needs, and support proactive action. OECD analyses note that AI can improve productivity, responsiveness, and accountability by improving the quality and timeliness of decision-making, especially when organizations create enabling conditions for robust and well-governed use (OECD, 2025b). As a result, management becomes less reliant on intuition or delays in administrative signals and more focused on continuous monitoring, predictive assessment, and coordinated response.

The second dimension of transformation concerns operational management. AI enables organizations to redesign workflows, optimize planning, support capacity planning, and improve coordination across departments and processes. In healthcare organizations, these functions are

particularly important, as operational bottlenecks often have direct consequences for service continuity, workload distribution, patient flow, and resource efficiency. Recent implementation-focused research shows that AI can facilitate a reduction in administrative burden, operational forecasting, and more systematic analysis of institutional processes, provided its use is integrated into practical management and implementation frameworks (Wells et al., 2025). In this regard, AI contributes not only to the acceleration of operations but also to the creation of a more integrated operational management model in which processes become increasingly measurable, interconnected, and responsive to changing organizational needs.

AI is also transforming strategic management, influencing how leaders interpret complexity, assess risks, and set institutional priorities. In traditional strategic planning, management decisions are often dependent on periodic reviews, limited forecasting capabilities, and partial access to relevant data. AI can improve this process by providing more dynamic analytical support for scenario planning, resource allocation, risk prediction, and long-term organizational adaptation. An AI maturity roadmap developed for healthcare systems suggests that effective and sustainable AI implementation depends not only on governance and infrastructure but also on business execution, value orientation, and the integration of AI into broader organizational strategy (Durlach et al., 2024). This emphasizes that AI is not only an operational innovation but also a strategic management issue, capable of influencing the direction of an organization and how it defines and pursues value creation.

Another important area of transformation concerns performance management and evaluation. Artificial intelligence enhances organizations' ability to track metrics, identify deviations, and obtain performance information in real time. This can strengthen management oversight and enable organizations to respond more quickly to inefficiencies, emerging risks, or imbalances in service delivery. At the same time, this transformation raises important questions about what is being measured, how algorithm results are interpreted, and how accountability is allocated when AI becomes part of institutional performance measurement systems. For this reason, performance transformation should not be understood solely in technical terms. It also impacts the epistemological foundation of management, as the categories through which organizations perceive performance, risk, or success may be increasingly mediated by AI-enabled analytics (Papagiannidis et al., 2025).

In healthcare organizations, these transformations are particularly noticeable, as management operates at the intersection of clinical,

administrative, regulatory, and societal expectations. Artificial intelligence can support strategic and operational decision-making in areas such as workforce allocation, demand forecasting, service coordination, identifying process inefficiencies, and prioritizing organizational interventions. The WHO emphasizes that AI is already changing approaches to planning, delivery, and management of health systems, thus reaffirming the need to analyze its organizational significance beyond clinical innovation alone (World Health Organization [WHO], 2025a). Similarly, applied health research argues that the value of AI depends on whether organizations view its implementation as part of a broader management ecosystem, rather than as a standalone digital solution (Wells et al., 2025). This suggests that the integration of AI into healthcare is most meaningfully understood as a transformation of management models, rather than a simple extension of existing digital tools.

At a deeper level, AI-driven transformation can be interpreted as a shift from hierarchical and fragmented management structures to more networked, coordinated, and learning-oriented organizational forms. AI systems enable cross-functional information flows, accelerate feedback, and create opportunities for closer interactions between data, operations, and decision making. However, these benefits are not automatic. Organizations must develop management capacity to interpret AI results, integrate them into institutional procedures, and balance efficiency gains with accountability, ethical safeguards, and human judgment. As modern management concepts demonstrate, organizational transformation through AI depends not only on technological capabilities but also on leadership, workforce readiness, clear implementation paths, and oversight mechanisms throughout the lifecycle of AI systems (Hassan et al., 2025; Kim et al., 2025). Therefore, management transformation should be viewed as a socio-technical process, not a purely technological one.

It is important to note that AI does not replace management; rather, it restructures the conditions under which governance occurs. Managers remain responsible for priority setting, interpretation, and institutional accountability, but their work is increasingly mediated by tools that work with large volumes of data, which influence how problems are framed and how solutions are selected. This is changing both the scale and nature of governance work. Decision making is becoming more distributed between human and technological systems, while strategic oversight requires greater attention to data quality, the interpretability of results, governance safeguards, and organizational trust. In this regard, AI is transforming governance models not only by increasing efficiency but also by redefining

how power, coordination, and knowledge are organized within institutions (OECD, 2025b; Papagiannidis et al., 2025).

Taken together, the literature indicates that AI-driven transformation affects healthcare management at strategic, operational, evaluative, and organizational levels. AI can support more adaptive, predictive, and integrated management models. However, this transformation depends on the governance and organizational context in which AI is implemented.

Governance Challenges in AI-Enabled Management Transformation

The organizational value of AI depends on the governance conditions that shape how systems are selected, implemented, monitored, and revised over time. Contemporary governance research therefore treats AI as a socio-technical and institutional phenomenon. Governance links innovation with accountability, strategic objectives, and risk management, while broader frameworks such as the NIST AI Risk Management Framework emphasize lifecycle-based control rather than one-time technical validation (National Institute of Standards and Technology [NIST], 2023; OECD, 2025b; Papagiannidis et al., 2025).

One of the most fundamental governance challenges concerns data governance. AI governance depends on the quality, interoperability, traceability, representativeness, and legitimate use of data. However, in healthcare organizations, data environments are often fragmented by legacy systems, uneven standards, incomplete interoperability, and varying degrees of digital maturity. The WHO has emphasized that effective data governance in healthcare is essential for building trusted, digital health systems, especially when AI systems rely on large volumes of sensitive and operationally critical information (World Health Organization [WHO], 2025b). Previously, the WHO guidance on the ethics and governance of AI in health also stated that privacy protection, data governance, and the quality of training and operational data are necessary conditions for the responsible implementation of AI (WHO, 2021). From a governance perspective, weak data governance undermines not only compliance but also the accuracy of forecasting, performance monitoring, resource allocation, and the legitimacy of AI-based decision-making.

The second challenge concerns accountability and oversight throughout the lifecycle. As AI is integrated into governance processes, organizations must determine who is responsible for the consequences of AI-enabled decisions, how performance is measured over time, and what escalation

mechanisms exist when systems perform poorly or cause unintended harm. The NIST framework is particularly useful in this context because it views AI governance as a continuous process of managing, mapping, measuring, and controlling risks, rather than a one-time approval (NIST, 2023). Research in healthcare supports this thesis. Hassan et al. (2025) argue that healthcare organizations need clearly defined governance structures and implementation mechanisms capable of structured management of AI implementation. Similarly, the FAIR-AI framework proposed by Wells et al. (2025) emphasizes that responsible implementation requires organizational elements, designated personnel, multidisciplinary review processes, and an inventory mechanism that ensures transparency and continuous monitoring. Taken together, these studies show that governance failures often arise not from a lack of AI tools, but from a lack of institutional accountability mechanisms.

Closely related to accountability is the issue of transparency, explainability, and fairness. Artificial intelligence can improve governance, but its organizational legitimacy depends on whether decision-makers can understand, communicate, and justify how the results are produced and used. In healthcare and the public interest, opaque systems can weaken trust, obscure accountability, and make it difficult to defend institutional decisions to staff, regulators, or the public. The 2021 WHO guidelines identify transparency, understandability, and accountability as core ethical requirements for AI in healthcare, while more recent case studies of implementation in healthcare operationalize these concerns through principles such as fairness, trustworthiness, privacy, security, transparency, explainability, accountability, and usefulness (Saenz et al., 2024; WHO, 2021). Panteli et al. (2025), addressing the issue from a public health policy perspective, also argue that accountability, data privacy, staff qualifications, and robust regulatory frameworks are necessary for AI to support public and health sector decision-making without exacerbating inequalities. Thus, interpretability is not simply a technical issue; it is a governance condition for maintaining institutional legitimacy.

Another major challenge relates to staff readiness and managerial capacity. AI governance is unlikely to be successful unless managers and staff have the skills necessary to interpret AI output, question limitations, integrate systems into workflows, and make informed decisions in high-stakes situations. A WHO regional readiness assessment shows that AI adoption in health systems is closely linked to staff readiness, stakeholder engagement, governance models, and institutional capacity (WHO, 2025a). This thesis is further supported by research in real-world healthcare practice. Kim et al. (2025) demonstrate that establishing an AI governance

system at a Canadian healthcare organization required attention not only to technology but also to people, processes, and operations. Stetson et al.'s (2025) report on responsible governance of AI in oncology also shows that governance in practice relies on multidisciplinary committees, program-level oversight, model registration, risk assessment tools, and lifecycle management processes. These examples demonstrate that readiness is not simply individual digital literacy; it is organizational capacity distributed across management, technical groups, clinical or operational stakeholders, and institutional oversight structures.

Governance challenges also arise around leadership, procurement, and implementation pathways. Organizations often approach AI as a procurement or innovation issue, focusing on acquiring tools rather than establishing governance structures that can evaluate long-term feasibility, risks, and organizational value. However, recent policy and implementation literature suggests that procurement itself is a key governance challenge. The OECD identifies procurement capacity as a prerequisite for the effective use of AI in the public sector and public services, as poorly managed procurement can lead to weak provider accountability, inconsistent standards, and mission drift (OECD, 2025b). In healthcare, Wells et al. (2025) also argue that institutions need practical pre- and post-implementation review mechanisms, while Vardas et al. (2025) note that the implementation of the EU AI Act raises important questions regarding risk categorization, post-marketing monitoring, transparency, fairness, and the allocation of responsibility in high-risk healthcare applications. These findings indicate that governance begins well before implementation and continues throughout the lifespan of AI systems.

Another governance challenge concerns regulatory alignment and institutional coherence. Healthcare organizations operate in a multi-layered environment shaped by privacy law, professional liability, digital health policy, procurement regulation, and sectoral standards. AI adds further complexity because internal innovation strategies must be aligned with external regulatory frameworks, including risk-based approaches to high-impact healthcare applications (Vardas et al., 2025; WHO, 2025a).

Finally, trust and legitimacy should be considered as independent governance outcomes. The trustworthiness of AI is not only determined by technical reliability; it also depends on whether organizations can demonstrate that AI-enabled governance remains ethically sound, auditable, and consistent with public and professional expectations. The WHO (2021) explicitly links AI governance in healthcare to human well-being, autonomy, transparency, and accountability, while the OECD (2025b) emphasizes that public trust depends on both fostering innovation and

visible risk management. In the public health literature, Panteli et al. (2025) further emphasize that effective AI adoption requires institutions to prioritize equity, regulatory literacy, secure data processing, and workforce development. For healthcare organizations, this means that AI governance is not only an internal control mechanism but also a source of external legitimacy. Poorly governed AI can weaken institutional trust, even if systems are technically effective; conversely, well-governed AI can foster more credible, transparent, and sustainable forms of management transformation. Taken together, these governance challenges demonstrate that AI-enabled management is subject to a wide range of organizational and institutional conditions. Data governance, accountability, explainability, staff readiness, leadership, procurement, regulatory compliance, and trust all influence whether AI facilitates meaningful management transformation or generates new forms of opacity, fragmentation, and risk. This broader and more diverse literature reinforces the article's central argument: in healthcare organizations, AI does not become a sustainable management asset simply because it is implemented. It only becomes valuable when technological capabilities evolve alongside governance capacity, organizational design, and institutional legitimacy.

Sustainability Opportunities for Healthcare Organizations

In this section, sustainability is treated as a multidimensional management outcome. It includes the long-term ability of healthcare organizations to maintain effective operations, ensure continuity of service delivery, support workforce resilience, adapt to uncertainty, and preserve public trust while delivering quality care. WHO/Europe's framework for resilient and sustainable health systems emphasizes transformation, responsiveness, trust, and institutional adaptability in the face of demographic pressure, workforce shortages, and systemic stress (World Health Organization [WHO], 2024).

One major sustainability opportunity associated with AI is operational resilience. Healthcare organizations are expected to maintain quality while managing limited resources, rising demand, ageing populations, and complex patient journeys. OECD analysis of AI in the EU healthcare sector notes that AI may alleviate workforce shortages by automating administrative tasks, optimizing resource allocation, and supporting hospital operations, including planning, patient management, bed and staff coordination, and workflow efficiency (OECD, 2026a). WHO evidence similarly indicates that big data and AI can support predictive modelling,

patient-flow forecasting, resource allocation, and the performance of health and social care workers (WHO, 2025a).

A second important aspect concerns workforce resilience. The resilience of healthcare organizations depends significantly on whether leaders can protect professional capacity, reduce excessive administrative burdens, and support staff in the face of overload and burnout. OECD work on AI and the healthcare workforce notes that healthcare systems face increased demand, rising costs, and overburdened staff, and argues that AI can help alleviate some of this pressure, although its value depends on trust, ethics, skills, and infrastructure (Almyranti et al., 2024). Related OECD work on digital and AI skills in the health professions adds that stakeholders see AI's potential to improve productivity and mitigate workforce shortages, and also call for more effective communication, education, and specialized management structures (OECD, 2025a). More focused research in healthcare similarly suggests that generative and conversational AI can reduce the burden of documentation and free up staff time for more important interactions, provided implementation is careful and human-centered (Mahajan & Powell, 2025). Thus, AI can contribute to workforce resilience not by replacing human labor, but by redistributing tasks, expanding decision support, and helping organizations conserve scarce professional resources.

AI also creates opportunities to enhance institutional resilience, understood as preparedness, learning, and adaptive response. In resilient organizations, management systems do not only react to crises; they identify changes earlier, coordinate responses more quickly, and maintain operational continuity under pressure. Evidence from the NHS AI Lab evaluation illustrates this point: the programme supported infrastructure, policy, real-world deployment, and learning, while also revealing barriers related to procurement, integration with existing systems, and alignment with service needs (Cresswell et al., 2025). This example shows that resilience emerges through coordinated governance and policy ecosystems rather than through isolated tools alone.

Another opportunity relates to economic and value sustainability. Artificial intelligence is often associated with promises of efficiency, but from a management perspective, these promises are only meaningful if they translate into real value over time. A recent paper in NEJM AI argues that the sustainable use of AI in healthcare depends on organizational maturity in several areas, including governance, business implementation, value creation, maintenance and operations, and information architecture (Durlach et al., 2024). This is important because sustainability is viewed not as a vague benefit, but as an outcome linked to management capabilities

and long-term operational effectiveness. Additionally, a 2025 systematic review on the cost-effectiveness and budget impact of AI in health found that economic evaluation is essential, as health leaders and policymakers need to know whether AI interventions deliver sustainable benefits and represent good value for money in the context of rising health care costs (El Arab et al., 2025). In other words, AI can contribute to the sustainability of health organizations when it improves value creation, not simply when it adds technological complexity.

At the same time, sustainability gains are conditional. The WHO regional readiness assessment shows that AI is already changing planning, service delivery, and health-system management, while also highlighting gaps in preparedness, governance, skills, and institutional capacity (WHO, 2025a). OECD evidence on scaling AI in health further indicates that AI may already be widespread in administrative uses, yet national-level scale-up remains constrained by fragmented data foundations, regulatory uncertainty, and gaps in governance and workforce capacity (OECD, 2026b).

It is also important to recognize that sustainability should not be reduced to efficiency rhetoric. Emerging literature cautions the need to evaluate AI in medicine in terms of long-term viability, implementation costs, and broader systemic implications, including ethical, infrastructural, and even environmental aspects (Bignami et al., 2025; Fiske et al., 2025). This does not undermine the case for the sustainable development of AI; rather, it reinforces the need for a more rigorous and responsible interpretation of the concept of sustainability. From a management perspective, the relevant question is not whether AI is inherently sustainable, but under what institutional conditions it supports sustainable organizational value, equitable service delivery, and resilient forms of coordination. This understanding is particularly important for a sustainability-focused journal, as it links digital transformation to responsible innovation, not just technological enthusiasm.

Taken together, the literature suggests that AI can contribute to healthcare sustainability in four interrelated ways: operational sustainability through improved coordination and resource utilization; workforce sustainability through reduced burden and better task distribution; institutional sustainability through strategic alignment and governance maturity; and organizational resilience through stronger anticipation, learning, and continuity under stress. These effects remain contingent on governance mechanisms and organizational maturity.

Conceptual Framework

The preceding analysis supports a conceptual framework explaining how AI can contribute to sustainable organizational development in healthcare. The framework links AI resources and capabilities, governance conditions, management transformation processes, organizational outcomes, and sustainability outcomes. Its purpose is not to present a deterministic account of technological change, but to clarify the organizational conditions under which AI becomes a meaningful driver of management and institutional transformation (OECD, 2025b; Papagiannidis et al., 2025; WHO, 2025a).

At the first level, the framework defines AI resources and capabilities as a basic input layer. This includes not only the AI tools themselves but also the broader organizational resources that enable AI use: data availability and quality, digital infrastructure, analytical capabilities, implementation experience, and leadership commitment. The “AI for Healthcare Maturity Roadmap” is particularly relevant here, as it defines effective and sustainable AI implementation through interrelated areas such as governance, business adoption, value, maintenance and operations, culture, and information architecture (Durlach et al., 2024). Similarly, the WHO regional readiness assessment shows that AI adoption in health systems depends on institutional readiness, governance models, workforce readiness, and data management, not just technology availability (WHO, 2025a). This means that AI capabilities should be understood as organizationally embedded, rather than technically isolated.

The second level of the framework consists of governance conditions, which act as a central mediating layer between AI capabilities and organizational transformation. This part of the model draws on several complementary traditions. Papagiannidis et al. (2025) conceptualize responsible AI governance through structural, relational, and procedural practices, emphasizing that governance includes formal roles and policies, stakeholder relationships, and operational oversight processes. The NIST AI Risk Management Framework similarly views governance as a lifecycle function and positions it alongside mapping, measuring, and managing AI-related risks (National Institute of Standards and Technology [NIST], 2023). In healthcare, governance is further operationalized through implementation frameworks that emphasize review pathways, accountability mechanisms, inventory of AI systems, interdisciplinary oversight, and attention to people, processes, technology, and operations (Kim et al., 2025; Wells et al., 2025). Taken together, these sources suggest that the governance conditions in the proposed model should include at

least the following elements: data governance, accountability, transparency, leadership, workforce readiness, procurement capacity, and institutional oversight.

The third level of the framework is management transformation processes. This component reflects how AI is changing the way organizations are managed in practice. Based on the literature reviewed, AI-enabled transformation is most visible in strategic planning, operational coordination, resource allocation, performance monitoring, risk forecasting, and decision support (OECD, 2025b; Wells et al., 2025; WHO, 2025a). The key analytical point here is that AI does not simply improve individual management tasks; it changes the architecture of management, enabling more predictable, adaptive, and data-driven coordination modes. In the proposed framework, management transformation is viewed as a process layer through which AI resources become organizationally meaningful. This process is not automatic: it depends on how robust the governance conditions are for integrating AI into institutional procedures in a way that is verifiable, legitimate, and strategically coherent.

The fourth level concerns organizational outcomes. These are the most immediate consequences of AI-enabled management transformation in healthcare organizations. These may include increased efficiency, improved coordination, more timely decision-making, expanded monitoring capabilities, better alignment between planning and operations, and greater organizational agility. OECD research on AI-enabled management shows that robust implementation can improve responsiveness, productivity, and accountability in organizational and government settings, while healthcare-focused research suggests that practical governance can facilitate safer and more systematic implementation of AI in institutional activities (OECD, 2025b; Hassan et al., 2025; Wells et al., 2025). In the proposed model, such organizational outcomes are considered intermediate rather than final effects. They are important not because they represent success in themselves, but because they shape the organization's ability to function sustainably over time.

The final level of the model is sustainability outcomes. This model draws on the WHO/Europe framework for resilient and sustainable health systems, which emphasizes transformation, trust, adaptability, and long-term system capacity as central elements of future health governance (WHO, 2024). In this article, resilience is understood broadly to include operational, workforce, institutional, and organizational resilience. Artificial intelligence can contribute to these outcomes by strengthening anticipation, coordination, continuity, and adaptive capacity, but only if the earlier layers of this framework function in concert. This is consistent with

WHO and OECD evidence showing that the benefits of AI do not arise solely from its implementation; they depend on readiness, governance, capacity, and institutional alignment (OECD, 2025b; WHO, 2025a). Resilience is thus conceptualized as an indirect and contingent outcome of AI-enabled management transformation, rather than an automatic consequence of digitalization.

A key advantage of this framework is that it integrates organizational, managerial, and sustainability aspects into a single analytical logic. Many studies examine AI maturity, governance, implementation risks, workforce pressure, or resilience separately. In contrast, the proposed model explains how AI resources become organizationally meaningful through governance conditions; how governance shapes management transformation; how transformation produces intermediate organizational outcomes; and how these outcomes may support long-term sustainability.

The proposed conceptual model also has practical value for the argumentation of this article. This framework allows us to analyze healthcare organizations not simply as passive users of AI, but as institutions whose resilience depends on how they manage AI and integrate it into management practices. It also helps explain why the same technology can yield different results in different organizations: where governance is fragmented, data quality is low, or management capacity is weak, AI can generate opacity, dependency, or limited value; where governance is mature and strategically aligned, AI can facilitate more adaptive and resilient management. In this sense, the conceptual framework provides a theoretical bridge between the article's three research questions. It clarifies how AI is transforming management models, why governance challenges play a central role in this process, and under what conditions resilience and sustainability outcomes are possible in healthcare organizations.

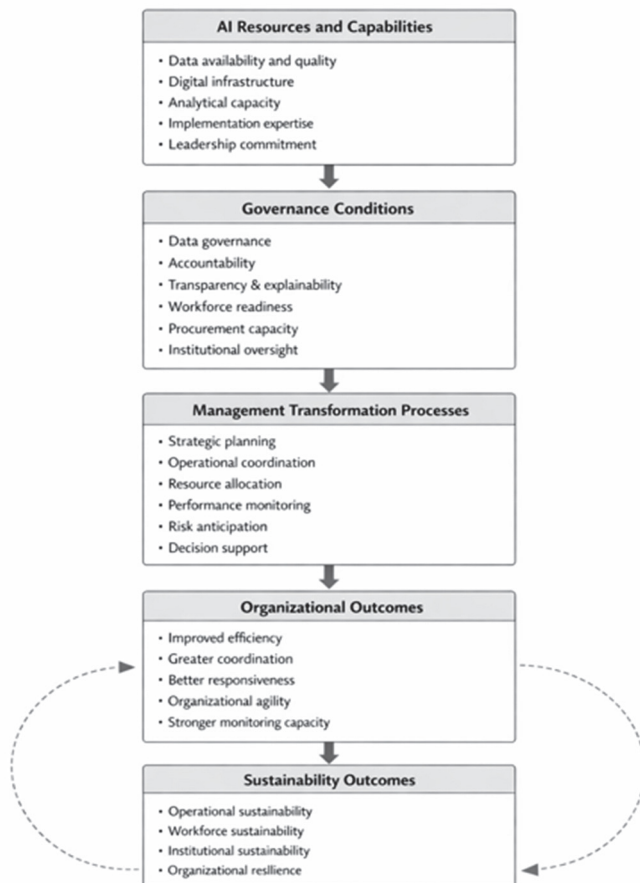
For the purposes of this article, the proposed framework can be represented as a five-stage sequence (see fig.1.):

- ✓ AI Resources and Capabilities.
- ✓ Governance Conditions.
- ✓ Management Transformation Processes.
- ✓ Organizational Outcomes.
- ✓ Sustainability Outcomes.

In empirical reality, this sequence should not be interpreted as strictly linear. In practice, feedback loops are likely to emerge: organizational outcomes may alter management mechanisms, and sustainability pressures may influence future capacity development. Nevertheless, as an analytical tool, this framework provides a holistic framework for examining AI as a

driver of management transformation in healthcare organizations. Therefore, it serves as a central interpretive model for the subsequent discussion.

Figure 1 - Conceptual framework of AI-enabled transformation of management models in healthcare organizations



Source: Developed by the authors based on the reviewed literature; visual drafting was supported by ChatGPT image tools.

Discussion

The analysis confirms that the organizational significance of AI in healthcare lies in its capacity to reshape planning, coordination, monitoring, and adaptation processes. This perspective complements clinical and

technical discussions by positioning AI as a management issue: its impact depends on how organizations redesign decision-making routines, oversight mechanisms, and operational workflows (OECD, 2025b; Papagiannidis et al., 2025; WHO, 2025a).

The central finding is that governance operates as a mediating layer between AI capabilities and sustainable organizational outcomes. AI can improve forecasting, coordination, and decision support, but its value depends on accountability, transparency, workforce readiness, data management, procurement capacity, and lifecycle control. This confirms a broader trend in recent governance research: the key issue is no longer only whether AI can be implemented, but under what institutional conditions it can be implemented responsibly, coherently, and with long-term value (NIST, 2023; Wells et al., 2025; WHO, 2025a).

The discussion also suggests that AI-enabled management transformation should be understood as a socio-technical, rather than purely digital, process. This is an important conceptual point. AI does not automatically create more intelligent or more efficient organizations; instead, AI changes the way management knowledge is generated, interpreted, and applied. Such changes require not only infrastructure and data, but also leadership commitment, organizational learning, process redesign, and institutional capacity to implement new forms of decision support. Thus, the conceptual framework proposed in this article helps explain why organizations with similar technologies can experience vastly different outcomes: transformation depends not so much on the mere presence of AI as on the maturity of the governance and management environment. This interpretation is largely consistent with recent maturity and adoption frameworks in healthcare, which emphasize culture, governance, business embedding, maintenance, and operational integration, rather than just technical deployment (Durlach et al., 2024; Kim et al., 2025).

Table 1 - Governance challenges and sustainability opportunities of AI-enabled management

<i>Governance challenge</i>	<i>Organizational risk if unaddressed</i>	<i>Sustainability opportunity if addressed</i>
Data governance	Poor data quality, fragmented decision-making, unreliable forecasting	More accurate planning, stronger operational sustainability, improved trust in AI-supported management
Accountability and oversight	Unclear responsibility for AI-assisted decisions, weak control over errors and unintended effects	More reliable governance, stronger institutional legitimacy, safer long-term implementation

Transparency and explainability	Reduced trust, difficulty justifying managerial decisions, opaque operational processes	Greater organizational trust, improved interpretability of decisions, stronger legitimacy of AI use
Workforce readiness	Misuse of AI tools, overreliance on automated outputs, implementation resistance	Better task integration, stronger workforce sustainability, more informed and adaptive management
Leadership and organizational design	Fragmented implementation, weak strategic alignment, inconsistent governance practices	More coherent transformation, stronger institutional sustainability, better coordination across units
Procurement and implementation pathways	Adoption of poorly matched or weakly governed systems, vendor dependency, mission drift	More sustainable technology adoption, improved strategic fit, better long-term value creation
Regulatory alignment	Compliance gaps, legal uncertainty, inconsistent implementation standards	Greater institutional stability, improved accountability, stronger external legitimacy
Trust and stakeholder engagement	Staff resistance, reduced public confidence, weak organizational acceptance	Stronger legitimacy, better adoption, more resilient and socially acceptable management transformation

Source: Developed by the authors based on the reviewed literature.

Table 1 summarizes the key governance challenges associated with the use of AI and shows how addressing these challenges can create opportunities for sustainable development in healthcare organizations.

To respond to the need for stronger empirical grounding, Table 2 adds selected real-world examples and data signals that support the framework. These examples do not turn the article into an empirical study; rather, they demonstrate that the proposed relationships are consistent with implementation evidence from health systems, policy evaluations, workforce data, and organizational governance cases.

The evidence summarized in Table 2 strengthens the conceptual argument in two ways. First, it shows that governance challenges are not abstract ethical concerns but practical barriers observed in real-world implementation, including procurement, workforce capability, data foundations, and scalability. Second, it demonstrates that sustainability outcomes depend on organizational maturity: AI creates value when

institutions can translate data and algorithms into coordinated management routines, review processes, and accountable decision-making.

Table 2 - Real-world implementation evidence supporting the proposed framework

Evidence / case	Key empirical or practical signal	Implication for AI-enabled management
WHO/Europe AI readiness survey (2024-2025)	The survey drew on insights from 50 Member States and examined national strategies, governance models, legal and ethical frameworks, workforce readiness, data governance, stakeholder engagement, and AI uptake (WHO, 2025a).	AI is already affecting how care is planned, delivered, and governed, but organizational benefits depend on readiness and governance capacity.
OECD digital and AI skills evidence	Analysis of nearly 55.5 million online job postings in Canada, the United Kingdom, and the United States tracked demand for digital and AI skills in health-related occupations from 2018 to 2023 (OECD, 2025a).	Workforce readiness is not a secondary issue; it is a core condition for sustainable AI adoption and for preventing implementation gaps.
OECD evidence on scaling AI in health	OECD (2026b) reports that AI is widely used in administration across member countries, while national-level scaling remains constrained by fragmented data foundations, regulatory uncertainty, and governance and workforce-capacity gaps.	Sustainability depends on moving from isolated use cases to scalable governance, shared objectives, and trustworthy deployment mechanisms.
NHS AI Lab evaluation	The NHS AI Lab evaluation identified progress in infrastructure, policy, and real-world deployment, but also barriers connected with procurement, integration into existing infrastructures, and alignment with service needs (Cresswell et al., 2025).	AI-enabled resilience requires system-level coordination, not only technically successful tools.

Evidence / case	Key empirical or practical signal	Implication for AI-enabled management
Canadian healthcare AI governance case	A healthcare delivery organization case study shows how governance can be structured through people, processes, technology, and operations (Kim et al., 2025).	The proposed governance layer is operationally realistic: it can be translated into committees, review pathways, system inventories, and lifecycle oversight.

Source: Developed by the authors based on WHO (2025a), OECD (2025a, 2026b), Cresswell et al. (2025), and Kim et al. (2025).

Another important implication concerns the relationship between AI and sustainability. Sustainable development should not be treated as an automatic byproduct of digital innovation. Instead, it should be understood as a contingent outcome of AI-enabled management transformation. AI may contribute to operational, workforce, institutional, and organizational resilience, but only when implementation is strategic, governed, and supported by learning-oriented institutions (OECD, 2025b; WHO, 2024; WHO, 2025a).

From a practical perspective, the article points to several implications for healthcare leaders and managers. First, AI implementation should be viewed as a management and governance project, not an isolated procurement or IT initiative. Second, institutions need to create cross-functional governance structures that integrate leadership, technical expertise, legal expertise, operations, and end-user perspectives. Third, organizational value should be assessed not only in terms of immediate effectiveness but also in terms of long-term adaptability, staff support, trust, and continuity. Recent real-world research on managing and scaling AI in healthcare supports this view, demonstrating that enterprise-level AI requires formal governance, risk mitigation pathways, model oversight, and alignment between implementation goals and institutional objectives. These findings suggest that the managerial challenge lies not simply in implementing AI, but in managing it as part of a coherent transformation strategy (Bodnari et al., 2025; Cresswell et al., 2025; Wells et al., 2025).

The article also has implications for policy and research. At the policy level, the findings support the argument that government agencies and healthcare institutions need implementation-focused governance frameworks, not just abstract principles. Regulatory discussions, including the burgeoning debates around the Artificial Intelligence Act and industry oversight, increasingly recognize the need to translate compliance into operational procedures, review structures, and institutional accountability.

At the research level, this study suggests that future research should pay greater attention to AI as a driver of organizational transformation, rather than limiting analysis to clinical effectiveness or narrow ethical issues. In particular, further research is needed on how artificial intelligence influences managerial authority, organizational learning, interdepartmental coordination, and resilience under uncertainty. Such a research program would help to integrate existing disparate research on digital transformation, healthcare management, and sustainability (OECD, 2025b; Vardas et al., 2025; WHO, 2025a).

Several limitations should be acknowledged. Because the study is based on a structured analytical review rather than primary empirical data, the proposed framework remains conceptual and interpretive. The additional real-world examples included in the discussion strengthen practical grounding but do not replace organization-level testing. Future research should therefore examine how specific governance conditions influence AI adoption, management transformation, and sustainability outcomes across different healthcare contexts.

Overall, the discussion reinforces the article's central thesis: AI should be understood as a driver of management transformation, with organizational effects dependent on governance capacity and long-term value expressed through sustainability and resilience outcomes. Healthcare organizations are particularly useful for demonstrating this argument, as they combine high management complexity, strong institutional constraints, and clear expectations of societal value. Therefore, the use of AI in healthcare is not simply a question of technology but also a question of how organizations manage complex systems, distribute responsibility, and maintain effective management in the face of change (OECD, 2025b; WHO, 2025a; Wells et al., 2025).

Conclusions

This article argues that artificial intelligence should be understood as an organizational capability that can transform management models in healthcare organizations under specific governance conditions. The analysis shows that AI affects strategic planning, operational coordination, resource allocation, performance monitoring, and decision support, thereby changing how healthcare organizations manage complexity and sustain performance over time.

The central finding is that the organizational effects of AI are conditional. AI does not automatically produce better governance,

efficiency, or resilience. Its value depends on data management, accountability, transparency, workforce readiness, leadership capacity, procurement competence, and institutional oversight. Governance therefore acts as the layer that determines whether AI becomes a meaningful organizational asset or a source of opacity, fragmentation, and institutional risk.

The article also demonstrates that AI-enabled transformation should be viewed as a socio-technical process, not a purely digital one. AI implementation requires not only technological infrastructure and information resources, but also organizational learning, adaptation of management processes, and strategic alignment. This perspective helps explain why similar AI tools can yield different results in different organizations: results depend not so much on the mere presence of AI as on the maturity of the institutional and management environment in which it is implemented.

Another important finding concerns the relationship between AI and sustainability. Sustainability in healthcare should be understood as operational continuity, workforce resilience, institutional adaptability, responsible resource use, and long-term organizational viability. AI can support these outcomes through better forecasting, coordination, responsiveness, and resource allocation, but only when implementation is coherent, accountable, and aligned with institutional goals.

The conceptual framework proposed in this article provides a synthetic explanation of these relationships, linking AI resources and capabilities, governance conditions, management transformation processes, organizational outcomes, and sustainability outcomes. This model contributes to the literature by integrating insights from governance research, management studies, digital transformation research, and health systems analysis into a single interpretive framework. Thus, it offers a more comprehensive way to understand AI in healthcare organizations than approaches limited to clinical effectiveness or isolated ethical concerns.

From a practical perspective, the article suggests that healthcare leaders should approach AI implementation as a strategic management objective, rather than a narrowly technical or procurement issue. Institutions seeking to reap sustainable benefits from AI must invest not only in technology but also in governance mechanisms, staff skills, cross-functional coordination, and review processes that ensure accountability and long-term institutional compatibility. For policymakers, the findings support the need to transform regulatory principles into implementation-oriented governance structures that can support robust and sustainable implementation in real-world organizational settings.

The study also has limitations. As a theoretical and analytical article based on a structured literature review, it does not empirically test the proposed relationships in specific healthcare organizations. Future research should therefore examine the framework through comparative case studies, surveys of healthcare managers, and mixed-method evaluations of AI governance practices in public and private healthcare institutions.

Overall, the article concludes that AI can become a significant driver of governance and management transformation in healthcare organizations when technological capabilities are matched with institutional readiness, responsible governance, and long-term sustainability objectives. Its value lies not in automation alone, but in its capacity to support more adaptive, coordinated, accountable, and resilient management models.

Declaration on the Use of Artificial Intelligence

During the preparation of this manuscript, the authors used AI-based tools, for language polishing, stylistic editing, reduction of textual repetition, improvement of argumentative clarity, and support in the visual presentation of the conceptual framework. Figure 1. was developed by the authors based on the reviewed literature; visual drafting was supported by ChatGPT image tools. These tools were not used to generate research data, conduct autonomous analysis, replace scholarly judgment, or make final interpretive decisions. No patient data or confidential institutional data were processed through AI tools. All AI-assisted outputs were critically reviewed, verified, edited, and approved by the authors, who take full responsibility for the accuracy, integrity, originality, and content of the submitted manuscript.

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