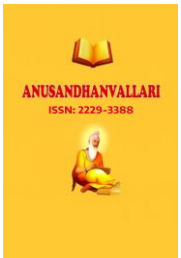

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Green HRM in the Era of AI: A Study on Implementation Challenges in the Hospital Sector

M. Shanmuga Sundari[1], Dr. J. Senthilvelmurugan[2], Dr. M. Surya Kumar[3]

[1]Ph.D Research Scholar, Department of Management Studies, Periyar University, Salem, Tamil Nadu, India

[2]Professor, Department of Management Studies, Periyar University, Salem, Tamil Nadu, India

[3]Assistant Professor, Department of Management Studies, Periyar University, Salem, Tamil Nadu, India

[1]sun_ram12@yahoo.co.in

[2]jsenthilv@periyaruniversity.ac.in, [3]suryakumarmprims@periyaruniversity.ac.in,

[1]https://orcid.org/0009-0007-4071-5288, [2]https://orcid.org/0000-0002-8282-7225, [3]https://orcid.org/0000-0003-3872-3776

Abstract: Green Human Resource Management (Green HRM) has become a strategic contributor towards organizational sustainability whereas Artificial Intelligence (AI) is profoundly reshaping practices in HR by means of automation, evidence-based decision-making and innovative resources. Although there is increasing body of research on Green HRM and AI, little has been done to understand difference in the perception of employees of the two practices in combination. This study examines the variations in perceptions of Green HRM in the era of AI across different age groups, focusing on five key dimensions: process and tools, people and culture, policy and strategy, ethics and compliance, and performance management. Using ANOVA analysis on responses from 200 employees representing three age categories. The study found no statistically significant differences across groups, though some variations in mean scores were observed. Younger employees rated people and culture higher, older employees' valued policy and strategy, while both younger and older groups emphasized ethics and compliance more than the middle-aged group. These findings suggest that while age does not strongly differentiate perceptions, subtle generational preferences exist. The study contributes to sustainable HR literature by highlighting the need for inclusive AI-enabled Green HRM strategies that address diverse workforce expectations.

Keywords: Green HRM; Artificial Intelligence; Sustainability; Generational differences; Age groups; Employee perceptions; People and culture; Policy and strategy; Ethics and compliance; and Performance management

Introduction

Hospitals are organizations that are resource intensive. They use energy, generate biomedical waste and have complicated supply chains, all of which have an impact on the environment. Meanwhile, hospitals are also labor-intensive: same people, clinicians, nurses, allied health professionals, administrators and support staff continue to be the fundamental resource. Green Human Resource Management (GHRM) aims to take advantage of that human aspect by integrating environmental sustainability into HR practices and routines (green recruiting, training, sustainable job design, green performance appraisal and green rewards). Artificial intelligence (AI) is also eating into HR functions and clinical workflows in the form of recruitment chat bots, automated schedulers, clinical decision support, and predictive models of staffing and other activities. The combination of GHRM and AI has the potential to provide synergy: AI can help scale green training and

monitor compliance with environmentally friendly procedures, optimize staff rosters to lower energy consumption, and help establish data-driven green performance indicators. However, within both literatures, GHRM and AI in healthcare, high barriers exist as well. This paper will dwell on those barriers and provide a frame work of handling those barriers in hospitals. In today world, providers of healthcare services have a twin imperative to both become environmental friendly (green) and to leverage the power of artificial intelligence (AI) to enhance the quality of service delivery and operational efficiency. GHRM is seen as a potential way of harmonizing staff behaviour, staff recruitment, training, staff performance management and rewards with partnership goals. At the same time, AI-based HR tools and clinical systems change the way hospitals recruit, educate, schedule, measure and re-deploy employees. Nonetheless, the combination of GHRM and AI in hospitals is not easy. This article summarizes existing sources and develops a narrow-focus discussion of the key implementation pitfalls that hospitals can encounter when turning to Green HRM in an ever more AI-based setting. It will then end with practical guidelines to hospital administrators and human resource leaders on how they can better reconcile the socio-technical and organizational tradeoffs involved

Green HRM; an overview

The term GHRM is used to refer to HR policies and practices that would help in encouraging sustainable use of resources and in decreasing environmental impact of organizations via people management. Typical elements are green hiring and selection, specific green learning and growing, green performance planning, green recognition and reward and green job design. Empirical studies show that GHRM has potential to enhance environmental performance in organizations, employee pro-environmental behaviour, and, by extension, patient- or community-facing outcomes within healthcare systems. As an example of HR-relevant AI at work in hospitals: automated candidate screening, intelligent scheduling and rostering, learning platforms personalizing training content, staff wellbeing sentiment analysis, and workflow optimizers that anticipate peak service load and recommend staffing changes. Wider AI in hospitals (diagnostic support, triage robots, imaging analytics, administrative automation) also has an impact on HR: re-defined roles, new competencies and changed staffing needs. Although the AI can bring efficiency and decision-making, research indicates that scepticism, regulatory confusion, privacy concerns, and workforce resistance are some of the key limiting factors.

A conceptual framing: where GHRM and AI intersect in hospitals

1. **Policy & Strategy**: Most of the policies and strategies should be integrated within the hospital industry to implement Green HRM in the age of AI. Most hospitals continue to view the approach towards sustainability and the use of AI as two distinct initiatives, and they contribute to resource duplication and wastage. A forward-looking policy framework must obviously integrate the green objectives, as making an effort to mitigate carbon footprint, to minimize medical waste, and to optimize resource utilization, etc., into their HR policies and AI deployment strategies. Strategic integration is required between top management, HR boundaries, information technology, and sustainability officers in order to evade operations. Further, any budgetary allocation, leadership commitment, and quantifiable green KPIs are to be provided..

2. **People & Culture**: Hospitals can be deemed as people oriented organizations; thus, the culture of the working people substantially affects the performance of Green HRM and AI incorporation. The implementation of AI-driven green practices involves not simply some technical facilitation but also the involvement of the staff and its acceptance, trust and common appreciation. Employees can either see sustainability procedures as increased workload or AI tools as a potential source of threat to the job or autonomy. Promotion of the pro-environmental culture includes frequent communication, involving employees in the decision-making process, and role-specific training. Rewarding employees to be the champions of being “green” develops ownership and commitment. Hospital leaders should further pursue AI literacy in order to lessen oppositions and build trust in

technology enabled HR applications. In the final, it is essential to transform green values into the hospital culture so that they are accepted and practiced on the long-term basis.

3. **Processes & Tools:** Artificial Intelligence (AI) and Green HRM are changing the domain of hospital HR (recruitment, training, measures of performance and rewards). Using AI software can assist in streamlining green recruitment by filtering applicants based on sustainability skills and capabilities and can help in personalized training on areas of recycling/ waste management and smart sensors can also be used to track compliance using green practices. However, in the case of hospitals, this brings certain difficulties in the sense that the data is fragmented and systems not interoperable (in HR and between HR and hospital management) and there is a lesser level of technical skills within HR departments. Moreover when the tools are overly complex to use or they lack good combinations of tools, the staff will likely not utilise them at all making them have limited value. Hospitals ought to be interoperable and they should gradually incorporate the use of AI in their daily HR operations. Efficient processes and sturdy tools are the work-horse that translates green strategy into quantitative results.

4. **Ethics, Compliance and Data**: Green HRM in combination with AI in healthcare institutions raises severe ethical, legislative, and data-governance concerns. The use of AI to deliver HR analytics can have implications related to employee surveillance since employee behaviour may need to be tracked. Employees dislike things being forced upon them so they may not like systems which feel intrusive, out-of-reach or unfair. The Artificial intelligence in Human resources instrumentation technology has a strict compliance in the labour laws and healthcare regulations peculiarities and data protection guidelines by the hospitals. A workplace decision should be known, reliable and that can initiate employee trust by being transparent and just. Information relating to HR should also be secured since it could be abused and leakage can occur. The high standards of ethics and compliance mechanisms are beneficial in ensuring that the goals of the sustainability are achieved in a manner that does not subject the employees to exploitation, or hurt the integrity of the organizations.

Research Gap

Despite Green Human Resource Management (Green HRM) receiving a lot of scholarly attention over the past few years, little is understood on how it interacts with Artificial Intelligence (AI) and workforce demographics. The existing literature more of the generic utilities that Green HRM has brought forth as regards to environmental sustainability, employee participation and performance. Similarly, the significance of AI in streamlining HR practices, improving decision-making and digital sustainability has also been suggested in the literature. Nonetheless, the few researches conducted on the subject have only discussed the perceptions and responses of various age groups to the Green HRM practices made possible by AI tools. The generational gap in the workforce and consisting of digital natives (younger employees) and digital migrants (older employees) brings to the table diverse attitude to adoption, compliance and strategic alignment with technology. Although the younger employees might be receptive to artificial intelligence-based solutions, compliance with ethical principles and policies might be a priority of the older groups, and as a result, they might be less willing to engage in Green HRM initiatives. The state of empirical evidence fails to give a clear insight into these generational aspects in AI-driven HR context. Therefore, the missing element is the need to investigate the differences in attitudes toward the practices of Green HRM during the age of AI, which prevents companies to create inclusive, effective, sustainability-oriented HR policies.

Importance of the Study

The significance of this research is that it explores the critical combination of sustainability, technology and the power of diversity at the workforce level. Organizations are also becoming under pressure to be more environmentally responsible as well as make use of AI to optimize their HR processes. Nonetheless, unless

organizations realize the manner in which employees across age groups perceive and react to these initiations, organizations may be met with cultural resistance, a mismatch in strategy, or an ineffectiveness of the Green HRM practices. This study has relevance since it determines the generational difference in attitudes to the application of AI-enabled green HRM processes, tool, policies, ethics, and performance management systems. With an awareness of such differences, organizations can develop their HR practices to promote inclusion and engagement of all the age categories. To give an example, younger employees could use the support of AI, including the use of interactive tools and games-based learning, whereas older employees might be more successfully addressed when they are taught to be more ethically oriented and have a more strategic focus. The results may also help policymakers and HR leaders in determining a balance between digital transformations and sustainability objectives. On the field, the differences between technology adoption and human acceptance can be narrowed down, thus, the Green HRM initiatives can be highly technologically advanced but also social sustainable. In this way, the research can be added to organizational resilience, succeeding responsibility to the environment and intergenerational balance at the work place.

Statement of the Problem

The increasing application of the Artificial Intelligence (AI) in the HRM has changed the process of designing, implementing and tracking the sustainable practices in organizations. Green HRM as a strategy focuses on the minimization of environmental impact done by use of human friendly HR policies, employee involvement and green culture. Yet, these practices are effective when they are accepted by employees of different demographic groups, no matter what they might perceive. A big stumbling block would be the fact that age gap differences will influence the approach of employees towards AI-driven Green HRM initiatives. The younger employees are in most cases more tech-savvy and may embrace the AI enabled tools and related processes easily, whereas the older employees may raise concerns based on ethics, compliance or organizational strategy. Without taking such generational differences into account, a given organization is likely to struggle with resistance, unequal contributions, or lack of effectiveness of their sustainability programs. In spite of the significance of this question, empirical study finding the answer to it is scarce, but whether age has any significant effect on the perceptions of Green HRM processes (understood as process and tools, people and culture, policy and strategy, ethics and compliance, performance management), through AI assistance, remains open. This is a source of a knowledge gap in both the academics and the practitioners. Thus, the main question is there may be no concrete findings on the age aspect of perceiving Green HRM in the AI era, which prevents formulating and implementing an effective strategy.

Objectives

1. To examine employee perceptions of Green HRM practices in the era of AI across different age groups.

2. To analyze differences in key dimensions of Green HRM—process and tools, people and culture, policy and strategy, ethics and compliance, and performance management—based on age.

3. To provide recommendations for organizations to design inclusive and sustainable HR strategies that balance technological innovation with workforce diversity.

Methodology

The study adopted a quantitative research design to examine generational differences in perceptions of Green HRM practices in the era of Artificial Intelligence. The data were collected using a structured questionnaire that covered five major dimensions: process and tools, people and culture, policy and strategy, ethics and compliance, and performance management. Each item was measured on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). A **convenience sampling** technique was employed to collect

responses, as it allowed easy access to participants within organizational and professional networks. While this non-probability method limits the generalizability of findings, it was considered appropriate given the exploratory nature of the research and the time constraints. Data analysis was conducted using descriptive statistics (mean, standard deviation) to understand overall trends, and **Analysis of Variance (ANOVA)** was applied to test for significant differences across age groups. The methodology thus provided insights into whether generational variations meaningfully influence perceptions of AI-driven Green HRM practices.

Analysis, Findings and Results

GHRM is implemented, positive associations with organizational environmental performance appear, but barriers—especially skills, data and incentive misfit—persist. Likewise, systematic reviews of AI implementation in healthcare highlight similar barriers: regulatory uncertainty, workforce resistance, data issues and the need for careful governance. These findings reinforce that the challenges delineated above are both real and empirically observed.

The null hypothesis is tested with the help of parametric tests, i .e., ONE WAY ANOVA

Table: 1
DIFFERENCE IN THE GREEN HRM IN THE ERA OF AI: BASED ON THE AGE GROUP

Age group		N	Mean	Std. Deviation	F	Sig.
Process and tools	Less than 30	49	3.67	.658	.690	.503
	30 to 50	112	3.84	1.135		
	More than 50	39	3.92	1.156		
	Total	200	3.82	1.042		
People & Culture	Less than 30	49	3.29	1.061	.372	.430
	30 to 50	112	3.10	1.048		
	More than 50	39	3.00	.459		
	Total	200	3.13	.966		
Policy & Strategy	Less than 30	49	2.33	1.029	.239	.786
	30 to 50	112	1.85	.750		
	More than 50	39	2.74	.818		
	Total	200	2.14	.908		
Ethics, Compliance and Data	Less than 30	49	3.86	.764	.723	.469
	30 to 50	112	3.43	1.029		
	More than 50	39	3.85	.540		
	Total	200	3.62	.912		
Performance management and rewards	Less than 30	49	3.06	.626	.854	.445
	30 to 50	112	3.35	.937		
	More than 50	39	3.23	.536		
	Total	200	3.26	.808		

The **F-value** (from ANOVA) and **Significance (Sig.)** indicate whether differences among age groups are statistically significant. A **p-value (Sig.) < 0.05** would mean significant differences across groups. In this case,

all Sig. values are above 0.05, meaning **no statistically significant difference** across age groups in any dimension. However, mean scores still provide insights into perceptional trends.

(a) Process and Tools

- **Means**: <30 years (3.67), 30–50 years (3.84), >50 years (3.92).
- **Trend**: Older employees (>50) rate process and tools slightly higher, followed by middle-aged, then younger employees.
- **Interpretation**: This suggests that **experienced employees are more appreciative of AI-enabled green processes and tools**. Younger employees (<30) may not see them as impactful, possibly due to less involvement in strategic HR processes.
- **F(0.690), Sig.(0.503)** → No significant difference.

(b) People & Culture

- **Means**: <30 (3.29), 30–50 (3.10), >50 (3.00).
- **Trend**: Younger employees (<30) show slightly more positive views, while older employees are least convinced.
- **Interpretation**: Younger employees may be more adaptable to **AI-driven cultural shifts** and **green workplace values**, whereas older employees may find changes harder to align with existing cultural practices.
- **F(0.372), Sig.(0.430)** → No significant difference.

(c) Policy & Strategy

- **Means**: <30 (2.33), 30–50 (1.85), >50 (2.74).
- **Trend**: Older employees (>50) strongly value green HRM policies and strategies, while the 30–50 group rates them lowest.
- **Interpretation**: Senior employees, with greater exposure to organizational strategy, may see **policy integration of AI and green HRM as critical**. Middle-aged employees may perceive a **gap in policy execution**. Younger employees show moderate awareness.
- **F(0.239), Sig.(0.786)** → No significant difference.

(d) Ethics, Compliance and Data

- **Means**: <30 (3.86), 30–50 (3.43), >50 (3.85).
- **Trend**: Both younger (<30) and older (>50) employees rate ethics & compliance higher than middle-aged (30–50).
- **Interpretation**: Younger employees may value **data ethics and sustainability** due to awareness of climate issues, while older employees may emphasize **regulatory compliance and organizational reputation**. Middle-aged employees may balance both but score lower, perhaps due to practical challenges.
- **F(0.723), Sig.(0.469)** → No significant difference.

(e) Performance Management and Rewards

- **Means**: <30 (3.06), 30–50 (3.35), >50 (3.23).
- **Trend**: The 30–50 age group rates AI-enabled performance management and green rewards more positively than younger or older employees.
- **Interpretation**: Middle-aged employees are often at mid-career stages where **performance systems and rewards directly affect their growth**, hence they value it more. Younger employees may not yet be reward-driven, while older employees may be less concerned with performance-linked incentives.
- **F(0.854), Sig.(0.445)** → No significant difference.

3. General Interpretation

- **No statistically significant differences** exist between age groups (all Sig. > 0.05). This implies that **perceptions of Green HRM in the AI era are broadly consistent across age groups**.
- **Perceptional tendencies**:
  - **Older employees (>50)** → More positive toward **processes, tools, and policies**, reflecting their strategic outlook.
  - **Younger employees (<30)** → More positive toward **people & culture, and ethics**, showing openness to cultural change and concern for sustainability.
  - **Middle-aged employees (30–50)** → More positive toward **performance management and rewards**, reflecting career-focused priorities.

4. Implications

- **HRM strategies should be age-sensitive**:
  - For **younger employees**, focus on **ethical, cultural, and environmental values**.
  - For **middle-aged employees**, emphasize **performance-driven rewards** tied to sustainability and AI efficiency.
  - For **older employees**, strengthen **policy involvement and strategic alignment** to leverage their experience.
- Although differences are not statistically significant, organizations can benefit by **customizing green HRM approaches** to different age cohorts for higher engagement.

Implementation challenges

1. **Misalignment of Strategies and Inexistent Priorities**: Strategic misalignment is one whereby the AI and GHRM initiatives are not in clear alignment with organization goals. The focus of the leadership can be more inclined on short term profitability and ignore long term sustainability or staff welfare, portraying conflict between innovation and operation objectives. Departmental interests also distort implementation as departments prioritize various aspects of implementation; HR might want workforce engagement whereas IT might prefer efficiency. Such misalignment causes confusion of accountability, diluting of resources and loss of momentum. In the absence of strategic synergy, AI-driven GHRM will be nothing more than an independent initiative that will not have been a transformative approach to performance gain or sustainability effort but a waste of investments, a negative response of stakeholders, and a failed organizational initiative.

2. **Cultural Resistance and the Human Factors**: Cultural resistance is the unwillingness of the employees to accept AI-driven GHRM practices based on the fear of losing their jobs or their distrust of technology or commitment to old working systems. Human issues related to poor digital literacy, reluctance to change behaviour and lack of trust in decisions made by algorithms discourage the use. Employees would feel that this AI is impersonal or biased and the managers may feel threatened that it would diminish their power. Such resistance frequently appears in the form of tardy adoption, passive non-compliance or even active resistance. The way to overcome this barrier is having proper change management, open communications, inclusive participation, and trust-building initiatives that focus on how AI can be a supportive tool rather than a replacement tool.

3. **Skills gap and unbalanced AI/GHRM skills**: Incorporation of AI in GHRM requires in specific technical and sustainability skills that most firms do not have. HR professionals might lack the relevant data analytics or AI-related literacy, and the technical authorities might be unaware of all aspects of human resource management or sustainability form frameworks. This competency gap results in the departments having lopsided capabilities, which contributes to useless capabilities, miscommunication and subpar decision-making. Smaller organizations have more disadvantages since they have little training budget and the difficulty to find talent. Overcoming this divide will require on-going training to bridge skill gaps, inter-disciplinary collaboration, and collaboration with academia or technology providers to develop a workforce that can harness the power of AI-driven GHRM.

4**. Data Quality, Integration and Interoperability:** GHRM AI applications are largely dependent on quality data that is accurate, consistent, and well organized. Nonetheless, in many organizations, HR systems are so disjointed, records so out of date, or platforms so incompatible that integrating data is a problem. The inaccurate information results in subprime solutions, prejudiced suggestions and uncertain decision-making. There is the interoperability issue in the HR, finance and IT systems that even increase the problem of smooth flow of information. Such issues generate delays, repetition, and distinctions of trust in AI results. Maintaining data integrity demands effective governance systems, common data practices, and investment in integrated systems that organizations can use AI to guide evidence-based HR and sustainable work management.

5. **Ethical, of course, Legal, and Privacy Concerns**: GHRM involving AI also brings up some challenging ethical and legal questions, with regard to employee surveillance, data privacy, and bias. Employees can be afraid that they will be over monitored or unfairly treated in the situation that performance or behavior is misinterpreted by AI systems Legal regulations, including data protection laws, have high compliance requirements and breaches may have reputation consequences or result in sanctions. Ethical dilemmas also occur between efficiency in the organization and rights and dignity of the employees. AI decision-making shoulders that neglect transparency, which intensifies misgivings. To counter such concerns, organizations will need to implement responsible AI practices, build ethical review boards and make sure that they comply with this and finally, organizations will need to focus on equitability, accountability and transparency of deployment.

6. **Vendor, procuring and Cost Challenges**: GHRM based on AI will need a huge investment in monetary terms in terms of infrastructure, software, and training. Most organizations do not consider the total cost and the cost of the maintenance, customization and vendor dependency. The procurement barriers consist of identifying the proper AI solution amidst the saturated market, agreeing to terms on the contracts, and making sure it is compatible with the current systems. Vendor lock-in issues and costs tend to develop that eat up budgets and compromise flexibility. Less equipped small and medium enterprises might have more problems. The tactical purchasing principles, assessment competition in suppliers, and implementation in stages can help manage the costs. A meaningful cost-benefit analysis should be done over a long time to prove the worth of adoption of AI and sustain organizational commitment to GHRM innovation.

7. **Measurement and Incentives Misfit:** The effect of AI-driven GHRM is difficult to measure, with traditional HR metrics being inaccurate when recording sustainability results, employee health, or innovations ledgers. The misfit between the measurement frames and organizations gives incentives those results in misaligned behavior. To illustrate, say performance measurement is focused on cost-cutting, which causes managers to abandon sustainability programmes. Similarly, employees can be opposed to using AI tools in case motivators do not encourage the utilization of digital promotion. This lack of connection debilitates a company in their use of strategy and lowers the perceived worth of investing in AI-GHRM. Multidimensional and comprehensive performance indicators and aligning them with incentive structures will lead to meaningful adoption encouraging employees and managers to undertake AI in order to achieve sustainable HR practices.

Practical recommendations

Based on the review and the four-domain framing, we propose practical steps hospitals can take.

1. Implement an integrated strategy and governance: Develop a cross-functional governance affair consisting of HR, clinical leadership, facilities, IT, legal/compliance and sustainability officers. Articulate any AI initiatives with respect to GHRM goals and secure budget lines on cross-program pilots. Establish measurable success targets that include environmental performance and employee health.

2. Invest in people and co-design: The priority is on staff engagement and co-design. Create green protocol designs and AI interfaces via participatory procedures so that clinical modes are compromised in the context of the clinical, scientific and cultural feasibility. Provide role-specific green training and make AI literacy programs a part of performance conversations; incorporate green competencies into the job description and performance discussions.

3. Start with pilot projects that present low risk and high exposure: Examples: an AI-enabled learning platform delivering micro-modules on waste segregation with gamified rewards; a scheduling optimizer that will reduce overtime does not violate clinical constraints or energy use. Pilots construct proofs, credibility and repetitive learning.

4. Focus on open ethical AI practices: Achieve explain ability in AI implementation in HR contexts. Facilitate the ability of staff to comprehend how decisions are made, what data goes into them, and how to appeal. Ensure data governance is kept to a high standard, data should be de-identified where it is possible, and limits should be issued regarding the surveillance limit. Bring in legal and ethics as soon as possible.

5. Address data integration practically: Priorities data required within GHRM+ AI and phase their integration. Utilise middleware and standard data models. Think now in terms of connective minimum viable datasets that can facilitate demonstrable values.

6. Consolidate incentives and measurement: Design green HR KPIs that are equitable and considerations of clinical limitations (e.g., special clinical-related green performance metrics to night shifts). Tie rewards that are not monetary and tie them to sustainability behaviours. Make use of AI to give feedback as soon as possible but maintain human-mediated final evaluations.

7. Select vendors and procurement models that allow flexibility: Select vendors which allow access to open APIs and interoperability. Collaboration with local business there may be consortium buying or even public-private partnerships and share cost among hospitals that are resource-limited

Limitations and areas for future research

Recent literature is synthesized in this article and some practical recommendations are drawn, yet there are several gaps that could be used as a research topic. There is a scarcity of longitudinal studies that assess the effects of integrated AI + GHRM interventions on struggles in the real world to improve hospital environmental performance, ensure staff wellbeing and patient outcomes. The comparative study of low-, middle- and high-income settings would also assist in focusing on the interventions depending upon their affordability. Lastly, ethical questions regarding AI design that supports the green HR use case (e.g., the development of privacy-preserving behaviour nudges) is under-studied and requires more research.

Conclusion

The hospital sector stands to gain substantially by integrating Green Human Resource Management with AI capabilities: improved environmental outcomes, streamlined HR processes, and enhanced staff engagement are all feasible. Yet the path to that integration is obstructed by strategic siloes, cultural resistance, skills gaps, data fragmentation, ethical and legal concerns, cost and measurement problems. Hospitals that succeed will be those that adopt an integrated governance approach, invest in people and co-design, pursue ethical and transparent AI, and phase their technical integrations pragmatically. Ultimately, GHRM in the AI era should be seen not as a purely technical exercise, but as an organizational transformation that reimagines how hospitals care — for patients, people, and the planet.

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