Journal for Business Education and Management
ISSN (Print): 2790–7848, ISSN (Online): 2790-7856
Volume 5, Issue 2, Page 37-71

IMPACT OF GREEN HRM PRACTICES ON ENVIRONMENTAL PERFORMANCE OF PUBLIC HOSPITALS: ROLE OF GREEN CULTURE, GREEN INNOVATION, AND TRANSFORMATIONAL LEADERSHIP

Muhammad Usman Ali
PhD Scholar, Department of Business Administration
Greenwich University, Pakistan
musmanaliphd89@gmail.com

Prof. Dr. Mohammad Shaiq
Dean, Faculty of Management Sciences
Greenwich University, Pakistan
drshaiq@greenwich.edu.pk

Prof. Dr. S. Khurrum Khan Alwi
Chairman, Department of Education, BBSU Lyari Karachi
drkhurrum@bbsul.edu.pk

Abstract

This study aims to investigate the impact of green human resource management (HRM) practices on organizational environmental performance with the mediating role of green culture in the public hospitals of Karachi. In addition, the study intends to assess the moderating role of green transformational leadership in strengthening the link between green HRM practices and green culture, and the moderating effect of green innovation on the relationship between green culture and organizational environmental performance. The study employed a survey method using a five-point Likert scale, collecting 384 responses from key personnel involved in GHRM practices in public hospitals of Karachi. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Results showed that green training and development, green compensation and reward and green performance management and appraisal have a significant impact on the organization's green culture, while the organization's green culture has a significant impact on the organization's environmental performance. However, green recruitment and selection have a positive but statistically insignificant impact on the organization's green culture. Moreover, organizational green culture significantly mediates the impact of green training and development, green compensation and reward and green performance management and appraisal on organizational environmental performance, whereas it does not mediate the impact of green recruitment and selection on organizational environmental performance. Moderation results indicate that GTL strengthens the link between green recruitment and OGC but weakens the influence of certain other practices, while GI shows no significant moderating effect on the OGC–OEP relationship. Healthcare administrators should embed sustainability into the organization’s mission, vision, and operations by promoting environmental goals through leadership communication, ensuring active top management involvement in green initiatives, and fostering a culture of shared accountability for sustainable development.

Keywords: Green Human Resource Management (GHRM), Green Culture, Organizational Environmental Performance, Green Transformational Leadership, Green Innovation.

This work is licensed under a Creative Commons Attribution 4.0 International License.

Introduction

The concept of Green Human Resource Management (GHRM) practices is developed in literature reviews by investigating relevant studies, and these come to present a relatively new institutional approach that can join harmonized ecological management with human resource management practice through search results (Amayreh et al., 2025). Because the social and environmental influences will not only favor its financial benefits, but it has also become a very important concept for other academia, including human resource management researchers, about new phenomena referred to as GHRM, which was interestingly addressed this way back, being existences of recognition wherever companies uphold (Jabbour & de Sousa Jabbour, 2016).

GHRM is defined as the "HRM aspects of Environmental Management" or more broadly as "phenomena relevant to understanding relationships between healthcare industry activities that impact the natural environment and the design, evolution, implementation and influence of HRM systems". GHRM includes raising employee awareness of environmental issues, training employees on greener practices, and encouraging employee participation in sustainability initiatives (Carnovali, 2025).

Research on GHRM practices began to gain momentum in 2010 and 2011, including recruitment and selection, training and development, green culture and reward and compensation, performance management, and employee engagement that are attached to enhanced pro-environmental eco-friendly behaviors and improved environmental sustainability (Ashraf et al., 2024). GHRM is a growing field of research that examines the role of human resource management in supporting organizational sustainability and environmental management objectives. The field continues to evolve as scholars explore new GHRM strategies and their impacts (Siyambalapitiya & Zhang, 2024).

GHRM is about reinforcing environmental sustainability amid HR practices (Amjad et al., 2021). It intends to synchronize HR activities with welfare objectives of corporate social responsibility, stewardship of the environment (Malik et al., 2021). GHRM focuses on how HR activities must be undertaken to be more environmentally friendly. Hiring new workers could be very expensive and time consuming to lure the best workers especially when trying to recruit the right employees (Jamil et al., 2023). It can be even a more expensive investment since employees are replaced years after they were hired. Retaining the best talent is a big problem facing organizations (Alman & Yusuph, 2020: Jamil et al., 2023).

The strategic framework offered by (Renwick et al. 2013) green HRM is aimed at incorporating environmental values into the management of HRM. The impact of GHRM practices in the healthcare industry, which is driven by the perception that it leads to adverse environmental effects and wastage of resources, has the potential to initiate significant change.

Even though environmental training is growing in common practice in certain states, there is still not enough of it when it comes to healthcare. A survey done in the UK revealed that staff in the healthcare industry receive environmental training in only

42 percent of the organizations (Khatib & Al Amosh, 2024). Moreover, due to the new threats that are being presented by climate change, it has been felt that it is necessary to train healthcare workers, particularly the administrative personnel, by subjecting them to focused GHRM tactics. There, however, remains a great research and practice gap vis-a-vis applying Green Recruitment and Selection (GRS), GTD, Green Compensation and Reward (GCM) and Green Performance Management and Appraisal (GPM) to the administrative work in healthcare. The HRM practices are generally focused towards clinical employees, as the administrative personnel, which is needed to carry the workload of healthcare organizations, lack representation in GHRM programs (Boxall & Macky, 2009; Delery & Doty, 1996).

The healthcare sector's dynamic nature—including regulatory pressures, technological changes, and increasing patient expectations—demands that all staff, including administrative personnel, be equipped with the skills to adapt and perform effectively. Neglecting their GHRM related needs could reduce organizational efficiency and employee satisfaction (Paauwe & Boselie, 2005; Rehman & Yaqub 2021).

Rationale of the Study

Environmental sustainability has become a significant issue for healthcare organizations because of the high level of energy, water, and medical consumption, as well as the production of hazardous waste. Public hospitals, especially in developing countries, are facing growing pressure to boost environmental performance and, at the same time, manage finite financial and human resources. Human resource management has been recognised as a strategic mechanism by which organisations can influence employee attitudes and behaviors towards environmental responsibility (Renwick, Redman, & Maguire, 2013; Tang et al., 2018).

Green human resource management (GHRM) involves incorporating environmental goals into the normal HR functions like recruitment, training, performance appraisal and compensation. Prior research implies that GHRM practices may help to promote pro-environmental behavior and positive organizational environmental performance (Dumont, Shen, & Deng, 2017; Pham et al., 2020). However, the empirical evidence continues to be fragmented, especially in the healthcare sector and public sector organisations in developing economies.

Moreover, the modes by which GHRM practices are translated into improvements in environmental performance are not well understood. Organizational green culture has been seen as an increasingly important mediating variable for shared values and norms and related behavior pertaining to environmental sustainability (Zhang, Wang, & Zhou, 2021). Leadership and innovation are equally required contextual factors. Green transformational leadership can help to reinforce the environmental values and encourage employees to support the sustainability initiatives, and green innovation can help to increase the effectiveness of the environmental practices (Chen & Chang, 2013; Singh et al., 2022).

Given the paucity of empirical research on these relationships in the public hospitals in Pakistan, the present study attempts to establish an important theoretical

and contextual gap by exploring the direct, mediating, and moderating relationships between GHRM practices and organizational environmental performance.

Problem Statement

Despite the increasing awareness of environmental sustainability, environmental performance in public hospitals in Pakistan is still facing challenges in achieving sustainable performance. Issues such as inefficient waste management, excessive implementation of energy and limited adoption of environmentally friendly practices remain. Although green human resource management has been advocated as a strategic approach for sustainable improvement of the organization, its implementation in public healthcare institutions is inconsistent and not so institutionalized.

Existing researches on GHRM mostly focus on manufacturing or private-sector organizations, not paying much attention to public hospitals in developing countries. Furthermore, there is a paucity of empirical evidence that explains the link between GHRM practices and environmental performance via organizational green culture and its contingency on leadership style and green innovation. The lack of such evidence limits policy-makers and healthcare administrators from developing appropriate HR-driven sustainability strategies.

Therefore, the fundamental issue that this research seeks to answer is the absence of empirical knowledge on the understanding of how and under what circumstances GHRM practices lead to environmental performance in public hospitals, especially through the roles of green culture, green transformational leadership, and green innovation.

Research Questions

- What is the effect of green human resource management practices on the organisational green culture of public hospitals?
- How does organisational green culture affect the environmental performance of the public hospitals?
- To what extent does organizational green culture mediate the green HRM practices-organizational environmental performance relationship?
- To what extent does Green transformational leadership moderate the link between green HRM practices and organizational green culture?
- To what extent does green innovation mediate the association between organizational green culture and organizational environmental performance?

Research Objectives

- To investigate the effect of green HRM practices on the organisational green culture of public hospitals.

- To determine the impact of green culture in an organization on the environmental performance of the organization.

- To determine the mediating role of organizational green culture in the relationship between green HRM practices and environmental performance.

- To examine the moderating effect of green transformational leadership on the correlation between green HRM practices and organizational green culture.

- To analyze the moderating role of green innovation for the relationship between organizational green culture and organizational environmental performance.

Literature Review

Theoretical Underpinnings

Herzberg's Motivation-Hygiene Theory

Herzberg's motivation-hygiene theory, known as the two-factor theory, posits that job satisfaction and dissatisfaction arise from different factors. Motivators, such as achievement and recognition, lead to job satisfaction, while hygiene factors, including salary and working conditions, can cause dissatisfaction if inadequate (Alshmemri et al., 2017). This section of Green Human Resource Management focuses on a sustainable environment, and providing an eco-friendly green management organizational culture can serve as a motivator. The healthcare industry has vital roles in its organization-specific rules to reduce environmental footprint and significant effect in the field cultures, for example, when healthcare organizations' employees engage in sustainable initiatives and recognize employees' contributions to these efforts and deliver, they enhance intrinsic motivation. This, in turn, can lead to higher job satisfaction among employees, as they feel their work contributes to a larger purpose—namely, environmental sustainability (Chiat & Panatik, 2019).

Social Exchange Theory (SET)

According to SET, relationships depend on mutual exchanges that encourage cooperation and social behavior (Cook et al., 2013) within the context of GHRM, an organization's embrace of sustainability as an effort can be interpreted as a commitment to its employees. Healthcare organizations that teach staff environmentally friendly practices and recognize their contributions encourage a sense of commitment that leads to greater engagement and loyalty from their staff. While employees feel their contributions are acknowledged (Kailay & Paposa, 2024), more cohesive and motivated employees may arise from this mutual relationship, which can help employee self-improvement, green-oriented /adoptability, and improve job satisfaction.

Organization Environment Performance

GHRM practices can significantly influence the sustainability culture within healthcare industry working on GHRM programs focused on environmental management equip employees with the knowledge, information and skills necessary to

implement environmentally sustainable practices in their daily operations routine (Wati & Almadana, 2025). For example, healthcare employees participated in environmental sustainability GRS, GC and training programs were more likely to engage in practices such as waste management and save energy (Kailay & Paposa, 2024). Through structured training initiatives, organizations can foster a workforce environment to address and mitigate the environmental impacts of healthcare delivery.

Moreover, GHRM practices cannot be understated without Leadership command and suggested that their responsibility to explain organizational culture and are instrumental in communicating the importance of sustainability to staff. In the context of the researcher highlights top management demonstrates a commitment to sustainability, it emphasizes their behavior and engagement with employees (Laksana et al., 2024a). Leaders create an environment where employees feel empowered to contribute to environmental sustainability goals, Employee engagement is a positive factor in the effectiveness of GHRM practices (Eckelman & Sherman, 2016). Responsibility of employees at all levels like top management, middle management and front-line management retain environmental sustainability (Hameed et al., 2020). GHRM practices are effective approach is establishing green practices—cross functional groups promoting and implementing sustainable practices within the health care industry (Dionysus & Arifin, 2020).

A recent study of organizations suggests that the adoption of GHRM was also driven by pressures placed on healthcare providers. Reorganized regulatory regimes are continuing to encourage eco-friendly practices and encourage behaviors that contribute to better waste management, energy use or resource use (Mitchell, 2021). When environmental problems become increasingly known in the public consciousness, it is likely that patients and members of the public will also join environmental conscience groups. Healthcare providers are therefore compelled to stay in the market and be competitive (Renwick et al., 2013b). GHRM in the healthcare sector represents an important opportunity to promote both environmental sustainability and organizational performance. Green oriented procurement and employee adoptability with employee engagement can utilize their human resources to bring about change. The literature suggests that the future of healthcare becomes increasingly dependent on the successful integration of sustainability into all aspects of organizational governance, making GRM an important component in the growth and development of the healthcare industry (Andoh et al., 2025; Mensah et al., 2025).

Green Culture

The awareness of environmental issues has led organizations across the Healthcare industry to adopt environmentally sustainable practices. In healthcare management, the integration of Green-oriented GHRM has become crucial for promoting environmental sustainability (Azizan et al., 2025).

The healthcare industry includes purchasing eco-friendly medical equipment and supplies, drugs and medicine, surgery equipment, machinery using parts, portable machine maintenance material and building materials for daily routine operational general supplies for facilities, or ensuring that waste management practices minimize environmental harm (Cherotich et al., 2021). GHRM practices are designed to promote

environmental sustainability within a healthcare organization's human capital. This can include green training and development, green reward and compensation programs that encourage employees to adopt environmentally eco-friendly practices, performance evaluations that factor in environmental sustainability goals and values (Jabbour & de Sousa Jabbour, 2016).

Green Culture enables healthcare organizations to lead a more focused approach towards environmental goals. For example, recognizing and rewarding employees who contribute to sustainability efforts through GC can drive further engagement and innovation in sustainable practices (Mehrajunnisa et al., 2022). Employees would be encouraged to participate in green behaviors such a culture promotes active participation in sustainability at all levels of the organization (Li et al., 2021). The GC and GHRM have essential roles in fostering environmental sustainability in healthcare management. By acting as a mediator, the GC enhances the effectiveness of GHRM practices, ultimately leading to a culture of sustainability within organizations (Azizan et al., 2025; Luo et al., 2025).

H_1: Organizational green culture has a significant impact on organizational environmental performance.

Green Human Resource Management

Green Recruitment and Selection

Green recruitment and selection identified in the literature includes screening candidates for environmental values in this context, screening candidates based on their surrounding attitudes, knowledge of sustainability complexity and candidate commitment to green practices. This practice increases not only skills in their respective roles but also aligns with environmental sustainability objectives. Focus on Environmental responsibility, an organization's effort to green recruitment responsibility during the recruitment and selection criteria process has become increasingly important. The Healthcare industry's environmental sustainability takes initiative and adopts a new hiring process; by doing so, healthcare services can attract individuals who resonate with their ethical and environmental values (Amayreh et al., 2025).

Green hiring practices, organizations or industry are developing a workplace culture that promotes environmental sustainability and responsibility. Green hiring initiatives and providing platforms for them to contribute ideas for sustainability improvements include encouraging employees' participation. Green recruitment and selection strategies hold particular importance in the healthcare sector, as healthcare and environmental challenges differ in regions and countries, including Pakistan, especially in the urban area of Karachi in Sindh Province. (Afzal et al., 2025).

In Karachi, the challenges of rapid urbanization, the increasing number of residents and environmental concerns, particularly pollution and public health problems, create obstacles for the healthcare system. As such, the integration of GHRM practices is not only beneficial but may also be essential for the success of healthcare organizations in this region (Ahmed, 2025).

H_2: Green recruitment and selection have a significant impact on organizational green culture.

H_3: Organizational green culture mediates the relationship between green recruitment and selection and organizational environmental performance.

Green Training and Development

GHRM practices showed that employees' confidence level increased and improved knowledge through GHRM policies (Hameed et al., 2020). Research indicates that while limited healthcare organizations have started to incorporate green training initiatives, the adoption of comprehensive GHRM practices remains limited across the industry (Zepeda-Lugo et al., 2020).

The existing research recommended that environmental awareness training can have a positive impact on healthcare workers' knowledge, attitudes, and behaviors related to sustainability. For example, a study by Chowdhury et al. (2023) Such training programs can equip healthcare professionals with the knowledge and skills needed to implement eco-friendly processes, reduce resource consumption, and engage in pro-environmental activities (Álvarez-Nieto et al., 2018).

H_4: Green training and development have a significant impact on organizational green culture.

H_5: Organizational green culture mediates the relationship between green training and development and organizational environmental performance.

Green Compensation and Reward

A green compensation and reward system to motivate employees to engage in sustainable practices. These types of compensation, implementation strategies, impacts on employee behavior and organizational performance, as well as challenges faced in this transition (Mitchell, 2021). Establishing clear links between sustainability efforts and compensation reinforces these expectations. (Kollmann et al., 2020).

Direct financial rewards for achieving sustainability environmental targets significantly motivate and retain employees (Prasidi, 2025). Recognition-based rewards, such as sustainability awards or public acknowledgment, foster an organizational culture that values eco-friendly practices. (Mäntymäki et al., 2020). Healthcare institutions are offering benefits to their employees that promote sustainability, such as subsidies for public transport or electric vehicle charging stations. (Chowdhury et al., 2025).

H_6: Green compensation and reward have a significant impact on organizational green culture.

H_7: Organizational green culture mediates the relationship between green compensation and reward and organizational environmental performance.

Green Performance Management and Appraisal

A primary premise of GHRM is that industry culture must align with green principles to foster sustainable practices (Al-Swidi et al., 2021). Organizations encourage employees to engage in environmentally responsible behaviors (Aggarwal & Agarwala, 2023). Literature suggests many frameworks for understanding the implications of GHRM in healthcare management. Employees in decision-making processes regarding environmental policies have been shown to enhance job satisfaction and industry loyalty, further reinforcing environmentally sustainable practices (Khan et al., 2025). These studies highlight that transparent communication and critical elements in promoting GHRM concerning sustainability goals and progress determination improve employee engagement and motivation (Renwick et al., 2013).

H_8: Green performance management and appraisal have a significant impact on organizational green culture.

H_9: Organizational green culture mediates the relationship between green performance management and appraisal and organizational environmental performance.

Green Transformational Leadership

Green Transformational Leadership (GTL) has a critical moderating function to reinforce or demonstrate the relationship between GHRM practices and the OGC. It has been demonstrated that GTL has a positive moderating effect on connections between GRS and OGC by enhancing the mutual values and incorporating them into organizational standards (Ahmad et al., 2025). By setting the example of green behaviors, leaders make sure that the environmentally conscious recruits have an impact on the rest of the culture. GTL, on the other hand, has a negative mediating influence on the case of GTD. Excessive dependence on leadership instructions can also diminish the personal desire of employees to use training on their own and restrain the cultural change (Ismail, 2025). Conversely, GTL reinforces green compensation and reward (GCR) because when transformational leaders increase the credibility and motivational force of green incentives, they integrate sustainability into an organizational culture at a higher level (Prasidi, 2025). Lastly, GTL has a negative moderating effect between GPMA and OGC because employees might be too dependent on the vision of their leaders instead of taking initiative in applying performance-based green initiatives (Rizvi & Garg, 2021a).

H_{10}: Green transformational leadership moderates the relationship between green recruitment and selection and organizational green culture.

H_{11}: Green transformational leadership moderates the relationship between green training and development and organizational green culture.

H_{12}: Green transformational leadership moderates the relationship between green compensation and reward and organizational green culture.

H_{13}: Green transformational leadership moderates the relationship between green performance management and appraisal and organizational green culture.

Green Innovation

Green innovation capabilities within the moderate GHRM sector play a vital role in improving patient care services, optimizing processes, and driving innovation (Agrawal et al., 2024). Healthcare IT systems help share patient data across different providers, which is critical to enhancing coordination of care and minimizing redundant patient interventions. These systems are often interlinked to create a cohesive environment where various aspects of healthcare delivery are managed efficiently, addressing several challenges, particularly network performance and congestion issues (Ojo et al., 2022). thus enhancing organizational practices such as patient involvement, customizing the treatment plans, and the quality of care due to accurate identification of the needs (Wang et al., 2025).

Therefore, it is imperative that these healthcare industries invest in both technological advancements and the development of specialized competencies among healthcare professionals to fully leverage the benefits of it in transforming healthcare delivery for environmental sustainability (Luo et al., 2025).

H_{14}: Green innovation moderates the relationship between organizational green culture and organizational environmental performance.

Conceptual Framework

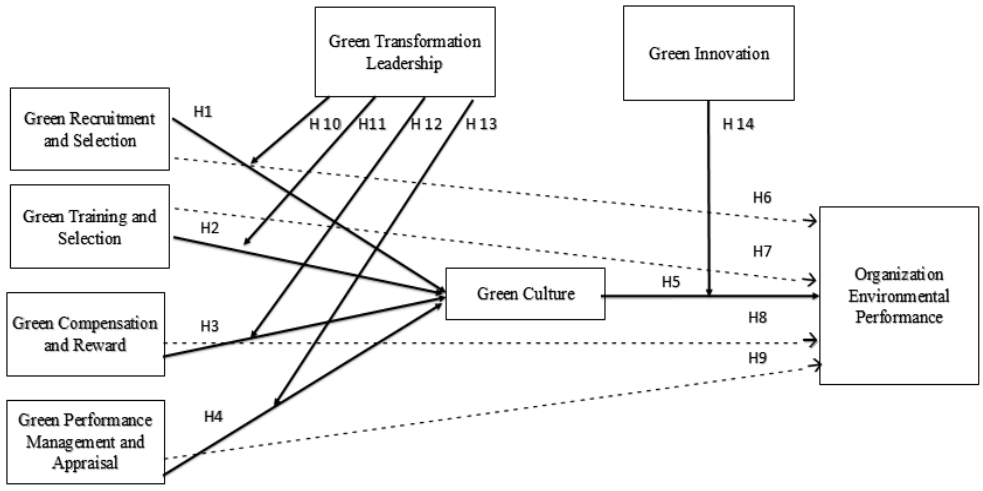


Figure 1: Conceptual Framework

Research Methodology

Population

The target respondents include HR professionals, sustainability officers, and administrator actively involved in implementing or overseeing GHRM practices in healthcare institutions. This study employed a non-probability convenience sampling method, which is commonly used in research and is suitable for studies involving specific professional groups, such as healthcare administrators and HR professionals.

Their insights help assess the role of green culture and innovation in driving sustainable performance in public hospitals (Baig et al., 2025). A total of 384 respondents were included in the study, ensuring a robust dataset for statistical analysis. The sample size is determined based on the guidelines provided by Yadewani and Duraipandi (2024), which suggest that a sample of this magnitude is appropriate for achieving a 95% confidence level with a 5% margin of error. A 90% response rate is anticipated, indicative of the active participation of HR practitioners, managers, and sustainability professionals in the discourse around green HRM practices. This sample is adequate for the purposes of inferential statistical analysis, including but not limited to regression and structural equation modeling (SEM).

Data Collection

The study employs primary data collection methods to gather firsthand information from HR professionals. Primary data ensures the reliability and relevance of insights, allowing for a more accurate analysis of the relationships between GHRM, green innovation, green culture, and sustainable performance in healthcare settings (Mazhar et al., 2021).

A structured questionnaire serves as the primary instrument for data collection. The questionnaire is developed using scales from prior research, ensuring reliability and consistency in the measurement of GHRM practices, green innovation, green culture, and sustainable performance. The questions are formulated to align with the research objectives and hypotheses, maintaining clarity and relevance (Kumari et al., 2021).

The questionnaire employs a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) to capture respondents' perceptions and attitudes toward GHRM practices (Creswell & Inoue, 2025).

Measures

- Green recruitment and selection have 3 items based on a five-point Likert scale adapted from Shah (2019). The sample item is "Our Health Organization has incorporated 'green aware' criteria in HR staffing policy."

- Green training and development has 4 items based on a five-point Likert scale adapted from Shah (2019). The sample item is "My Health Organization assesses who needs training in environmental management."

- Green compensation and reward have 5 items based on a five-point Likert scale adapted from Shah (2019). The sample item is "My Health Organization compensation system recognizes and rewards contributions in environmental protection."

- Green performance management and appraisal has 6 items based on a five-point Likert scale adapted from Shah (2019). The sample item is "Our Hospitals establishes green targets, objectives, and duties for each employee across the organization."

- Green transformational leadership has 4 items based on a five-point Likert scale adapted from Chen & Chang (2013). The sample item is "My leader inspires the organization members with the environmental plans."

- Organizational green culture has 6 items based on a five-point Likert scale adapted from Banerjee (2002) and Fraj et al. (2011). The sample item is "Our firm makes a concerted effort to make every employee understand the importance of environmental preservation."

- Green innovation has 5 items based on a five-point Likert scale adapted from Asadi et al. (2020). The sample item is "Hospital uses materials that are easy to recycle, reuse, and decompose."

- Organizational environmental performance has 5 items based on a five-point Likert scale adapted from Laosirihoasets et al. (2013). The sample item is "Hospital h, addressing compliance with environmental regulations."

Analyses and Interpretation

Description of the Sample

Table 01: Demographic Profile (n = 384)

		Frequency	Percent
Gender	Female	288	75
	Male	96	25
Age Group	18-26	164	42.7
	27-34	100	26
	35-42	84	21.9
	43-50	28	7.3
	51+	8	2.1
Education Level	Intermediate	24	6.3
	Bachelor's Degree	176	45.8
	Master's Degree	88	22.9
	Postgraduate	84	21.9
	Ph.D.	8	2.1
	Other	4	1
Position / BPS	BPS 11-17	128	33.3
	BPS 18-21	60	15.6
	Contractual Employee	148	38.5
	Freelancer	28	7.3
	NGOs	16	4.2
	Senior Manager	4	1
Years of Work Experience	0-2	96	25
	3-8	140	36.5
	9-16	88	22.9
	17+ years	6	15.6
Type of Organization	Public	204	53.1

	Autonomous bodies	40	10.4
	Other	140	36.5
Industry/ Sector	Healthcare	28	7.3
	Hospital	112	29.2
	Other	244	63.5
Organization Size	Less Than 50	72	18.8
	51-100	60	15.6
	101-500	56	14.6
	501-1000	72	18.8
	1000-1500	20	5.2
	More than 1500	104	27.1
Involvement in GHRM Practices	Yes	192	50
	No	192	50
Employment Type	Full-time	60	15.6
	Part-time	304	79.2
	Other	20	5.2

Data Analysis

Partial Least Squares Structural Equation Modeling (PLS-SEM) is a multivariate statistical analysis technique used to test and estimate complex cause–and–effect relationship models involving multiple latent constructs (Hair et al., 2019). It is particularly suitable for studies that focus on prediction and theory development, rather than theory confirmation. PLS-SEM allows researchers to simultaneously assess the measurement and structural model (Hair et al., 2011a).

In this study, PLS-SEM is used because it effectively handles complex models with multiple independent, mediating, and dependent variables related to GHRM practices, GI, GTL and GC. The method is also appropriate given the relatively small to medium sample size. By using PLS-SEM, the study ensures robust analysis, enabling accurate evaluation of hypothesized relationships and providing deeper insights into direct and indirect effects among variables (Hair & Alamer, 2022).

Results

Assessment of the Measurement (Outer) Model

Examination of the measurement (outer) model is the most important step in PLS-SEM, as it determines the degree to which the indicated variables of constructs reflect their corresponding latent constructs. The reliability and validity of the measurement items are established in this way prior to studying the structural relationships between variables (Hair et al., 2021). The assessment includes the analysis of some fundamental points, such as indicator reliability, construct reliability, and convergence validity, to make sure that every item is representative of the specified construct and that constructs themselves are internally similar. There is also an assessment of discriminant validity that determines different constructs defined separately in the model. (Henseler et al., 2015).

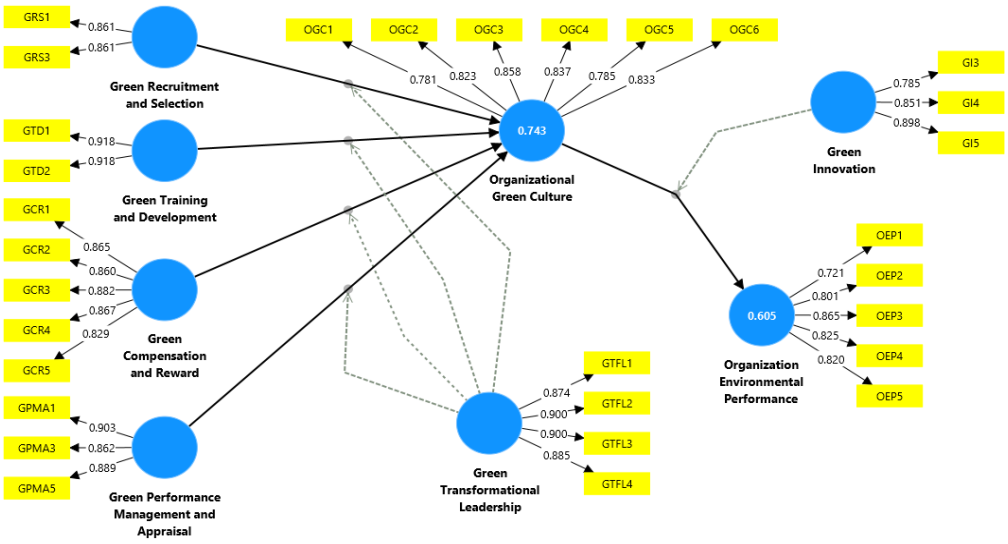


Figure 2: PLS Algorithm using SmartPLS

Construct and Convergent Validity

Table 2: Measurement Model

Constructs	Indicators	Loadings	Prob.	Alpha	CR	AVE
Green Recruitment and Selection	GCR1	0.865	0.000	0.912	0.935	0.741
	GCR2	0.860	0.000			
	GCR3	0.882	0.000			
	GCR4	0.867	0.000			
	GCR5	0.829	0.000			
Green Innovation	GI3	0.785	0.000	0.800	0.883	0.716
	GI4	0.851	0.000			
	GI5	0.898	0.000			
Green Performance Management and Appraisal	GPMA1	0.903	0.000	0.861	0.915	0.782
	GPMA3	0.862	0.000			
	GPMA5	0.889	0.000			
Green Recruitment and Selection	GRS1	0.861	0.000	0.650	0.851	0.741
	GRS3	0.861	0.000			
Green Training and Development	GTD1	0.918	0.000	0.813	0.914	0.842
	GTD2	0.918	0.000			
Green Transformational Leadership	GTFL1	0.874	0.000	0.912	0.938	0.791
	GTFL2	0.900	0.000			
	GTFL3	0.900	0.000			
	GTFL4	0.885	0.000			
Organizational Environmental Performance	OEP1	0.721	0.000	0.866	0.903	0.652
	OEP2	0.801	0.000			
	OEP3	0.865	0.000			

	OEP4	0.825	0.000			
	OEP5	0.820	0.000			
Organizational Green Culture	OGC1	0.781	0.000	0.902	0.925	0.672
	OGC2	0.823	0.000			
	OGC3	0.858	0.000			
	OGC4	0.837	0.000			
	OGC5	0.785	0.000			
	OGC6	0.833	0.000			

According to Hair et al. (2011b), outer loadings should be greater than 70% with a probability level below 0.05 for acceptable construct development, Cronbach's alpha should be greater than 60% for significant internal consistency based on inter-item correlation, composite reliability should be greater than 80% for constructs' composite internal consistency, and AVE must be greater than 50% in order for indicators and their latent constructs to have a significant correlation (Hair et al., 2017c). Furthermore, the VIF should not exceed 5 to prevent multicollinearity among indicators (Hair et al., 2019).

The above table shows that all indicators have loadings above the suggested threshold, with alpha, CR, and AVE coefficients exceeding 0.60, 0.80, and 0.50, respectively. Futhermore, because all indicators have VIF coefficients below 5,, indicating that there is no multicollinearity issue among them. Thus, by using the suggested criteria, convergent validity has been adequately attained.

Discriminant Validity

The discriminant validity gauges the extent to which a given construct is different from the others, both in concept and statistics. It also confirm that there is a latent variable that accounts for the phenomena that the other variables in the model lack (Hair et al., 2021). When using PLS-SEM, the evaluation of the discriminant validity is to ensure that constructs are never equal, and each of them signifies another concept. This is achieved using the Heterotrait-Monotrait (HTMT) ratio. Table 3 provides the result of the HTMT ratio for discriminant validity.

Table 3: Heterotrait-Monotrait (HTMT) Ratio

	GCR	GI	GPMA	GRS	GTD	GTL	OEP	OGC
GCR								
GI	0.773							
GPMA	0.882	0.739						
GRS	0.831	0.703	0.836					
GTD	0.862	0.801	0.760	0.893				
GTL	0.720	0.834	0.760	0.621	0.679			
OEP	0.729	0.743	0.756	0.654	0.658	0.632		
OGC	0.837	0.755	0.882	0.757	0.775	0.796	0.860	

GRS = Green Recruitment and Selection; GTD = Green Training and Development; GCM = Green Compensation and Reward; GPM = Green Performance Management and Appraisal; GI = Green Innovation; GTFL = Green Transformational Leadership; OGC = Organizational Green Culture; OEP = Organizational Environmental Performance

The above table shows that constructs have attained HTMT ratios below the suggested cut-off value of 0.90; therefore, discriminant validity has been established using the HTMT ratio (Henseler et al., 2016; Henseler et al., 2015).

Predictive Power of the Endogenous Constructs

The predictive power of the endogenous constructs in PLS-SEM refers to the ability of the model to explain the variance in the dependent (endogenous) variables. This is primarily assessed using the coefficient of determination (R^2), which indicates the proportion of variance in an endogenous construct explained by its predictor constructs (Hair et al., 2021). A higher R^2 value suggests a stronger explanatory power. At the same time, there are no absolute cut-offs; R^2 values of 0.75, 0.50, and 0.25 are typically described as substantial, moderate, and weak, respectively (Hair et al., 2019). Table 4 provides the result of predictive power for all endogenous constructs in the model.

Table 4: Predictive Power of the Endogenous Constructs

	R-Square	Decision
Organizational Environmental Performance	0.605	Moderate
Organizational Green Culture	0.743	Moderate

According to Hair et al. (2011b), latent constructs' predictive power (R2) higher than 25%, 50% and 75% are considered as weak, strong and moderate predictability. The above table shows that organizational environmental performance has a moderate predictability of 60.5% and organizational green culture has a moderate predictability of 74.3%.

Assessment of the Structural (Inner) Model

The structural (inner) model of PLS-SEM seeks to test the postulated connections among the latent constructs so as to determine the extent to which the theoretical model can explain the dependent variables of the study and research. It is performed following the validation of the measurement model, and it must involve the consideration of path coefficients, t-statistics, p-values, and the confidence limits to establish whether the connections are significant and strong (Hair et al., 2021).

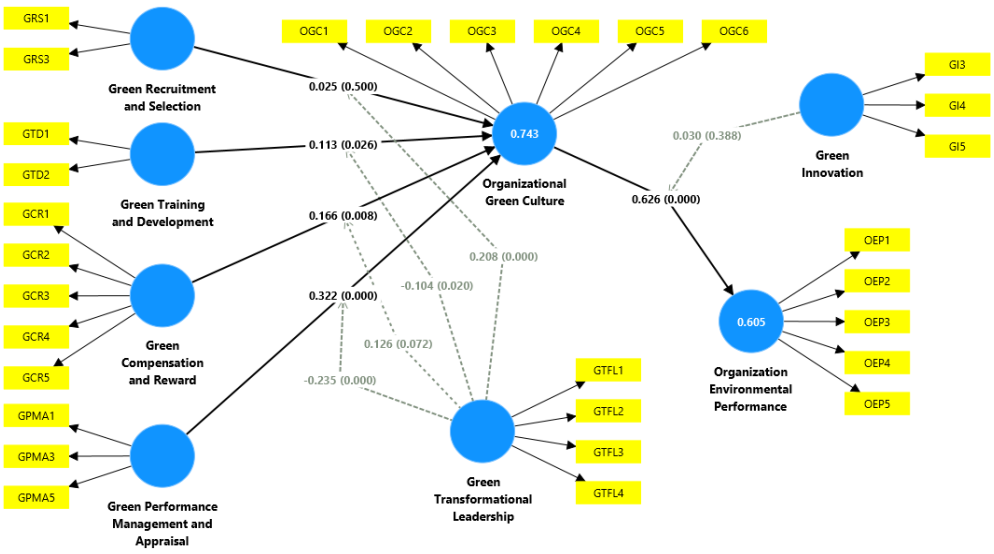


Figure 3: PLS Bootstrapping using SmartPLS

Direct-Effect Analysis

Table 5: Direct-Effect Analysis

	Estimate	Std. Dev.	t-Statistics	Prob.	Decision
GRS -> OGC	0.025	0.037	0.675	0.500	Not Supported
GTD -> OGC	0.113	0.051	2.231	0.026	Supported
GCR -> OGC	0.166	0.062	2.656	0.008	Supported
GPMA -> OGC	0.322	0.068	4.730	0.000	Supported
OGC -> OEP	0.626	0.055	11.305	0.000	Supported

GRS = Green Recruitment and Selection; GTD = Green Training and Development; GCM = Green Compensation and Reward; GPM = Green Performance Management and Appraisal; OGC = Organizational Green Culture; OEP = Organizational Environmental Performance

Table 5 shows that GRS has an insignificant positive effect on OGC ($\beta = 0.025$; $p > 0.05$). GTD significantly and positively influences OGC ($\beta = 0.113$; $p < 0.05$), and GCR also positively significantly affects OGC ($\beta = 0.166$; $p < 0.05$). Likewise, GPMA has a significant positive effect on OGC ($\beta = 0.322$; $p < 0.05$), while OGC has a significant positive effect on OEP ($\beta = 0.626$; $p < 0.05$).

Specific-Indirect Effect Analysis

Table 6: Specific Indirect-Effect Analysis

	Estimate	Std. Dev.	t-Statistics	Prob.	Decision
GRS -> OGC -> OEP	0.016	0.023	0.680	0.496	Not Supported
GTD -> OGC -> OEP	0.071	0.032	2.228	0.026	Supported
GCR -> OGC -> OEP	0.104	0.040	2.578	0.010	Supported
GPMA -> OGC -> OEP	0.202	0.050	3.993	0.000	Supported

GRS = Green Recruitment and Selection; GTD = Green Training and Development; GCM = Green Compensation and Reward; GPM = Green Performance Management and Appraisal; OGC = Organizational Green Culture; OEP = Organizational Environmental Performance

Table 6 shows that GRS (β = 0.016, > 0.05) has a positive, insignificant effect on OEP with the mediation of OGC. Moreover, GTD (β = 0.071; p < 0.05), GCR (β = 0.104; p < 0.05), and GPMA (β = 0.202; p < 0.05) all have a positive and significant effect on OEP with the mediation of OGC.

Moderation Analysis

Table 7: Moderation Analysis

	Estimate	Std. Dev.	t-Statistics	Prob.	Decision
GTL x GRS -> OGC	0.208	0.051	4.053	0.000	Supported
GTL x GTD -> OGC	-0.104	0.045	2.321	0.020	Supported
GTL x GCR -> OGC	0.126	0.070	1.798	0.072	Not Supported
GTL x GPMA -> OGC	-0.235	0.056	4.167	0.000	Supported
GI x OGC -> OEP	0.030	0.034	0.863	0.388	Not Supported

GRS = Green Recruitment and Selection; GTD = Green Training and Development; GCM = Green Compensation and Reward; GPM = Green Performance Management and Appraisal; GI = Green Innovation; GTFL = Green Transformational Leadership; OGC = Organizational Green Culture; OEP = Organizational Environmental Performance

Table 7 shows that GTL plays a significant positive moderation between the relationship of GRS (β = 0.208; p < 0.05) and OGC, while GTL plays a significant negative moderation between the relationship of GTD (β = -0.104; p < 0.05) and OGC. Further, GTL plays an insignificant positive moderation between the relationship of GCR (β = 0.126; p > 0.05) and OGC, whereas GTL plays a significant negative moderation between the relationship of GPMA (β = -0.235; p < 0.05) and OGC. GI plays an insignificant positive moderation between the relationship of OGC (β = 0.030; p > 0.05) and OEP.

Predictive Relevance of the Endogenous Constructs

As in PLS-SEM, the predictive significance of the endogenous constructs is established by the value of the Stone-Geisser Q-square, providing an estimate of how much of the individual values of the observed elements of the dependent variables are predictable on the basis of the model. (Geisser, 1975). The determination of Q-square is, in turn, performed by a blindfolding procedure that sequentially removes data points and performs a model prediction of the removed point to measure the predictive accuracy (Hair et al., 2021). When Q-square = 0, then the model has no predictive relevance value to the endogenous construct of interest (Chin, 1998). In particular, the Q-square of 0.02, 0.15, and 0.35 implies that it has small, medium, and large predictive relevance, respectively (Hair et al., 2019). Table 8 provides the results of predictive relevance for endogenous constructs in the model.

Table 8: Predictive Relevance of the Endogenous Constructs

	Q-Square	Decision
Organizational Environmental Performance	0.476	Strong
Organizational Green Culture	0.538	Strong

ISSN (Print): 2790–7848, ISSN (Online): 2790-7856
Volume 5, Issue 2, Page 37-71

Hair et al. (2013) suggested that in the structural model, Q2 greater than 2%, 15% and 35% be evaluated as having weak, moderate and strong relevance. The above table shows that organizational environmental performance has a strong relevance of 47.6% and organizational green culture has a strong relevance of 53.8%.

Discussions

Relationship between Green Recruitment and Selection and Organizational Green Culture

The study found that green recruitment and selection have a positive, insignificant effect on organizational green culture. This result is also supported by Hooi et al. (2022), who indicated that GRS may prioritize greenwashing or superficial traits over cultural fit. GRS can be implemented independently without the support of the organization, leadership, or continual training. GRS practices by themselves might not be enough to create a robust green culture within an organization. GRS plays a significant role in a broader green human Resource management (GHRM) approach that maximizes the positive impact on environmental sustainability by incorporating green performance management and green training. The prevailing culture may also be resistant to change, even if the new hires are environmentally conscious. The impact of individual green recruits may be overshadowed by organizational inertia. Additionally, green recruitment aims to draw in people who share green values. However, leadership behaviours, procedures, and systems all influence organizational culture. Individual efforts may be limited if sustainability is not supported by the overall organizational structure. Green individuals may experience disengagement or turnover instead of cultural influence if their personal values do not align with the actual organizational climate (Ahmad et al., 2023).

Relationship between Green Training and Development and Organizational Green Culture

The study identified that green training and development have a significant positive effect on organizational green culture. This result is also consistent with Danirmala and Prajogo (2022), who concluded that green T&D also refers to the process of giving employees the information, skills, and attitudes needed to behave in an environmentally conscious manner within an organization. Employees are encouraged to prioritize sustainability in their work by a strong green culture, which highlights environmental responsibility as a core value. Employees who participate in systematic green training programs start to internalize environmental values, which increases their eco-conscious behaviour and involvement in green initiatives. Sun et al. (2024)

Relationship between Green Compensation and Reward and Organizational Green Culture

The study has shown that green compensation has a significant positive effect on organizational green culture, which is also in line with Prasidi (2025), also encourage employees to adopt environmentally friendly practices. Green rewards and compensation show management's commitment to sustainability. Rewarding employees for environmentally conscious behaviour promotes adherence to the

organization's green values. Rewards encourage green behaviour, which eventually becomes standard practice within the organization. In addition, Employee engagement and commitment to the organization's green initiatives are increased when they perceive that their sustainability efforts are valued and rewarded (Anyona, 2023).

Relationship between Green Performance Management, Appraisal and Organizational Green Culture

The study revealed that green performance management and appraisal have a significant positive effect on organizational culture. This result is also consistent with Irani (2022), Sustainability is incorporated into daily work when incentives and evaluations are in line with eco-friendly practices. Encourages environmentally conscious thinking among employees, which gradually creates a common green corporate identity. Coelho et al. (2024) While a green culture provides the motivation and opportunity to participate in eco-friendly activities, GPM practices such as training and performance assessments can improve these aspects (Dias et al., 2024).

Relationship between Organizational Green Culture and Organizational Environmental Performance

The study shown that organizational green culture has a significant positive effect on organizational environmental performance, which is also in line (Imran et al,. 2021). Organizational environmental performance strengthens the green culture as it advances by showing tangible results, raising morale, and drawing in eco-aware talent and customers. Fang et al. (2022) also explained that organizations with a strong green culture typically have better environmental results, including lower waste generation, increased resource efficiency, and less pollution. Organizations with a strong green culture are more likely to strategically align sustainability objectives with innovation, operations, and investment. Employee innovation in addressing environmental issues is fostered by a green culture, which results in the development of green practices and technologies that improve environmental performance.

Mediation of Organizational Green Culture between Green Recruitment and Selection and Organizational Environmental Performance

The study has found that organizational green culture insignificantly mediates the relationship between GRS and OEP. This result implies that GRS alone might not significantly impact building a green culture capable of changing environmental performance. It could be explained by the idea that recruitment processes tend to be an early, fixed point of intervention and are unlikely to influence organizational culture, unless other HR activities support them (Zeeshan & Qazi, 2023). Also, GRS could potentially be appealing to a consciously environmental hiring pool. However, without organizational backing and the continuance of greening efforts, the cultural change demanded to achieve better OEP may never be realized. Furthermore, other studies have shown that green culture is more likely to be developed via long-lasting behaviors and routines than one-sided activities (Hadjri et al., 2019).

Mediation of Organizational Green Culture between Green Training and Development and Organizational Environmental Performance

The study has found that OGC significantly mediates the relationship between GTD and OEP. This observation suggests that GTD is vital in instilling environmental values in the workplace, which subsequently inculcates the culture of sustainable organizational practices and results (Pham et al., 2018). Which states that unceasing learning and growth are essential notions of cultural change and performance enhancement (Abbas & Khan, 2023).

Mediation of Organizational Green Culture between Green Compensation and Reward and Organizational Environmental Performance

The study has shown that OGC significantly mediates the relationship between GCR and OEP. This underscores the point that incentive systems based on environmental performance have not only individual behavioral effects, but also play a significant role in creating a more general green organizational culture, t (Roscoe et al., 2019). Employees are more likely to regularly embrace and propagate environmentally friendly behaviors when the correlation between environmental practices and monetary or non-monetary rewards is tangible. Given behavioral reinforcement, rewards become stimuli and boost desired behavior (Bhatti et al., 2022).

Mediation of Organizational Green Culture between Green Performance Management and Appraisal, and Organizational Environmental Performance

The study has found that OGC significantly mediates the relationship between GPMA and OEP. This pathway provided the most significant estimate of all the other relationships reviewed and highlights the critical role of performance evaluation systems in establishing a green culture that leads to environmental outcomes. Using performance management systems with environmental performance measures means sustainability is built into employee appraisals and responsibility systems (Ikram et al., 2019). When employees are periodically evaluated based upon green performance measures (energy consumption, waste generation, etc), there is a greater chance of internalizing the goals and incorporating them into the everyday performance of the personnel. In the long term, this repeated reinforcement leads to cultivating a common green culture. This is also consistent with goal-setting theory, where specific, strict, and goal-linked acts, such as environmental targets, improve performance (Pham et al., 2018).

Moderation of Green Transformational Leadership between Green Recruitment and Selection and Organizational Green Culture

The study identified that green transformational leadership has a significantly positive moderating effect between green recruitment and selection and organizational green culture. This outcome is also in line with Rizvi and Garg (2021a), who indicated that leaders who exhibit transformational leadership behaviours focused on environmental sustainability are likely to have a greater positive impact on building a strong green culture through green recruitment and selection. Effective green leadership also increases the benefits of recruiting and employing environmentally friendly employees. Green values are reinforced by green transformational leadership

through motivation, vision, and modelling. Leaders act as catalysts in order to incorporate green values into much broader organizational practices. The integration of green recruits' values into a shared green organizational culture is supported by this alignment. Also, organizations that place a high priority on green recruitment and selection are more likely to hire people who share their environmental values, which strengthens the organization's green culture (Ahmad et al., 2025).

Moderation of Green Transformational Leadership between Green Training and Development and Organizational Green Culture

The study identified that green transformational leadership has a significantly negative moderating effect between green training and development and organizational green culture. This result is also consistent with Rizvi and Garg (2021a), who revealed that employees may be less inclined to actively pursue their own sustainability knowledge if they depend too much on the green transformational leader for guidance and motivation. Employees may not fully internalize the training if they are waiting for the leader's direction on every matter. If leadership and training actively promote green agendas, employees may feel overburdened or worn out. The efficacy of green transformational leadership may be weakened as a result of resistance or disengagement. Ismail (2025) also found that when leaders already model and enforce green behaviours, employees might not perceive green training as necessary or repetitive. The impact of the training may be undermined if the leader's decisions or actions run counter to the principles covered. Initiative and creativity among employees may be hindered if green transformational leadership is seen as being unduly authoritarian or controlling.

Moderation of Green Transformational Leadership between Green Compensation and Reward and Organizational Green Culture

The study found that GTL positively moderates the relationship between green compensation and organizational culture. This outcome is also in line with Hameed et al. (2022) and highlights that leaders who establish an example for environmental responsibility encourage employees to embrace sustainable practices and embody and promote environmental values. A high green transformational leadership increases the strength of the relationship between green compensation and rewards and organizational green culture. When employees receive rewards for their green behaviour, they are more likely to adopt and promote green values. Prasidi (2025) also found the same outcome and concluded that the impact of the green compensation and reward system on creating a green culture can be greatly increased when green transformational leaders actively promote it, stress its significance, and set an example of the desired behaviours. More participation and a stronger sense of environmental responsibility result from employees' perceptions of the system as fair and consistent with the organization's values.

Moderation of Green Transformational Leadership between Green Performance Management, Appraisal, and Organizational Green Culture

The study found that green transformational leadership has a negative significant moderating effect between green performance management and appraisal

and organizational culture which is also in line with Hemmet (2025) and stated that if a leader has a strong green transformational style, employees may rely more on the leader's direction and guidance, which could lessen their own proactive engagement with green initiatives or sense of ownership over creating a green culture. Employees can become reliant on the leader's green vision instead of adopting the green practices that green performance management and appraisal systems promote. When leadership is more abstract or visionary and green performance systems are strict or metric-based, employees might get conflicting messages. Additionally, highly transformational leaders may unintentionally foster a culture in which employees are less inclined to take charge or make independent contributions to the green culture because they may be waiting for cues or instructions from the leader (Rizvi & Garg, 2021a).

Moderation of Green Innovation between Organizational Green Culture and Organizational Environmental Performance

The study revealed that green innovation has a positive and insignificant moderating effect on the relationship between organizational green culture and organizational environmental performance. This result is also consistent with Imran and Jingzu (2022) and indicates that organizational green culture may have a direct and significant impact on organizational environmental performance. Strong green cultures may already incorporate environmental values so thoroughly that innovation is not required to achieve better results. It is possible that green innovations do not match the precise environmental performance indicators being monitored. Furthermore, internal communication, HR procedures (such as green hiring and training), and leadership values all have a significant influence on OGC, though not always innovation. A supportive environment can be created by an organization with a strong green culture, which is characterized by values, norms, and behaviours that put environmental protection first. It is more probable that employees in these cultures will be inspired and involved in creating and implementing environmentally friendly practices and technologies.

Conclusion

This study aimed to examine how the practices of GHRM influence organizational green culture and the effects on environmental performance in the healthcare industry, and determine the mediation and modulating functions of green culture, green transformational leadership, and green innovation. The results showed that it justifies the greatness of employing GHRM practices as a means of professional strategy aimed at achieving environmental sustainability and organizational effectiveness in institutions of healthcare. The outcome proved that three fundamental dimensions of GHRM, including green training and development, green compensation and reward and green performance management and appraisal, had substantive positive impacts on green culture in the organization. This implies that an organized series of training, rewarding systems to fit the environment, and the performance appraisal systems not only contribute to the awareness of the employees, but also develop a sense of being collective towards sustainable practices.

Moreover, green culture was determined to have a substantial impact on organizational environmental performance and, by extension, confirmed its primacy as the pathway channel through which GHRM practices can be expected to impart

materialized environmental results. These indirect effects also showed that the relationship between the dimensions of GHRM and the environmental performance was mediated by the green culture, which showed that HR plans of sustainability cannot be separated without a powerful organizational culture, so as to deliver significant results. Also, the important moderating effect of green transformational leadership was confirmed in multiple pathways, pointing to the fact that commitment and vision of leaders enhance the role of GHRM practices in developing an environmentally responsible workforce. Moreover, lack of significant relations in the case of green recruitment and selection triggers the support that recruitment is not important in driving environmental culture, except when supported by training, development and reinforcement processes.

Also, the results showing the rejection of green innovation as a moderator of environmental performance point to the necessity to employ more sustainable innovation-based systems in healthcare environments, accompanying the effort of HR-based sustainability development. Finally, the research offers a valuable amount of support to the idea of adopting GHRM practices in healthcare organizations as a step toward making human capital management sustainable. At a time when healthcare organizations are deeply concerned with their environmental performance, one should promote the incorporation of green practices into HR operations and encourage leaders to support them in an effort to positively affect both the environmental performance and the level of employee engagement and organizational reputation. The insights not only contribute to the academic discourse on GHRM, but also provide policy and health administration leaders potential pathways to become sustainability-oriented.

Theoretical Implications

The research supports the SET by proving that organizations that invest in green initiatives directed at employees are more likely to develop pro-environmental actions on the part of the organizations (Renwick et al., 2013). Employees in the healthcare sector feel that their organization cares about sustainability and facilitates their environmental initiatives by designing coherent HRM-related activities; they tend to respond to them with more dedication, accountability, and eco-friendly behavior (Cook et al., 2013). The idea of mutual benefit in the proposal of SET is further supported by the fact that the green organizational culture mediates the former association between HR practices and environmental performance.

The findings provided theoretical support to the argument that cultural mechanisms influenced by HRM have a decisive role in determining environmental outcomes. Also, leadership was revealed as significant and complicated. Although green transformational leadership enhanced the beneficial impact of some of the HR practices, it incidentally undermined others. Such a subtle understanding enriches the current literature on leadership, which repeatedly implies that the pro-environmental behavior tends to be positively affected by the transformational styles in an unqualified way (Teece, 2024). Unstructured training or performance structures, in certain instances, can be upset by visionary or change-focused leadership due to its lack of alignment with the realities of operations (Robertson & Barling, 2023).

Practical Implications

This research has important practical implications, as the findings can be used by healthcare organizations, HR professionals, policymakers, and leadership bodies to attempt to incorporate sustainability into their strategic and operational practices. The findings of the study show that green training and development, green compensation and reward and green performance management and appraisal play major roles in promoting green culture in healthcare organizations. It is thus the role of HR professionals to ensure that these practices become part of the mainstream HR functions.

Employees can be encouraged towards sustainable behavior through the provision of non-monetary rewards, which include recognition awards for green practices, and financial incentives in the form of bonuses based on environmental performance. Also, there should exist environmental criteria within performance appraisal mechanisms, and employee contributions to green goals should be formally recognized and included in the evaluation processes. Engaging with the HR practice in accordance with the sustainability measures will enable healthcare organizations to institutionalize environmental responsibility towards their workforce.

Healthcare administrators are advised to pursue an active green culture within an organization, incorporating the concept of sustainability in its mission, vision, and operational plan. It could be done by means of leadership communication focusing on the environmental aims, the obvious involvement of the top management in the green programs, and the creation of a shared accountability culture in which sustainable development is considered a common enterprise rather than a separate process. Internal campaigns, workshops and fire brigades can also create more awareness and engagement of all staff levels. These programs have both the benefit of enhancing environmental performance as well as enhancing the engagement of employees in evoking a feeling of purpose and alignment of the individual interests with those of company-wide values.

The leadership development programs ought to be invested in by the healthcare facility to enable managers and supervisors to inspire employees, provide mentorship, and promote pro-environmental modelling. Training leaders to describe clearly a strong vision of sustainability, inspire their employees to work towards common green goals and show consistency of organizational policies and their behavior should be considered. When leaders take active steps toward promoting environmental programs, including getting involved in energy-saving activities or promoting green innovations, the employees are more likely to follow the example and incorporate it into their daily practices, thus strengthening sustainability at all levels of the organization.

A well-defined set of environmental performance indicators, including the goals of energy consumption reduction rates, waste minimization, and adherence to green building standards, has to be developed by healthcare organizations. Monitoring and reporting of such indicators on a regular basis not only enables accountability but also establishes transparency, thus prompting employees to work towards the achievement of these indicators.

Limitations and Future Research

The study was limited to the administrative staff within organizations within the healthcare industry; therefore, it would be useful to increase the sample sizes to incorporate clinical staff who participated in it, such as doctors, nurses, and paramedics, among the administrative staff who were employed. The study was based on the information gathered in a certain geographical area, i.e., Karachi, which would not be able to explain the experiences and practices of healthcare institutions in other provinces. Therefore, multi-regional or national-level studies can increase the generalizability of findings and explain differences in environmental policies, organizational culture, and availability of resources. Furthermore, the study has a cross-sectional research design. This limits the capacity to make causal inferences about how practices of GHRM affect outcomes in the long run. The use of self-reported survey data also presents the issue of savoir faire gap, whereby respondents have indicated that they might have exaggerated some of their environmentally friendly actions. It is also advisable that longitudinal research designs should be used to understand the time-effect of GHRM practices on employee behavior and also environmental performance. To provide more reliable data, mixed methods with surveys and interviews or observation may be used to have greater insight into an issue and reduce the presence of self-reporting bias. Finally, moderating and mediating variables were tested, but the study did not control for the possible confounding variables; therefore, there is a need to assess contextual controls, such as the size of organizations, financial capabilities, and regulatory compliance rates, which could be considered.

Significance of the Study

This study makes important contributions to theory, empirical research and practice of human resource management, environmental management and public sector administration. From a theoretical perspective, the research contributes to the green human resource management (GHRM) literature by empirically establishing organizational green culture as an important mediating mechanism by which GHRM practices affect organizational environmental performance. By combining context moderators of green transformational leadership and green innovation, the study contributes to a deeper understanding of the issue of the boundary conditions under which GHRM practices are effective, especially within public-sector healthcare settings.

Empirically, the study adds to the scarce body of literature on the sustainability practices in public hospitals in developing countries, specifically in Pakistan. Most studies that have been conducted on GHRM concerned private-sector or manufacturing organizations and, therefore, may not be generalizable to public healthcare institutions. By concentrating on public hospitals, this study fills an important gap in the context and is evidence-based to policymakers, healthcare administrators, and regulatory authorities.

The study also highlights the importance of leadership in shaping environmental values and behaviors among employees and thus provides practical

information for leadership development and capacity-building exercises among public hospitals.

Recommendations

Based on findings of this study, a few recommendations are made for policymakers, hospital administrators and future researchers.

First, there should be an institutionalization of green HRM practices in public hospital administrations by formally incorporating the environmental objectives in HR policies, procedures, and job descriptions. Green training and development programs should be regularly undertaken to increase environmental awareness of employees and technical skills associated with waste management, energy efficiency and the sustainable use of resources.

Second, performance management and compensation systems should be integrated into the environmental goals. Hospitals should have clear environmental performance indicators in appraisal schemes and tie rewards and recognition to contributions made by employees to sustainability initiatives. Such alignment can help reinforce pro-environmental behavior and reinforce green culture in organizations.

Third, environmental sustainability should become part of the hospital leadership activities (green transformational leadership behaviors). Senior management needs to show visible commitment to environment-related efforts, communicate sustainability goals effectively and drive employee participation in sustainable methods. Leadership development programmes should therefore include environmental management and sustainability competencies.

Fourth, even though green innovation did not reveal a significant moderating effect in this study, it is still encouraged that hospitals continue to invest in cool technologies and innovative practices. Innovation efforts should be promoted with proper funding, cross-departmental cooperation and investment from environmental agencies and academic institutions in order to improve environmental performance over the long term.

Finally, future studies may want to consider the use of longitudinal research designs to investigate long-term impact of GHRM practices on environmental performance. Comparative studies among private and public healthcare institutions or among different regions and countries would be additional and further increase the generalizability of the findings. Additionally, future research can also investigate other mediating and moderating variables, such as green psychological climate or regulatory pressure, to advance understanding of sustainability dynamics in healthcare organizations.

References

Abbas, J., & Khan, S. M. (2023). Green knowledge management and organizational green culture: an interaction for organizational green innovation and green performance. *Journal of Knowledge Management*, *27*(7), 1852-1870.

Afzal, S., Butt, S., Chohan, M. A., Afzal, M., & Yasin, F. (2025). Impact of sustainable human resource management practices on employee job satisfaction. In *Adaptive strategies for green economy and sustainability policies* (pp. 357–368). IGI Global Scientific Publishing.

Aggarwal, P., & Agarwala, T. (2023). Relationship of green human resource management with environmental performance: mediating effect of green organizational culture. *Benchmarking: An International Journal*, *30*(7), 2351–2376.

Agrawal, R., Agrawal, S., Samadhiya, A., Kumar, A., Luthra, S., & Jain, V. (2024). Adoption of green finance and green innovation for achieving circularity: An exploratory review and future directions. *Geoscience frontiers*, *15*(4), 101669.

Ahmad, F., Hossain, M. B., Mustafa, K., Ejaz, F., Khawaja, K. F., & Dunay, A. (2023). Green HRM practices and knowledge sharing improve environmental performance by raising employee commitment to the environment. *Sustainability*, *15*(6), 5040.

Ahmad, J., Al Mamun, A., Masukujjaman, M., Makhbul, Z. K. M., & Ali, K. A. M. (2023). Modeling the workplace pro-environmental behavior through green human resource management and organizational culture: Evidence from an emerging economy. *Heliyon*, *9*(9).

Ahmad, R., Naheed, R., Bismil, I. U. H., Abbas, Q., Afzal, M., & Ahmad, I. (2025). The Synergistic Effects of Green Recruitment and Training on Employee Performance: Moderation by Transformational Leadership. *Review Journal of Social Psychology & Social Works*, *3*(2), 975–992.

Ahmed, T. N. (2025). Exploring the Healthcare and Socio-economic Challenges Confronted by Retired Employees in Karachi. *Journal of Social Sciences Review*, *5*(1), 128–136.

Alman, K. L., & Yusuph, M. L. (2020). Performance Appraisal Experiences and Their Implications on Human Resource Decisions in Decentralized Health Services in Shinyanga Region, Tanzania. *Journal of Public Administration and Governance*, *10*(2), 181193–181193.

Alshmemri, M., Shahwan-Akl, L., & Maude, P. (2017). Herzberg's two-factor theory. *Life Science Journal*, *14*(5), 12–16.

Al-Swidi, A. K., Gelaidan, H. M., & Saleh, R. M. (2021). The joint impact of green human resource management, leadership and organizational culture on employees' green behaviour and organisational environmental performance. *Journal of Cleaner Production*, *316*, 128112.

Álvarez-Nieto, C., Richardson, J., Parra-Anguita, G., Linares-Abad, M., Huss, N., Grande-Gascón, M. L., Grose, J., Huynen, M., & López-Medina, I. M. (2018). Developing digital educational materials for nursing and sustainability: The results of an observational study. *Nurse Education Today*, *60*, 139–146.

Amayreh, M. M., Albqaeen, J. G., & Alajlouni, B. S. (2025). The Relationship between Green Human Resource Management Practices, Job Satisfaction, and Turnover Intention in 3-Star Hotels in Jordan. *International Journal of Academic Research in Business and Social Sciences*, *15*(7), 832–841.

Andoh, R. P. K., Owusu, N. K., Hayford, C., Ansong, L. O., & Ansong, A. (2025). Implications of green knowledge sharing, organizational green culture and green training and development for organizational environmental citizenship behavior in the hotel sector. *Journal of Hospitality and Tourism Insights*, *8*(2), 637–653.

Anyona, B. O. (2023). Green Human Resource Management and Performance of Selected Employees in Nairobi City County Government, Kenya, Kenyatta University.

Ashraf, A., Andrabi, U., Virgil, P., & Ramona, B. (2024). Green Human Resource Management (GHRM) Practices: Unlocking the Path to Sustainable Organizational Performance. *Annals of Constantin Brancusi University of Târgu-Jiu. Economy Series/Analele Universităţii'Constantin Brâncuşi'din Târgu-Jiu Seria Economie*(6).

Azizan, O., Tajmir Riahi, M., Shahriari, M., & Rasti-Barzoki, M. (2025). The effect of green culture and identity on organizational commitment. *Journal of Environmental Planning and Management*, *68*(4), 843-865.

Baig, M. N. A., Fatmi, Z., Khan, N. U., Khan, U. R., Raheem, A., & Razzak, J. A. (2025). Characteristics and outcomes of out-of-hospital cardiac arrest in rural and suburban areas of Sindh, Pakistan: A cross-sectional study. *Resuscitation Plus*, *21*, 100840.

Bhatti, S. H., Saleem, F., Murtaza, G., & Haq, T. U. (2022). Exploring the impact of green human resource management on environmental performance: the roles of perceived organizational support and innovative environmental behavior. *International Journal of Manpower*, *43*(3), 742–762.

Boxall, P., & Macky, K. (2009). Research and theory on high-performance work systems: progressing the high-involvement stream. *Human resource management journal*, *19*(1), 3–23.

Carnovali, A. (2025). Greening Organization from Within: Unveiling Employee Responses to Green Human Resource Management.

Chaudhary, R. (2020). Green human resource management and employee green behavior: An empirical analysis. *Corporate Social Responsibility and Environmental Management*, *27*(2), 630–641.

Chen, Y. S., & Chang, C. H. (2013). Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *Journal of Business Ethics, 114*(3), 489–500.

Cherotich, S., Rop, Dr. W., & Bett, Dr. A. (2021). The Relationship between Job Rotation and Employee Performance in Level-Four Hospitals within the South-Rift region in Kenya. *International Journal of Scientific and Research Publications (IJSRP)*, *11*(9), 139–145. https://doi.org/10.29322/IJSRP.11.09.2021.p11718

Chiat, L. C., & Panatik, S. A. (2019). Perceptions of employee turnover intention by Herzberg's motivation-hygiene theory: A systematic literature review. *Journal of Research in Psychology*, *1*(2), 10–15.

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. In (pp. vii-xvi): JSTOR.

Chowdhury, S. R., Sakib, M. N., Sanju, N. L., Sabah, S., Chowdhury, F., & Rahman, M. M. (2025). Aspects and practices of green human resource management: a review of literature exploring future research direction. *Future Business Journal*, *11*(1), 147.

Cook, K. S., Cheshire, C., Rice, E. R., & Nakagawa, S. (2013). Social exchange theory. In *Handbook of social psychology* (pp. 61–88). Springer.

Creswell, J. W., & Inoue, M. (2025). A process for conducting mixed methods data analysis. *Journal of General and Family Medicine*, *26*(1), 4–11.

Delery, J. E., & Doty, D. H. (1996). Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictions. *Academy of Management Journal*, *39*(4), 802–835.

Dias, G., Ribeiro, N., Gomes, D. R., Leandro, A., & Santos, M. J. (2024). Should human resources management "go green"?: The impact of green human resources management on employees' green behavior, affective commitment and company green performance. In *Building the future with human resource management* (pp. 71–93). Springer.

Dumont, J., Shen, J., & Deng, X. (2017). Effects of green HRM practices on employee workplace green behavior: The role of psychological green climate and employee green values. *Human Resource Management, 56*(4), 613–627.

Geisser, S. (1975). The predictive sample reuse method with applications. *Journal of the American Statistical Association*, *70*(350), 320–328.

Guerci, M., Longoni, A., & Luzzini, D. (2016). Translating stakeholder pressures into environmental performance–the mediating role of green HRM practices. *The International Journal of Human Resource Management*, *27*(2), 262–289.

Hadjri, M. I., Perizade, B., & Farla, W. (2019). Green human resource management, green organizational culture, and environmental performance: An empirical study. 2019 International Conference on Organizational Innovation (ICOI 2019),

Hagger, M. S., & Hamilton, K. (2025). Progress on theory of planned behavior research: advances in research synthesis and agenda for future research. *Journal of Behavioral Medicine*, *48*(1), 43–56.

Hair, J. F., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, *1*(3), 100027.

Hair, J. F., Astrachan, C. B., Moisescu, O. I., Radomir, L., Sarstedt, M., Vaithilingam, S., & Ringle, C. M. (2021). Executing and interpreting applications of PLS-SEM: Updates for family business researchers. *Journal of Family Business Strategy*, *12*(3), 100392.

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017c). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011a). PLS-SEM: Indeed, a silver bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139-152.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, *31*(1), 2-24.

Hameed, Z., Khan, I. U., Islam, T., Sheikh, Z., & Naeem, R. M. (2020). Do green HRM practices influence employees' environmental performance? *International Journal of Manpower*, *41*(7), 1061–1079.

Harris, L. C., & Crane, A. (2002). The greening of organizational culture: Management views on the depth, degree and diffusion of change. *Journal of Organizational Change Management*, *15*(3), 214–234.

Hassan, S., Jehangir, M., Shams, H. A., & Khan, I. (2025). Impact of GHRM on Sustainable Firm Performance through Green Dynamic Capability; The Role of Strategic Flexibility: Evidence from the Construction Industry of Pakistan. *Journal of Media Horizons*, *6*(1), 387–403.

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial Management & Data Systems*, *116*(1), 2–20.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, *43*(1), 115–135.

Ikram, M., Zhou, P., Shah, S., & Liu, G. (2019). Do environmental management systems help improve corporate sustainable development? Evidence from manufacturing companies in Pakistan. *Journal of Cleaner Production*, *226*, 628–641.

Jabbour, C. J. C., & de Sousa Jabbour, A. B. L. (2016). Green human resource management and green supply chain management: Linking two emerging agendas. *Journal of Cleaner Production*, *112*, 1824–1833.

Kailay, M., & Paposa, K. K. (2024). Sustainable Human Resource Management in the Hospital Sector: A Review of Literature. *Journal of Health Management*, 09720634231216062.

Khan, K., Gogia, E. H., Shao, Z., Rehman, M. Z., & Ullah, A. (2025). The impact of green HRM practices on green innovative work behaviour: empirical evidence from the hospitality sector of China and Pakistan. *BMC psychology*, *13*(1), 96.

Khatib, S. F., & Al Amosh, H. (2024). Corporate governance, management, environmental training, and carbon performance: the UK evidence. *Journal of the Knowledge Economy*, *15*(3), 14787–14809.

Kollmann, T., Stöckmann, C., Kensbock, J. M., & Peschl, A. (2020). What satisfies younger versus older employees, and why? An aging perspective on equity theory to explain interactive effects of employee age, monetary rewards, and task contributions on job satisfaction. *Human Resource Management*, *59*(1), 101–115.

Kumari, A., Ranjan, P., Chopra, S., Kaur, D., Upadhyay, A. D., Kaur, T., Bhattacharyya, A., Arora, M., Gupta, H., & Thrinath, A. (2021). Development and validation of a questionnaire to assess knowledge, attitude, practices, and concerns regarding COVID-19 vaccination among the general population. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *15*(3), 919-925.

Li, J., Huang, D. Q., Zou, B., Yang, H., Hui, W. Z., Rui, F., Yee, N. T. S., Liu, C., Nerurkar, S. N., & Kai, J. C. Y. (2021). Epidemiology of COVID-19: A systematic review and meta-analysis of clinical characteristics, risk factors, and outcomes. *Journal of Medical Virology*, *93*(3), 1449–1458.

Lubis, N. W. (2022). Resource-based view (RBV) in improving a company's strategic capacity. *Research Horizon*, *2*(6), 587–596.

Luo, J., Zaman, S. I., Jamil, S., & Khan, S. A. (2025). The future of healthcare: green transformational leadership and GHRM's role in sustainable performance. *Benchmarking: An International Journal*, *32*(3), 805–837.

Mäntymäki, M., Islam, A. N., & Benbasat, I. (2020). What drives subscribers to premium in freemium services? A consumer value-based view of the differences between upgrading to and staying with a premium. *Information Systems Journal*, *30*(2), 295–333.

Mazhar, S. A., Anjum, R., Anwar, A. I., & Khan, A. A. (2021). Methods of data collection: A fundamental tool of research. *Journal of Integrated Community Health*, *10*(1), 6–10.

Mehrajunnisa, M., Jabeen, F., Faisal, M. N., & Mehmood, K. (2022). Prioritizing green HRM practices from a policymakers' perspective. *International Journal of Organizational Analysis*, *30*(3), 652–678.

Mensah, P. O., Yong, J. Y., Dura, C. C., & Mensah, H. K. (2025). Institutional networking capability as a catalyst for sustainable supply chains in the manufacturing sector of Ghana: The role of green human resource management strategy and green dynamic capability. *Journal of Environmental Management*, *387*, 125865.

Mitchell, T. R. (2021). Expectancy-value models in organizational psychology. In *Expectations and actions* (pp. 293–312). Routledge.

Ojo, A. O., Tan, C. N.-L., & Alias, M. (2022). Linking green HRM practices to environmental performance through pro-environment behaviour in the information technology sector. *Social Responsibility Journal*, *18*(1), 1–18.

Paauwe, J., & Boselie, P. (2005). HRM and performance: what next? *Human resource management journal*, *15*(4), 68–83.

Pham, N. T., Tučková, Z., & Chiappetta Jabbour, C. J. (2020). Greening the hospitality industry: How do green human resource management practices influence organizational citizenship behavior in hotels? *Tourism Management, 72*, 386–399.

Pham, T. N., Phan, Q. P. T., Tučková, Z., Vo, T. N., & Nguyen, L. H. (2018). Enhancing the organizational citizenship behavior for the environment: the roles of green training and organizational culture. *Management & Marketing-Challenges for the Knowledge Society*.

Prasidi, A. (2025). Analysis of Organizational Performance through Employee Engagement: Green Behavior, Green Organizational Culture, Green Compensation and Rewards. *Greenation International Journal of Tourism and Management*, *3*(1), 1–14.

Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green Human Resource Management: A Review and Research Agenda*. *International Journal of Management Reviews*, *15*(1), 1–14. https://doi.org/10.1111/j.1468-2370.2011.00328.x

Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. *International Journal of Management Reviews, 15*(1), 1–14.

Renwick, D. W., Redman, T., & Maguire, S. (2013a). Green human resource management: A review and research agenda. *International Journal of Management Reviews*, *15*(1), 1–14.

Rizvi, Y. S., & Garg, R. (2021a). The simultaneous effect of green ability-motivation-opportunity and transformational leadership in environment management: the

mediating role of green culture. *Benchmarking: An International Journal*, *28*(3), 830-856.

Robertson, J. L., & Barling, J. (2023). Greening organizations through leaders' influence on employees' pro-environmental behaviors. *Journal of Organizational Behavior*, *34*(2), 176–194.

Roscoe, S., Subramanian, N., Jabbour, C. J., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. *Business Strategy and the Environment*, *28*(5), 737–749.

Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2022). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change, 179*, 121602.

Siyambalapitiya, J., & Zhang, X. (2024). Evaluation of human resource management in the green revolution. Key constructs in green human resource management. In *Green Human Resource Management: A View from Global South Countries* (pp. 93–119). Springer.

Tang, G., Chen, Y., Jiang, Y., Paillé, P., & Jia, J. (2018). Green human resource management practices: Scale development and validity. *Asia Pacific Journal of Human Resources, 56*(1), 31–55.

Teece, D. J. (2024). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal*, *28*(13), 1319–1350.

Wang, L., Zhang, Z., Cui, S., & Zhu, H. (2025). Green human resource management and corporate environmental performance: The mediating role of corporate reputation and green dynamic capability. *Asia Pacific Journal of Human Resources*, *63*(2), e70000.

Yapsabila, T., & Kwasira, J. (2023). Record Documentation Practice and Performance of Human Resource Function at Moi Teaching and Referral Hospital, Eldoret, Kenya. *International Journal of Academic Research in Business and Social Sciences*, *13*(10), Pages 891–903. https://doi.org/10.6007/IJARBSS/v13-i10/18914

Yong, J. Y., Yusliza, M.-Y., & Fawehinmi, O. O. (2020). Green human resource management: A systematic literature review from 2007 to 2019. *Benchmarking: An International Journal*, *27*(7), 2005–2027.

Zainal, N., Din, N. N. O., & Munusami, C. (2023). Relationship between human resource management practices and employees' job performance in selected private Health Care Sector, Selangor, Malaysia. *Human Resources Management and Services*, *5*(1), 3344-3344.

Zeeshan, M., & Qazi, H. H. B. (2023). Cultural Impact on Human Resource Management Practices in Pakistan. *Bulletin of Business and Economics (BBE)*, *12*(4), 586–591.

Zepeda-Lugo, C., Tlapa, D., Báez-López, Y., Limón-Romero, J., Ontiveros, S., Pérez-Sánchez, A., & Tortorella, G. (2020). Assessing the impact of lean healthcare on inpatient care: A systematic review. *International Journal of Environmental Research and Public Health*, *17*(15), 5609.

Zhang, Y., Wang, X., & Zhou, G. (2021). Antecedents of employee green behavior: A meta-analysis. *Journal of Cleaner Production, 278*,