

The Role of Green Leadership in Enhancing Environmental Innovation: the Mediating Role of Sustainable Human Resource Management: A Study in Healthcare Institutions in Kirkuk

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Abstract: The research investigates how green leadership impacts environmental innovation through sustainable human resource management practices in healthcare institutions of Kirkuk Governorate. The research design employed description and analysis while obtaining information from 400 healthcare administrative staff. SEM through SPSS along with Amos was utilized for investigating the variable connections. Research data showed that green leadership establishes a robust connection with sustainable human resource management which demonstrates its capability to direct sustainable practices. Sustainable human resource management functions as an effective mediation tool to enhance the connection between green leadership and environmental innovation. The results demonstrate that sustainable HRM practices boost institutional abilities to develop environmental innovations. Our recommendations support organizations to embrace green leadership principles while making sustainable human resource management investments because these bases strengthen environmental innovation and long-term environmental success.

Keywords: Green Leadership, Sustainable Human Resource Management, Environmental Innovation, Healthcare Institutions.



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Introduction

When leaders have adaptive traits and strategic intelligence they become capable of resolving uncertainties while encouraging innovation which leads them to direct organizations toward long-term expansion. Such leadership competencies resolve current problems while developing lasting organizational achievement paths. The efficient leader creates unified teams by leading people to accomplish collective objectives (Al-Naqeeb & Aboudi 2024). Leadership functions as a fundamental approach to mold human resource management strategies which focuses on organizational performance improvement while supervising mission accomplishment along with environmental adjustment (Hussein, 2014).

The practices of sustainable growth in HRM receive direction from green leadership which secures organizational continuity and strengthens cultural values that support the organization.

The system allows organizations to reach their long-term targets and advance those targets persistently. The fast-paced spread of globalization together with technological advancements and technical developments drove major operational and activity changes in organizations. The adoption of green leadership concepts along with their human resource management capabilities serves as a requirement for sustainable resource administration. Green leadership stands as an essential foundation for organizations to realize their administrative, societal, economic and ecological goals and environmental dedication (Saleh & Zainal, 2021).

Green leadership plays a pivotal role in fostering innovation by motivating subordinates to achieve environmental goals and inspiring them to exceed expected performance levels in environmental sustainability (Alawi, 2022). Additionally, green leadership influences a company's environmental performance by promoting innovation in green processes, thereby enhancing the understanding of specific mechanisms through which transformational green leadership programs drive innovation in green operations, improve environmental performance, and contribute to organizational success, sustainability goals, collaboration, and stakeholder engagement (Ahsan, 2024).

The strategic nature of green leadership enables organizations to create human resource management (HRM) practices which aim at acquiring green employees and developing these employees while keeping them engaged in order to achieve environmental performance excellence through innovation. The innovation process alongside environmental performance of companies depends on green leadership through its direct and indirect influence of green HRM practices (Singh et al., 2020).

The research problem exists in the rising obstacles Iraqi healthcare facilities encounter specifically in Kirkuk Governorate and nationwide when it comes to environmental innovation under environmental and regulatory pressure. Leadership practices as well as human resource management quality levels determine how effective this innovation becomes. The major hurdles in healthcare institution development stem from poor funding support and inadequate planning structure alongside insufficient infrastructure and professional absence.

This research develops solutions regarding environmental innovation in healthcare facilities through the utilization of green leadership together with sustainable human resource management practices. The research investigates these points: What extent does green leadership serve to improve environmental innovation? Sustainable human resource management acts as a mediating factor which strengthens the relationship between green leadership and environmental innovation within Kirkuk's Health Directorate.

Additionally, the research aims to explore the role of green leadership in improving the level of environmental innovation in healthcare institutions, with a particular focus on the mediating role of sustainable human resource management, in order to diagnose and address challenges based on both theoretical and practical perspectives.

Previous Studies and Hypothesis Development

The Relationship Between Green Leadership and Sustainable Human Resource Management

The study by Saleh and Zainal (2021), "Green Leadership and Its Role in Sustainable Human Resource Management for Business Organizations," aimed to analyze and conceptualize the framework of green leadership and its role in managing sustainable human resources in business organizations. The study's significance primarily stems from aligning the environmental and economic dimensions of the research problem, which is considered a fundamental goal for business organizations.

The study adopted an exploratory methodology, gathering opinions from a sample of administrative leaders at the University of Kirkuk. A total of 40 questionnaires were distributed to administrative leaders within the university. The study yielded several findings and recommendations, the most notable being that green leadership plays a crucial role in university management by ensuring the sustainability of human resources and enabling the institution to achieve its future goals and aspirations. One key recommendation emphasized the necessity for university management to adopt training and development programs focused on green leadership to foster innovation and continuous development, thereby helping leadership acquire cumulative knowledge and experience.

Based on this study, we formulate the first hypothesis:

H1: There is a statistically significant relationship between green leadership and sustainable human resource management.

The Relationship Between Green Leadership and Environmental Innovation

Ahsan (2024) explores aspects of transformational green leadership and green process innovation along with employee environmental beliefs regarding their impact on environmental performance in Italian manufacturing entities through his study "Green Leadership and Environmental Innovation: Catalysts for Environmental Performance in Italian Manufacturing."

The study utilized a multi-item survey questionnaire to obtain responses from leaders working in diverse Italian firms through which researchers gathered a total of 296 valid surveys. SPSS software was used to conduct statistical analyses of gathered information through correlation analysis as well as confirmatory factor analysis and structural equation modeling (SEM).

The research shows that transformational green leadership straightly affects corporate environmental performance while demonstrating positive outcomes from green process innovation. The research proposes organizations to develop green leadership initiatives while promoting innovative green process development alongside precise monitoring of environmental performance for both organizational success and sustainable achievement.

Based on this study, the second hypothesis is formulated:

H2: There is a statistically significant relationship between green leadership and environmental innovation.

The Relationship Between Sustainable Human Resource Management and Environmental Innovation

Research by Grabara et al. (2020) studied the mediation effect of sustainable innovation and work environment between sustainable human resources and corporate entrepreneurship on university development in Poland. This study analyzed how sustainable innovation together with work environment members affect sustainable university development in Poland.

A questionnaire was distributed among Polish university employees to collect data for this research purpose. A study of university employees in Poland led to the SEM application through PLS analysis for data processing.

Results from the study demonstrate how sustainable human resources together with corporate entrepreneurship drive better university sustainability by promoting sustainable innovation. The research discovered that sustainable human resources together with entrepreneurship create positive effects on sustainable innovation that leads to sustained university development. The study results demonstrate the essential nature of sustainable human resources together with corporate entrepreneurship because they enable successful innovation activities which promote sustainable university development.

Based on these findings, the third hypothesis is formulated:

H3: There is a statistically significant relationship between sustainable human resource management and environmental innovation.

The Relationship Between Green Leadership, Sustainable Human Resource Management, and Environmental Innovation

The research paper by Arici & Uysal (2022) investigates the research gap by examining the scholarly work about connections among green leadership and green innovation and green creativity. Research findings show that Asian nations lead the field of examination regarding relationships between leadership and green innovation and green creativity. Further research should investigate methods through which green innovations and creativity functions in service industries and develop understanding about leadership effects on these processes.

The research conducted by Singh et al. (2020) analyzes how green human resource management mediates between green transformational leadership, green innovation, and environmental performance. The research collected information through survey questionnaires from 309 manufacturing SMEs before validating its propositions through variance-based structural equation modeling (SEM). The study demonstrates how green human resource management practices create a pathway through which green transformational leadership influences green innovation. Green human resource management practices enable indirect improvement of environmental performance by facilitating green innovation. All direct and indirect effect hypotheses receive validation in the study which produces multiple theoretical together with practical implications.

H4: There is a statistically significant relationship between green leadership and environmental innovation through sustainable human resource management.

Theoretical Framework

First: Green Leadership

Green leadership is defined by Saleh and Zainal (2021) as the behaviors of leaders who motivate subordinates to achieve environmental goals and inspire them to perform beyond the expected levels of environmental performance. The implementation of green leadership requirements is based on three dimensions:

1. Sustainable Management: Business organizations call on leaders to address environmental and social impacts. Sustainable business leaders must apply a set of knowledge and skills to perform their tasks and solve complex problems, such as achieving sustainable development, through the application of systems thinking (Abdelghafour, et al., 2018).
2. Sustainable Initiatives: These are the directions and activities adopted by organizations to focus on environmental and social impacts, achieving positive effects on economic, environmental, and social levels. These initiatives can be considered a form of awareness regarding the company's positive impact on the surrounding environment and society, while striving to minimize the negative effects of the company's operations by adopting practices that consider the three core elements of development: society, environment, and economy. These initiatives align with the national leadership's vision for an environmentally friendly future within the framework of a green economy strategy (Saleh & Zainal, 2021).
3. Sustainable Practices: A set of methods and approaches used by leadership to maintain the integrity of society, individuals, and the environment within organizations. These include shaping the future, developing culture, ensuring transparency, establishing innovation standards, and finding alternatives to traditional solutions in order to adopt leadership practices that are friendly to the environment and society (Saleh & Zainal, 2021).

Second: Sustainable Human Resource Management

According to Al-Hariri et al. (2023, p. 602), sustainable human resource management is management that aims to achieve organizational sustainability by developing policies, strategies, and procedures that support the environmental, economic, and social dimensions. Some of the key practices of sustainable human resource management include:

1. **Sustainable Planning:** According to Suleiman et al. (2022, p. 257), it involves managing all human resource requirements in a way that enhances and supports the organization's social and environmental goals through the development of fair and transparent action plans, non-discrimination on any basis, enabling employees, and achieving a work-life balance.
2. **Sustainable Recruitment:** Al-Hariri et al. (2023, p. 604) describe it as recruiting employees with the appropriate skills and experience who are interested in environmental and social issues, and whose qualifications align with recruitment standards related to the specific job duties, aiming to build a workforce directed towards sustainability.
3. **Sustainable Training and Development:** Kang et al. (2022, p. 3) refer to it as allowing employees to acquire relevant knowledge, skills, and attitudes related to sustainability before performing a particular job, in order to improve environmental awareness and encourage participation in environmental protection practices through training.
4. **Sustainable Performance Evaluation:** Nayem & Uddin (2024, p. 2) define it as the process of periodically and regularly evaluating and reviewing employee performance to promote sustainability within the organization, taking into account environmental and social dimensions alongside financial performance, with the aim of improving efficiency, reducing negative environmental impact, and enhancing the well-being of employees and society as a whole.
5. **Sustainable Compensation and Rewards:** Motivating employees' attitudes and motivations through a sound reward and compensation system. This system can help organizations achieve relevant sustainable goals and have a positive impact on sustainable performance outcomes (Kang, 2022, p. 4).

Third: Environmental Innovation

Al-Samak and Al-Samak (2021) define environmental innovation as innovation that enhances the environmental performance of production and consumption activities to make processes newer and more efficient in resource usage. The success of environmental innovation depends on three dimensions:

1. **Organizational Innovation:** This is manifested in the application of a new organizational approach within the business practices of the company and the organization of the work environment or external relations. Regarding environmental organizational innovations, these include environmental management systems or other environmental tools, such as process monitoring tools or environmental audits. The most common environmental management systems are those related to the ISO 14000 family or the European voluntary system under the environmental management and auditing system (Al-Samak & Al-Samak, 2021).
2. **Marketing Innovation:** The demand for environmentally friendly products increases over time, without the need for government regulation to push consumers, companies, and other institutions to adopt better environmental behaviors. Focusing on environmental factors as determinants of innovation enhances the concept of "customer benefits," which is widely recognized in marketing literature. Although regulation is necessary to overcome common environmental challenges (Al-Samak & Al-Samak, 2021).
3. **Technological Innovation:** Improving technical capabilities, intensifying research and development activities, and environmental innovations, as well as providing greater technical

knowledge within the company, reduces its vulnerability to the demands of new environmental systems (Belin, et al., 2011).

Field Study

Study Methodology:

1. Study Method: The study adopted a descriptive-analytical approach to measure the relationship between green leadership and environmental innovation through the mediation of sustainable human resource management, and to identify the existence or absence of correlation and impact between the study variables.

2. Measurement Tool: A questionnaire was designed consisting of three main sections and additional sub-sections. The questionnaire was designed using a five-point Likert scale (1 strongly disagree..... 5 strongly agree). The items of the questionnaire were based on scientific sources (Saleh & Zainal, 2021; Al-Samak & Al-Samak, 2021; Suleiman et al., 2022; Al-Hariri et al., 2023).

3. Sample: The study sample included working managers, department heads, and heads of sections and units from employees in health institutions in Kirkuk Governorate. The sample size was 400 individuals, and the questionnaire was distributed to them. The response rate was 90%, with some questionnaires deemed unsuitable for analysis.

4. Data Analysis: After collecting and filtering the data, the statistical programs (SPSS, Amos) were used for analysis. The overall Cronbach's alpha result was 95%. To test the relationships between the variables and to test the hypotheses, Structural Equation Modeling (SEM) was used.

Analysis of Results

Overall Indicator of Green Leadership Dimensions Results: Table (1) shows that the overall average results for the dimensions of green leadership indicate that the responses of the study sample individuals were inclined towards agreement, with a percentage of (67.606%), reflecting a relatively high level of acceptance for green leadership. This is supported by the arithmetic mean result (3.369) and the response rate of (0.6738), meaning that individuals recognize the importance of the role of green leadership in shaping the company's environmental, social, and economic plans. The percentage of neutral responses was (5.559%), while the percentage of disagreement was (26.801%), showing a general tendency towards agreement, with a lower proportion of undecided and opposing responses. The total standard deviation was (1.004), yielding a coefficient of variation (0.3262). The table also shows the levels of agreement and variation in opinions regarding sustainable management, sustainable initiatives, and sustainable actions. Sustainable initiatives achieved the highest agreement percentage (75.143%), indicating a strong consensus on sustainable initiatives. Sustainable management received an agreement percentage of (67.234%), reflecting a large portion of participants supporting sustainable management, while sustainable actions formed an agreement percentage of (60.442%), the lowest among the other dimensions. It is clear that there is good acceptance of sustainable initiatives, followed by sustainable management, with some reservations regarding sustainable actions.

Table 1: Overall Indicator of Green Leadership Dimensions Results

Overall Indicator of the Results of Green Leadership Dimensions							
Dimensions	Agreement	Neutral	Disagreement	Mean	Standard Deviation	Response Rate	Coefficient of Variation
Sustainable Management	67.234	6.824	25.942	3.105	1.095	0.621	0.379
Sustainable	75.143	3.036	21.821	3.984	0.913	0.796	0.203

Initiatives							
Sustainable Actions	60.442	6.818	32.642	3.018	1.004	0.603	0.396
Average	67.606	5.559	26.801	3.369	1.004	0.673	0.326

Overall Index of Sustainable Human Resource Management Practices Results: The results in Table (2) show the responses of individuals regarding sustainable human resource management practices, both overall and individually. Most participants agreed, with a percentage of (69.335%), reflecting a relatively high acceptance of sustainable human resource management practices, as evidenced by the mean value (3.746) and the overall response rate (0.7492). The neutral responses accounted for (5.2198%), and the negative responses formed (25.3824%), with a standard deviation of (0.965) and a coefficient of variation (0.2508). The results indicate significant acceptance of sustainable human resource management practices. The table reflects the practices of sustainable human resource management (sustainable planning, sustainable recruitment, sustainable training, sustainable performance evaluation, and sustainable compensation), where the values represent the level of agreement among participants. The highest agreement was observed in the dimension of sustainable performance evaluation with an agreement rate of (74.121), indicating strong acceptance of this dimension. This was followed by sustainable recruitment with an agreement rate of (74.043), the highest among the dimensions, reflecting strong consensus on this aspect. The third position was held by sustainable compensation, which achieved an agreement rate of (68.735), followed by sustainable planning with an agreement rate of (68.344). The lowest agreement rate was for sustainable training at (61.432).

Table 2: Overall Index of Sustainable Human Resource Management Practices Results.

Overall Index of Sustainable Human Resource Management Practices Results							
Dimensions	Agreement	Neutral	Disagreement	Mean	Standard Deviation	Response Rate	Coefficient of Variation
Sustainable Planning	68.344	4.744	26.911	3.305	0.950	0.661	0.339
Sustainable Recruitment	74.043	3.148	22.737	4.144	0.923	0.8288	0.1712
Sustainable Training	61.432	6.918	31.542	3.685	1.014	0.737	0.263
Sustainable Performance Evaluation	74.121	6.023	19.825	3.858	0.927	0.7716	0.2284
Sustainable Compensation	68.735	5.266	25.897	3.738	1.011	0.7476	0.2524
Average	69.335	5.2198	25.3824	3.746	0.965	0.7492	0.2508

Overall Indicator of Environmental Innovation Dimensions Results: The results of Table (3) show the responses of the survey participants regarding the overall and individual dimensions of environmental innovation. Most participants agreed with a rate of (67.490), indicating a relatively high level of acceptance of environmental innovation in general. This agreement is confirmed by the mean value of (3.409) and the response rate of (0.6818). The neutral responses accounted for (5.668%), while the negative responses, indicating disagreement, were (26.840%), reflecting a moderate level of reservation, as indicated by the standard deviation (1.008) and the coefficient of variation (0.3182). The table also highlights the different dimensions: organizational innovation,

marketing innovation, and technological innovation. The following values show the levels of agreement among participants. Marketing innovation ranked first with an agreement rate of (74.572%), indicating a strong consensus on marketing innovation. Organizational innovation achieved an agreement rate of (68.015%), reflecting a good level of support for organizational innovation, while technological innovation had the lowest agreement rate at (59.885%), the lowest among the dimensions. The results suggest a good acceptance of environmental innovation, with strong support for marketing innovation, while there was relative reservation regarding technological innovation.

Table 3: Overall Indicator of Environmental Innovation Dimensions Results

Overall Indicator of Environmental Innovation Dimensions Results							
Dimensions	Agreement	Neutral	Disagreement	Mean	Standard Deviation	Response Rate	Coefficient of Variation
Organizational Innovation	68.015	7.112	24.873	3.145	1.082	0.629	0.371
Marketing Innovation	74.572	2.947	22.481	4.035	0.927	0.807	0.193
Technological Innovation	59.885	6.947	33.168	3.047	1.015	0.6094	0.3906
Average	67.490	5.668	26.840	3.409	1.008	0.6818	0.3182

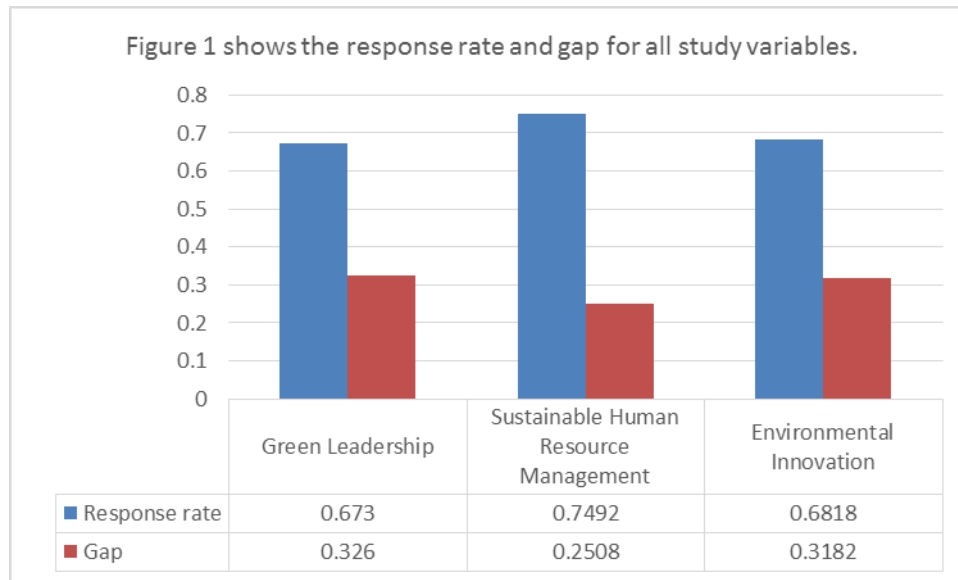
The overall mean of the results for all study variables: The results in Table 4 show the responses of the study sample regarding the three study variables (green leadership, sustainable human resource management, and environmental innovation). It appears that most responses leaned towards agreement at a rate of (68.143%), indicating that the majority of individuals agree on the importance of the study topic, as evidenced by the mean value (3.508) and the response rate of (70.1%), suggesting that most individuals have sufficient awareness of the study topic and recognize its importance for implementation. On the other hand, neutral responses accounted for (5.482%), and the disagreement responses accounted for (26.341%), with a standard deviation value of (0.992) and a coefficient of variation (29.8%), meaning that there is a small group of individuals who are either opposed to or do not understand the importance of applying the study topic.

Table 4: Overall mean of the results for all study variables.

The overall indicator of the results for all study variables:							
Dimensions	Agreement	Neutral	Disagree	Mean	Standard Deviation	Response Rate	Coefficient of Variation
Green Leadership	67.606	5.559	26.801	3.369	1.004	0.673	0.326
Sustainable Human Resource Management	69.335	5.219	25.382	3.746	0.965	0.749	0.250
Environmental Innovation	67.490	5.668	26.840	3.409	1.008	0.681	0.3182
Mean	68.143	5.482	26.341	3.508	0.992	0.701	0.298

The results shown in Figure 1 illustrate the response rate and the gap for each of the three study variables (green leadership, sustainable human resource management, and environmental

innovation). It is evident that sustainable human resource management achieved the highest response rate of 74.9%, indicating that individuals in healthcare institutions are well aware of the importance of sustainable human resource management in mediating the relationship between green leadership and environmental innovation. The second variable is environmental innovation with a response rate of 68.8%, followed by green leadership in the final position with a rate of 67.3%. This means that individuals have an awareness that enables them to prioritize sustainable human resource management, through which leaders are directed towards environmental friendliness via the innovation process.



Hypothesis Testing

Testing the First Hypothesis:

The results in Table 5 indicate a significant correlation and effect between green leadership and sustainable human resource management. The estimate ratio between these two variables is 0.92, which suggests a very strong relationship between green leadership and sustainable human resources. This ratio reflects the strength of the statistical relationship, based on the C.R. (Critical Ratio) value of 11.975, which is high, as well as the P-value. The variance is 0.589, indicating the influence of green leadership on sustainable human resources. The standard error (S.E.) is 0.049, which is a small error, suggesting high accuracy in the estimation. Therefore, we accept the first hypothesis (H1: There is a statistically significant relationship between green leadership and sustainable human resource management). This result aligns with the study by Salih and Zainal (2021).

Testing the Second Hypothesis:

Table 5 shows that both variables demonstrate a strong statistical relationship and effect through their significant correlation. Environmental innovation shows a strong relationship with green leadership based on the estimate ratio of 0.870. The statistical relation between these variables displays high strength through the critical ratio (C.R.) value of 11.571. A P-value of 0.000 supports the confidence level in this relationship while proving that the effect maintains statistical significance. The analysis reveals a moderate relationship between green leadership and environmental innovation through the 0.258 variance value which includes multiple aspects. High precision marks the accuracy of the estimation because the standard error (S.E.) stands at 0.022. Toward evaluating the second hypothesis the researchers can now accept its findings due to the established statistical relationship between green leadership and environmental innovation. The findings match the research published by Ahsan (2024).

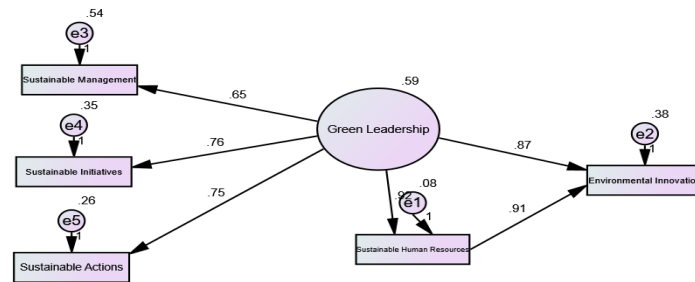
Testing the Third Hypothesis:

Results in Table 5 prove the existence of substantial correlations and effects between sustainable human resource management and environmental innovation since the estimation ratio reached 0.910. The statistical relationship strength appears through this ratio with a critical ratio (C.R.) value of 5.500 which indicates strong statistical significance. The P-value is 0.000, further reinforcing confidence in this relationship. Regarding variance, it is 0.078, indicating the stability of the effect of sustainable human resources on environmental innovation. The standard error (S.E.) is 0.014, which is a small error, indicating high estimation accuracy. Therefore, the hypothesis assuming a statistically significant relationship between sustainable human resources and environmental innovation can be accepted. This result aligns with the study by Grabara et al. (2020).

Table 5: Regression Analysis Results (Relationships Between Variables)

Relationship)(Estimate)S.E(.))C.R(.))P(Variances
Sustainable Human Resources	<---	Green Leadership	0.920	0.049	11.975	0.000	0.589
Environmental Innovation	<---	Sustainable Human Resources	0.910	0.014	5.500	0.000	0.078
Sustainable Management	<---	Green Leadership	0.650	0.033	11.750	0.000	0.384
Sustainable Initiatives	<---	Green Leadership	0.760	0.043	12.687	0.000	0.540
Sustainable Actions	<---	Green Leadership	0.750	0.029	11.994	0.000	0.345
Environmental Innovation	<---	Green Leadership	0.870	0.022	11.571	0.000	0.25

Figure 2 illustrates a model of the relationships between green leadership and environmental innovation, with a mediating variable being sustainable human resource management. The key variable of green leadership has three direct effects which produce impact ratios of 0.65 for sustainable management while sustainable initiatives achieve 0.76 and sustainable operations reach the 0.75 impact ratio. Environmental innovation shows considerable impact from green leadership according to a ratio of 0.87. Environmental innovation shows an indirect relationship with green leadership through sustainable human resource management because the effect ratio is 0.91. According to this model green leadership influences environmental innovation through separate paths where sustainable human resource management, initiatives, and operations support the enhancement of innovation. The fourth hypothesis is supported because green leadership relates to sustainable human resource management which generates environmental innovation. This result is consistent with the studies by Singh et al. (2020) and Arici & Uysal (2022).

Figure 2: Structural Equation Model

Discussion of the Results

This study focused on green leadership effects on environmental innovation by sustainable human resource management in hospital institutions. Previous studies formed the basis of review by the study to identify relationships between variables and develop the research hypotheses. The review examined multiple sources and their theoretical insights about both green leadership principles and dimensions of its achievement along with its understanding. The study evaluated sustainable human resource management practices as well as environmental innovation dimensions which organizations use.

Researchers determined that the general index indicated (67.606%) sample members backed the green leadership concept and its vital role in organizational environmental social economic objectives. The survey findings revealed that respondents strongly endorse sustainable human resource management practices since they reached an agreement rate at (69.335%). These results demonstrate their understanding that sustainable human resource strategies contribute to effective environmental and social outcomes. The study results demonstrated a substantial alignment regarding environmental innovation dimensions because participants showed agreement at (67.490%) thus validating the significance of environmental innovation for sustainability targets. Overall the sample members showed (68.143%) agreement regarding the three research variables which included green leadership and sustainable human resource management along with environmental innovation.

People demonstrated strong knowledge about sustainable human resource management when this variable received a response rate of (74.9%) posting the highest figure among the survey variables. The variables of environmental innovation secured second place with a response rate of (68.8%) while green leadership followed closely with a rate of (67.3%) which showed participants' understanding of supporting environmental sustainability for organizations.

The analysis of regression carried out evidence that green leadership leads to environmental innovation by providing direction for organizational practices towards sustainable environmental targets (0.870 estimate value with high C.R.). Leadership teams which successfully motivate people for sustainable innovation create more substantial environmental impacts on organizational performance. The regression analysis demonstrates how sustainable human resource management acts has a critical function by linking green leadership to environmental innovation thus making it essential for sustainable innovation. Coherent research demonstrates the significance of

sustainable human resource practices for attaining environmental innovation through its high value of 0.910. All study propositions received validation through the experimental results.

For effective environmental innovation through green leadership it is vital to address obstacles including inexperienced leaders and insufficient funds and strategic deficit. Green leadership challenges can be resolved through extensive training that develops green leadership competencies and dedicated environmental infrastructure investments and special leadership programs that integrate green leadership principles into human resources strategies. Such measures will enhance staff understanding of sustainability concerns as well as environmental innovation requirements.

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