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Research Article

Driving Sustainability: Green HRM's Impact on Green Innovation, Mediating Role of Green Human Capital, and Moderating Influence of Organizational Culture

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Declaration of interests

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Abstract

A sustainable environment is essential for businesses, and it is encouraging to see companies embracing green practices. This study investigates the relationship between green human resource management (HRM) practices and green innovation, with a specific focus on the mediating role of green human capital and the moderating effect of organizational culture. Data was collected from 316 participants working in Pakistan's small and medium enterprises in the manufacturing sector. The data was gathered through self-administered questionnaires and analyzed using SPSS and AMOS software. The study employed structural equation modeling to test the hypotheses. The findings indicate that green HRM practices have a positive impact on green innovation, and green human capital plays a significant role in mediating this relationship. Moreover, the study reveals that organizational culture reinforces the relationship between green HRM practices and green human capital. These results provide theoretical and practical insights for policymakers and managers of small and medium enterprises, emphasizing the importance of prioritizing environmental practices for long-term success and societal contribution. It is worth noting that this research is a pioneering effort in examining this theoretical model within the unique context of small and medium enterprises in Pakistan.

Keywords: Green Human Resource Management, Green Human Capital, Green Innovation.

How to Cite this Work:

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1 INTRODUCTION

In today's corporate landscape, the integration of environmentally friendly practices into organizational strategies has become increasingly imperative. Central to this effort is the concept of Green Human Resource Management (HRM), which encompasses a suite of initiatives aimed at embedding environmental consciousness within organizational culture (Ahluwalia, 2017; Ahmad, 2015; AlZgool, Ahmed, Shah, Alkadash, & AlMaamary, 2021). This essay examines the influence of Green HRM practices on fostering green innovation, with a particular focus on the pivotal roles of green human capital and management commitment. Green HRM represents a strategic approach wherein organizations prioritize environmental sustainability in their HRM functions (Asiaei, Bontis, Alizadeh, & Yaghoubi, 2022). This entails incorporating green values into the recruitment, training, performance appraisal, and motivation processes. By nurturing a workforce attuned to environmental concerns, organizations can harness the collective capabilities of employees to drive innovation in green practices (Amjad et al., 2021). Through initiatives such as green training programs and incentivized participation in sustainability efforts, Green HRM fosters a culture in which employees are empowered to contribute to environmental innovation (Tang, Chen, Jiang, Paille, & Jia, 2018).

The extent of Green HRM in fostering green innovation lies in its ability to align HRM practices with environmental imperatives. By integrating green considerations into HRM processes, organizations signal their commitment to sustainability and provide employees with the necessary support and resources to innovate (Asiaei, Bontis, et al., 2022; Asiaei, Jusoh, Barani, & Asiaei, 2022). For instance, performance appraisal systems that evaluate environmental performance metrics incentivize employees to adopt green practices and contribute to organizational goals. Moreover, recruitment practices that prioritize candidates with a demonstrated commitment to sustainability ensure that the organization's talent pool is aligned with its environmental objectives (Pellegrini, Rizzi, & Frey, 2018). Green human capital is central to the success of Green HRM initiatives. Green human capital refers to employees' knowledge, skills, and attitudes that enable them to drive environmental innovation within organizations (Chaudhry & Chaudhry, 2022). Employees who are knowledgeable about environmental issues, skilled in sustainable practices, and motivated to contribute to sustainability efforts constitute valuable assets for organizations seeking to innovate in green practices. Green HRM plays a crucial role in developing and nurturing this green human capital through initiatives such as training programs, knowledge sharing platforms, and recognition of environmentally friendly behaviors (Ren, Tang, & Jackson, 2018).

However, the impact of Green HRM on green innovation is contingent on the level of management commitment to environmental sustainability. Management commitment serves as a moderating factor that influences the effectiveness of Green HRM initiatives in driving green innovation (Khan, Li, Shahzad, & Sampene, 2023). Organizations in which senior management is actively engaged in promoting environmental sustainability are more likely to see positive outcomes from their Green HRM practices. Management commitment manifests in various forms, including resource allocation for green initiatives, setting environmental goals and targets, and leading by example through the adoption of sustainable practices in decision-making processes (Suharti & Sugiarto, 2020). While Green HRM holds promise for fostering green innovation, it is not without challenges. One of the primary challenges faced by organizations is the need for investment in green initiatives. Developing and implementing sustainable practices often require significant financial resources, technological expertise, and organizational commitment. Overcoming these challenges requires strong leadership and a clear vision for sustainability, coupled with effective communication and engagement with employees at all levels of the organization (Küçükoğlu & Pınar, 2015)

Many studies have highlighted the importance of the influence of green HRM on green innovation. The outcomes of these studies show that green HRM admits that human capital is a valuable asset for any organization; thus, they focus on green HC and arrange training programs to increase their skills and knowledge to become capable of adopting new innovative processes and products (Ahmeda, Mozammelb, & Zamanc, 2020; Song, Yu, & Xu, 2020). Organizational culture plays a crucial role in the development of a green economy. An effective culture provides an environment for employees to work with any pressure or hurdle; companies give confidence to their employees by giving decision-making abilities at a specific level. Therefore, employees try to use innovative products and processes to enhance firm performance by decreasing pollution, electricity consumption, and raw material waste, which leads to increasing environmental sustainability (Maamari & Majdalani, 2017; Mutonyi, Slåtten, & Lien, 2020; Shanker, Bhanugopan, Van der Heijden, & Farrell, 2017). The importance of green has become crucial, especially for developing countries: to create a creatively friendly environment for HRM so that they make policies for human capital, they will be able to adopt innovative processes and products to enhance not only firm performance but also increase environmental sustainability.

2 LITERATURE REVIEW AND THEORETICAL FARMWORK

Building upon the Resource-Based View (RBV) of the firm, the theoretical framework suggests that Green HRM practices serve as valuable resources that enhance the organization's ability to innovate in environmentally sustainable ways (Ahmad, Islam, Sadiq, & Kaleem, 2021; Islam, Khan, Ahmed, & Mahmood, 2021). According to the RBV, firms gain a competitive advantage through the strategic deployment of valuable, rare, and inimitable resources. Green HRM practices, such as training programs and incentives for environmental sustainability, represent valuable and potentially rare resources within organizations. These practices foster the development of human capital focused on environmental knowledge and skills, thereby enhancing an organization's capacity for green innovation (Malik, Ali, Kausar, & Chaudhry, 2021; Shahzad, Jianguo, & Junaid, 2023). Human capital acts as a mediator, translating the effects of Green HRM practices to enhanced green innovation capabilities. Additionally, the Contingency Theory of Management suggests that the relationship between Green HRM practices and green innovation is contingent upon management commitment to environmental sustainability (Naz, Jamshed, Nisar, & Nasir, 2023). Strong management commitment reinforces the strategic importance of Green HRM practices and amplifies their impact on green innovation. Thus, Green HRM practices, mediated by human capital and moderated by management commitment, contribute to an organization's competitive advantage through increased green innovation capabilities.

2.1 Green HRM and Green Innovation

Green HRM is pivotal for fostering environmentally conscious behaviors within organizations (Song et al., 2020). Training programs offered by Green HRM enhance employees' skills, knowledge, and abilities, stimulating creativity in green innovation. Studies show a significant positive relationship between Green HRM and green innovation, with organizations focusing on green involvement and training better equipped for innovative green product development (Bahrami, Barati, Ghoroghchian, Montazer-Alfaraj, & Ezzatabadi, 2016). Compensation policies under Green HRM also directly influence employee behavior towards environmental issues, thus impacting firm sustainability (Song et al., 2020). Green innovation involves eco-friendly product development, utilizing greener materials and reducing resource consumption (Albort-Morant, Leal-Millán, & Cepeda-Carrión, 2016).

Research in India highlights Green HRM's indirect impact on green innovation, which subsequently boosts firm performance (Sharma & Gupta, 2015). Hiring practices that emphasize environmental values and green training play a vital role in fostering innovation (Aggarwal & Sharma, 2015). Additionally, recording employees' environmental practices for appraisal and rewards promotes green behavior (Singh, Del Giudice, Chierici, & Graziano, 2020). Australian studies reveal a positive relationship between Green HRM and green innovation moderated by green transformational leadership, indicating that effective HR practices enhance green innovation and firm environmental performance (Ahmeda et al., 2020). Environmental training initiatives led by Green HRM positively influence organizational environmental performance and raise awareness and motivation for sustainability (Rehman, Kraus, Shah, Khanin, & Mahto, 2021)It is hypothesized to positively correlate with green innovation, underscoring its critical role in driving environmentally sustainable innovation within organizations. Based on this discussion, the following hypothesis is proposed:

H1: Green HRM has a positive impact on green innovation.

2.2 Green HRM and Green Human Capital

Green HRM has emerged as an essential requisite for organizations, primarily driven by several compelling factors. First, the utilization of natural resources in manufacturing processes often leads to environmental pollution and wastage. Second, the escalation of unfavorable environmental incidents, coupled with concerns over global warming and pollution, underscores the need for environmentally sustainable practices (Shahzad et al., 2023). Research by (Asiaei, Bontis, et al., 2022) elucidate the interrelationship between green human capital and Green HRM, revealing the pivotal impact of green rational and human capital on Green HRM. However, this study did not establish a significant relationship between green structural capital and Green HRM. Furthermore, investigations in Pakistan emphasized the mediating role of green human capital in the relationship between Green HRM practices and organizational commitment, providing insights for managerial and policy interventions aimed at fostering a green workplace culture (Li, Aziz, Asim, Shahzad, & Khan, 2023).

Green HRM not only serves as a mechanism for protecting the environment but also plays a crucial role in steering organizations towards environmental sustainability. With the global shift towards a green economy, the corporate sector is increasingly recognizing the importance of integrating environmentally friendly practices into HRM policies. Such initiatives foster a conducive environment for enhancing green human skills, thereby contributing to a firm’s sustainability and environmental performance (Gharib et al., 2022). Scholars advocate for innovative approaches

to address environmental challenges and emphasize the role of Green HRM practices in promoting corporate social responsibility among employees (Asiaei, Jusoh, et al., 2022; Chaudhry & Chaudhry, 2022; Huo, Gu, & Wang, 2019). Studies conducted in South Africa corroborate the positive impact of green human capital on environmental performance, highlighting the instrumental role of Green HRM in enhancing green human capital skills (Truong, Nguyen, Vrontis, & Ahmed, 2023). Therefore, we hypothesize that Green HRM significantly influences green Human.

H2: Green HRM has positive impact on green human capital.

2.3 Green Human Capital and Green Innovation

Green Human Capital plays a crucial role in driving Green Innovation within organizations. With a focus on environmental awareness, education, skills, and knowledge, green human capital enables employees to understand the importance of sustainability and to adopt green energy practices (Islam et al., 2021). This heightened awareness leads to advancements in innovation design, as green human capital facilitates the development and utilization of green technologies (Huang & Li, 2017). Moreover, proficiency in green skills allows for efficient task completion with minimal resource utilization, contributing to environmentally sustainable practices (Kien, Tri, & Linh, 2021). As highlighted in previous research, the innovation process is both conscious and active, comprising phases such as idea generation, conversion, and diffusion (Nassani et al., 2023). Throughout these phases, the influence of green human capital on green innovation is apparent both directly and indirectly. By fostering a culture of creativity and competitiveness, organizations leverage green human capital to drive innovation adoption for environmental performance (Samad, 2020). Through investments in hiring and training programs, companies enhance human capital efficiency, further promoting innovation adoption for sustainable practices (Berrone, Fosfuri, Gelabert, & Gomez-Mejia, 2013). Studies indicate a positive relationship between green human capital and green innovation, reinforcing each other's contributions to organizational sustainability and competitive advantage (Shahzad et al., 2023; Wang, Qu, Wang, Wang, & Yang, 2019; Xie, Huo, & Zou, 2019). Thus, the synergy between green human capital and green innovation underscores their instrumental role in shaping environmentally conscious organizations.

H3: Green human capital has positive impact on green innovation.

2.4 Mediating Role Green Human Capital

Human capital theory encompasses employees' knowledge, skills, and expertise in effectively completing tasks. Previous studies highlight the impact of green human capital on innovation. Green HRM enhances green human capital, positively impacting innovation Green HC, comprising employees' skills and motivations, and is nurtured by green HRM through training programs, fostering innovation (Ni et al., 2023). Organizations under environmental pressures prioritize green innovation facilitated by green HC and enhanced by green HRM. This underscores HC's role as a primary source of product innovation and a unique asset for organizational success (Chen & Chang, 2013).

Research in Bangladesh by (Pham, Thanh, Tučková, & Thuy, 2020)indicates the direct positive impact of green innovation on firm performance through Green HRM policies, enhancing human capital efficiency. (Sarmad, Pirzada, & Iqbal, 2023) demonstrate the significant positive impact of green HRM on innovation, particularly in educational institutions, emphasizing its importance in low-green-value worker settings. While some studies show a direct influence of HRM practices on innovation, others suggest indirect effects through organizational variables (Tjahjadi, Agastya, Soewarno, & Adyantari, 2023). Nisar et al. (2021) argued that green HRM enhances green human capital and associated resources, fostering a positive relationship between performance and innovation (Tjahjadi et al., 2023). HRM activities such as selection, hiring, and training impact human capital and provide opportunities for green innovation (Ahmad et al., 2021; Amjad et al., 2021; Chen & Chang, 2013).

H4: Green human capital significantly mediates between green HRM and Green Innovation:

2.5 Moderating Role of Organizational Culture

Over the past four decades, organizational culture has garnered significant attention from both practitioners and academics. Organizational culture has become an educational topic, with numerous studies indicating its influence on outcomes such as school performance (Aktaş, Çiçek, & Kıyak, 2011). It encompasses an organization's policies, practices, procedures, and reward systems, providing motivation and support for employees to maximize their efforts, thereby impacting organizational performance (Erkutlu, 2011). Research suggests that organizational culture serves as a strong moderator variable in the relationship between green HRM and innovation (Ong, Magsi, & Burgess, 2019). It is defined as the collective perception of individuals within a work environment regarding the observable nature of the social, political, and physical factors influencing work accomplishment. A conducive organizational culture fosters a competitive environment where employees are trained to adopt innovative processes, thereby enhancing green practices

(Alhefiti, Ameen, & Bhaumik, 2019). Moreover, organizational culture moderates the relationship between green HRM and green innovation, highlighting its pivotal role (Erkutlu, 2011; Iranmanesh, Zailani, Hyun, Ali, & Kim, 2019)

Furthermore, organizational culture and culture play a moderating role in organizational productivity and employee involvement (Liu, Ke, Wei, Gu, & Chen, 2010). Studies conducted in Pakistan and Malaysia emphasize the positive impact of organizational culture on innovation capability and employee behavior, providing valuable insights for managers and leaders (Asiaei, Bontis, et al., 2022; Nisar et al., 2021). Green HRM initiatives aim to enhance human capital through policies and training programs, foster creativity, and focus on green innovation, thereby positively influencing employee behavior and job satisfaction positively (Erkutlu, 2011; Tjahjadi et al., 2023)

H5: Organizational culture moderates the relationship between green HRM and green human capital.

2.6 Research Framework

Figure 1 shows the framework of the current study and interprets the relationships between all variables.

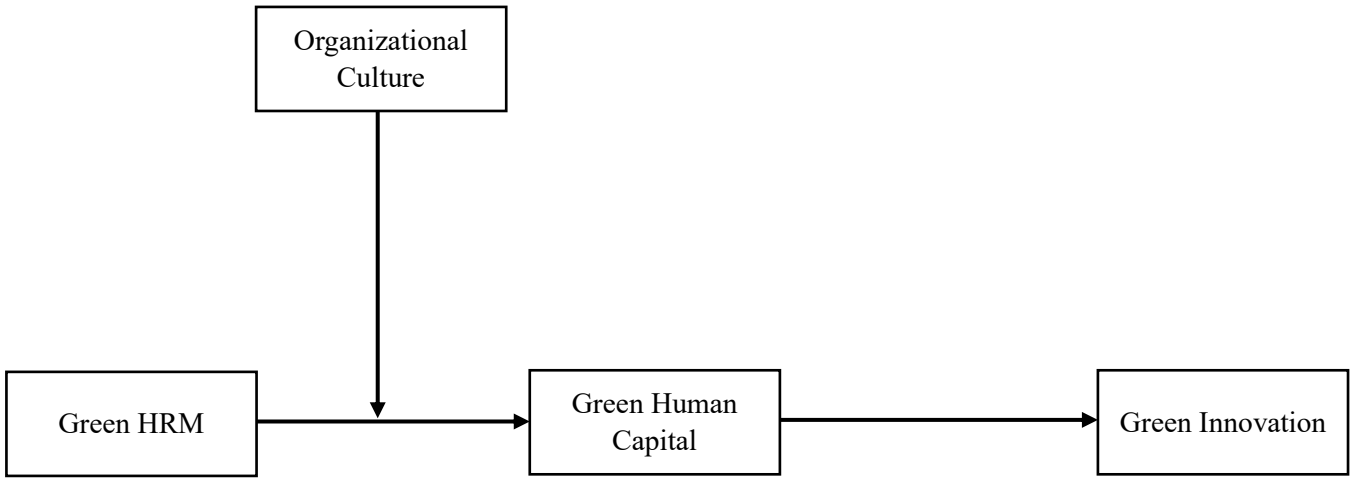

Figure 1. Research Model

3 RESEARCH METHODS

We conducted a survey among small and medium-sized enterprises (SMEs) in Punjab, Pakistan, using questionnaires. Recognizing the pressing need for green initiatives owing to environmental concerns stemming from rapid economic growth, the Pakistani government has reinforced environmental regulations, particularly in industries such as manufacturing and services. We collected data from various SMEs in Punjab, inviting middle- to high-level managers, identified based on their roles, to participate in a survey conducted at their workplace. The survey focused on assessing the green HRM practices and innovation within these enterprises. It covers various aspects including demographics, firm size, age, ownership, and industry. Out of 450 distributed questionnaires, 316 usable responses were received, indicating a response rate of 79%. To ensure the reliability of our findings, we conducted Harman's one-factor test to examine the common method variance (CMV), which revealed the presence of four distinct factors instead of a single general factor. This suggests that CMV is unlikely to have significantly affected our results.

3.1 Measurement Tools

A Five-Point Likert Scale was used, ranging from "1st Strongly Disagree" to "5th Strongly Agree." Initially, the questionnaire items were crafted in English and then converted into an online survey on Google Forms, distributed via various social media platforms. Data were collected from August to September with a sample size of 350. Data on Green HRM was collected using a questionnaire adapted from previous studies (Guerci, Longoni, & Luzzini, 2016; Song et al., 2020). Questionnaire items included aspects such as "Employee selection based on environmental criteria," "Employee attraction through environmental commitment," and "non-monetary incentives for environmental performance." Green innovation data were gathered through the six items developed by Chang (2011). These items assess various aspects of green innovation, such as the company's approach to material usage, recycling, waste reduction, and resource consumption. Green human capital was measured using the four-item scale developed by Chang (2016). The items focused on aspects such as managerial support for environmental protection goals, employee competence in environmental matters compared with competitors, and the cooperative degree of teamwork on environmental issues.

The role of organizational culture was assessed using the questionnaire developed by Patterson et al. (2005). Items in this questionnaire examined perspectives on performance feedback and flexibility within the organization, including aspects such as regular performance assessment, flexibility in procedures, and acceptance of new ideas.

4 EMPIRICAL FINDINGS

Table 1 provides the demographic characteristics of the respondents and employees, including gender, age, and qualifications. The results indicated that 165 responses were completed by male staff members, while 151 were completed by female respondents. Male responses accounted for 52.2% of the total, while female responses accounted for 47.8%. The ages of the 77 respondents ranged between 21 and 30 years, while 93 respondents fell between the ages of 31 and 40 years. Additionally, 97 respondents were between the ages of 41 and 50, and 49 respondents were over 50.

Table 1. Demographics Description of Participants

Demographics	Demographics Features	Frequencies	Percentages
Gender	Male	165	52.2
	Female	151	47.8
	Total	316	100
Age	21-30 years	77	24.4
	31-40 years	93	29.4
	41-50 yeas	97	30.7
	More than 50	49	15.5
	Total	316	100
Education	Graduation	38	12
	Post Graduation	137	43.4
	Masters	105	33.2
	Others	36	11.4
	Total	316	100
Firm size	Less than 100 Emp.	35	11.1
	101-300	49	15.5
	301-500	104	32.9
	More than 500	128	40.5
	Total	316	100

Measuring instrument reliability is a crucial aspect of any research endeavor. Cronbach's alpha is often used to assess reliability. In accordance with (Hair, Sarstedt, Ringle, & Mena, 2012) findings, values of Cronbach alpha should ideally fall between 0.7 and 0.95, with values above 0.5 being deemed unacceptable. Cronbach alpha values between 0.5 and 0.7 are considered marginal, while values between 0.6 and 0.7 are uncertain. Values between 0.7 and 0.8 are acceptable, and values above 0.8 are considered good. Cronbach alpha values above 0.9 are considered excellent (Bryman, 2016). The current study found that the Cronbach's alpha values for all variables fell within the acceptable range, indicating the reliability of the measures used.

Table 2. Discriminatory Validity

Constructs	CR	AVE	GI	GHRM	GHC	OC
GI	0.833	0.583	0.786			
GHRM	0.841	0.578	0.391	0.836		
GHC	0.783	0.639	0.554	0.569	0.809	
OC	0.893	0.570	0.301	0.484	0.294	0.831

Green human resource management comprises eight items, green innovation has six items, green human capital consists of four items, and organizational culture includes 11 items. The results also demonstrated the convergent validity of the test. For the convergent validity test, the CR value should be greater than 0.7, and the AVE value should be greater than 0.50. The current research found that the values of CR for all variables exceeded 0.7, and in the case of AVE, the values for green HRM, green innovation, green human capital, and organizational culture were 0.578, 0.583, 0.639, and 0.570, respectively. All of these values were deemed acceptable as they exceeded 0.5.

Confirmatory Factor Analysis is a sophisticated statistical tool used to evaluate whether a variable effectively demonstrates the specified concept. It is widely regarded as an effective method for verifying or disproving hypotheses. The first step in this process was to assess the rationality of the measured variables against the theoretical model. With the exception of common errors, the results of the CFA analysis indicated that the majority of the attributes fell within acceptable ranges.

Table 3. Model Fitness

CFA Indicators	Threshold Value	Observed Value
CMIN/DF	Less than 3	2.099
GFI	≥ 0.80	0.861
IFI	≥ 0.90	0.950
CFI	≥ 0.90	0.950
RMSEA	≤ 0.08	0.059

Above Table 4 presents the threshold range of CMIN/DF should be less than 3, GFI should be more than 0.80, IFI and CFI should be more than 0.9, and RMSEA must be less than 0.80. In the current study, all the values are in the acceptable range CMIN/DF is 2.09 which is less than 3, GFI is 0.861 which is more than 0.80, IFI is 0.950 which is more than 0.90, CFI is 0.950 which is also more than 0.9 and in the last value of RMSEA is 0.059 which is less than 0.08. The CFA diagram shows the CFA of all constructs.

The SEM results show that there is a positive significant relationship among the variables at level 0.01. Green human capital had a significant and positive relationship with green HRM (0.533). Green innovation has a positive and significant association with green HRM (0.241). Green innovation and green human capital have 0.381 positive and significant associations.

Table 4. Structural Equation Modeling

	Relations	Estimate	S.E.	C.R.	P	Results
Direct	GHC<--GHRM	.533	.049	11.168	***	Sig
	GINV<--GHRM	.241	.055	4.338	***	Sig
	GINV<--GHC	.381	.053	6.855	***	Sig
Mediating		.203	.040	-	**	Sig
Moderating		.082	.046	1.978	*	Sig

Green HRM has a significant positive effect on green innovation, as the value of standardized estimates (beta = 0.241; $p < 0.05$) from outcomes maintains the researcher's hypothesis in a significant way. The current study results are similar with previous studies outcomes (Ahmeda et al., 2020; Malik et al., 2021), Green HRM has positive significant effects on green human capital as the value of standardized estimates (beta = 0.533; $p < 0.005$) from outcomes its indicates hypothesis is significant current research outcomes are similar with (Malik et al., 2020; Shoaib, Zámečník, Abbas, Javed, & Rehman, 2021), Green innovation has a positive significant impact on green human capital as the value of standardized estimate (beta = .466) and the value of p is less than 0.05 which shows the significant impact between this relationship some prior studies (Song et al., 2020; Sun, Edziah, Sun, & Kporsu, 2019).

Green human capital mediates the relationship of green HRM on green innovation as the value of standardized estimate (beta = .203 value of p is less than 0.05) that shows significant relationship previous studies are related with this results (Chaudhry & Chaudhry, 2022; Singh et al., 2020) and organizational culture as moderating variable have a positive significant impact on green human capital as the values of standardized estimates (beta = .082 and values of p is less than 0.05) this hypothesis was also accepted. The moderating effects of these variables are as follows. The moderating impact of organizational culture shows a positive and significant relationship with the standardized value of beta = .082 and a positive relationship with green human capital. The Below Figures 2 show the graph of the moderating effects of organizational culture on the relationship between green HRM and green innovation when organizational culture is low versus high. The regression results show that when organizational culture is low, green innovation is low, and when organizational culture is high, green innovation is high.

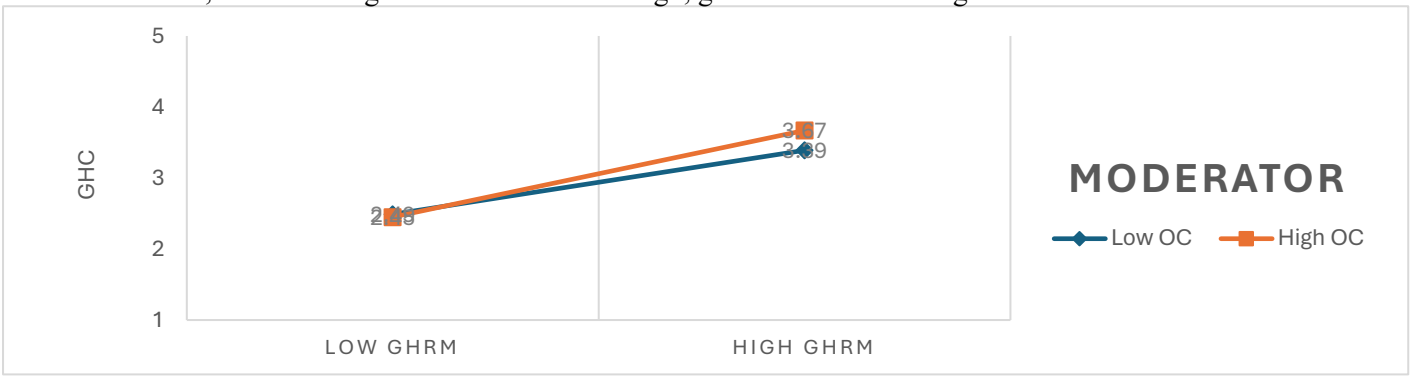

Figure 2. Moderating Effect of Organizational Culture

5 CONCLUSION

This study sheds light on the intricate interplay among green HRM practices, green human capital, and green innovation within the context of small and medium-sized enterprises (SMEs) in Pakistan. Through rigorous quantitative analysis employing a positivist research philosophy and deductive approach, this study examined the relationships among these key constructs. The findings underscore the significant and positive impact of green HRM practices on both green human capital and green innovation. This reaffirms the pivotal role of strategic HRM initiatives in fostering environmentally sustainable practices and driving innovation within organizations. Moreover, this study reveals the mediating role of green human capital in the relationship between green HRM practices and green innovation. This highlights the importance of investing in human capital development to catalyze innovation processes geared towards environmental sustainability.

Additionally, this study elucidates the moderating influence of organizational culture, emphasizing its crucial role in shaping HR practices and facilitating the effective utilization of green human capital to drive innovation initiatives. This underscores the importance of fostering a supportive organizational culture conducive to promoting green HRM practices and nurturing green innovation capabilities. The findings of this study contribute to the existing body of knowledge on green HRM, green human capital, and green innovation, thereby providing valuable insights for SMEs in Pakistan and beyond. By elucidating the mechanisms through which these constructs interact, this study offers practical implications for organizations striving to enhance their environmental sustainability and innovation performance in today's dynamic business environments.

5.1 Research Implications

The findings of our study have significant implications for the theoretical, practical, and policy-making domains. Our research contributes to the advancement of HRM theory by empirically testing the mechanism through which Green HRM practices influence green innovation. Additionally, it enriches the human capital theory by highlighting the role of HRM interventions in fostering green human capital and driving sustainability. From a practical perspective, our study provides guidance for organizational practices by emphasizing the importance of adopting Green HRM strategies such as green training and reward systems to enhance employee motivation and knowledge. Furthermore, it underscores the necessity of creating a supportive organizational culture for environmental management to promote green innovation and collaboration among employees. In terms of policymaking, our findings suggest that policymakers should prioritize initiatives aimed at promoting Green HRM practices within organizations. By incentivizing the adoption of sustainable HR practices and integrating them into national strategies for environmental management, policymakers can drive innovation and sustainability at both organizational and national levels. In essence, our study bridges the gap between theory and practice, offering actionable insights into fostering a greener and more innovative future.

5.2 Research Limitations

Several limitations were encountered during the study. First, the data were collected from various industries, each with a unique approach to workplace issues. Consequently, the differences in the results between industries cannot be fully justified. Second, the impact of green HRM activities on firms' green innovation and human capital may require time. Given that the data were collected at a single point in time, the study may not fully capture the dynamic nature of the relationship between green HRM and green innovation.

5.3 Recommendations for Future Studies

To address these limitations, future studies could focus exclusively on specific sectors, such as banking, or services, which may exhibit varying levels of demand for green innovation and human capital to resolve environmental challenges. Longitudinal studies are recommended to provide a more comprehensive understanding of the associations examined. Additionally, while our study was conducted in Pakistan, future research could explore other cultural contexts, particularly in developed countries where green HR practices are given greater emphasis. Moreover, future studies could examine the moderating effects of organizational strategy and other organizational factors on the relationship between green HRM, green innovation, and green human capital. Exploring additional factors such as environmental knowledge, pro-environmental values, shareholder pressure, and organizational culture would further enhance our understanding of how green HR practices impact environmental sustainability and innovation.

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