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RESEARCH PAPER

Measuring Determinants of Environmental Performance during COVID-19: Evidence from the Healthcare Sector

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ABSTRACT

PURPOSE: The current study aims to investigate the role of green human resource management (GHRM) (i.e., green competence building, green motivation enhancement, and green employee involvement) practices in enhancing employee environmental performance in the health care sector during the COVID-19 pandemic.

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DESIGN/METHODOLOGY/APPROACH: Data were collected from hospital staff (N=350) working in different private and public hospitals of China. Structural equational modeling-partial least squares (PLS-SEM) modelling was used to test the proposed model based on the respondents' data.

FINDINGS: The study results support the relationship between GHRM practices and environmental performance directly, and through employees' green attitudes during COVID-19. The study results also extend this support to the negative moderating role of perceived personal inconvenience on the relationship between GHRM practices and environmental performance.

KEYWORDS: *Health care; COVID-19; GHRM practices; Green employee attitude; Perceived personal inconvenience; Environmental performance*

INTRODUCTION

In this era of competition, hospitals prioritise their economic activities while ignoring ecological considerations. Recently, organisational stakeholders have increased their pressure on organisations to reduce environmental hazards (e.g., environmental resource depletion, increasing pollution, loss of biodiversity, etc.) due to organisational activities (Longoni *et al*., 2018). In addition to the traditional objective of organisations' efficiency and profitability, environmental sustainability has become a strategic objective of modern businesses (Li *et al*., 2020). Organisations are now required to adopt environmental management practices to enhance their social and environmental performance (EP) (Nisar *et al*., 2021). These calls make organisational leaders more responsible for the formulation and implementation of environmentally friendly policies to reduce the adverse effects of business operations on the environment and enhance their EP (Gill *et al*., 2021; Nisar *et al*., 2021).

EP refers to organisations' or hospitals' behaviour towards the environment in utilising resources and provides a check on adverse environmental practices (Gill *et al*., 2021; Afum *et al*., 2021). Companies' attention has turned towards recruiting and selecting employees with higher green intentions and environmental protection consciousness to achieve sustainable EP (Kim *et al*., 2019; Afum *et al*., 2021). Green human resource management (GHRM) practices are widely employed in multinational companies (Haddock-Millar *et al*., 2016), health care (Duncan *et al*., 2022; Afum *et al*., 2021; Ababneh, 2021) and manufacturing firms (Khairina *et al*., 2020). However, the role of GHRM practices in the health care sector has been overlooked (Mousa and Othman, 2020; Duncan *et al*., 2022). Therefore, this study focuses on the paucity of literature on implementing GHRM practices in the health care sector (Mousa and Othman, 2020). Shockingly, health care management is largely unaware of sustainability and green concepts, and these aspects are understudied empirically (Hameed *et al*., 2020). GHRM practices foster people's EP (Chaudhary, 2020). The role of GHRM practices has yet to be explored in detail in health care (Amrutha and Geetha, 2020), particularly during pandemic times and considering the non-green aspects of current practices.

Several studies have endorsed HR practices' influencing role in managing employees' attitudinal and behavioural issues (Zhu *et al*., 2021). An organisation's human resources play a vital role in the firm's EP at all levels (Singh and El-Kassar, 2019). Likewise, GHRM practices help to implement environmental protection activities (Khairina *et al*., 2020). The role of GHRM practices has also been found to be a critical factor in enhancing the environmentally friendly attitudes and behaviours of employees (Saputro and Nawangsari, 2021). HRM practices, particularly employee training, appraisal systems, monetary incentives, and non-monetary incentives, can significantly influence employees' environmental attitudes and behaviour (Ababneh, 2021; Zhu *et al*., 2021; Saputro and Nawangsari, 2021; Rubel *et al*., 2021).

Dispositional factors can significantly influence GHRM practices' impact on employees' green attitude (Amoako *et al*., 2020; Giefer *et al*., 2019). Perceived personal inconvenience has been previously discussed in the context of consumer purchase intentions (Joshi *et al*., 2019; Amoako *et al*., 2020; Li *et al*., 2020). However, employees' perceived personal inconvenience in a hospital setting is also essential and warrants further investigation. We define perceived personal inconvenience (PPI) to evaluate employees' personal efforts to become involved in environmentally friendly practices. In most cases, employees believe that environmentally friendly efforts and practices are stressful, time-consuming, and economically unfavourable (Nejati *et al*., 2017). In addition, employees require additional time, cost, and sometimes cognitive resources to perform green practices to achieve sustainable green goals (Ahn and Kwon, 2020). The values, attitudes, and behaviour of employees towards attaining a firm's sustainable development goals are still open for inquiry (Verma *et al*., 2019), particularly during COVID-19. Therefore, it is crucial to study employee inconvenience as a boundary condition for the effect of GHRM practices during COVID-19.

The current study contributes to the green management literature in multiple ways. First, GHRM practices in enhancing green EP are investigated, therefore helping organisations achieve sustainable development. Second, a green employee attitude (GEA) is proposed as a possible mediator between GHRM practices and EP. Our research therefore contributes to the current sustainability issues related to attitude and behaviour (Verma *et al*., 2019). Third, this study proposes PPI as a moderator, which might reduce the effectiveness of GHRM practices. The role of employee-related factors is less studied in comparison to the customer's perspective. Finally, the current study is among the pioneer studies to enhance GHRM practice knowledge in the health care sector in China.

Hypothesis Development and Theoretical support

The current study is supported by ability, motivation, and opportunities (AMO) theory (Appelbaum *et al*., 2000): leaders widely utilise AMO theory as a tool to enhance employees' performance. AMO

theory revolves around three different work systems (i.e., ability, motivation, and opportunities) that work interdependently and contribute to an organisation's employees' performance and overall performance in general. This theory lends support to our proposed model.

First, green competence building practices (GCBP), such as recruitment, selection, and training programmes, will enhance employee abilities. The concept of GCBP is related to recruitment, selection, and training programmes to improve the skill set of employees (Hossain *et al*., 2012) and enhance beneficial actions for a sustainable environment (Hameed *et al*., 2020). Second, green motivation-enhancing practices (GMEP), such as providing monetary and non-monetary rewards, might influence employee motivation to engage in green behaviour. Green performance management processes motivate employees to attain organisational goals that enhance the overall performance of an organisation (Ahmed, 2015). Third, green employee involvement practices (GEIP), such as introducing practices that concord with employees' work-life balance and knowledge sharing, might enhance opportunities for the employee to learn new things through participation in sustainability activities. Green employee involvement increases participation in decision-making and promotes a green attitude (Soo Wee and Quazi, 2005), therefore effectively and efficiently enhancing organisational performance.

These GHRM practices are a strong predictor of employees' green attitude (Verma *et al*., 2019; Amoako *et al*., 2020) and enhance an organisation's EP. Individuals' personal choices (i.e., PPI) negatively affect their pro-environmental attitude in response to GHRM practices. Green attitude is considered an outlook that helps to evaluate the EP of employees; previous studies have shown that green attitude is beneficial for environmental management and that there is a significant relationship between GEA and GHRM practices (Kim *et al*., 2019). According to previous studies, organisations should select those employees who have awareness related to a green environment and can handle particular environmental issues (Hameed *et al*., 2020). Organisations always prefer employees who are responsible and committed to the organisation to solve their environmental issues (Jabbour *et al*., 2008). Green training motivates employees to solve difficult environmental issues and to protect the environment (Renwick *et al*., 2013). Motivational activities are needed to enhance the performance of employees within an organisation. GMEP includes rewards and performance appraisals for motivating employee behaviour to accomplish organisational goals (Harvey *et al*., 2013). When employees are rewarded for performing their tasks, they become more committed to an organisation, and they perform their tasks with greater responsibility. The green performance management system sets green criteria for all employees in giving rewards for their performance, which helps them to be more committed to the organisation. Green employee involvement motivates employees to participate in decision-making and promotes their green attitude, and they start focusing on taking initiative and solving any environmental issue facing the organisation (Renwick *et al*., 2013; Soo Wee and Quazi, 2005). Green learning in the workplace helps employees

understand environmental issues and their solutions by sharing skills, knowledge, and their abilities to perform specific tasks. GEA has a significant impact on the EP of an organisation and tends to improve organisational performance. Promoting EP in an organisation's employee attitude and behaviour is the greatest challenge for an organisation (Chan and Hawkins, 2010). Therefore, green attitude plays a significant mediating role between GHRM practices and EP.

The green performance management system sets green criteria for all employees to reward their performance, which helps them be more committed to the organisation. Green employee involvement motivates employees to participate in decision-making and promotes their green attitude; they start focusing on taking initiatives and solving any environmental issue. This attitude helps the organisation to enhance its performance effectively and efficiently (Nisar *et al*., 2021; Gill *et al*., 2021; Afum *et al*., 2021). Therefore, green attitude can play a significant mediating role between GHRM practices and an organisation's EP.

The notion of non-green behaviour is worrisome for organisations in the attainment of sustainable environmental goals. People are less inclined towards green behaviour, and non-green behaviours are commonly observed due to lower awareness in the public about environmental changes and their adverse effects on society (Ismail *et al*., 2022). Some researchers cited a few reasons for the reluctance to engage in green behaviours as:

a) the extra cost associated with eco-friendly products;
b) time used for engaging in green practices;
c) cognitive efforts for making unusual decisions; and
d) stress due to the pressure of green behaviour engagement (Joshi *et al*., 2019; Saputro and Nawangsari, 2021).

Overall, the literature on employees' PPI in an organisation is scant. Employees' characteristics can severely reduce their green attitude in response to GHRM practices. Therefore, this study proposes the following hypotheses; the proposed paths are depicted in Figure 1.

H_1: *GCBP has a significant impact on GEA.*
H_2: *GMEP has a significant impact on GEA.*
H_3: *GEIP has a significant impact on GEA.*
H_4: *GEA has a significant impact on EP.*
H_5: *PPI moderates the relationship between GCBP (H_{5a}), GMEP (H_{5b}), GEIP (H_{5c}), and GEA.*
H_6: *GEA mediates the relationship between GCBP (H_{6a}), GMEP (H_{6b}), GEIP (H_{6c}), and EP.*

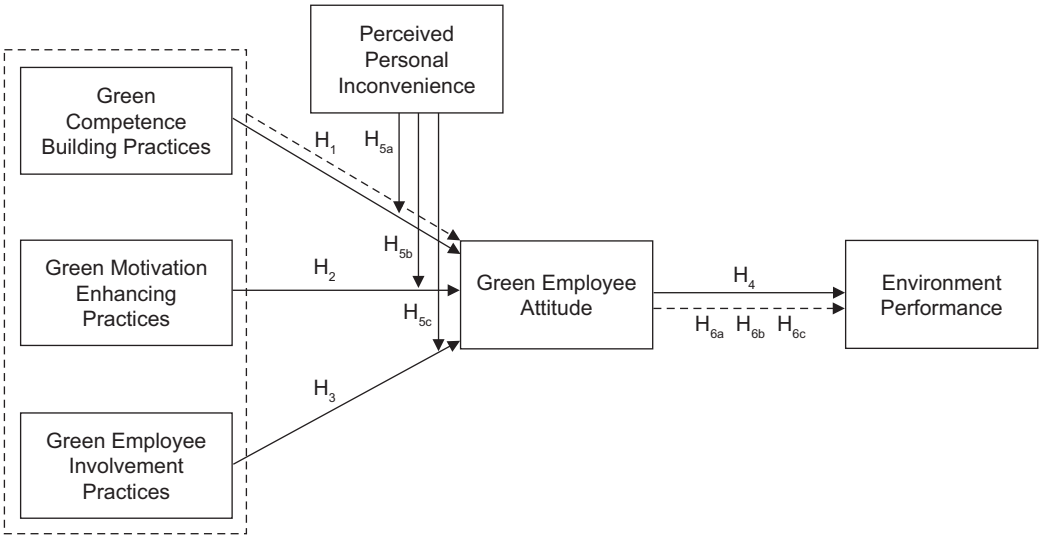


Figure 1: Conceptual Model

Source: Constructed by authors

Research Methods

This study is based on positivism because the research strategy is approached based on data collection and hypothesis development. These hypotheses are tested and confirmed, and the results can be used for further research. The research was cross-sectional. The population for this survey was hospital staff from four types of hospital, including public secondary hospitals, public tertiary hospitals, private primary hospitals, and private secondary hospitals. A convenience sampling technique was utilised. Hospital staff from different faculties who were readily accessible and willing to participate in this research composed the sample for this study. The survey method was chosen to collect data through a structured questionnaire (used electronically) covering a total of 38 items that were. The sample size was selected in accordance with the Smart-PLS approach, as it can produce significant results with a smaller sample size. A dataset of 350 respondents was considered, although a total of 384 responses were gathered, and the remaining 34 responses were screened out.

Questionnaire Design and Measurement Development

This study is based on primary sources because in this study, a questionnaire was used for analysis. All measurement items for GCBP, GMEP and GEIP were adapted from Tang *et al*. (2017); a total of 17 items were used. GEA was adapted from Han *et al*. (2011) with seven items. and eight items were chosen from Madueno *et al*. (2016) to measure a hospital's EP. A 5-point Likert scale ranging from 1 (not at all) to 5 (to a very great extent) was used.

Data Analysis Technique

The estimation of causal relationships of the model followed an effective approach structural model assessment (SEM) using Smart-PLS (Hair *et al*., 2017). It is a two-stage approach, measurement, and structural estimation. The measurement model requires an estimation of construct reliability, validity, and the indicator reliability. The average variance extracted (AVE) was used for convergent validity measurement and the Fornell and Larcker criterion, and the heterotrait–monotrait (HTMT) ratio was used for discriminant validity. The structural model confirms the proposed hypothesis via PLS bootstrapping.[1] Table 5 below reports structural model outputs.

Results

Demographic Summary

In the analysis in Table 1, 52.86% are male respondents, 47.14% are females; the majority are employed in public hospitals. Among the respondents, most were medical doctors from multiple departments, and most of them were above 30 years of age. Respondents aged between 31 and 35 years of age accounted for 22% of the respondents, and those above 40 accounted for 35%. Details of the respondents' frequency analysis are shown in Table 1.

Table 1: Summary of Respondents

Characteristics		Total	Percentage
Gender	Male	185	52.86
	Female	165	47.14
Hospital Types	Public Primary Hospitals	87	25.0
	Public Secondary Hospitals	63	18.0
	Public Tertiary Hospitals	70	20.0
	Private Primary Hospitals	50	14.2
	Private Secondary Hospitals	74	21.14
Education	Graduation	21	6.0
	Masters	135	38.7
	MBBS	188	53.5
	Others	6	1.8
Age (years)	21-25	17	5.0
	26-30	34	10.0
	31-35	78	22.0
	35-40	98	28.0
	>40	123	35.0

Source: Constructed by authors

[1] See Sarstedt *et al*. (2017) for structural model assessment.

Measurement Model Assessment

All values above 0.70 are considered for factor loading (Sarstedt *et al*., 2017); therefore, all items are highly reliable.

Table 2: Measurement Model

Constructs	Code	FD	α	AVE	CR
Green competence-building practices			0.913	0.699	0.933
	GCBP1	0.874			
	GCBP2	0.832			
	GCBP3	0.853			
	GCBP4	0.835			
	GCBP5	0.864			
	GCBP6	0.753			
Green motivation-enhancing practices			0.894	0.656	0.919
	GMEP1	0.795			
	GMEP2	0.842			
	GMEP3	0.726			
	GMEP4	0.881			
	GMEP5	0.790			
	GMEP6	0.816			
Green employee involvement practices			0.911	0.738	0.934
	GEIP1	0.858			
	GEIP2	0.866			
	GEIP3	0.850			
	GEIP4	0.860			
	GEIP5	0.861			
Perceived personal inconvenience			0.907	0.779	0.934
	PPI1	0.855			
	PPI2	0.895			
	PPI3	0.875			
	PPI4	0.905			

(continued)

Table 2: Measurement Model *(continued)*

Constructs	Code	FD	α	AVE	CR
Green employee attitude			0.921	0.680	0.937
	GEA1	0.830			
	GEA2	0.786			
	GEA3	0.722			
	GEA4	0.852			
	GEA5	0.835			
	GEA6	0.850			
	GEA7	0.889			
Environmental performance			0.947	0.680	0.955
	EP1	0.827			
	EP2	0.883			
	EP3	0.826			
	EP4	0.811			
	EP5	0.667			
	EP6	0.828			
	EP7	0.888			
	EP8	0.800			
	EP9	0.853			
	EP10	0.841			

Note: FD=factor loadings, CR=construct reliability, AVE=average variance extracted, and α=Cronbach's alpha
Source: Constructed by authors

The cut-off points for factor loading, construct reliability (CR), and Cronbach alpha (α) estimates must be greater than or equal to 0.70 (Sarstedt *et al*., 2017). The predictors of all constructs were higher; therefore, all constructs and indicators were reliable, except EP5 0.667 in EP. The acceptability AVE value is 0.50 or greater (Sarstedt *et al*., 2017). All values are above the predetermined thresholds depicted in Table 2.

The diagonal values that are greater than the values below (which are correlation values) signal strong correlations among items and constructs (Sarstedt *et al*., 2017). All diagonal coefficients are higher than off-diagonal coefficients; therefore, discriminant validity is maintained.

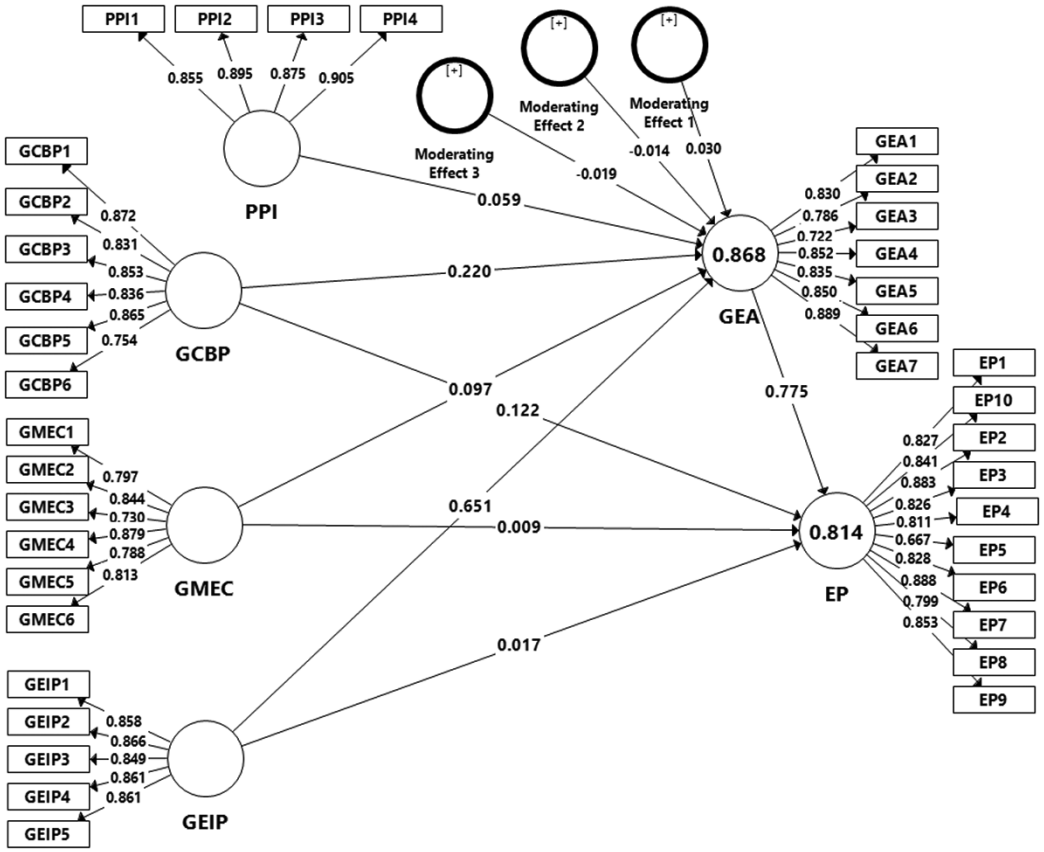


Figure 2: Measurement Model

Source: Constructed by authors

If the value falls under 0.85, then it indicates a problem of discriminant validity. All values are within the endorsed range delineated in Table 3. The Fornell and Larcker ratio produced a few faulty values that are greater than the diagonal value in Table 3. Therefore, HTMT ratio validity must be preferred for discriminant measures by researchers. In overview, Figure 2 also displays the outcomes of the measurement model assessment. Therefore, all these coefficients verified the results illustrated in Tables 2-4.

Table 3: Fornell and Larcker Criterion

	EP	GCBP	GEA	GEIP	GMC	M1	M2	M3	PPI
EP	0.824								
GCBP	0.783	0.836							
GEA	0.899	0.825	0.825						
GEIP	0.827	0.786	0.911	0.859					
GMEC	0.763	0.848	0.822	0.804	0.810				
M1	-0.302	-0.176	-0.257	-0.277	-0.163	1			
M2	-0.416	-0.237	-0.347	-0.409	-0.197	0.813	1		
M3	-0.288	-0.171	-0.235	-0.241	-0.153	0.908	0.768	1	
PPI	0.376	0.246	0.325	0.286	0.293	-0.340	-0.371	-0.350	0.883

Note: M1=Moderating effect, M2=Moderating effect 2, M3=Moderating effect 3

Source: Constructed by authors

Table 4: HTMT Ratio

	EP	GCBP	GEA	GEIP	GMEC	M1	M2	M3	PPI
EP	-								
GCBP	0.836	-							
GEA	0.825	0.813	-						
GEIP	0.825	0.567	0.802	-					
GMEC	0.817	0.443	0.704	0.631	-				
M1	0.304	0.182	0.267	0.291	0.17	-			
M2	0.422	0.246	0.357	0.429	0.206	0.813	-		
M3	0.291	0.178	0.244	0.254	0.161	0.801	0.768	-	
PPI	0.395	0.262	0.343	0.305	0.32	0.353	0.385	0.363	-

Source: Constructed by authors

Structural Model Assessment

The results reveal a significant positive relationship between GCBP and GEA, with ($\beta = 0.220$, $p = 0.000$, $t = 6.319$), and confirm $H1$. GMEP has a significantly positive relationship with GEA, and $H2$ is supported, with ($\beta = 0.775$, $p = 0.000$, $t = 10.756$). The results of this study proved the relationship between GEIP found to have a strong positive significant impact on GEA, with ($\beta = 0.651$, $p = 0.001$, $t = 13.858$), confirming $H3$.

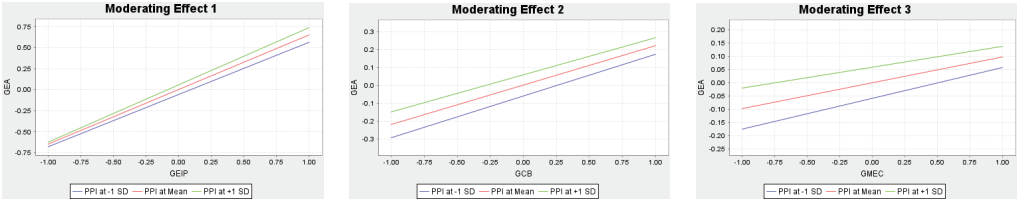
Table 5: Direct and Indirect Path Analysis

Hypothesis	Relationships	Std. Beta	Std. Error	t value	p value	Discussion	R^2	f^2	VIF	Q^2
H1	**GCBP → GEA**	0.22	0.035	6.319	0.000	**Supported**	0.865	0.092	1.572	0.584
H2	**GMEC → GEA**	0.097	0.046	2.107	0.018	**Supported**		0.015	1.078	
H3	**GEIP → GEA**	0.651	0.047	13.858	0.000	**Supported**		0.799	1.366	
H4	**GEA → EP**	0.775	0.072	10.756	0.000	**Supported**	0.812	0.887	1.111	0.545
H5a	**Moderating Effect 1 → GEA**	0.023	0.023	1.140	0.127	**Rejected**		0.091	1.194	
H5b	**Moderating Effect 2 → GEA**	-0.010	0.025	2.341	0.033	**Supported**		0.083	1.139	
H5c	**Moderating Effect 3 → GEA**	-0.015	0.028	2.573	0.034	**Supported**		0.068		
H6a	**GCBP → GEA → EP**	0.171	0.034	5.081	0.000	**Supported**				
H6b	**GEIP → GEA → EP**	0.505	0.058	8.687	0.000	**Supported**				
H6c	**GMEC → GEA → EP**	0.075	0.035	2.139	0.016	**Supported**				

Source: Constructed by authors

The results (β = 0.097, p = 0.018, t = 2.107) of *H*4 denote that GEA has a positive significant impact on EP.

The results confirm the proposed moderation of PPI between GHRM practices and GEA, with *H5a* (β = –0.023, p = 0.127, t = 1.140), *H5b* (b = –0.076, p = 0.033, t = 2.341) and *H5c* (β = –0.059, p = 0.034, t = 2.573), respectively. Likewise, Figures 3(a), 3(b), and 3(c) confirm the interactive effects for moderation analysis.



(a) (b) (c)

Figure 3: Interactive Effects

Source: Constructed by authors

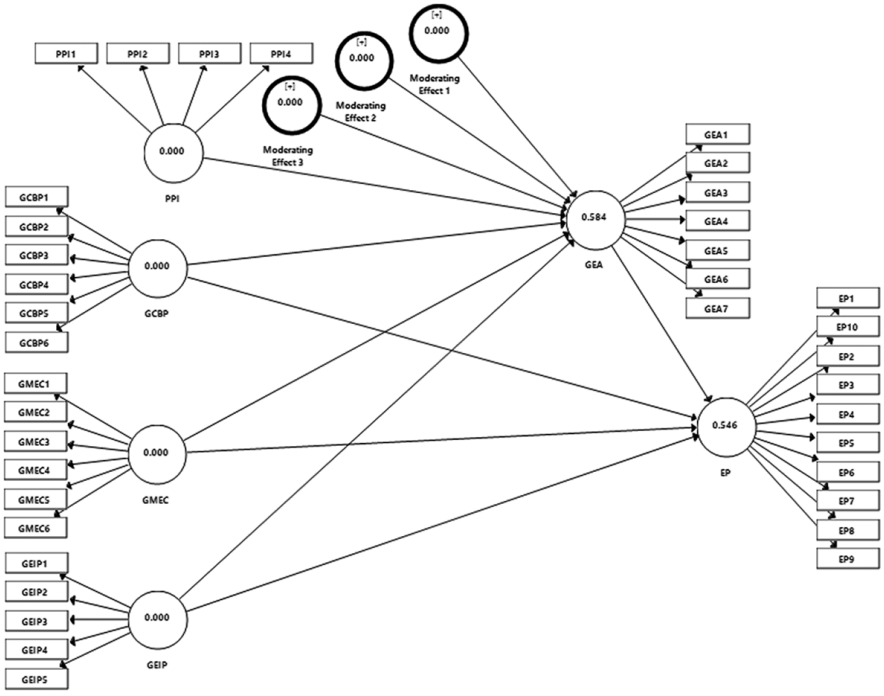


Figure 4: Model Predictive Accuracy

Source: Constructed by authors

Table 6: Out-of-Sample Prediction

	PLS-MAE	LM-MAE
EP1	0.457	0.487
EP2	0.518	0.529
EP3	0.499	0.517
EP4	0.592	0.600
EP5	0.699	0.753
EP6	0.511	0.524
EP7	0.532	0.523
EP8	0.612	0.631
EP9	0.543	0.564
EP10	0.576	0.593
GEA1	0.492	0.517
GEA2	0.485	0.535
GEA3	0.523	0.562
GEA4	0.418	0.463
GEA5	0.497	0.483
GEA6	0.396	0.449
GEA7	0.423	0.430

Note: PLS-MAE=PLS-Mean Absolute Error; LM-MAE=Linear Regression-Mean Absolute Error
Source: Constructed by authors

Finally, the proposed mediation of GEA proved an indirect effect between GHRM practices and EP as follows: *H6a*, with ($\beta = 0.171$, $p = 0.000$, $t = 5.081$); *H6b*, with ($\beta = 0.505$, $p = 0.000$, $t = 8.687$), and *H6c*, with ($\beta = 0.075$, $p = 0.016$, $t = 2.139$).

PLS-predict was used to measure the out-of-sample prediction to conduct prediction analysis, where higher LM-MAE coefficients over PLS-MAE are shown in Table 6. The results illustrated the higher predictive relevance of the model; Figure 4 also verifies the same.

Discussion and Implications

The 21st century has brought new challenges to businesses, particularly due to COVID-19. The focus of the business on financial performance only is not sufficient for sustainability. All organisations, irrespective of their specific businesses, must move forward with a balanced approach among social, financial, and EP during the pandemic. Recent literature has also highlighted the need for studies on the antecedents of EP (Raut *et al*., 2019; Longoni *et al*., 2018; Latan *et al*., 2018; Hameed *et al*., 2020; Zhu *et al*., 2021). Our research is in line with previous research (Hameed *et al*., 2020), where GHRM practices significantly improve employee empowerment and EP. Moreover, GHRM practices not only enhance environmental job performance but are also an important roadmap to build a strong environmental belief system to make it more sustainable for employees (Zhu *et al*.,

2021). Finally, these findings provide important information in support of achieving the global sustainable development goals set by the United Nations.

Theoretical Implications

The current study adds to the existing literature in several ways. First, this study helps clarify the role of GHRM practices (i.e., GCBP, GMEP and GEIP) in enhancing the EP of employees based on AMO theory (Appelbaum *et al*., 2000) during the COVID-19 pandemic. We advance GHRM systems literature by identifying the role of ability advancement, motivation enhancement, and employee involvement practices in promoting green behaviour in employees. Second, employees' green attitude is highlighted in explaining the relationship between GHRM practices and EP by supporting reasoned action theory (Azjen and Fishbein, 1980). The current study contributes to the literature on the antecedents and consequences of attitudinal factors in understanding employees' extra-role behaviours (i.e., green behaviour). Third, this study advances the green management literature by identifying and magnifying a missing link in the literature: employee personal factors previously overlooked in the literature. Employees' values and inclinations play a significant role in promoting or obstructing the impact of GHRM practices.

Practical Implications

The present study presents many practices for health care policy-makers to promote the green behaviour of employees for sustainability during COVID-19. Health care specialists can promote green behaviour by designing and implementing effective HR systems aimed at improving the green behaviour of employees during pandemic and post-pandemic times. Health care stakeholders should enhance their employees' abilities to perform eco-friendly activities by providing them with adequate training and counselling sessions, and rewards and recognition systems to promote intrinsic and extrinsic motivation.

Furthermore, employees' green attitudes should be promoted through encouragement, empowerment, and acknowledgment. Health care experts need to be cautious about the hindering factor related to employee personal values. Non-green practices should be discouraged. This study provides health care specialists and health care policy-makers with insight into the importance of employees' perceptions about green practices during the COVID-19 pandemic. Therefore, hospitals and health care policy-makers should focus on GHRM practices in the health care sector to enhance EP by promoting employees' attitudes towards sustainable practices; this will benefit society and organisational sustainability during pandemics.

CONCLUSIONS

Environmental stakeholders pressure organisations to adopt eco-friendly practices to achieve sustainable development. The current study aimed to provide insights into those HR practices that can benefit organisations in promoting employees' green behaviour. The current study is grounded in AMO theory by investigating GHRM practices in promoting EP during and post-pandemic periods. The findings reveal

that practices inclined to promote employees' ability, motivation, and green management opportunities can significantly influence employees' attitudes and ultimately green organisational performance in China's health care sector during unprecedented times. Employee PPI hinders the outcomes of GHRM practices among health care sector employees. Therefore, the perceived inconvenience of environmentally friendly practices affects GEA and results in a lack of participation in attaining sustainable goals during COVID-19. In post-pandemic times, green human resource management practices should be encouraged to eliminate the chronic psychological effects of PPI. Future research should explore the current model in other sectors, such as the textile or clothing industry, or other geographical locations to generalise the overall findings in both cross-sectional settings and longitudinal time frames.

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