

# Green Training and Development Revolutionizing Organizational Performance: The Moderating Role of Green Employee Involvement in the Bangladeshi Pharmaceutical Industry

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## Abstract

Green Human Resource Management (GHRM) has been found to positively affect job satisfaction (JS) and job performance as employees are more engaged and motivated to improve organizational performance (OP). However, few studies have investigated this phenomenon, and none have examined green employee involvement (GEI) within the Bangladeshi context. Therefore, this study examines the moderating role of GEI and the mediating role of JS and employee motivation (EM) on green training and development (GTD), organizational commitment (OC), and OP among pharmaceutical companies in Bangladesh and contributes to the theories of action and job performance and of ability-motivation-opportunity. Self-administered surveys were sent to executives working in 10 pharmaceutical companies in Bangladesh, and data were collected from 180 respondents using convenience sampling. These findings show that the GTD positively influenced OC and OP. Additionally, GEI played a significant moderating role between GTD and OC and GTD and OP. The study also revealed that JS played a significant mediating role between GTD and OC and, GTD, and OP. However, EM did not play a mediating role between GTD and OC and GTD and OP. Based on the research findings, pharmaceutical companies in Bangladesh should embrace GHRM practices, prioritize GTD, foster EI, and nurture JS, which are crucial for enhancing OC and OP. These recommendations contribute to a better understanding of sustainable HR practices and underscore the importance of aligning environmental goals with organizational success. The limitations of this study include limited generalizability, convenience sampling, cross-sectional design, self-report bias, limited mediation analysis, and omitted variables. To address these limitations, future research should employ a more diverse and representative sample, use longitudinal designs to establish causal relationships, incorporate qualitative methods to gather in-depth insights, and include a broader range of variables.

**Keywords:** green training & development, green employee involvement, organizational commitment, job satisfaction, organizational performance, employee motivation

## 1 Introduction

In recent decades, pharmaceutical companies that develop, manufacture, and sell medicinal drugs have incorporated green practices into their service delivery. This trend has also been observed in Bangladesh (Ahmed, 2019), where 231 local and 26 multinational licensed pharmaceutical companies provide 98% of the country's pharmaceutical needs through generic (80%) and patented (20%) drugs (Chaudhuri, 2020). However, 95% of the active ingredients required to produce pharmaceutical medications in Bangladesh are imported from overseas (Haque et al., 2020). Additionally, weakening restrictions and the inability to meet customer needs and supply

demands have resulted in the folding of 54 of the 257 pharmaceutical companies in Bangladesh (Chaudhuri, 2020).

For the Bangladeshi pharmaceutical industry, adopting a green approach to meet customer needs and supply demands (Shivdas & Ray, 2021) is insufficient; the industry must also concentrate on economic, environmental, financial, and social factors to achieve success and increase profits (Daily et al., 2009; Govindarajulu & Daily, 2004). According to Glavas et al. (2010), several concrete processes should be developed and coordinated to successfully implement sustainable corporate strategies. That is, several corporate departments such as green marketing (Peattie & Ratnayaka, 1992), green accounting (Bebbington, 2001), green retailing (Lai et al., 2010), and green management (McDonagh & Prothero, 1997) should come together to constitute a company's environmental program.

However, an organization's human resources are the most substantial contributors to any environmental program. The corporate sector's active participation in adopting environmental management strategies (González-Benito & González-Benito, 2006) enables a green management perspective, particularly green human resource management (GHRM). The most significant element of going green defines GHRM as using HR policies to encourage the environmentally conscious use of resources within a corporation and promote sustainability to further boost employee morale and satisfaction (Mampra, 2013).

Through GHRM, organizations see significant increases in job satisfaction (JS) and job performance (Gile et al., 2018) as employees become more engaged and motivated, resulting in improved organizational performance (Lee & Raschke, 2016). Therefore, HR development is essential for enhancing employees (Shoaib et al., 2021), and most technologically savvy organizations adjust their organizational policies, strategies, and plans (Khalid & Nawab, 2018) to incorporate GHRM to increase employee productivity (Khalid & Nawab, 2018). In addition, organizations use employee development to motivate workers, which improves their job performance (Ababneh, 2021). Thus, economic development focusing on employee development should increase organizational commitment (OC) and OP.

Various factors contribute to green engagement regarding OC and OP. Through training programs, employees become more confident in their competencies, abilities, and leadership skills (Aboramadan, 2022). According to Malik and Garg (2020), JS and work motivation are critical elements impacting work participation, whereas Varma (2017) predicts that motivated workers constantly advance an organization's ability to achieve its objectives, goals, and mission. Work incentives influence OC (Chen, 2019). Skilled and motivated employees can also address organizational difficulties (Al-Madi et al., 2017). Furthermore, Raziq and Maulabakhsh (2015) suggest that work motivation is closely associated with JS and improves OP.

While studies in industrialized countries have found a strong link between employee motivation (EM), employee happiness, and company success (Ahmed, 2019), no comparable studies have been conducted in underdeveloped countries such as Bangladesh. Furthermore, most studies have only examined a few variables to understand the complex interactions between green training and development (GTD), OC, and OP. According to Wiradirja et al. (2020), firms are more productive, and OC and OP expand as a result of green employee involvement (GEI).

GEI is crucial for sustainable OC and OP (Matthes et al., 2014). Employees have opportunities to learn about green solutions through GTD and implement them to prevent pollution and other environmental challenges (Gupta & Gupta, 2018). The more active employees are in environmental protection initiatives, the greater the paradigm shift toward environmental responsibility (Matthes et al., 2014). Employees use GEI to compose newsletters and form problem-solving green teams and committees, thereby improving the quality of OC and OP (Tang et al., 2018). GEI strives to create a shared learning environment for environment-oriented behavior that influences OC and OP by developing a clear development-based vision of environmental management. It also allows for the development of structured and unstructured (informal) communication channels to foster an OP-friendly organizational culture. With increased GTD practices in environmental management and OC culture development, GEI provides value enhancement and problem-solving abilities to tackle ecological concerns (Ghani et al., 2017).

In the context of pharmaceutical businesses in Bangladesh, this study focuses on the moderating function of GEI in GTD and the mediating role of JS and EM on OC and OP, respectively. The rest of the paper is structured as follows: Section 2 includes a literature review and the conceptual framework used to test the seven hypotheses; Section 3 details the methodology undertaken; Section 4 discusses the findings; and Section 5 presents the conclusions, limitations, and suggestions for future research.

## 2. Underpinning Theories and Literature Review

According to the action and job performance (AJP) theory developed by Boyatzis (1982), three primary aspects influence OP: individual, organizational environment, and task demand. The first consideration is the person's vision, values, philosophy, knowledge, skills, competencies, and career goals. The second factor, organizational environment, discusses work culture, climate, structure, strategic position, and industry maturity. The third consideration is employment demand, which comprises specific responsibilities, functions, and roles (Boyatzis, 2008). According to the AJP, the initial components of individual factors and the responsibilities of individual employees enhance OP.

Additionally, according to the ability-motivation-opportunity (AMO) theory, human resource management systems that focus on individual abilities, motivations, and opportunities can influence OP (Boxall & Purcell, 2003; Marin-Garcia & Martinez, 2016). Performance levels rise with an opportunity for training and development, and EM improves owing to increased OC, which is a critical business component influencing various factors, including employee satisfaction, emotional commitment, and retention rates (Tirelli & Goh, 2015). Employee commitment is critical in developing GHRM, influencing the industry's growth, productivity, and sustainability (Huo et al., 2020), where employers must utilize planning and motivational campaigns to boost staff productivity (Jawaad et al., 2019).

Similarly, GTD aims to develop multitalented employees by improving their knowledge and skills. Organizations gain a competitive advantage through training because they instill new skills and efficiency, which are critical for long-term success (Yafi et al., 2021). Furthermore, training and development contribute to employees' overall development by instilling good behavioral patterns that influence OC and OP (Amankwah-Amoah, 2018). Training generates the green skills, green behaviors, green attitudes, and green knowledge that influence an organization's performance, which depends on its environmental policies (Malik et al., 2020).

Existing research has also demonstrated that engaging in eco-environmental activities improves overall performance, where organizational working cultures influence employees' participation in an effort to improve performance (Bhatti & Qureshi, 2007). According to Moge (2023), training and development activities are crucial because they show how human resources support strategic goals and objectives, whereas Hameed et al. (2020) using resource-based review theory confirmed that green human resources significantly impact OP.

Similarly, JS depends on the work environment and opportunities that positively affect OC (Korkmaz et al., 2020). According to Chen et al. (2020), work experience and beliefs significantly affect JS; that is, if employees have vast work experience and are highly skilled and knowledgeable, they strive to improve their performance. By contrast, employees who do not receive proper training and orientation programs experience poor JS. Thus, training and development enhance expertise, leading to more satisfied and motivated employees who are more focused on increasing their capacity to achieve organizational goals (Varma, 2017).

Furthermore, JS is essential for defining OP and productivity in any business, whether large or small. Research on employee happiness and productivity has shown that high employee contentment improves staff attitudes, customer satisfaction, and revenue development (Salas-Vallina et al., 2020). Similarly, several organizational elements such as rewards, praise, and work culture contribute to JS (Salas-Vallina et al., 2020), whereas employees willing to participate in the organization and improve performance and production benefit from training and development (Varma, 2017).

Moreover, motivation drives employees' behavior toward achieving organizational goals and objectives. OC is successful when the staff is appropriately motivated. Training and development are human resource management (HRM) methods that encourage employees to participate more (Roscoe et al., 2019). According to Roscoe et al. (2019), training and development are critical components of any HRM strategy to ensure that employees' skills, knowledge, and habits are current. Innovative ideas and thoughts are essential for excellent OP and new skills and attitudes support them. While OC and employee cooperation determine employee performance, training improves employee competency and boosts OP (Gyurák Babel'ová et al., 2020).

Other research shows that HRM techniques such as recruiting, training, coordinating, and motivating employees, help boost overall productivity (Ahmad, 2015). Similarly, compensation schemes that make employees feel like an essential part of the company encourage them to participate in various activities ensuring their commitment. Consequently, training improves knowledge, which is necessary for companies to reduce waste and conserve energy (Yafi et al., 2021).

According to Vance (2006), OC and OP assess employee participation, activeness, and dedication. He also

suggests that 10 key factors are responsible for employee engagement and OC: recognition, employer satisfaction, JS, challenging work, positive feedback, supervisory support, the job's relation to the organization's mission, future growth opportunities, and a high likelihood of employee retention. Thus, employee involvement in training and development programs positively impacts OC by boosting workplace capability (Yafi et al., 2021).

Finally, employee involvement is a motivator or indicator that influences OP outcomes (Karatepe et al., 2020; Karatepe et al., 2014). According to Yafi et al. (2021), green skills and motivation significantly affect the relationship between green training and environmental performance; all six competency dimensions examined—skills, abilities, knowledge, behavior, attitude, and awareness—increase green motivation and employees' ability to generate new ideas when they are engaged in the organization's initiatives. Training and development programs have a strong influence on OP.

While GEI in organizational training programs boosts an organization's commitment to work and improves OP, other factors may moderate and mediate these relationships. Thus, by combining the AJP and AMO theories used in previous studies, we can examine the complex correlation between the different variables associated with OP and commitment. To better understand this intricate relationship, we combined numerous variables found in the AJP and AMO theories and hypothesized that the moderating role of GEI and the mediating role of JS and EM in GTD significantly affect OC and OP among pharmaceutical companies in Bangladesh.

Figure 1 illustrates the theoretical outline of the current study and demonstrates the complexity of the relationships faced by HR managers. In other words, if HR managers focus solely on GTD without considering GEI, JS, or motivation, they may not attain the levels of OC and OP necessary to remain viable in the demanding Bangladeshi pharmaceutical industry.

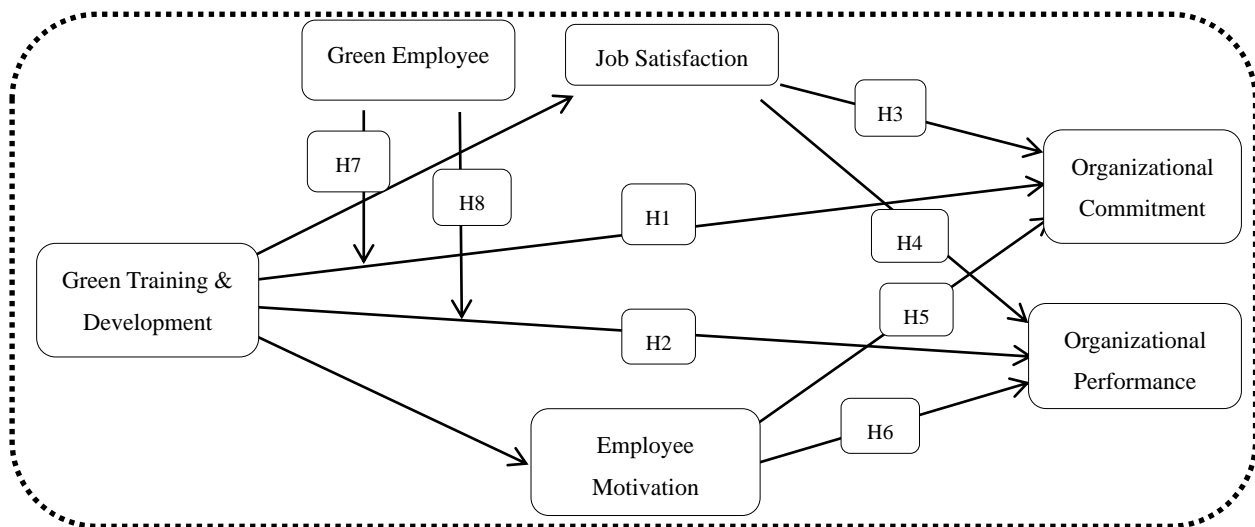


Figure 1. Conceptual framework

### 3. Methodology

The survey was developed by adapting the works of several researchers to address the complex relationships presented in the conceptual framework. Rawashdeh (2018) examined the link between GTD and GEI. Alam et al.'s (2019) survey was modified to measure EM. The researcher adopted OP, JS, and OC from Čulibrk et al. (2018) and Miah (2018) and used a 5-point Likert-type scale questionnaire, with 1 indicating severe disagreement and 5 indicating strong agreement. Industry, linguistic, and academic specialists and a pilot test confirmed the validity and dependability of the instrument. Cronbach's alpha for all constructions was greater than 0.7, indicating acceptable internal consistency (Sekaran, 2003).

The respondents were selected based on convenience sampling, and the top 10 pharmaceutical companies were chosen from 257 registered pharmaceutical companies in Bangladesh. The total number of managerial positions (managers, assistant managers, deputy general managers, and general managers) was 332. Using Krejcie and Morgan's (1970) table, we determined the sample size to be 180. The managers emailed a cover letter with a brief description of the study and a web link to ensure anonymity while completing the questionnaire. Data were collected from September to November 2021, and follow-up emails were sent to the respondent group. After assessing and removing incomplete surveys and outliers, the final response rate was 54.22% ( $n = 180$ ), which is

acceptable for online surveys (Nulty, 2008).

Finally, Harman’s one-factor test was used to identify common method bias (Podsakoff et al., 2003), and the analysis revealed no common method variance (CMV) for the current study. The total variation for a single element was less than 50%, and the CMV was unlikely to affect the data. The total variance was 24.931% (< 50%), indicating no CMV in the study data.

#### 4. Findings

Smart-PLS 3.3.3, a unique tool in non-parametric data with several indicators, was used for data analysis. Partial least squares structural equation modeling (PLS-SEM) analyzes composite-based path models for theory testing (Kock, 2015; Hair et al., 2017), while Smart-PLS measures the validity, reliability, convergent validity, discriminant validity, and testing results of the proposed hypotheses. SPSS (v23.0) software was also used to detect the missing value computation, check outliers and data normality, and test for common method bias and descriptive statistics.

The demographic profile of the 180 respondents was as follows: 34.3% were from production; 28.4% from research and development departments; 17.3% from commercial; and 20% from accounts, HRM, and sales and marketing. A substantial number of employees held higher education degrees: 3.1% had a PhD, 45.5% a master’s degree, 39.1% a bachelor’s degree, and 12.3% a diploma. Most participants (82.6%) were men, and 17.4% were women; 53.4% were married, 2.1% divorced, and 44.5% single. Many employees were relatively young, with 57.08% aged 31–40 years, 33.5% aged 22–30 years, and 9.42% aged 40 years and older.

Table 1 lists the mean, standard deviation, and intercorrelations among all variables. The constructs’ descriptive statistics and intercorrelations demonstrate that all variables substantially correlate with OP and commitment. The mean value of GTD was the lowest (3.985), whereas employee motivation was the highest (4.370).

Table 1. Means, SD, and intercorrelation

Variables	Mean	SD	1	2	3	4	5	6
1. GTD	3.985	0.830	1					
2. EM	4.370	0.711	.189**	1				
3. JS	4.099	0.794	.318**	.425**	1			
4. OP	4.255	0.792	.250**	0.024	.195**	1		
5. GEI	4.024	0.804	0.026	.193**	0.074	-0.060	1	
6. OC	4.256	0.713	.342**	-0.035	.211**	.423**	-.122**	1

Note. SD = standard deviation; \*\* two-tailed significant correlation at the 0.01 level

Using a two-step Smart-PLS technique, the construct validity, reliability, convergent validity, and internal consistency (Fig. 2) of all variables were checked; then, structural modeling was conducted to test the hypotheses (Hair et al., 2017; Ringle et al., 2020). The factor loadings of all items were obtained through the partial least squares (PLS) algorithm procedure in Smart-PLS: they were between 0.679 and 0.923, achieving the threshold values (Hulland, 1999). In addition, the average variance extracted (AVE) was higher than 0.5, as recommended by Hair et al. (2017). Cronbach’s alpha and composite reliability were higher than 0.7, thus confirming internal consistency (Hair et al., 2017).

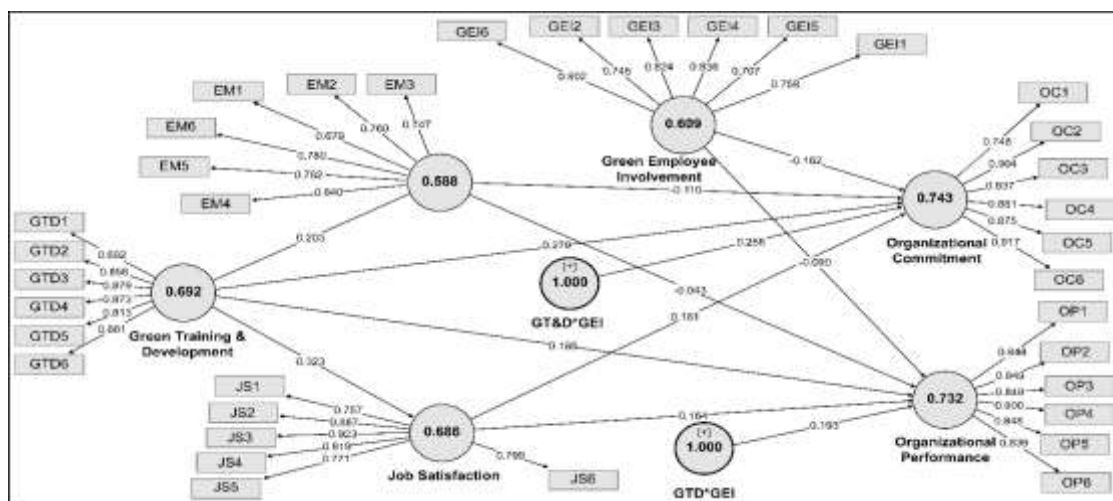


Figure 2. Construct validity and reliability

All the correlation values were less than 0.9, as recommended by Henseler et al. (2015); thus, discriminant validity (Table 2) was established using the Heterotrait and Monotrait Ratio (HTMT). The height of the HTMT was 0.479.

Table 2. Discriminant validity—HTMT

Constructs	EM	GEI	GTD	JS	OC	OP
Emp. Motivation						
G. Emp. Involvement	0.220					
G. T. & Development	0.212	0.083				
Job Satisfaction	0.479	0.087	0.351			
Org. Commitment	0.068	0.144	0.371	0.227		
Org. Performance	0.064	0.082	0.272	0.213	0.453	

After assessing the measurement model, collinearity was checked through inner VIF and was found to be less than 5, complying with the recommendation of Hair et al. (2017). The coefficient of determination R<sup>2</sup> values, effect size (f<sup>2</sup>), and predictive relevance (Q<sup>2</sup>) of the structural model were also assessed. All recommended R<sup>2</sup>, F<sup>2</sup>, Q<sup>2</sup>, and inner VIF values were achieved, as presented in Table 3.

Table 3. Assessment of the structural model

R-Square	<b>Endogenous Variables</b>	<b>R Square</b>		<b>R Square Adjusted</b>		0.26: Substantial, 0.13: Moderate, 0.02: Weak (Cohen, 1989)
	Emp. Motivation	0.041		0.039		
	Job Satisfaction	0.105		0.103		
	Org. Commitment	0.239		0.232		
	Org. Performance	0.127		0.118		
Effect Size (F-square)	<b>Exogenous Variables</b>	<b>Emp. Motiv</b>	<b>Job Satis.</b>	<b>Org. Commit.</b>	<b>Org. Perf.</b>	0.35: Substantial, 0.15: Medium effect, 0.02: Weak effect (Cohen, 1989)
	Employee Motivation			0.012	0.002	
	G. Emp. Involvement			0.033	0.009	
	G. T. & Development	0.043	0.117	0.089	0.034	
	Job Satisfaction			0.032	0.023	
Collinearity (Inner VIF)	Employee Motivation			1.325	1.325	VIF <= 5.0 (Hair et al., 2017)
	G. Emp. Involvement			1.041	1.041	
	G. T. & Development	1.000	1.000	1.147	1.147	
	Job Satisfaction			1.336	1.336	
Predictive Relevance (Q-Square)	<b>Endogenous Variables</b>	<b>CCR</b>		<b>CCC</b>		Value larger than zero (0) indicates Predictive Relevance (Hair et al., 2017)
	Emp. Motivation	0.02		0.425		
	Job Satisfaction	0.067		0.558		
	Org. Commitment	0.168		0.639		
	Org. Performance	0.089		0.619		

Once all the criteria of the measurement model were confirmed and the structural model assessed using Smart-PLS, a 5,000 resampling bootstrapping procedure was used to assess the proposed hypotheses, revealing the results shown in Table 4. H1 represents the direct relationship between GTD and OC, which is statistically significant as  $\beta = 0.279$ ,  $p = 0.000$ , and  $t = 4.613$ . This indicates that GTD has a significant direct effect on OC. Likewise, the second hypothesis (H2) regarding the relationship between GTD and OP was significant as  $\beta = 0.185$ ,  $t = 3.016$ ,  $p < 0.000$ .

Smart-PLS has the option of a specific indirect effect using the same bootstrapping procedure to examine the mediating effect. Therefore, hypothesis (H3) was the first mediating effect of JS on GTD, and OC was found to be significant as  $\beta = 0.059$ ,  $p < 0.022$ . Furthermore, LL (0.019) and UL (0.120) were both positive with no zeros (0) between them, confirming a significant mediating effect (Preacher & Hayes, 2008). Mediation indicates partial mediation as the direct relationship is significant. Likewise, hypothesis H4 related to the mediation effect of JS between GTD and OP was significant as  $\beta = 0.053$ ,  $p = 0.011$ , and the values of LL (0.018) and UL (0.099) confirmed a significant positive effect (Preacher & Hayes, 2008). This mediation was also partial as its direct relationship (GTD and OP) was significant. The third and fourth mediation hypotheses (H5 and H6) were between GTD and OC and between GTD and OP through EM; we found no significant mediation effect as  $\beta =$

-0.022 and  $\beta = -0.009$  and  $p = 0.078$  and  $p = 0.482$ , respectively. In addition, their LLs (-0.023 and -0.009) were negative, and their ULs (0.003 and 0.012) were positive, confirming no mediating effect.

The moderating effect of GEI was also examined. The results, presented in Table 4, illustrate that H7 indicated a moderating effect of GEI between GTD and OC; this was significant as  $\beta = 0.256$ ,  $t = 3.837$ , and  $p = 0.000$ . This means that the relationship between GTD and OC strengthened in the presence of GEI. Similarly, H8, which indicated a moderating effect of GEI between GTD and OP, was also found to be significant as  $\beta = 0.193$ ,  $t = 2.974$ , and  $p = 0.003$ . This confirms that GEI has a significant moderating effect on the relationship between GTD and OP.

Table 4. Results of proposed hypotheses

Hypotheses	Beta/OS	SD	T	P Values	Decision	
H1. GTD -> OC	0.279	0.060	4.613	0.000	Significant	
H2. GTD -> OP	0.185	0.061	3.016	0.003	Significant	
Hypotheses	Beta/OS	LL	UL	P Values	Decision	Mediation
H3. GTD -> JS -> OC	0.059	0.019	0.120	0.022	Significant	Partial
H4. GTD -> JS -> OP	0.053	0.018	0.099	0.011	Significant	Partial
H5. GTD -> EM -> OC	-0.022	-0.054	0.003	0.078	Not Significant	No Mediation
H6. GTD -> EM -> OP	-0.009	-0.039	0.012	0.482	Not Significant	No Mediation
Hypotheses	Beta/OS	SD	T	P Values	Decision	
H7. GT&D*GEI -> OC	0.256	0.067	3.837	0.000	Significant	
H8. GTD*GEI -> OP	0.193	0.065	2.974	0.003	Significant	

## 5. Discussion

This study examined various statistical relationships between (1) GTD and OC and (2) GTD and PC and three mediation variables in the Bangladeshi pharmaceutical industry. While it showed a significant direct relationship between GTD and OC and GTD and OP, the mediating variables of employee involvement, JS, and employee motivation had mixed results.

Hypothesis (H1) examined the direct relationship between GTD and OC and revealed statistical significance, which indicates that GTD has a significant direct effect on OC. The study's findings demonstrate a direct and meaningful connection between GTD and OC and imply that providing green-focused training and development opportunities has a noteworthy impact on fostering OC among employees, supporting the findings of Alansaari et al. (2022). This finding contributes to our understanding of how environmentally conscious training initiatives can enhance employees' skills and knowledge and instill a more profound sense of commitment into their respective organizations. Additionally, the pharmaceutical sector, which is known for its environmental impact, can benefit from such insights by implementing tailored GTD programs. As employees become better equipped to address environmental challenges, their increased commitment can improve their overall OP and sustainability efforts.

Similarly, the second hypothesis (H2), which considered the direct relationship between GTD and OP, was found to be significant. These findings reveal a significant link between GTD and OP in the Bangladeshi pharmaceutical industry. This discovery has considerable implications for both the pharmaceutical sector and broader industries, highlighting the pivotal role of environmentally focused training in driving organizational success. By investing in GTD initiatives, companies can cultivate a workforce equipped with the skills and knowledge needed to contribute positively to environmental sustainability, while simultaneously elevating overall OP (Almeer & Almaamari, 2022). This symbiotic relationship underscores the need for businesses to integrate green practices not only for ecological reasons but also to bolster their competitive edge and long-term viability.

Turning to the mediating variables, this study found statistical significance in the mediating role of JS between GTD and OC, as hypothesized in (H3). This substantial mediating effect indicates that JS plays a significant role in the relationship between the GTD and OC, and these findings are consistent with those of Nath and Goel (2016). The significance of this mediation is underscored by the concept of partial mediation, where the direct relationship between GTD and OC remains significant alongside the mediating effect of JS, suggesting a more intricate interplay between these variables. The implications for organizations are twofold: enhancing GTD directly influences OC and indirectly shapes it through increased JS. Consequently, fostering a workplace culture that prioritizes green training can increase employee satisfaction and strengthen OC. As a result, this research deepens our understanding of the GTD-OC connection and offers practical insights for businesses striving to optimize employee commitment and performance.

Regarding hypothesis (H4), this study established a significant mediating effect, highlighting the role of JS in explaining the link between GTD and OP. Notably, this mediation is characterized by partial mediation, in which the direct relationship between GTD and OP remains statistically significant alongside the mediating impact of JS. This intricate pattern suggests that while JS serves as a conduit through which GTD influences OP, other factors may also contribute to the observed relationship, which supports the findings of Abdelhamied et al. (2023). These findings have valuable implications for organizations. By enhancing GTD initiatives, businesses directly contribute to improving OP and indirectly influence it through elevated JS. Thus, fostering green-oriented training advances employees' skills and influences their contentment, thereby fostering a more engaged and productive workforce. This research enhances our understanding of the multifaceted connections between GTD, JS, and OP, offering practical insights for companies aiming to optimize their performance and sustainability efforts.

Concerning hypothesis H5, the research findings also shed light on the mediating role of EM in the relationship between GTD and OC within the Bangladeshi pharmaceutical industry. Contrary to expectations, this study revealed no significant mediation effect. This outcome implies that in this specific context, the impact of GTD on OC does not operate predominantly through the mediating mechanism of employee motivation. Although the GTD directly influences OC, factors other than employee motivation may be responsible for the observed connection. These findings contribute to a nuanced understanding of the intricate dynamics within this sector, suggesting that the pathway from GTD to OC might be more complex than initially hypothesized. This highlights the importance of considering industry-specific nuances and underlying variables when designing training and development strategies for practitioners and policymakers. While EM might not serve as a primary mediator in this case, the study underscores the need for further exploration to uncover other factors shaping the relationship between GTD and OC in the Bangladeshi pharmaceutical context.

The findings pertaining to hypothesis H6 provide insights into the mediating role of EM in the connection between GTD and OP within the Bangladeshi pharmaceutical industry. This study revealed the absence of a significant mediation effect, which suggests that in this specific industry setting, the influence of GTD on OP does not primarily operate through the mediating factor of employee motivation. While GTD might directly influence OP, other unexplored variables might contribute to this relationship. These findings underscore the complexity of the interplay between GTD, EM, and OP, necessitating a more comprehensive exploration of the mechanisms at play. For industry practitioners and policymakers, these results highlight the need to tailor strategies to the unique characteristics of the Bangladeshi pharmaceutical sector. While EM might not play a predominant mediating role, understanding the direct connection between GTD and OP remains crucial for fostering sustainable organizational success. Therefore, further investigation into the underlying dynamics influencing the relationship between GTD and OP in this specific industry context is needed.

Hypothesis H7 highlights the significant moderating role played by GEI in the relationship between GTD and OC. This finding underscores the notion that the presence of GEI enhances the association between GTD and OC. These findings emphasize the importance of employees in environmental initiatives. When GEI is integrated, the impact of GTD on OC becomes more robust. This suggests that businesses fostering GEI and training initiatives create a more robust commitment among employees to sustainable practices and improve the organization's overall success. This offers practitioners and business leaders a strategic perspective on bolstering commitment through environmental initiatives; by actively engaging employees in green practices, companies can amplify the positive outcomes of training efforts. This research contributes to understanding how OC can be harnessed through the synergy of GTD and GEI, guiding companies in pursuing a more sustainable and dedicated workforce.

Finally, the research findings concerning H8 illustrate the significant moderating influence of GEI on the relationship between GTD and OP. This discovery underscores that the presence of GEI amplifies the connection between GTD and OP. This outcome highlights the pivotal role of employees in environmental endeavors. In the presence of GEI, the impact of GTD on OP becomes stronger; this implies that organizations integrating GEI with training programs enhance their employees' capacities to contribute positively to both OP and sustainability goals. For business leaders and practitioners, these insights offer strategic perspectives on leveraging employee engagement for optimal outcomes. Companies can enhance the positive impact of their training efforts on overall performance by integrating green practices and fostering employee participation. This study contributes to the understanding of how GEI can synergistically enhance the relationship between GTD and OP, guiding organizations toward a more sustainable and prosperous future.



### 5.1 Theoretical Implications

From a theoretical perspective, various factors shape OC and OP. The AJP theory asserts that individual attributes significantly affect employees' behavior and performance within an organization. In parallel, the AMO theory underlines the pivotal role of HRM systems in influencing OP. This theory posits that OP is optimized when employees possess the necessary abilities, motivations, and opportunities for growth. In line with these theoretical frameworks, Marin-Garcia and Martinez (2016) elaborate on the AMO theory, which encompasses a spectrum of skills, attitudes, motivations, and employment opportunities. This holistic perspective emphasizes that enhancing OP requires a multifaceted approach that nurtures employee capabilities and fosters an environment conducive to motivation and growth.

Our findings support and substantiate these theoretical hypotheses. Empirical evidence underscores the intricate relationship between GTD, GEI, JS, and inspiration for shaping both OC and OP. Integrating GTD and GEI, two vital components of the broader green initiative landscape, is pivotal; this synergy serves as a catalyst, augmenting the impact of GTD on both OC and OP. Our study highlights that the effectiveness of GTD extends beyond its isolated influence, and GTD flourishes when intertwined with GEI, JS, and inspirational elements. This research underscores the theoretical underpinnings that advocate a comprehensive approach to organizational enhancement. Recognizing the multifaceted nature of employee development and the impact of environmental involvement, organizations can craft strategies that resonate with the intricate interplay between abilities, motivations, and opportunities. The alignment of GTD with GEI, accompanied by nurturing JS and fostering inspiration, has emerged as a strategy to enhance both OC and OP. These theoretical implications underscore the relevance of tailoring interventions to the unique dynamics of each organization. The findings enrich our understanding of the interwoven elements contributing to OC and OP and offer a blueprint for designing initiatives that holistically enhance employee commitment and overall organizational success.

### 5.2 Practical Implications

The growth and sustainability of pharmaceutical companies in Bangladesh are closely tied to the adoption of GHRM practices. To effectively navigate the increasing demand for environmentally responsible operations and boost OP, companies must prioritize the implementation of robust GTD programs. The findings substantiate the importance of this approach, emphasizing the need for pharmaceutical firms to harmonize their commitment to sustainability through OP enhancement.

Amid global emergencies and pandemics, pharmaceutical companies often face challenges related to supply chain disruptions, necessitating re-shoring, near-shoring, and swift operational adjustments (Shivdas & Ray, 2021). This emphasizes the significance of maintaining or increasing OC and OP within the industry. A comprehensive approach is pivotal for HR managers tasked with developing GTD initiatives. The incorporation of GEI, JS, and EM has emerged as a strategic imperative to bolster OC and OP.

Recent research by Malik and Garg (2020) highlighted the increasing relevance of work engagement, including employee green engagement, underscoring the critical role of deliberate training and development in nurturing it. This study indicates that fostering a positive attitude toward goal achievement, defined as green engagement (enhance, 2021), is pivotal in driving organizational success. Similarly, Bataineh (2019) underscores the positive outcomes derived from employee well-being, dedication, and absorption, which contribute to JS, work-life balance, and active green participation.

This study extends these insights by investigating the moderating role of GEI and the mediating roles of JS and EM within the broader framework of GTD, OC, and OP in the Bangladeshi pharmaceutical sector. The outcomes shed light on the pivotal role of GEI, further emphasizing its importance in driving OP. The synergy between GTD and GEI shows its potential to cultivate employee commitment and enhance overall operational outcomes.

In conclusion, the practical implications of this study are clear: pharmaceutical companies in Bangladesh can enhance their OP by integrating green practices within their HRM strategies; fostering GEI within comprehensive GTD programs has emerged as a critical strategy. This study underscores the significance of a holistic approach that encompasses employee engagement, JS, and motivation to pursue sustainable organizational success. By aligning these factors, pharmaceutical firms can establish a strong foundation for improved performance while meeting the demands of a rapidly evolving and environmentally conscious industry landscape.

### 5.3 Limitations of the Study and Future Research Directives

Although this study enriches our understanding by applying the AJP and AMO theories to investigate the relationship between GTD, green EM, JS, OC, and motivation, certain limitations warrant consideration.

The first limitation is the context-specific nature of the study. As our findings focus exclusively on the pharmaceutical industry in Bangladesh, they may not be readily extended to other sectors or geographical settings. The unique characteristics, practices, and cultural nuances inherent to the pharmaceutical industry in Bangladesh may create a scenario in which the relationships between the studied variables differ significantly from those in other industries or countries. Consequently, caution is necessary when attempting to generalize the findings beyond the confines of this particular sector and locality.

Given the bounded scope of this study, future research should aim to overcome these limitations. Similar investigations across diverse industries and international contexts could provide a more comprehensive and nuanced understanding of the relationships under scrutiny. By employing a comparative approach, researchers can discern whether the observed correlations hold true across sectors and regions, thereby enhancing the robustness and applicability of the findings.

Furthermore, to delve deeper into the intricate interplay between GTD, green EM, JS, OC, and motivation, a mixed-method analysis integrating qualitative and quantitative data could yield valuable insights. Such an approach would offer a more comprehensive understanding of the complexities inherent in these relationships and provide a multifaceted view of the underlying mechanisms. Qualitative data can reveal the nuanced factors influencing the variables, shedding light on context-specific dynamics that quantitative data might overlook.

Despite these limitations, this study makes a substantial contribution to the academic discourse on GTD and OP. By revealing insights into the solid interconnections between physical activity and progress and the symbiotic relationship between green EM and employee dedication, this research contributes to a deeper understanding of the intricate interactions within the pharmaceutical industry in Bangladesh. The findings offer pragmatic insights that can guide strategic decision making and policy formulation within the sector, aligning human resource practices with broader organizational objectives.

In conclusion, although this study advances our understanding of the complex relationships examined, the constrained scope and context-specific focus underscore the need for cautious interpretation. By acknowledging these limitations and expanding the research scope through cross-industry and cross-country studies, researchers can fortify the generalizability and significance of the findings, paving the way for more comprehensive insights into the interplay between GTD, green EM, JS, OC, and motivation.

#### *5.4 Conclusion*

This study underscores the pivotal role of GHRM practices in shaping the dynamics of JS, EM, OC, and OP within the unique context of pharmaceutical companies in Bangladesh. While the positive impact of GHRM on JS and job performance has been recognized, this study makes a contribution by exploring the uncharted territory of GEI in this context. It offers valuable insights into the interplay of these variables by adopting a comprehensive framework that integrates the AJP and AMO theories. This study confirms the positive influence of GTD on both OC and OP in the pharmaceutical sector. A noteworthy discovery is the significant moderating role of GEI, which augments the relationship between GTD and OC and OP. This emphasizes the importance of involving employees in green initiatives to amplify the impact of training efforts on OC and OP.

Furthermore, the mediating role of JS between GTD, OC, and OP underscores the intricate pathway through which green training fosters employee contentment and leads to enhanced commitment and performance. This provides a pragmatic roadmap for organizations to focus on nurturing a satisfied workforce as a conduit to augment overall outcomes. While EM did not emerge as a significant mediator, the findings offer a comprehensive picture of the nuanced connections within this framework. This study underscores the strategic importance of aligning environmental goals with organizational practices to maximize the effectiveness of GHRM initiatives. However, it is crucial to acknowledge the limitations of this study, including its limited generalizability due to its specific industry and local focus, convenience sampling, cross-sectional design, self-report bias, limited mediation analysis, and potentially omitted variables. To address these shortcomings, future research should explore diverse industries and countries to enhance the applicability of the findings. Longitudinal designs could offer insights into causal relationships, and mixed-method approaches could provide a richer understanding. Additionally, accounting for a more comprehensive array of variables would deepen our understanding of the complexities of play. In a larger context, this research contributes to the understanding and advancement of sustainable HR practices by delineating the pathways through which GTD, GEI, JS, and OC impact OP. These recommendations provide a strategic guide for pharmaceutical companies in Bangladesh and other countries to optimize their human resource strategies, align environmental goals with organizational success, and pave the way for a more sustainable and prosperous future.

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