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Socially responsible human resource management and organizational sustainability among Bangladeshi pharmaceutical manufacturing organizations: The explanatory link of voluntary green behavior

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A B S T R A C T

Recent organizational trends give more importance to the social and responsible behavior of organizations to their sustainability. Numerous factors are responsible for prioritizing social responsiveness and pro-environmental or employee-green behavior for organizational sustainability. Nevertheless, no studies have yet considered how voluntary green behavior (VGB) and socially responsible human resource management (SRHRM) influence this perception. Hence, this study determines the explanatory link of VGB along with the impacts of SRHRM on organizational sustainability (environmental [EnS], social [SS], and economic [ES] sustainability). Data was collected from a developing nation context. An explanatory research strategy was used for the present study. To acquire data from 100 Bangladeshi pharmaceutical manufacturing organizations, structured questionnaires were used. For testing the proposed hypotheses of the study, we used partial least squares structural equation modeling (PLS-SEM). The outcomes of the analysis reveal that SRHRM has a considerable impact, both positively and significantly, on organizational sustainability (EnS, SS, and ES). Once again, SRHRM has a substantial positive effect on VGB. Furthermore, VGB plays an influential role as a mediator in the relationship between SRHRM and organizational sustainability. The findings have significant implications for pharmaceutical manufacturing organization management in Bangladesh and other Southeast Asian contexts. Based on the findings, pharmaceutical company managers will have a stronger rationale to invest in SRHRM while simultaneously establishing strong ties with employees and CSR-oriented green behavior to accomplish their organizational sustainability objectives. This study contributes to the existing body of research on the sustainability of organizations and the triple bottom line, along with SRHRM and VGB, by providing evidence from a country that is rapidly industrializing and developing. In this work, SRHRM was measured as a whole, even though it has three dimensions. Since the sample consists of Bangladeshi pharmaceutical manufacturing organizations, it is also uncertain whether the results can be generalized.

1. Introduction

Organizations have new challenges and possibilities to achieve organizational sustainability at their own pace in the transforming global economic context. For the world economy to catch up, organizational structures, methods, and behaviors that the company and its customers want must be integrated and modified. Therefore, sustainability is an international issue as businesses and consumers are becoming increasingly sensitive to the environmental and social impacts associated with their product choices. Sustainability is now widely accepted as a principle, goal, and standard by a variety of groups and individuals. Sustainability in the workplace refers to the practice of incorporating the principles of sustainable development

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into a company's day-to-day operations (Varsei et al., 2014). The majority of research focused on sustainability as the ultimate goal, which might be attained by integrating the three dimensions of sustainability (environmental, social, and economic). However, the nature and context of the many definitions and notions of organizational sustainability vary widely. Some of these imply that common presumptions, values, and beliefs influence how an organization thinks about and handles its social, environmental, and economic impacts. Therefore, a company's capacity to adapt and succeed is a key factor in its long-term viability. According to Rahman et al. (2022b), a sustainable organization is the product of conscious leadership, a deep pool of talent, ample resources, proactive employee behavior, and a pervasive culture that values long-term success. Concisely, "sustainability" refers to a strategy for achieving sustainability from environmental, social, and economic dimensions within an organization.

New developments and environmental repercussions present substantial challenges to sustainability for many businesses today (Akhtar et al., 2017). According to Friedman (1970), socially responsible businesses should employ their resources on activities that would not result in long-term success to maximize profits (DuBois & Debois, 2012). The adaptability and success of an organization are crucial to its continued existence (Rahman et al., 2022b). Companies in the industrial sector particularly the pharmaceutical manufacturing sector need to pay more attention to societal and environmental concerns, stakeholder relationships, and employee conduct if they are to survive in the era of modern technology (Rahman et al., 2022a). As such, businesses should prioritize SRHRM and VGB which have been shown to significantly improve long-term sustainability (Shen and Benson, 2016; Sancho et al., 2018; Uddin et al., 2020). Employee VGB leads organizational culture towards organizational overall sustainability. Through the lens of institutional theory (Rahman et al., 2023), the importance of SRHRM aspects such as employee well-being, legal compliance, and CSR facilitation may be better understood from the standpoint of the institution or company. This research frames the topic of organizational sustainability as a three-fold concept, including the environmental, social, and economic aspects of sustainability. A condition for the environmental sustainability of operations, goods, and services is environmental sustainability itself, which is defined as "a state of balance, interconnectedness, and resilience that enables the completion of human needs without compromises in supporting the environment and biodiversity" (Milanesi et al., 2020). Individual and community welfare, occupational health and safety, workplace conditions, and human and labor rights are all part of the social dimension of sustainability (Bom et al., 2019; Milanesi et al., 2020). However, external economic contributions to financial viability, economic performance, future financial benefits, and trade opportunities are given to economic sustainability (Sheth et al., 2011; Milanesi et al., 2020). Nevertheless, the economic dimension of sustainability is concerned with the impact of a company on its market growth, reduction of the cost of energy usage, and waste disposal (Longoni et al., 2018; Mousa and Othman, 2019; Al Kerdawy, 2018; Zaid et al., 2018a). Organizations have been under ongoing pressure to raise their environmental sustainability (Delmas, 2018; Kim et al., 2017) due to expanding consciousness about the necessity to preserve the environment for future generations and the enduring impact of damage to the environment on climate change. To address this collective ecological concern, businesses have started to implement SRHRM and have begun to identify the actions within it that boost good environmental performance (Kramar, 2013). In response to this moral dilemma, business leaders and scientists across the globe have begun to recognize the significance of implementing organizationally ethical and environmentally responsible programs. Social capital (Maak, 2007), crisis mitigation (Wang et al., 2015), employee retention (Doh and Quigley, 2014), and workplace commitment (Miska et al., 2014) were all cited as benefits of engaging in responsible activities.

Shen and Benson (2016) state that SRHRM is an essential element of CSR initiatives. Therefore, SRHRM entails teaching workers about CSR, keeping tabs on how they're doing in terms of social responsibility, and keeping them around. They found a strong relationship between SRHRM and employee commitment to the company. An organization that cares about the environment, the economy, and society will follow the advice of Rahman et al. (2022a) and work to strengthen its SRHRM procedures, consider the opinions of its stakeholders, and cooperate with the government. SRHRM promotes eco-friendliness, social responsibility, and financial prudence among workers to increase the sustainability of organizations (Rahman et al., 2023). Significant research has been conducted on the benefits of SRHRM for employee health and happiness, legal compliance for businesses, and community service initiatives (Shen and Benson, 2016; Shen and Zhang, 2017; Sancho et al., 2018; Uddin et al., 2020). In addition, scholars recommended that researchers investigate the indirect effects of VGB on SRHRM and organizational competitiveness or sustainability (Uddin et al., 2020). Consequently, the study focuses on the legal compliance, employee orientation, and CSR facilitation of HRM in a composite form to observe the influence of SRHRM on the sustainability of pharmaceutical organizations from a management perspective with institutional theory. From the researchers' point of view, and as far as we know, no study has been done on the role of VGB in explaining the link between SRHRM and organizational sustainability in the pharmaceutical sector. Research on the sustainability of manufacturing organizations, particularly pharmaceutical organizations, has not emphasized SRHRM, VGB, and organizational sustainability within a unified framework. By examining the direct and indirect relationship between SRHRM and the sustainability of pharmaceutical organizations, this study concentrates on a win-win-win situation for employees, organizations, and society.

The research provides an important theoretical perspective that was previously inadequately addressed. This study makes a substantial contribution to the body of knowledge on SRHRM and employees' VGB by offering a framework that examines both direct and indirect impacts of SRHRM, VGB, and organizational sustainability from the perspectives of environmental (EnS), social (SS), and economic (ES) sustainability. This study intends to tackle this missing link by utilizing data from

Bangladeshi pharmaceutical manufacturing organizations. Bangladesh's pharmaceutical manufacturing sector is undergoing a massive transformation as a result of the country's industrialization vision, which aims to make Bangladesh a pharmaceutical manufacturing hub in Southeast Asia and a global competitor. This has motivated the researchers to conduct this study. However, the same sector has been identified as one of the most significant polluters and toxic substance emitters. Therefore, research in this field is relevant for management and professionals, particularly in Bangladesh and comparable regions. This investigation has three purposes: (1) to evaluate the influence of SRHRM on organizational sustainability; (2) to evaluate the influence of SRHRM on VGB; and (3) to examine the indirect effect of VGB on SRHRM and organizational sustainability.

The remaining portion of the research is divided into subsequent sections: The second section focuses on the literature review and hypothesis development. The third section addresses the methodology of the research. The fourth section examines the analysis of the results and discusses the empirical findings. The fifth, sixth, and seventh section continues with a discussion of the practical implications, conclusion, and suggestions for future research respectively.

2. Literature Review and Hypotheses Development

2.1 Socially Responsible Human Resource Management

The term "socially responsible human resource management" (SRHRM) was developed by Shen and Zhu in 2011. SRHRM is an employee-focused aspect of corporate social responsibility that focuses on addressing the concerns of employees and includes recruiting socially responsible staff and recompensing workforces for their contribution to CSR initiatives. According to Shen and Zhang (2019), the concepts of "human resource management" and "socially responsible human resource management" are interchangeable. Shen and Zhu (2011) presented three dimensions of SRHRM, namely legal compliance HRM, employee-oriented HRM, and CSR facilitation HRM, about the organizational citizenship behavior of employees. Similarly, SRHRM is conceptualized in this study as a composite of these three-dimensional constructs (Uddin et al., 2020; Shen and Benson, 2016; Newman et al., 2015; Shen and Zhu, 2011). In the realm of human resource management (HRM), the term "legal compliance" refers to an organization's observance of all applicable laws and policies, both local and international, concerning issues such as equal employment opportunity, health and safety, working hours, the minimum wage, and the employment of child laborers and forced laborers. Employee-focused HRM entails attending to the non-required personal and family requirements of employees. Newman et al. (2016) define corporate social responsibility facilitation in human resource management as the adoption of policies and practices that encourage organizations and employees to participate in corporate social responsibility initiatives. If employees perceive that their organization's human resource management is socially responsible, it fosters identification with and generates a sense of ethical responsibility for their organizations (Shen & Zhu, 2011).

Corporate social responsibility and SRHRM, in particular, are not entirely self-sufficient actions of philanthropy. Frans van Houten, the CEO of Philips, stated that they are the outcome of strategic considerations and "a way to do business." Numerous studies examining the connection between SRHRM and job-related conduct show that these activities have a positive impact on organizations. Studies examined the effects of SRHRM on numerous dimensions, such as corporate citizenship behavior, work satisfaction, organizational identity and perceptions of overall justice, intellectual capital, turnover intentions, and organizational sustainability considerations (Shen & Zhu, 2011; Kundu and Gahlawat, 2015; Newman et al., 2016; Barrena-Martinez et al., 2016; Nie et al., 2018; Uddin et al., 2020). SRHRM and organizational sustainability, with the mediating effect of voluntary green behavior as viewed through the lens of institutional theory from a managerial perspective, are awaiting recognition. Marques et al. (2019) emphasize the environmental, social, and economic importance of organizational sustainability to attain more value and international prominence in the pharmaceutical manufacturing sector. This is because organizational sustainability is a crucial field of concentration for the pharmaceutical industry (EFPIA, 2016; Ang et al., 2020). The examination of the relevant studies suggests that SRHRM and VGB comprise some of the elements or considerations that influence the organizational sustainability of pharmaceutical companies that make use of modern technologies.

2.2 Socially Responsible Human Resource Management and Organizational Sustainability

According to Jastrzębska (2016), contemporary businesses plan not only for profits but also for limiting and reducing their harmful effects on the environment and overcoming barriers to progress. Organizations are increasingly implementing strategies based on sustainability philosophies as a response to rising global social consciousness and the sensitivity of concerned parties (Bombiak & Marciniuk-Kluska, 2019). To this end, businesses should create value for their constituents in a way that encourages long-term expansion and keeps local supporters invested (Pichola & Noco, 2008). Intentionally adopting these expectations based on a business strategy that ultimately yields economic gains with social implications has the opposite effect. The social components of sustainable development are given far less attention in current research, even though notions of sustainability and corporate social responsibility have been growing over recent periods (Florea et al., 2013). So far, there is no consensus on how to fully integrate human resource management (HRM) into a corporate sustainability

framework and achieve sustainable development goals. Organizations should protect the rights and privacy of their workers if they want to foster positive relationships with them.

Even though HRM is essential to a company's performance, the typical strategy is to exploit its employees (Thom and Zaugg, 2004), which is counterproductive. The adoption of SRHRM is directed toward counteracting this undesirable trend. Human resource management with a focus on promoting social equality and other aspects of social responsibility in business makes up SRHRM (Gond et al., 2011). The concept of corporate social responsibility (CSR) (Carroll, 2016) means that a company acts responsibly toward its social, legal, economic, ethical, and charitable stakeholders. The World Bank's definition of CSR emphasizes the connection between SRHRM and sustainable growth: "CSR is the commitment of businesses to contribute to sustainable development, improving the quality of life, and thus to business and social development through cooperation between workers, families, local communities, and society" (Szumiak-Samolej, 2013). Equally important but not adequate is the idea of labor law in SRHRM, as Cohen et al. (2012) highlight. This research will construct a comprehensive framework for analyzing how SRHRM, in its composite form of legal compliance, employee orientation, and CSR facilitation of HRM, encourages organizations in a variety of contexts to take on a wide range of sustainability initiatives to add to their organizational sustainability issues.

Several studies (Barrena et al., 2017; Shen & Zhang, 2017; Shen & Benson, 2016; Newman et al., 2016) highlight the importance of socially responsible policies and processes for employees. Furthermore, SRHRM advocates for CSR programs to guarantee short- and long-term success (Shen & Benson, 2016). As was indicated previously, Shen and Benson (2016) showed SRHRM to be positively correlated with worker commitment to the firm and suggested that SRHRM is an integral aspect of CSR initiatives. This idea is a driving force in the field of corporate ethics research and a bridge between the fields of human resource management and CSR (Nie et al., 2018). It has been observed that SRHRM has a direct effect on the competitiveness or sustainability (EnS, SS, and ES) of an organization (Sancho et al., 2018; Uddin et al., 2020). Considering the existing research highlighting the importance of SRHRM (Shen & Zhu, 2011; Gahlawat & Kundu, 2018; Uddin et al., 2020), this research focused on SRHRM as a synthesis of legal requirements, staff orientation, and CSR guidance in HRM. Finally, SRHRM provided evidence that an organization was sustainable from an ecological, social, and economic point of view. Consistent with previous research, it has been demonstrated that SRHRM has a favorable influence on organizational sustainability (EnS, SS, and ES). As a result, these hypotheses were put forth:

H1a: *SRHRM has a significant positive impact on EnS.*
H1b: *SRHRM has a significant positive impact on SS.*
H1c: *SRHRM has a significant positive impact on ES.*

2.3 Socially Responsible Human Resource Management and Voluntary Green Behavior

The correlation between SRHRM and VGB illustrates how HRM policies and programs can motivate workers to take ecologically sound actions on the job. Ethical concerns, social responsibility, and sustainability principles are all incorporated into HRM practices and policies to form SRHRM. Employees who go beyond their legal requirements to protect environmental issues are said to be employees of VGB. Recent studies have supported the following connections between SRHRM and VGB: Global agencies are actively working to improve environmental responsibility and their management in response to rising community distress around the enduring effects of climate change and environmental deprivation, alongside the challenges of economic profitability and development (Aguinis & Glavas, 2012). Activities or behaviors compatible with environmental protection are also known as green behaviors (Andersson et al., 2013), and they are increasingly the focus of attention from organizations and management researchers (Rahman et al., 2022; Renwick et al., 2013; Andersson et al., 2013). Although scholars have studied VGBs in non-work contexts, management scholars have only recently begun to investigate the development of VGBs in the workplace.

The rapid rise in industrial pollution and the decrease in natural resources have led governments, non-government organizations, green organizations, patrons, contestants, consumers, workers, and the community to force organizations to use green practices largely. Where these practices can help a group develop, make money, and put in place an environmental initiative (El-Kassar and Singh, 2019). This study allows us to learn more about the effects of SRHRM on employees, including the social and psychological processes that lead to VGB. A company's workers are more likely to act well at work if the company's internal CSR activities are effectively managed. Which gives the organization an edge over others and helps it stay in business. It also helps the organization reach its green goals in the future (Paillé and Raineri, 2015). Studies have shown that employee behavior is affected by CSR activities. This is because active participation in initiatives related to SRHRM makes employees seem more trustworthy (Shen et al., 2016). Therefore, SRHRM has equally a straight and a secondary influence on VGB's ability to keep the organization advancing. So far, the reasons backing the assertion that SRHRM has a favorable effect on VGB. Consequently, we come up with the following hypothesis:

H2: *SRHRM has a significant positive impact on VGB.*

2.4 Voluntary Green Behavior and Organizational Sustainability

Environmental initiatives often depend upon employee behavior; consequently, it is now crucial for organizations to maintain their workforce's green behavior to reduce the adverse impacts of environmental degradation. This kind of green behavior among workers is associated with pro-environmental behavior or voluntary green behavior (VGB). According to Paillé et al. (2016), the VGB of employees encourages collaboration in contributing to the cause of environmental sustainability. Employees may also endeavor to exceed the organization's environmental requirements. Consequently, the research has already defined VGB as a link between individual initiatives that exceed the expectations of the organization. This involves the organization, influencing, lobbying, and promotion of environmental policies and initiatives, as well as the pursuit of environmental objectives. The idea of voluntary green behavior is meticulously associated with the concepts of environmental sustainability and corporate citizenship (Organ, 1997), which indicate acts that encourage the organizational, social, and psychological environment in which task performance occurs. However, VGB significantly influences organizational competitiveness or sustainability (Uddin et al., 2020), so encouraging employee participation in environmentally friendly practices is crucial (Robertson and Barling, 2017). A similar body of research (Iqbal et al., 2018) concludes that an organization's sustainability impact can be maximized if its personnel prioritize green behavior. Linking employee job satisfaction with voluntary workplace green behavior has been shown to increase the practical benefits of environmentally sustainable organizations (Kim et al., 2018; Kim et al., 2017), and research shows that this is the case (Iqbal et al., 2018). Xiao et al. (2020) also found a favorable connection between organizational fit and VGB. Research shows that VGB (extra-role behavior) is much more effective at preventing environmental degradation than existing laws (Das et al., 2019; Liu, Teng, & Han, 2020). As a result, it has recently emerged as a focal point of study in the field of organizational study (Chaudhary, 2019; Kim et al., 2018; Iqbal et al., 2018; Kim et al., 2017; Paillé et al., 2016). Even though other organizational studies (e.g., Xiao et al., 2020; Chaudhary, 2019; Iqbal et al., 2018; Kim et al., 2018; Kim et al., 2017; Paillé et al., 2016; Paillé et al., 2014) have focused on voluntary green behavior, nothing yet has been done on pharmaceutical companies.

VGB substantially influences organizational sustainability standards, as it is influenced by SRHRM. Therefore, the research takes into account the favorable influence of VGB on organizational sustainability (EnS, SS, and ES). Employees practice eco-friendly behaviors, including reusing materials and recycling waste, and they suggest more eco-friendly initiatives to upper management and an environmental committee. To increase their company's environmental efficiency and act in environmentally and socially responsible ways to secure their company's long-term financial health (Kim et al., 2017; Bissing-Olson et al., 2013; Xiao et al., 2020). Organizational sustainability was finally secured from EnS, SS, and ES viewpoints owing to the preserving, reusing, and participating nature of VGB. The following hypotheses were generated using the aforementioned literature as a basis for their reasoning:

H3a: *VGB has a significant positive impact on EnS.*
H3b: *VGB has a significant positive impact on SS.*
H3c: *VGB has a significant positive impact on ES.*

2.5 Socially Responsible Human Resource Management, Voluntary Green Behavior, and Organizational Sustainability

This investigation uses real-world data to show how important VGB is for understanding the link between SRHRM and organizational sustainability. VGB, therefore, serves as a facilitator (indirect effect) in SRHRM and organizational sustainability. The evidence, both practical and conceptual, implies that organizations that embrace and execute initiatives that are socially responsible, such as SRHRM, tend to improve their organizational sustainability (Rahman et al., 2022a; Rahman et al., 2023). Environmental and social interaction between companies and their employees, communities, and other partners is crucial to the effective execution of SRHRM, as stated by Rahman et al. (2022a). As organizations engage their VGB in the implementation of SRHRM, their EnS, SS, and ES will improve, as illustrated in Fig. 1 of the research model.

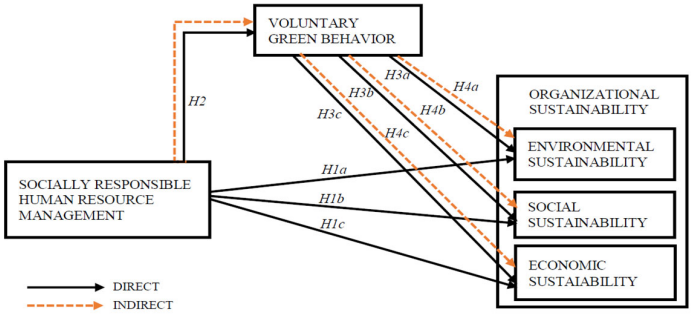

Fig. 1. The Research Model

Note (S): Dependent Variable = Organizational Sustainability (Environmental Sustainability, Social Sustainability, Economic Sustainability)

Independent Variable = Socially Responsible Human Resource Management, Mediating Variable = Voluntary Green Behavior

Consequently, SRHRM influences the sustainability performance of organizations by fostering synergistic relationships with VGB. Subsequently, we put forward the hypotheses listed below:

H4a. *VGB mediates the relations between SRHRM and EnS.*
H4b. *VGB mediates the relations between SRHRM and SS.*
H4c. *VGB mediates the relations between SRHRM and ES.*

3. Methodology of the Study

3.1 Research Design, Sample, and Data Collection

Due to the quantitative and predicted nature of the study, an explanatory research design was required. The exploratory approach was utilized predominantly because it enabled the researchers to explain and demonstrate an obvious causal connection between exogenous and latent variables that are endogenous (Zikmund et al., 2012). We initially approached 164 registered pharmaceutical manufacturing organizations selected from the list of directorate generals of drug administration in Bangladesh via personal visits by research associates, phone calls, and emails to determine their interest in participating in the study. After approximately three weeks of waiting, only 141 pharmaceutical companies agreed to participate in the study. Following the creation of a cover letter outlining the research's objectives, a formal questionnaire was developed to collect the necessary data. The author, with the assistance of research associates, distributed the survey questionnaires to interested pharmaceutical manufacturing organizations. While delivering the questionnaires, the organizations were informed that research associates would visit them within a time interval of 15 days so that the questionnaires could be completed without bias. Initial pilot testing of the questionnaire was conducted with 30 pharmaceutical manufacturing organizations. The results of the pilot testing of the questionnaires improved their validity, clarity, and overall quality. To allow ample time for respondents to complete the questionnaires, a three-month timeframe from January 2023 to March 2023 was provided. During the three months, non-responders were reminded via research associate visits and follow-up phone calls. In the end, however, 100 authentic questionnaires were received, representing a response rate of 70.93 percent. According to Baruch and Holtom (2008), a response rate of 35.5% is adequate for statistical analysis.

Table 1
Information Relating to the Demography

Variables	Options	Frequencies	Percentage (%)
Number of years in business	1 – 10 years	14	14
	11 – 20 years	32	32
	21 – 30 years	29	29
	31 – 40 years	17	17
	More than 40 years	8	8
Size of organization	Less than 100 employees	7	7
	101 – 500 employees	36	36
	501 – 1000 employees	32	32
	1001 – 5000 employees	16	16
	More than 5000 employees	9	9
Type of organization	Traditional organization	14	14
	Hi-tech organization	83	83
	Others	3	3
Experience of respondents	Less than a year	13	13
	1 – 5 years	42	42
	6 – 10 years	34	34
	More than 10 years	11	11
Position of respondents	CEO/Director/Owner/MD	3	3
	General manager	40	40
	HR manager	41	41
	Director Finance	16	16

Table 1 provides a descriptive summary of the demographic characteristics of pharmaceutical manufacturing organizations. Table 1 exhibits that 32% of respondents originated from organizations with 11–20 years in operation, 29% came from organizations with 21–30 years in operation, 17% came from organizations with 31–40 years in operation, 14% came from organizations with 1–10 years in operation, and only 8% came from businesses with more than 40 years in operation. This demonstrates that our sample completely captured the description of all pharmaceutical manufacturing organizations in Bangladesh, from the most recent to the most seasoned. In terms of the size of the organizations, it was noticed that the majority of them had between 100 and 500 people (36 percent), between 501 and 1000 employees (32 percent), and between 1001 and 5000 employees (16 percent). 9 percent of the respondents belonged to companies with more than 5,000 employees, while 7 percent belonged to companies with fewer than 100 employees. According to these findings, our sample successfully captured the description of the entire spectrum of pharmaceutical manufacturing companies within the setting of Bangladesh, from the smallest to the largest of the organizations. When looking at the many types of organizations, it was

discovered that 83% of organizations were high-tech-oriented, 14% were conventional, and just 3% fell into the category of other types. According to the respondents' levels of professional experience, it has been observed that 42% of them have between one and five years of experience, 34% have between six and ten years of experience, 13% have less than one year of experience, and 11% have more than ten years of experience. The majority of respondents (41%) held the job of HR manager, while 40% held the post of general manager, 16% held the position of director of finance, and only 3% held the position of CEO, director, owner, or MD. The respondents' various roles and experiences in the pharmaceutical industry demonstrate that they are knowledgeable industry professionals who might be trusted to provide accurate data for the study. As a result, the respondents assisted the researchers in making well-informed decisions and drawing appropriate conclusions.

3.2 Measurements

In this exploration, the primary instrument for data collection was a questionnaire. The questionnaire was meticulously developed based on a careful analysis of the relevant literature as well as input from industry experts. According to the assessment of the relevant literature, all latent variable indicators were collected and derived from prior research that had already been validated. All of the constructs were measured with a total of 33 indicators (SRHRM = 12 items, VGB = 8 items, EnS = 4 items, SS = 5 items, and ES = 4 items). The measures were selected and adjusted to suit the pharmaceutical manufacturing organizations in Bangladesh. As shown in Table 2, all latent variables were evaluated on a five-point Likert scale that extended from 1 (strongly disagree) to 5 (strongly agree).

Table 2
Measurement Items

Items		Source
Socially Responsible Human Resource Management		
SRHRM1:	My firm ensures equal opportunity in HRM	Shen and Zhu (2011), Newman et al. (2015), Shen and Benson (2016), and Gahlawat and Kundu (2018)
SRHRM2:	Employees in my firm are paid above minimum wages and based on their performance	
SRHRM3:	Working hours in my firm do not exceed the maximum that the labor law permits	
SRHRM4:	My firm does not employ child labor or forced labor	
SRHRM5:	My firm has clear and detailed regulations on occupational health and safety	
SRHRM6:	My firm adopts flexible working hours and employment programs to achieve work-life balance	
SRHRM7:	Employees participate in decisions making and total quality management	
SRHRM8:	Unions can represent and protect workers' rights and can be involved in determining labor terms	
SRHRM9:	My firm provides adequate training and development opportunities to employees	
SRHRM10:	My firm appoints adequate staff to implement general CSR initiatives	
SRHRM11:	My firm rewards employees who contribute to charity, communities, and other CSR activities	
SRHRM112:	My firm gives priority in employment to candidates who are in difficulty and who are local	
Voluntary Green Behavior		
VGB1:	Employees print double-sided whenever possible and allow reuse discarded papers to write a memo or notes and messages when they work in the office	Robertson and Barling (2013), Kim et al. (2017), Bissing-Olson et al. (2013), and Xiao et al. (2020)
VGB2:	Employees put compostable items in the compost bin	
VGB3:	Employees turn lights off when not in use	
VGB4:	Employees put recyclable material (e.g. cans, paper, bottles, and batteries) in the recycling bins	
VGB5:	Employees bring reusable eating utensils to work (e.g. travel coffee mugs, water bottles, reusable containers, reusable cutlery)	
VGB6:	Employees participate in environmentally friendly programs (e.g. bike/walk to work day, bring your local lunch day)	
VGB7:	Employees make suggestions about environmentally friendly practices to managers and/or environmental committees, to increase my organization's environmental performance	

	VGB8: Employees take the initiative to act in environmentally-friendly ways at work	
Organizational Sustainability		
Environmental Sustainability		
	EnS1: Direct and indirect toxic emissions and waste are reduced	Longoni et al. (2018), Rawashdeh (2018), Mousa and Othman (2019), Al Kerdawy (2018), Paillé et al. (2014), Abdullah et al. (2015), and Zaid et al. (2018a)
	EnS2: Increase the rate of purchase of environmentally friendly goods and the volume of recycled materials	
	EnS3: Increase activities that protect our natural environment such as the presence of green areas in the institution	
	EnS4: Reduced the risk of environmental accidents such as medical waste leakage, poisoning, or radiation emissions	
Social Sustainability		
	SS1: Increase attention to the rules for the health and safety of employees, especially when using hazardous materials and radiation	
	SS2: Improving community health and safety, and infection control	
	SS3: Reducing the impact of the organization's waste on the community	
	SS4: Improving the quality of products produced, and commitment to the code of ethics	
	SS5: Develop and design better service and participation of staff initiatives in management decisions	
Economic Sustainability		
	ES1: Growth in the organization's profits, in general, is due to energy consumption and materials reduction	
	ES2: Rise in the market share of the enterprise and improve the reputation of the organization	
	ES3: Reduce the cost of energy use	
	ES4: Reduce processing fees and waste disposal	

3.3 The Analytic Instrument

Partial least squares structural equation modeling (PLS-SEM) with SmartPLS version 4 was used to carry out the statistical analysis for the study. One of the most popular and commonly used techniques for statistical analysis in business studies is partial least squares structural equation modeling (PLS-SEM) (Salem et al., 2023; Sarstedt et al., 2020). Since PLS-SEM is well suited for investigating sophisticated estimations of correlations, the technique has experienced extensive use. Researchers have argued that PLS-SEM is the best predictive analytical tool for explanatory studies like this one (Hair et al., 2017; Bodoff and Ho, 2016) since it evaluates how well one part of the framework estimates the outcomes of the remaining parts of the research framework. PLS-SEM is widely recognized as more robust than alternative covariance-based analytical approaches for managing reflective (as in this study) and formative models.

3.4 Common Method Bias

The common method of bias testing is a type of exploratory factor analysis (EFA) that examines all of the variables that were observed when a single factor explains a value equal to or higher than 50%, which is almost all of the collected variance within measures (Podsakoff et al., 2003). If a common method bias exists, then the single factor explains the majority of the cumulative variance among measures. Harman's one-factor test (Herman, 1976) was used to verify the absence of common method bias. In this study, the variables were subjected to EFA, which demonstrated that the initial extracted component accounted for 44.241% of the variance. This is less than the 50% threshold. Therefore, it is reasonable and sufficient to conclude that this investigation does not contain common-method bias.

4. The Findings and Analysis

4.1 The Reflective Measurement Model

It was required to confirm that our reflective model was both valid and dependable before going on to the testing phase of the work and putting the study's hypotheses to the test. After that, the reflective model was evaluated for its construct reliability (using Cronbach's alpha and composite reliability), convergent validity (using average variance extracted [AVE]), indicator reliability, and discriminant validity (using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio [HTMT], respectively). The results of these analyses were presented as follows:

4.1.1 Construct Reliability and Convergent Validity

Cronbach's Alpha and Composite Reliability: Cronbach's alpha and composite reliability were computed to ascertain the construct's trustworthiness. Cronbach's alpha is expected to be over 0.7, while the composite reliability should be above 0.6 (Hair et al., 2019; Sarstedt et al., 2017). Cronbach's alpha and the composite dependability value are both higher than the 0.7 and 0.6 thresholds, respectively, as shown in Table 3. Since no issues with convergent validity or reliability have been found, these findings confirm the validity and dependability of the reflective model.

Convergent Validity. Convergent validity, which is a measure of the degree to which various indicators of the same construct are positively connected, was examined. AVE is an often-utilized criterion that is used to measure the convergent validity of a reflective model. The AVE values, according to Benitez et al. (2020), indicate the extent of the difference between the measurements of the latent variable that may be responsible. Hair et al. (2019) said that an AVE value of more than 0.5 would be a strong indication of convergent validity. A close examination of Table 3 reveals that the AVE values exceeded the 0.5 thresholds (they ranged from 0.589 to 0.627). This indicates that the latent variables that accompany the indicators explain more than half of the variation in the indicators. This demonstrates that the study achieves convergent validity.

Indicator Reliability. The reliability of indicators was assessed using factor loading estimations. Due to the standardization of factor loading values in PLS-SEM, the anticipated indicator reliability is equal to the squared factor loading estimation. Benitez et al. (2020) advised factor loadings to be greater than 0.707, which denotes that the associated latent variable can account for more than 50% of the variance in a single indicator. Nevertheless, Hair et al. (2019) argued that estimations of factor loading exceeding 0.70 are close enough to 0.707 to constitute a sufficient threshold. This study contains three-factor loading items with values of 0.681, 0.696, and 0.699 that do not initially satisfy the factor loading threshold. Therefore, these items were removed from the model with care, but their removal does not increase the composite reliability but rather a slight decrease in the composite reliability values. With the rest of the reflective model's factor loadings exceeding the 0.70 thresholds, we retain these reflective indicators (Hair et al., 2019). Consequently, Table 3 displays the estimated factor loadings for all 33 items of the reflective model.

Table 3
Construct Reliability, Convergent Validity, and Indicator Reliability

Constructs	Factor loadings	Cronbach's alpha	Composite reliability	Average variance extracted AVE
Economic Sustainability				
ES1	0.774	0.788	0.791	0.610
ES2	0.807			
ES3	0.787			
ES4	0.756			
Environmental Sustainability				
EnS1	0.818	0.771	0.795	0.589
EnS2	0.788			
EnS3	0.681			
EnS4	0.775			
Social Sustainability				
SS1	0.771	0.851	0.856	0.627
SS2	0.812			
SS3	0.825			
SS4	0.801			
SS5	0.747			
Socially Responsible HRM				
SRHRM1	0.788	0.941	0.942	0.609
SRHRM10	0.790			
SRHRM11	0.789			
SRHRM12	0.701			
SRHRM2	0.745			
SRHRM3	0.809			
SRHRM4	0.830			
SRHRM5	0.831			
SRHRM6	0.806			
SRHRM7	0.779			
SRHRM8	0.696			
SRHRM9	0.785			
Voluntary Green Behavior				
VGB1	0.714	0.899	0.907	0.589
VGB2	0.701			
VGB3	0.714			
VGB4	0.699			
VGB5	0.805			
VGB6	0.843			
VGB7	0.802			
VGB8	0.846			

4.1.2 Discriminant Validity

The extent to which one construct in the reflective model differs from every other construct is defined by its discriminant validity. To ensure discriminant validity, our analysis considered the Fornell-Larcker criterion and the HTMT ratio. The square root of the AVE values is compared to the correlations of the latent constructs using the Fornell-Larcker criterion. The results of this investigation meet the Fornell-Larcker criterion, as shown in Table 4. The HTMT ratio values should be less than 0.85 (typically considered a strict requirement), 0.90 (a substantially more tolerant criterion), or significantly less than 1 in a correctly fitted reflective model (Benitez et al., 2020). A thorough investigation of Table 5 reveals that the values of the HTMT ratio were lower than the allowed range. Consequently, our reflective model has discriminant validity since it corresponds to all discriminant validity criteria.

Table 4
The Fornell–Larcker Criterion

Constructs	ES	EnS	SS	SRHRM	VGB
ES	0.781				
EnS	0.484	0.787			
SS	0.505	0.775	0.792		
SRHRM	0.434	0.669	0.723	0.842	
VGB	0.369	0.754	0.671	0.831	0.768

Table 5
The Heterotrait–Monotrait Ratio (HTMT)

Constructs	ES	EnS	SS	SRHRM	VGB
ES					
EnS	0.605				
SS	0.609	0.945			
SRHRM	0.384	0.757	0.657		
VGB	0.424	0.866	0.752	0.908	

4.2 The Structural Model

4.2.1 Predictive accuracy (R^2) and predictive relevance (Q^2)

The R-square (R^2) and Stone-Geisser's Q-square (Q^2) values, respectively, were utilized to evaluate the prediction accuracy and predictive significance of the model. The R^2 values explain how the endogenous latent variable is influenced by the exogenous latent variables in combination. Based on the results of Table 6, SRHRM and VGB were able to explain 57.4% of the variation in EnS. In a similar vein, SRHRM and VGB were able to account for 45.4% of the total variance in SS. In addition, SRHRM and VGB each explained 13.9% of the variance in ES. In conclusion, SRHRM was able to account for 69.1% of the variance in VGB. As was previously noted, the predictive usefulness of our reflective model was evaluated based on the Q^2 values. Generally speaking, Q^2 values that are lower than 0 indicate that the reflective model does not have any predictive relevance for the endogenous latent variables. If, on the other hand, the Q^2 values are greater than zero, this is evidence that the reflecting model has a significant value for prediction. Table 6 shows that all of the Q2 values in the reflective model are greater than 0, indicating that they have predictive relevance for all of the exogenous latent variables included in the study.

Table 6
Predictive Accuracy (R^2) and Predictive Relevance (Q^2)

Constructs	R square	Q square
EnS	0.574	0.345
SS	0.454	0.272
ES	0.139	0.084
VGB	0.691	0.415

4.2.2 The Effect Size

To establish whether or not the exogenous latent variables had made a significant contribution to the corresponding endogenous variables, the values of the f-square were estimated and compared against each other. According to the findings of Benitez et al. (2020), the f^2 values could range anywhere from 0.02 to 0.150, 0.150 to 0.350, or larger or equal to 0.350, with each of these ranges indicating a different level of effect size: small, medium, or high. In light of this, a look at Table 7 reveals that SRHRM is a powerful predictor of VGB ($f^2 = 2.231$). However, socially responsible HRM is only a small predictor of EnS ($f^2 = 0.027$), SS ($f^2 = 0.029$), and ES ($f^2 = 0.024$). It was shown that VGB exerted a moderate influence on both EnS and SS with f^2 values of 0.298 and 0.199, respectively. On the other hand, it was demonstrated that VGB had only a small influence on ES ($f^2 = 0.074$).

Table 7
The Effect Size

Latent variable	*f*-square
SRHRM → ES	0.024
SRHRM → EnS	0.027
SRHRM → SS	0.029
SRHRM → VGB	2.231
VGB → ES	0.074
VGB → EnS	0.298
VGB → SS	0.199

4.2.3 Estimating Path Coefficients and Testing Hypotheses

Calculating the reflective model's path coefficient allowed researchers to assess the study's hypotheses. The beta coefficient values, t-statistics, and p-values, which reflect whether or not the proposed study hypotheses have been approved or denied, are presented in Table 8. Importantly, p-values less than 0.05 indicate that the research hypotheses were deemed significant. The results of the study confirmed all hypotheses, as shown in Table 8. As evidence, hypothesis H1a, which proposed that SRHRM has a considerable positive influence on EnS, was demonstrated to be correct (β = 0.669, t =9.785, p-value = 0.000). This finding is in line with the findings of earlier studies (Sancho et al., 2018; Uddin et al., 2020), which revealed that manufacturing organizations that effectively implement SRHRM achieve greater environmental success and boost the EnS of organizations and competitiveness. The current result indicates that organizations can be convinced to investing in SRHRM will lead to substantial positive environmental impacts for their long-term sustainability. Consequently, it might be worthwhile to draw attention to the fact that companies should anticipate long-term financial returns from SRHRM rather than immediate monetary benefits. Because of the reality that organizations incur instant or near-term expenses when pursuing SRHRM, it will take a reasonable amount of time to recover these expenses before reaping financial rewards.

In addition, H1b, which suggested that SRHRM has a significant positive impact on SS, was confirmed (β = 0.593, t = 8.444, p-value = 0.000). The results also supported hypothesis H1c, which stated that SRHRM has a substantial positive impact on ES (β = 0.334, t = 2.717, p = 0.007). These results are consistent with those of Sancho et al., (2018) and Uddin et al., (2020), who concluded that SRHRM positively and significantly influences organizational competitiveness or sustainability SS and ES, and with those of Bombiak and Marciniuk-Kluska, (2019), who noted that manufacturers that apply SRHRM are more likely to enjoy a win-win-win situation among employees, society, and the organization. Which ultimately results in enhancing organizational sustainability from an environmental, social, and economic viewpoint. The findings demonstrate that companies implementing SRHRM can enhance their environmental and social outcomes. Cleaner production and optimized manufacturing processes are two examples of how SRHRM can benefit both the environment and the well-being of an organization's and a community's residents. The fact that organizations are adopting SRHRM in reaction to pressure coming from beneficiaries (employees, society, and ecological authorities) to mitigate the adverse impacts of their actions on both communities and the environment may also be a factor. Noting that SRHRM has substantial and beneficial impacts on all three dimensions of organizational sustainability (EnS, SS, and ES), the beta-coefficient value for the effect of SRHRM on EnS is the highest, which indicates that the effect of SRHRM on EnS has the greatest impact.

Moreover, there was substantial evidence for H2, which hypothesized that SRHRM had a highly significant beneficial effect on VGB and was strongly supported (β = 0.831, t =21.185, p-value = 0.000). This finding suggests that organizations committed to sustainability goals will prioritize efforts to foster synergistic relationships with their workforce, community, and natural environment. VGB is a highly influential instrument that accelerates ecologically and socially responsive behaviors; therefore, it makes sense that companies with environmentally conscious workers would want to see more combined initiatives. In addition, the findings imply that organizations are more likely to seek out collaborative networks based on social, ecological, and employee-oriented human resource management practices when they respond to environmental, social, and economic sustainability challenges by adopting SRHRM.

Table 8
Path Coefficient (direct effect)

Hypotheses	Path	Beta coefficient	t-statistics	p-values	Supported
H1a	SRHRM → EnS	0.669	9.785	0.000	Yes
H1b	SRHRM → SS	0.593	8.444	0.000	Yes
H1c	SRHRM → ES	0.308	2.383	0.009	Yes
H2	SRHRM → VGB	0.831	21.185	0.000	Yes
H3a	VGB → EnS	0.641	4.134	0.000	Yes
H3b	VGB → SS	0.576	4.308	0.000	Yes
H3c	VGB → ES	0.441	2.382	0.009	Yes

Furthermore, H3a was confirmed (β = 0.641, t = 4.134, p-value = 0.000), indicating that VGB has a significant positive impact on EnS. This confirms the findings of (Iqbal et al., 2018; Liu et al., 2023), who found that pro-environmental behavior in the workplace has a positive impact on environmental sustainability (EnS). This indicates that firms can improve their knowledge of environmental issues and the likelihood of implementing green behavior practices that boost EnS by encouraging effective collaboration and significant eco-oriented voluntary green behavior among employees. The data assessment also confirmed H3b (β = 0.576, t = 4.308, p-value = 0.000), which stated that VGB has a significant positive impact on SS. This outcome may be attributable to companies progressively recognizing VGB as a crucial component for boosting their SS to improve the lives of their workers and the neighborhoods where they operate. This leads to a significant theoretical finding that has been overlooked nonetheless, as seen in Fig. 2.

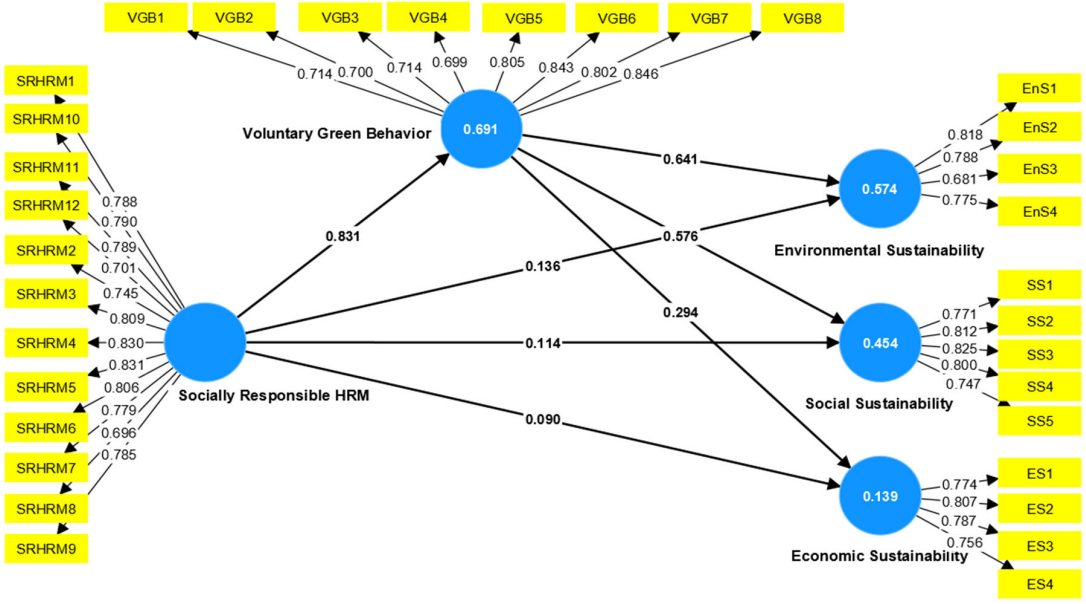

Fig. 2. The Structural Model

Similarly, H3c was supported (β = 0.441, t = 2.282, p = 0.009), which stated that VGB has a significant positive impact on ES. This finding is consistent with that of (Iqbal et al., 2018; Liu et al., 2023) who identified pro-environmental behavior in the workplace as a key enabler of EnS and financial performance. This result indicates that establishing an effective complementary link with eco-oriented employee VGB is an essential facilitator for achieving economic benefits. Effectively incorporating ecologically conscious employees into VGB enables organizations to improve the efficiency of their operations and manufacture a high standard of environmentally friendly goods, thereby satisfying customers' environmental demands. The effective relationship between employee VGB and environmental concern is likely to generate greater economic benefits as a result of consumers' environmental and social requirements being met.

4.3 The Mediation Analysis

The results of the study's mediation analysis are presented in Table 9. The mediation analysis demonstrates how much the indirect effect of VGB changed the hypothetical straight path of socially responsible HRM and organizational sustainability. In this study, VGB was deemed to explain the relationship between SRHRM and organizational sustainability (EnS, SS, and ES). The mediation effect was determined by contrasting the directions and significance levels of the specific indirect and direct paths. Zhao et al. (2010) have validated this method for conducting mediation analysis. The analysis of the data supports hypothesis H4a that VGB mediates the relationship between SRHRM and EnS as the results are β = 0.532, t = 4.065, p-value = 0.000. Consequently, VGB serves as a complementary, partial mediator between SRHRM and EnS. In addition, the data validated the H4b hypothesis, which states that VGB serves as a mediator in the association between SRHRM and SS (β = 0.472, t = 4.157, p = 0.000). Thus, the results demonstrate that VGB also acts as a partially complementary mediator between SRHRM and SS. Finally, the findings of this study support hypothesis H4c, which states that VGB mediates the association between SRHRM and ES (β = 0.363, t = 2.323, p-value = 0.002). Therefore, we found that VGB acts as a partial mediator between SRHRM and ES in a complementary way.

Table 9
The Analysis of Mediation (indirect effect))

Hypotheses	Path	Beta coefficient	t-statistics	p-values	Supported
H4a	SRHRM → VGB→ EnS	0.532	4.065	0.000	Yes
H4b	SRHRM → VGB → SS	0.479	4.157	0.000	Yes
H4c	SRHRM → VGB → ES	0.363	2.323	0.002	Yes

5. Implications of the Study

The findings have important theoretical and practical implications for the management of pharmaceutical organizations and policymakers alike. From a theoretical point of view, this study contributes to the body of knowledge by establishing a framework to examine both direct and indirect impacts of SRHRM, VGB, and organizational sustainability considerations (EnS, EnS, and SS) from the perspective of a developing nation. From the viewpoint of management, this study offers strategic guidance for pharmaceutical manufacturing organization management. Based on the findings of this study, pharmaceutical manufacturing organizations in Bangladesh and similar environments can recognize the significance of SRHRM as a socially responsible effort for a strategic plan aimed at improving all three of their bottom lines (EnS, SS, and ES). The study also reveals the indirect function that VGB plays between SRHRM and organizational sustainability. This has significant implications for pharmaceutical manufacturing organization management in Bangladesh and other Southeast Asian contexts. To accomplish their organizational sustainability objectives, the management of pharmaceutical organizations has better reasons for investing in SRHRM if they simultaneously establish strong connections with eco-friendly voluntary green behavior. For instance, Bangladeshi firms that invest in SRHRM may develop solid ties with eco-oriented voluntary green behavior by considering the design of socially responsible practices at the initial phase of their development. From this viewpoint, buyers may offer organizations the environmental and social attributes of goods they would desire to purchase and traders can use additional socially, environmentally responsible ingredients, and promotional materials that reflect social and environmental issues to satisfy producers' sustainability objectives. However, Bangladeshi firms have the potential to move in the correct direction in terms of SRHRM investment by ensuring their employees' voluntary green behavior, which is mutually beneficial and founded on mutual respect, loyalty, and reliability. Moreover, investments in SRHRM can be improved through long-term collaboration and voluntary green behavior. A long-term collective effort will make sure that both firms and the community understand each other, get their money back for the original costs of working together, and share control over operations. Environmental protection-based, long-term collaboration can become a virtuous cycle. From the perspective of policymakers, particularly the government and other environmental regulatory authorities, the results offer an incentive for implementing current policies as well as drafting particular national regulations that will support and exert pressure on the voluntary green behavior of Bangladeshi pharmaceutical manufacturing organizations to implement SRHRM in the pharmaceutical industry. This is especially essential considering that the socially responsible concept is still in its infancy throughout the nation's pharmaceutical industry.

6. Conclusions

Empirical evidence demonstrates that SRHRM has a substantial positive impact on organizational sustainability (EnS, SS, and ES). However, it indicates that SRHRM not only benefits businesses financially but also advances environmental progress and enhances the standard of living for those involved in an organization and the surrounding community. Moreover, the outcomes demonstrate that SRHRM has a substantial positive effect on VGB. In addition, the results of the analysis and examination revealed that VGB has a considerable positive impact on organizational sustainability (EnS, SS, and ES). Furthermore, the mediation analysis demonstrates that VGB provides an explanatory linkage to the role of mediator between SRHRM and organizational sustainability. Thus, the study found that VGB has an indirect effect, indicating that the influence of SRHRM on organizational sustainability (EnS, SS, and ES) is not only direct but also affected by VGB.

7. Limitations and Future Research Direction

This study, like other studies, contains several deficiencies that can serve as a desirable impetus for conducting future research. First, it is quite difficult to generalize the findings because the sample of the study was mostly made up of pharmaceutical manufacturing organizations in Bangladesh, and the sample size was relatively small. Thus, future research can be conducted on a global scale with a large sample size. Since the research was mainly conducted in Bangladesh, our findings require replication in other developing nations, particularly those in Southeast Asia. Consequentially, a global investigation could improve the generalizability of our findings while offering further inspiration for thinking. The use of data from a cross-sectional investigation is also a limitation of this study. Therefore, future researchers may focus on longitudinal studies that can analyze the evolution of knowledge over time. In addition, this study suggests that future researchers evaluate the model's acceptability in the pharmaceutical organizations of other developing and developed nations. Furthermore, this study only considered the pharmaceutical management perspective. In light of this limitation, it is difficult to generalize the research findings to all levels of pharmaceutical organizations. Therefore, the study recommends that future research concentrate on all categories of employees in similar organizations. Furthermore, this study focused on VGB as a mediator between SRHRM and the organizational sustainability of pharmaceutical manufacturing organizations. Future

research can investigate whether innovative behavior (IB) moderates the adoption of SRHRM. Lastly, while this research examined SRHRM as an independent variable and measured it from a holistic perspective, other studies can examine each of SRHRM's three dimensions separately.

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