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Green Innovation as a Mediator between Green Human Resource Management Practices and Sustainable Performance in Palestinian Manufacturing Industries

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Abstract: Green human resources management (GHRM) is a critical research issue that has emerged in recent decades. This study aims to investigate the effect of GHRM practices on sustainable performance, with green innovation as a mediating variable, in manufacturing firms in Palestine. To this end, a research model was developed, and a self-administered questionnaire was designed and distributed to a random sample of top management personnel in manufacturing firms in Palestine. The research model was assessed via the partial least squares structural equation modeling (PLS-SEM) using the Smart-PLS software, based on a sample of 58 responses. The model revealed that GHRM practices, green innovation, and sustainable performance are implemented at a moderate level. Moreover, the results confirmed that GHRM practices and green innovation have significant positive effects on sustainable performance. GHRM practices also positively and significantly affect green innovation. Green innovation partially mediates the relation between GHRM practices and sustainable performance. The results of this research present a conceptual framework and a guideline for policymakers in manufacturing firms on how to use GHRM practices to strengthen employees' commitment to the environment in order to maximize sustainable performance. Furthermore, the study provides a holistic view of GHRM practices, green innovation, and sustainable performance; such a perspective is considered a foundation for future research directions and provides empirical evidence about the relationships between these variables.

Keywords: green human resources management (GHRM); green innovation; sustainable performance; partial least squares structural equation modeling (PLS-SEM); manufacturing sector

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1. Introduction

In recent years, sustainability issues have become a pressing concern for organizations and institutions around the world. The use of the term "sustainability development" first appeared in the World Conservation Strategy report of the International Union for the Conservation of Nature and Natural Resources [1]. It subsequently came to the fore in the Brundtland report in 1987, where it was used to refer to development that enables

people to achieve their present needs, without affecting the ability of future generations to meet their needs [2]. Moreover, Ben Eli [3] identified five core principles of sustainability, which are related to the material, economic, life, social, and spiritual domains. In addition, sustainability was defined as "A dynamic equilibrium in the process of interaction between a population and the carrying capacity of its environment such that the population develops to express its full potential without producing irreversible, adverse effects on the carrying capacity of the environment upon which it depends". In this regard, organizations and firms now seek to upgrade their operations to achieve sustainable performance. Gunasekaran and Subramanian point out that, in today's business environment, in addition to traditional performance objectives such as flexibility, cost, reliability, dependability, quality, and reliability, the need to fulfil social and environmental responsibilities must also be incorporated in business operations decision making. This study also notes that the development of sustainable decision models is intermittent, and it is not always obvious how social and environmental factors can be incorporated in operations management. Departing from conventional operational research models, the primary concern of which is economic feasibility, there is a need to develop sustainable models [4]. From another perspective, meanwhile, industries are now facing counterfeiting issues, which affect supply chain operations. Hence, it is necessary to use new technologies for effective traceability to ensure safe and sustainable supply chain operations. Furthermore, one study recommended the use of innovative technologies and laboratory techniques to guarantee the originality and sustainability of products [5]. Gayialis et al. noted that the supply chain cannot become sustainable without addressing the problem of traceability by recognizing, monitoring, and implementing key processing stages; they also provide a reference model for supply chain traceability [6]. Moreover, Gayialis et al. presented a proposed system for the restriction of counterfeit products; this system can be applied throughout the supply chain, including operations such as production, distribution, and sales. The implementation of such systems is critical to reducing the impact of counterfeited products on businesses, and on consumers, in terms of reduced revenues, economic growth, and consumers' health [7]. Regarding the rapid development of information communication technologies, online sales channels facilitate the sustainable operation of supply chains. Therefore, allocating product portfolios across online and physical channels has an impact on the profits and carbon emissions of the supply chain [8]. All of the trends that exist in today's business environment are geared towards encouraging companies to continuously improve their sustainable performance, in various fields, by adopting innovative methods and improving their departments in order to maintain superiority over other firms.

Elsewhere, John Elkington [9] coined the phrase "triple bottom line" (TBL) and used it as the basis of a sustainability framework used to examine a company's social, environmental, and economic impacts. Meanwhile, in business organizations, "Green human resource management" (GHRM) practice has come to the fore as one of the environmental tools to be used to align human resource management (HRM) activities, such as selection, training, and rewards, with environmental requirements [5,6,10]. The establishment and increasing acceptance of GHRM as an essential human resource management function have invited its association with the concepts of green innovation, sustainability performance, and sustainability development [11]. The terms most commonly used in the literature to describe the notion of green innovation are "green", "eco", "environmental", and "sustainable" [12]. Driessen and Hillebrand [13] noted that green innovation does not necessarily have to be developed with the intent of reducing a firm's environmental burden; however, it must produce significant environmental benefits. Simultaneously, studies on sustainability in HRM activities using the terms GHRM, GI, sustainability performance, and sustainability development have begun to appear and proliferate. For example, Kim et al. [14] note that GHRM enhances the environmental performance of hotels in Thailand through employees' commitment and eco-friendly behavior; they advised HR managers and top management personnel to support the adoption of GHRM policies. Chaudhary [15] also found that GHRM practices including green involvement, green pay and rewards, green

performance management, green training, and green recruitment and selection significantly influenced the green behaviors of employees, and gave evidence of GHRM's ability to generate environmental sustainability in India's automobile sector. Like GHRM practices, green innovation seems to have a positive effect on environmental performance. García-Machado and Martínez-Ávila [16] further reported that green innovation has a positive influence on environmental performance; additionally, they showed that green innovation mediates the relationship between green culture and environmental performance in the Mexican automotive industry. They advise future researchers to replicate their study in other industrial sectors, and even in other countries, with larger sample sizes to strengthen the results. Singh et al. [17] further asserted that GHRM practices indirectly influence environmental performance through green innovation as represented by green products and green process innovation. They conducted a study in small and medium manufacturing enterprises (SMEs) in the United Arab Emirates (UAE) and opened the door for future studies to investigate this relation in other sectors and contexts to bolster the original study's findings. Green innovation can be applied to products, processes, and management and marketing activities in firms or in related technologies, in order to fulfil environmental needs such as energy savings, waste reduction, environmental audits and control systems, and ecologically friendly product labeling. As such, when the GHRM affects employees' awareness in terms of green innovation, sustainable performance is accordingly affected. In other words, when green innovation is the central axis supported by the GHRM practices of an organization in order to boost sustainable results, it will likely be a determining factor as well as a mediating construct. This mediating effect has not been extensively studied, and we believe that no existing research presents comprehensive models that investigate the role of green innovation in enhancing the relation between GHRM practices and sustainable performance, especially in manufacturing firms in Palestine. This means that scientific research is needed to investigate this mediating role in order to bridge the gap in this study area.

In Palestine, a developing region, Masri and Jaaron [18] found that there was a moderate level of implementation of six GHRM practices in manufacturing sectors, and specifically in the chemical, pharmaceutical, and food sectors; these practices were implemented in relation to environmental performance. Similarly, in the service sector, Mousa and Othman [19] found that GHRM practices are also applied on a moderate level, specifically in the healthcare sector. The Palestinian Central Bureau of Statistics (PCBS) asserted the relative importance of transformative industries, including the food industry, which constitute 87.89% of the total industry activities [20]. However, the chemical, pharmaceutical, and food sectors are considered the most polluting manufacturing sectors in Palestine [21]. Hence, it is important to use more environmentally friendly practices to reduce the environmental impact of this sector.

The results of the existing research indicate the important role of GHRM practices in improving sustainable performance in the manufacturing sector in Palestine; a number of studies discuss the impact of some of those practices on environmental performance in particular [13,16]. However, to gain a better understanding of the relationship between GHRM practices and sustainable performance in this important sector, there remains a need for more studies that investigate the potential influence of other moderating or mediating variables. As Palestine is a developing country, there are no studies that investigate the role of green innovation as a mediating variable in manufacturing. Therefore, this research is designed to investigate the role of green innovation in Palestinian manufacturing companies, and specifically in the chemical industry, the pharmaceutical industry, the food industry, and the metal and engineering industry. More specifically, this study aims to address the following two main research questions (RQ):

RQ_1: *How do GHRM practices influence green innovation and sustainable performance in the Palestinian manufacturing sector?*

RQ_2: *Does green innovation mediate the relationship between GHRM practices and sustainable performance in the Palestinian manufacturing sector?*

The significant contributions of this study are as follows. First, the study provides a comprehensive model for the role of GHRM practices on sustainable performance in its environmental, social, and economic dimensions. Second, this research attempts to add green innovation to the nexus between GHRM practices and sustainable performance and examine its mediating role; this is believed to be the first study that addresses this topic in this way in Palestine. Third, by incorporating green innovation, the study offers new findings regarding green innovation, and complements the existing body of knowledge about GHRM practices and sustainable performance in manufacturing firms. Regarding the potential practical contributions, the study provides a road map for decision makers and top management in the manufacturing sector, and encourages them to adopt cleaner production practices, evaluate the current situation found in their organizations, and adopt further green practices. Furthermore, the study also measures the implementation level of green innovation in the manufacturing industries in Palestine. Adherence to environmental practices contributes to reductions in the costs of water and electricity, which can increase the profits of firms and contribute to the enhancement of economic growth. The implementation of green practices is also beneficial in terms of enhancing the health of workers and providing more jobs.

The remainder of this paper is structured as follows. Section 2 presents the theoretical background and a literature review and develops the hypotheses for this study. Section 3 outlines the methodology used. Section 4 presents the data analysis, descriptive statistics, and an assessment of the proposed model. Then it discusses the results obtained and highlights their implications. Finally, Section 5 offers a conclusion, recommendations, limitations, and expected future research directions.

2. Literature Review

2.1. Theoretical Background

Resources and products are closely related, because all products require the usage of resources. For example, human resources constitute a resource for every firm and organization. Wernerfelt [22] studied firms according to their resources, not their products, and argued that looking at a firm in terms of its resources provides different insights than those obtained from the traditional firm's product perspective (the resource-based view) theory known as RBV. In the same vein, Dunford et al. [23] concluded that RBV has a significant and independent effect on strategy and strategic human resource management (SHRM). García-Machado and Martínez-Ávila [16] added that, by using the natural resources that RBV considers, a competitive advantage can be obtained. Sustainability has become an important need in many countries because it is linked to the usage of natural resources such as water and oil. Zhang et al. [24] note that earth is facing a global water crisis and water scarcity is a crucial issue, but unfortunately it has not received enough attention in the past. In Palestine, climate change is expected to lead to a drop in annual levels of rainfall and to temperature rises, which will increase water scarcity, affecting the agricultural sector's productivity, as well as leading to social instability and resulting in increased poverty [25]. Likewise, the use of more electricity produced from nonrenewable sources and carelessness about recycling, which increases waste, also affect the environment. Hence, it is clear that natural resources are interrelated and necessitate sustainable development steps that preserve the environment. Simiarly, Wheelen et al. [26] discussed the use of business practices that might manage TBL; these practices relate to the economic, environmental, and social responsibilities of organizations in terms of long-term sustainability. As in all nascent phenomena, there is no consensus among management researchers and practitioners over the term "sustainability" and its measurement [27]. Therefore, while many studies call for business organizations to adopt the TBL approach for measuring sustainability performance (e.g., Hourneaux et al. [28], Glavič and R. Lukman [29]), other studies criticize the usage of this approach [24,25]; nevertheless, support for the TBL approach is growing [30,31].

Meanwhile, other approaches have begun to emerge; for example, Anwar et al. [32] suggested that, in the GHRM context, the ability, motivation, and opportunity (AMO)

view—which groups HR practices into the three areas of ability, motivation, and opportunity—provides better understanding of greening HRM and business environmental outcomes. Furthermore, the AMO approach is considered by some researchers to be crucial for understanding the effect of HRM on organizational performance (e.g., Benevene and Buonomo [33]). The current literature contains studies that combine the AMO and RBV theories in investigating the influence of GHRM on green innovation and environmental performance [34]; it also contains studies that remain faithful to the original RBV theory in investigating this effect [35]. In this study, we use a new approach by combining the RBV theory, the TBL approach, and the AMO approach as a basis for elucidating the relationships between the relevant research variables.

2.2. Environmental Management

It is argued that organizations that adopt environmental practices institute an environmental management system (EMS) as part of an integrated management system (IMS) to monitor and control environmental issues [36]. An IMS for a socially responsible sustainable organization may be understood as a sustainable organizational development made up of a combination of various management standards. In 1996, the International Organization for Standardization (ISO) adopted a new international standard, ISO 14001, in the field of EMS in order to facilitate trade, diminish the barriers of trade, and foster environmental practices worldwide [37]. Jabbour et al. [38] referred to ISO14001 as the most widely recognized EMS, the adoption of which in organizations has many environmental benefits. Similarly, in the study conducted in 211 manufacturing companies in Pakistan, Ikram et al. [36] noted that the adoption of an EMS by various organizations can improve environmental protection. Furthermore, the performance of companies that have integrated EMS into their IMS was better than that of those companies that did not have an EMS. They concluded that, through EMS, organizations can improve corporate business performance, increase long-term corporate sustainability, and handle economic, social, and environmental issues.

2.3. Human Resource Management (HRM) and Green Human Resource Management (GHRM)

It is suggested that HRM is solely concerned with managing people effectively at work in order to achieve organizational and individual goals [39]. Although there are similarities between personnel management and HRM, personnel management is considered work-force-centered, directed at employees, while HRM is resource-centered, and directed towards management. Mutsuddi [40] identified three important concerns of HRM: people, organizational performance, and innovation, as well as the aim of achieving a competitive advantage for the organization. Now, with increasing concerns about environmental management and green culture, organizations, companies, and institutions are looking for environmental tools and techniques that might facilitate the greening of the current systems, policies, strategies, and resources. A new concern of HRM is for the organization to "go green" in accordance with GHRM; although this concern has increased among organizations in recent years, studies of the environmental perspective on HRM (i.e., GHRM) are rare [41]. In this regard, Renwick et al. [42] conducted a review of studies on the impact of GHRM on environmental outcomes (i.e., firm performance metrics); they referred to GHRM as the environmental management (EM) aspect of HRM, and reported a significant research gap in this area. Moreover, Tang et al. [43] referred to GHRM as the greening of human resources through a set of organizational policies and aimed at protecting the environment, including green recruitment and selection, green training, green performance management, green pay and rewards, and green involvement.

2.3.1. Human Resource Management Practices

Mutsuddi [40] confirmed that HR practices include any practice needed to enhance competences, culture building, and commitment. Moreover, these practices may refer to any method, activity, process, system, or rule connected to the culture, vision, and values of

an organization. Furthermore, Robbins and Coulter [44] illustrated that HRM is important insofar as it represents a significant source of competitive advantage; they also highlighted its importance for organizational strategies, alongside its effect on organizational performance. The authors also suggested that the HRM process includes eight activities, the first three of which are HR planning, recruitment, and selection. These practices are important for identifying and selecting competent employees. The next two activities are orientation and training, which provide employees with skills and knowledge. The final three activities are performance management, compensation, and career development, which are essential in ensuring high performance and employee retention. Chaudhary [15] stressed the importance of organizations using GHRM to help develop green behaviors and attitudes among employees, because green behaviors cannot be realized without the active participation of HR; this is necessary for the successful implementation of environmental sustainability, which enables the achievement of organizational goals, and GHRM is one of the strategies used to achieve this. Similarly, Yong et al. [45] argued that HR environmental practices have an impact on many areas related to the environment, such as the elimination of waste, the reinforcement of green behavior, enhanced efficiency, and cost reductions. From the AMO perspective, GHRM practices can be sorted into three categories. The first involves developing green capabilities by attracting, selecting, training, and developing employees. Part two involves motivating employees to engage in green behaviors through performance management, appraisal, pay, and reward systems. Part three involves providing green opportunities through employee involvement, empowerment, and engagement and a supportive climate/culture, as well as inviting the participation of unions in employee involvement and environmental management. This study will address the following six GHRM practices: Green Analysis and Descriptions of Job Positions, Green Recruitment, Green Selection, Green Training, Green Performance Assessment and Green Rewards.

2.3.2. Green Analysis and Descriptions of Job Positions

Workforce planning or personnel planning is defined as "the process of deciding what positions the firm has to fill, and how to fill them" [46]. According to Jabbour [47], the analysis and description of job positions should enhance the environmental performance of an organization by enabling employees to engage with, possess, and expand on their environmental management knowledge. Job descriptions are also useful for other GHRM practices. For example, in recruitment and green performance management, they are considered a reference for identifying sustainability requirements and green targets [48].

2.3.3. Green Recruitment

According to Yong et al. [45], organizations should select employees who adhere to environmental issues. Similarly, Jabbour [47] stated that, if the recruitment process contains an environmental dimension, this means using environmental performance to attract applicants to the company. Renwick et al. [42] reported that green recruitment and selection refer to "the use of job descriptions and personnel specifications that emphasize environmental aspects of the job and interview protocols that probe applicant environmental knowledge, values and beliefs".

2.3.4. Green Selection

Ivancevich [39] defines green selection as a "process that enables organizations to choose a person who meets the selection criteria from a list of applicants considering equal employment opportunity legislation". From a green perspective, Chaudhary [15] stated that green recruitment and selection refer to "giving preference to environmentally-aware and sensitive employees in the recruitment and selection process of the organization".

2.3.5. Green Training

Yong et al. [45] defined green training according to Jabbour et al. [38], as environmental training that "provides employees with the needed knowledge about the environmental pol-

icy of a company, its practices, and necessary attitudes". On this topic, Ji et al. [49] provided empirical evidence from 218 manufacturing firms in both South and North China, showing that the relation between the environmental attitudes of firms and their performance can be better understood through employee training in sustainable development. It was also discovered that training on work and motivation affects employee performance [50].

2.3.6. Green Performance Assessment

In general, the process of evaluating the performance of employees aims to determine whether work is effectively undertaken by employees; it is a useful metric for the development process to determine who needs training, and to evaluate training programs for employees [39]. In green performance management, the environmental goals of employees are identified, and then the performance of employees is evaluated according to these goals [48]. Renwick et al. [42] discussed green performance assessment deals in relation to topics including environmental incidents, and addressed the matter of how to utilize responsibilities and policies related to the environment.

2.3.7. Green Rewards

Compensation is defined as the payment given to the employee in return for the work conducted for an organization. There are two types of compensation: direct compensation, which refers to employees' salaries, wages, commissions, etc., and remuneration, which includes compensation that the employee receives from her/his contribution to the organization. Renumeration includes fringe benefits (medical care, canteen benefits, and health insurance) and perquisites (a company car and paid holidays); this type of compensation is also called indirect compensation. Furthermore, non-financial remuneration includes the recognition of merits, competent supervision, and job sharing [40]. Chaudhary [15], stated that green compensation management means "distributing financial and nonfinancial rewards to employees for displaying environmentally-friendly attitudes and behaviors". Moreover, Jabbour et al. [38] argued that both financial and non-financial rewards for employees contribute to environmental management.

2.4. Sustainable Performance

Traditionally, economic growth was the indicator usually used to represent development, but it has been found that using this metric alone has an adverse effect on the environment [51]. Hourneaux et al. [28] noted that, traditionally, business performance was only viewed from an economic perspective. The introduction of the TBL approach, however, added environmental and social dimensions to this model, approaching business performance from a sustainability perspective. John Elkington [9] was the first researcher to coin the phrase triple bottom line (TBL), and used it as a sustainability framework to examine a company's social, environmental, and economic impact. The term TBL encompasses three different bottom lines: profit or loss, social organizational responsibility, and environmental organizational responsibility [52]. Environmental sustainability requires businesses to consider their effects on the environment, while economic sustainability concerns the financial success of the business, and social sustainability represents factors related to the human context of businesses [45]. Glavič and Lukman [29] presented social responsibility as a societal principle that integrates social and environmental business performance, referring to it as safe, respectful, liberal, equitable, and equal human development, which contributes to human well-being and to the environment. They further described environmental performance as environmental principles that endeavor to minimize the usage of hazardous energy and resources through repair, recycling, and reuse, and maximizing the use of renewable resources. This further requires economic performance to be evaluated based on economic growth alongside environmental protection and improving quality of life [53].

2.5. Green Innovation

In the context of business organizations, innovation refers to the development of new knowledge or new processes that increase an organization's value [54]. In this regard, Davila et al. [55] identified three main areas (three levers) in which business model change can drive innovation. These areas are value proposition, which is related to what is delivered to the market, the supply chain, or how value is created and delivered to the market, and those to whom products are sold and delivered, by identifying the segment of customers or target customers. In addition to the business model, new technologies sometimes represent a major part of innovation through the offering of products and services, process technologies, and enabling technologies.

Weng et al. view green innovation as a tool with which managers might enhance and sustain their organizations' performance and capabilities [56]. Furthermore, green innovation can be defined as hardware or software innovation related to green products or processes, such as new technologies for use in energy savings, pollution prevention, and waste recycling, as well as green product designs or corporate environmental management [57]. Similarly, Calza et al. [58] view all products, processes, management, and marketing activities or related technologies that adhere to environmental interests, such as energy savings, reducing waste, environmental audits and control systems, and product eco-labeling, as green innovations. Green product innovation refers to any significant improvement in products or services that minimizes overall environmental impact [59]. Green process innovation refers to innovation in production and manufacturing processes [60], or improvements in the production process that result in reduced environmental impacts—for example, closed loops for solvents, material recycling, or filters [61]. The green innovation process was also applied to Supply chain management as seen in [62]. Green managerial innovation, on the other hand, refers to an environmental management system (EMS) or specific environmental management tools, such as process control tools, chain management, or environmental audits [59]. Green marketing innovation is an important aspect of green innovation, which involves product eco-labeling in promotion, pricing, licensing, and franchising, taking into consideration the environmental aspects of these practices [54,57]. However, García-Granero et al. [63] pointed out that, although green marketing innovation is given high importance, it receives less attention in literature than the other types of green innovation.

2.6. GHRM and Sustainable Performance

HRM is thought to play an important role in developing sustainable organizations [54] and influencing organizational performance [64]. Rawashdeh [65] found that, although the implementation of GHRM in hospitals in Jordan was moderate, HRM nevertheless had a positive effect overall on environmental performance in health service organizations. Additionally, Pham et al. [66] noted that green employee training and green involvement activate hotels' environmental performance. Sittisom and Mekhum [67] further explained that green human resource practices moderate the relationship between environmental cooperation and social performance, which means that green HR practices affect one of three important dimensions of sustainable performance (namely, the social performance). In addition, Al-Shammari et al. [35] performed a study in manufacturing firms in Saudi Arabia which confirmed the important role that GHRM bundles play in sustainable performance; this study uses three practices to measure GHRM, namely, green hiring, green training and involvement, and green performance management and compensation. Zhao and Huang reported a significant association between green HRM and sustainable business performance [68]. Furthermore, Yong et al. [45] noted that GHRM practices play an important role in aligning the strategies of businesses with the environment. Their study in manufacturing firms in Malaysia reported the positive impact of green recruitment and training on sustainability, but found no significant effects for other GHRM practices, such as selection and performance assessment. They suggested refining and adjusting their framework by considering other moderating or mediating variables that they felt may

contribute to these relationships. They also encouraged other researchers to use the same framework in other contexts to test its wider applicability.

Overall, it is clear that GHRM plays an important role in affecting the dimensions of sustainable performance. Although many studies emphasise the importance of HRM and GHRM practices in improving performance, Mukherjee et al. [48] concluded that the level of implementation of GHRM in the NIT Silchar (an educational institution in India) is low, and it is important to improve HR practices to be as environmentally friendly as possible. Hence, investigating the relationship between GHRM practices and organizational sustainability in other contexts will help to generalize these findings, and strengthen the base of knowledge about this link. Although studies investigating the impact of GHRM practices on the three dimensions of sustainable performance (i.e., environmental, economic, and social performance) are still rare, it is clear that GHRM is likely to play an important role in affecting sustainable performance in the Palestinian manufacturing sector. Accordingly, the following hypothesis can be proposed:

H1: *GHRM practices positively affect the sustainable performance of manufacturing firms in Palestine*.

2.7. GHRM Practices and Green Innovation

Singh et al. [17] noted that GHRM practices can improve the green performance of firms through continuous product, process, and service innovation; in a study conducted on the manufacturing sector in the UAE, they encouraged firms to consider GHRM and green innovation as strategic assets and to invest in them to achieve innovative environmental management goals. In the same manner, Abdullah et al. [69] found that HRM practices such as compensation, planning, and empowerment positively affect innovation in education and knowledge firms. Al-Shammari et al. [70] examined the relationship between the human resource management practices (HRMPs) of staffing, compensation, performance appraisal, training, participation in decision making, and technological innovation in the Kingdom of Bahrain's banking sector. The results showed that HRMPs positively correlated with technological innovation. They also found that the implementation of green innovation by companies can be enhanced using GHRM and other mediating or moderating factors. In Palestine, especially in the manufacturing sector, there are no studies investigating the relationship between GHRM practices and green innovation. Based on the above studies, the following hypothesis can be proposed:

H2: *GHRM practices positively affect green innovation in manufacturing firms in Palestine*.

2.8. Green Innovation and Sustainable Performance

Strategic management deals with many managerial decisions that emphasize the long-term performance of organizations. Moreover, sustainability and innovation are considered to be strategic management challenges and the main elements for successful strategic management that enable firms to gain a competitive advantage [26]. Njoroge et al. [71] found that innovation strategy positively relates to economic sustainability performance. Asadi et al. [72] focused on the importance of the role of green innovation and its effect in achieving sustainable performance; they reported a positive relationship between these two variables. Similarly, Al-Shammari et al. [35] and Zhao and Huang [68] found that green innovation had a significant effect on sustainable performance. Abu Seman et al. also found that green innovation positively affects environmental performance through green product innovation, green process innovation, green managerial innovation, and green marketing innovation [62]. Other studies further confirmed that green process innovation, green product innovation, and green managerial innovation contribute to green innovation [51,68,69,73]. Based on the findings of these studies, the following hypothesis can be proposed to investigate whether green innovation influences sustainable performance in the Palestinian manufacturing sector:

H3: *Green innovation positively affects sustainable performance in manufacturing firms in Palestine.*

2.9. Green Innovation as a Mediator

Song et al. [74] reported that GHRM has a positive effect on green innovation. In a more detailed investigation, Sobaih et al. found that GHRM practices have a positive influence on environmental performance and green innovation; they also showed that, in the presence of green innovation, the positive effect of GHRM practices on environmental performance doubles [34]. Similarly, in a study conducted in the banking industry of Bangladesh, Rakin et al. reported that green innovation has a positive influence on environmental performance, and that green innovation mediates the relationship between socially responsible HRM practices and environmental performance [60]. Elsewhere, Shahzad found that corporate social responsibility affects green innovation and environmentally sustainable development [75]. Furthermore, studying 244 large manufacturing firms in Malaysia, Rehman et al. provided evidence that GHRM has a positive impact on green innovation, that green innovation has a positive impact on environmental performance, and that the link between GHRM and environmental performance is fully mediated by green innovation. However, this study does not investigate the mediating effect of green innovation between GHRM practices and overall sustainable performance [76]. In a further study of small- and medium-sized (SMEs) businesses operating in the Kingdom of Saudi Arabia, Al-Shammari et al. [35] found that green innovation has an impact not only on environmental performance, but also on social and economic performance. Researchers rarely investigate the full relationship between green innovation and sustainable performance (i.e., environmental, economic, and social performance). Nevertheless, the above discussion offers many indicators supporting the idea that green innovation plays a supporting role in the link between GHRM practices and sustainable performance, which requires confirmation by new studies and in new settings. Hence, we propose the following hypothesis in a Palestinian manufacturing context:

H4: *Green innovation mediates the relationship between GHRM practices and sustainable performance in manufacturing firms in Palestine.*

2.10. The Proposed Model

Based on the previous discussion, and in order to achieve and answer the research questions, a proposed model is developed. As shown in Figure 1, the model consists of three main constructs: GHRM practices, green innovation, and sustainable performance. These constructs are composed of several dimensions that were derived, along with the model, from the cited studies, and helped in developing the questionnaire for the collection of data to investigate these relationships. In addition, the model includes the above-mentioned hypotheses in order to test the effect of these constructs on each other.

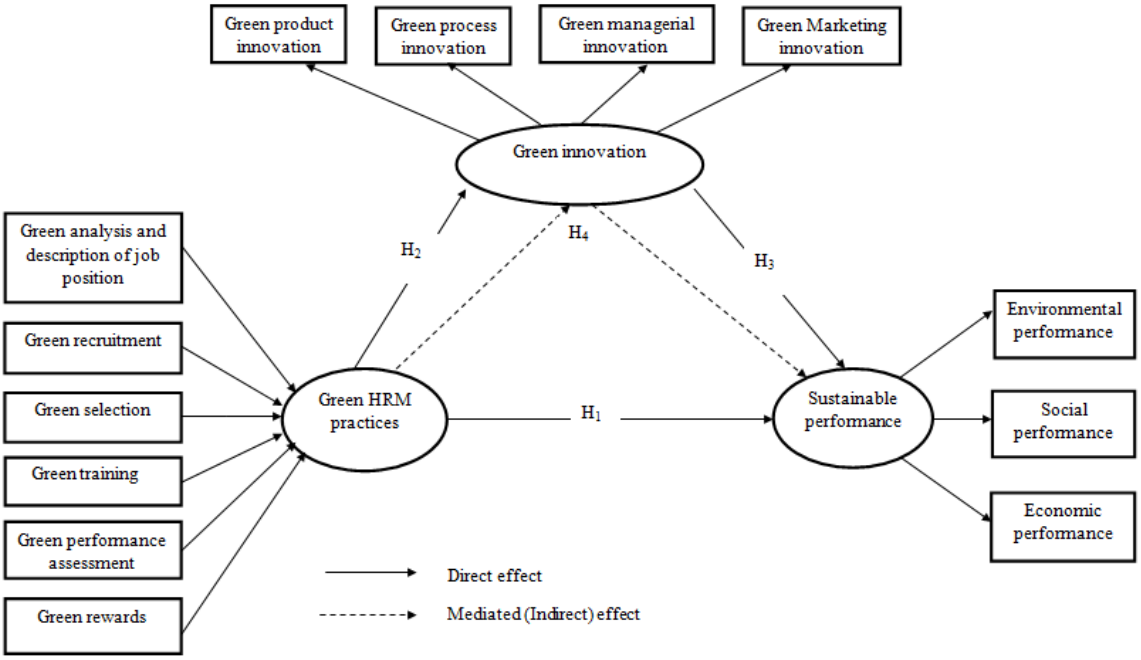

Figure 1. The research conceptual model.

3. Methodology

According to Hair et al. [77], research is a "discerning pursuit of the truth". In addition, Leedy and Ormrod [78] noted that research is a cyclical process that starts with a problem or unanswered question and finishes with an interpretation of this problem; however, the supported and unsupported hypotheses may lead to the emergence of new problems. In the case of studies performed in the manufacturing sector in Palestine, there is a lack of information regarding the implementation of green practices related to HRM, innovation practices, or sustainable performance in this sector. Hence, according to Hair et al. [77], the most appropriate research design for this study is exploratory research; when there is little information about an issue or a problem, this type of research design provides a better understanding of businesses' problems, and can be conducted using either qualitative or quantitative research approaches [74,79]. Moreover, the literature review helped to develop the questionnaire used in data collection and in investigating the relationships between the relevant variables.

The general methodological steps that the study adopted started with identifying the problem represented by the need to investigate the role of GHRM practices on sustainable performance in manufacturing firms in Palestine, and the role of green innovation in this relationship. After that, a literature review for the main three concepts was conducted and the research gap was identified. Based on the literature, the hypotheses were developed, and a quantitative research approach was adopted. To test the hypotheses proposed in the conceptual model, a survey was conducted; the study participants were general managers, HR managers, quality managers, and production managers at several manufacturing firms (specifically, in the chemical industry, the pharmaceutical industry, the food industry, and the metal and engineering industry) in Palestine. The questionnaire was distributed electronically via email, followed by phone calls. After the data were collected, Smart-PLS software was used for the data analysis and testing of the hypotheses; then, the results, discussion, and recommendations were generated.

3.1. Sampling Techniques and Data Collection

The sampling process includes defining the study population, choosing the sampling frame, selecting the sampling method, calculating the sample size, and implementing the sampling plan. This study was conducted to evaluate the effect of GHRM on sustainable

performance, with green innovation as a mediator of this relationship, in manufacturing firms in Palestine. The Palestinian Federation of Industries (PFI) is a national institution that represents the industrial sector in Palestine, and it is also the umbrella that encompasses sixteen specialized federations. Among these specialized federations are the Palestinian federation of chemical industries, the union of Palestinian pharmaceutical manufacturers, the Palestinian food industries union, and the metal and engineering industries union. In order to obtain the database of companies legally registered as members of each union, the PFI and specialized unions were contacted. The sampling frame is the list from the target population from which the sample was selected. In this study, it was determined that, as a condition for entry into the sampling frame, the company should be legally registered, have green practices, and have manufacturing, not trade, as its economic activity. As such, a representative sample was obtained so that the results could be generalized correctly. From 260 total members, 113 firms could be contacted as they met the predetermined conditions. To ensure that a representative sample was obtained, with the possibility of generalizing the results, the probability sampling procedure (which is typically used in qualitative research of this kind) was adopted in this study. The sample size obtained during the data collection period (about two and half months) was represented by 58 responses. According to Hair et al. [80], Cohen (1992) provided recommendations of sample size in PLS-SEM for a statistical power of 80%. With a maximum number of arrows pointing at a construct equal to six in this study, the sample size achieves a 1% significance level with a minimum R^2 of 0.75, which is acceptable.

3.2. Measurement Development and Questionnaire Design

In this research, a total of 47 items were generated. To measure GHRM practices, 18 items (green analysis and description of job position, green recruitment, green selection, green training, green performance assessment, and green rewards, with three items for each) were selected according to previous studies that adopted and tested these items, such as [37,42,76]. In order to evaluate green innovation, fourteen measurement items (green product innovation: four items, green process innovation: three items, green managerial innovation: three items, and green marketing innovation: four items) were also adopted from the literature [12,52,58,68]. Likewise, sustainable performance scale items were developed from previous studies where fifteen measurement items (environmental performance: five items, economic performance: six items, and social performance: four items) were designed [9,11,12,14,23,32,48,77,78,81–83]. All items were evaluated using a five-point Likert scale, where the respondents were asked to score the extent to which their organizations use the mentioned practices. The answers were as follows: (one: not at all), (two: to a slight degree), (three: to a moderate degree), (four: to a great degree), (five: to a very great degree).

4. Data Analysis and Discussion of Results

4.1. Analysis of Survey Responses

After screening the data collected via questionnaires, 58 responses were obtained from the 113 contacted firms, with a response rate of 51.33%. Table 1 summarizes the findings of the frequency analysis, conducted using SPSS software. A descriptive statistical analysis for the respondents' variables was established to study the different characteristics of our statistical sample.

Table 1. Summary of respondents' profiles.

No.	Items	Option	Frequency	Percentage
1.	Gender	Male	42	72.4%
		Female	16	27.6%
		Total	**58**	**100.0%**

Table 1. *Cont.*

No.	Items	Option	Frequency	Percentage
2.	Educational level	Diploma or less	9	15.5%
		Bachelor's degree	39	67.2%
		Higher education	10	17.2%
		Total	**58**	**100.0%**
3.	Job experience	0–5 Years	9	15.5%
		6–10 Years	16	27.6%
		11–15 Years	14	24.1%
		More than 15 years	19	32.8%
		Total	**58**	**100.0%**
4.	Position	General manager/CEO	21	36.2%
		HR manager	15	25.9%
		Production manager	7	12.1%
		Quality manager	9	15.5%
		Others	6	10.3%
		Total	**58**	**100.0%**
5.	Organization sector	Chemical industry	10	17.2%
		Pharmaceutical industry	3	5.2%
		Food industry	32	55.2%
		Metal and Engineering industry	13	22.4%
		Total	**58**	**100.0%**
6.	Number of employees	1–9	10	17.2%
		10–19	7	12.1%
		20–49	15	25.9%
		50–99	15	25.9%
		100–249	8	13.8%
		250 and more	3	5.2%
		Total	**58**	**100.0%**
7.	Engagement with environmental management practices	Currently exists	25	43.1%
		Currently there are no plans to implement	9	15.5%
		Plan to implement within 12 months	3	5.2%
		Plan to implement within a period of more than 12 months	1	1.7%
		There are some practices through activities without a clear plan	18	31.0%
		Not sure	2	3.4%
		Total	**58**	**100.0%**
8.	Having a formal environmental certificate such as ISO14001	Currently exists	13	22.4%
		Currently there are no plans to implement	25	43.1%
		Plan to implement within 12 months	6	10.3%
		Plan to implement within a period of more than 12 months	7	12.1%
		Not sure	7	12.1%
		Total	**58**	**100.0%**
9.	Production process role in green programs	Yes	39	67.2%
		No	13	22.4%
		Not sure	6	10.3%
		Total	**58**	**100.0%**
10.	HR role in green programs	Yes	40	69.0%
		No	12	20.7%
		Not sure	6	10.3%
		Total	**58**	**100.0%**

4.2. Descriptive Analysis

As illustrated in Table 2, the mean and standard deviation of each construct were reported. In the current study, a Likert scale of five-point equal-sized categories was used. In order to interpret the results, scores between 1.00 and 2.33 are considered low, scores from 2.34 to 3.66 are considered moderate, and scores from 3.67 to 5.00 are considered high.

Table 2. Level of implementation of GHRM practices, green innovation, and sustainable performance.

Item	Mean	Standard Deviation	Implementation Level
Green analysis and description of job position (GA)	2.5574	1.0553	Moderate
Green recruitment (GR)	2.5172	1.2508	Moderate
Green selection (GS)	2.3448	1.0467	Moderate
Green training (GT)	2.4713	1.1481	Moderate
Green performance assessment (GPA)	2.2414	0.9940	Low
Green rewards (GRE)	2.3104	1.1758	Low
Green product innovation (GPDI)	3.4440	1.0921	Moderate
Green process innovation (GPCI)	3.1264	1.1842	Moderate
Green managerial innovation (GMGI)	2.6264	1.3224	Moderate
Green marketing innovation (GMAI)	2.2888	1.2821	Low
Environmental performance (EP)	3.0138	1.2864	Moderate
Social performance (SOP)	3.0819	1.1103	Moderate
Economic performance (ECP)	2.6034	1.1725	Moderate
Total for GHRM	**2.4071**	**1.1118**	**Moderate**
Total for green innovation	**2.8714**	**1.2202**	**Moderate**
Total sustainable performance	**2.8997**	**1.1897**	**Moderate**

4.3. Assessment of the Model

The partial least squares (PLS) approach was adopted, using the Smart-PLS v 3.2.8 software for the data analysis, considering that we were handling data that were not normalized and also small samples. Analysis with the Smart-PLS involves two main elements. The first element is the outer model or the measurement model. The second element is the inner model or the structural model. The PLS algorithm is the first step to calculate path parameters; meanwhile, bootstrap procedures are the second step, and are used to calculate the significance of the model parameters.

4.3.1. Assessment of the Measurement Model

The assessment of reflective measurement models includes evaluating the construct validity and the reliability of the constructs. The process of determining convergent validity includes evaluating the indicator reliability, the composite reliability, and the average variance extracted. Moreover, cross-loadings, the Fornell–Larcker criterion, and the heterotrait–monotrait ratio (HTMT) are used to assess the discriminant validity. Convergent validity is the degree to which a measure correlates positively with other measures of the same construct. In reflective measurement models, the assessment of convergent validity includes three determining tests. First are the factor loadings, where a higher outer loading means that the indicators have much in common for a construct; a common rule of thumb is that the outer loadings should be 0. 708 or higher. However, in exploratory studies, it is allowed to be above 0.60 [81]. Second is composite reliability (CR): in order to ensure internal consistency, composite reliability is evaluated for all indicators. The CR values are between 0 and 1; the higher the value of CR, the higher the level of reliability. According to [81], a value higher than 0.70 is considered acceptable. Third is the average variance extracted (AVE). The AVE is calculated as the summation of value of the squared loadings of the indicators of the construct, divided by the number of indicators. The AVE should be higher than 0.50, which means that the construct explains more than half of the variance of its indicators [81]. Cronbach's alpha and the CR of all constructs were listed

for all constructs in the study model. Cronbach's alpha is the criterion traditionally used in evaluating internal consistency. A value higher than 0.7 is recommended; all of the constructs' Cronbach's alpha values agree with the threshold. Figure 2 and Table 3 illustrate the values of these tests where the convergent validity was confirmed.

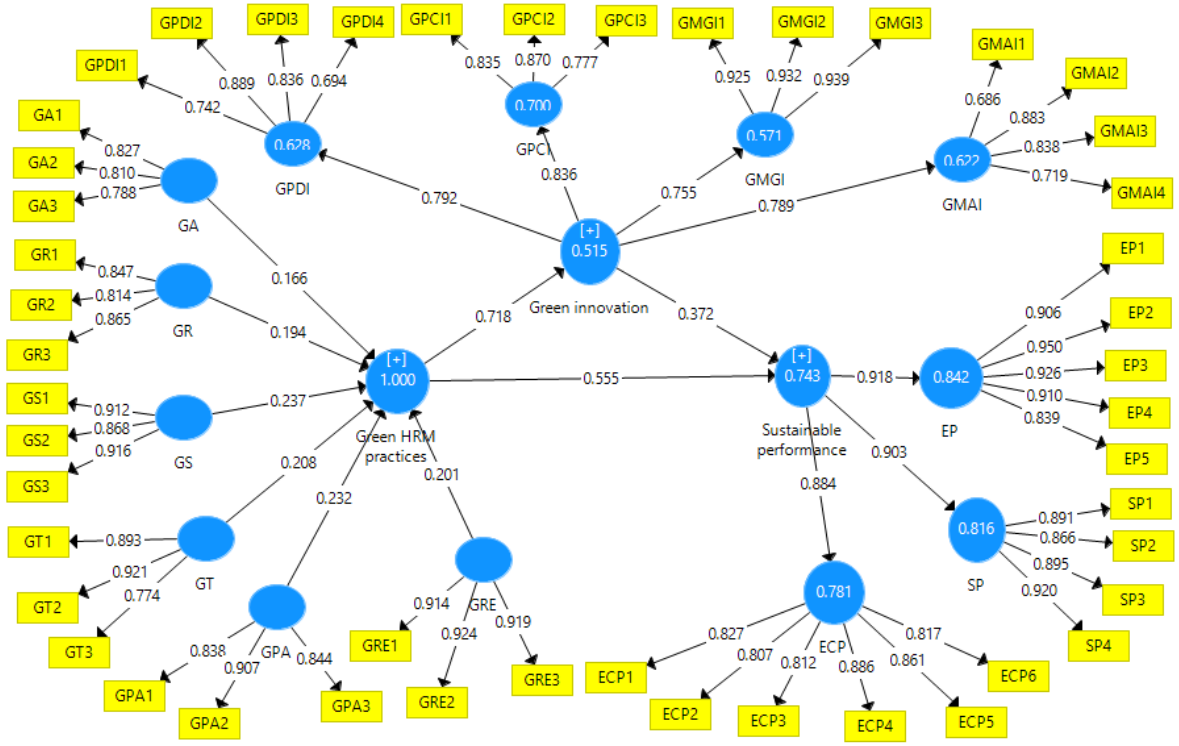

Figure 2. The measurement model.

Table 3. Measurement properties of indicative constructs.

Construct	Number of Items	Cronbach's Alpha	Composite Reliability (CR)	AVE
GA	3	0.739	0.850	0.654
GR	3	0.796	0.880	0.710
GS	3	0.881	0.927	0.808
GT	3	0.830	0.899	0.748
GPA	3	0.829	0.898	0.746
GRE	3	0.909	0.942	0.845
GPDI	4	0.801	0.871	0.630
GPCI	3	0.770	0.867	0.686
GMGI	3	0.925	0.952	0.869
GMAI	4	0.789	0.865	0.617
EP	5	0.945	0.958	0.822
SOP	4	0.916	0.940	0.798
ECP	6	0.913	0.933	0.698

Table 4 lists the tests for the formative constructs, where weights, t-values, and variance inflation factors (VIF) are presented. The values for VIF for all factors are lower than 5, which indicates that multi-collinearity was not a problem in the research model [81].

Table 4. Weight, t-values, and variance inflation factor (VIF) values.

Second-Order Construct	First-Order Construct	Outer Weight	t-value	VIF
GHRM practices	**GA**	0.411	7.032	1.487
	GR	0.395	14.122	1.697
	GS	0.371	10.966	2.563
	GT	0.383	9.610	2.234
	GPA	0.385	15.608	1.994
	GRE	0.363	8.103	3.074

The discriminant validity test is used to determine the degree to which a construct is different from other constructs, to ensure that the construct is unique and that events not represented by other constructs in the model can be interpreted [81]. To investigate the discriminant validity, the cross-loadings (correlations) of the construct indicators should be greater than all of its loadings for other constructs in the model. Table 5 summarizes all cross-loadings of the model indicators. It is obvious that the cross-loading discriminant validity method is confirmed.

Table 5. Cross loading discriminant validity.

Indicator/ Variable	GA	GR	GS	GT	GPA	GRE	GPDI	GPCI	GMGI	GMAI	EP	SP	ECP
GA1	0.827	0.590	0.574	0.357	0.569	0.459	0.336	0.205	0.406	0.386	0.540	0.522	0.536
GA2	0.810	0.457	0.361	0.387	0.54	0.137	0.396	0.364	0.541	0.342	0.354	0.404	0.303
GA3	0.788	0.451	0.373	0.283	0.439	0.155	0.383	0.395	0.337	0.450	0.367	0.349	0.348
GR1	0.572	0.847	0.627	0.338	0.523	0.485	0.341	0.321	0.248	0.411	0.399	0.426	0.526
GR2	0.585	0.814	0.526	0.444	0.531	0.234	0.296	0.236	0.355	0.315	0.405	0.571	0.390
GR3	0.445	0.865	0.742	0.557	0.569	0.603	0.480	0.460	0.251	0.376	0.544	0.706	0.570
GS1	0.534	0.740	0.912	0.566	0.584	0.578	0.441	0.396	0.270	0.504	0.594	0.588	0.675
GS2	0.419	0.638	0.868	0.482	0.529	0.509	0.423	0.309	0.188	0.348	0.525	0.640	0.563
GS3	0.535	0.661	0.916	0.514	0.563	0.558	0.479	0.379	0.201	0.459	0.616	0.604	0.678
GT1	0.348	0.496	0.530	0.893	0.684	0.409	0.425	0.465	0.545	0.551	0.575	0.543	0.409
GT2	0.426	0.540	0.595	0.921	0.626	0.476	0.379	0.478	0.430	0.567	0.575	0.502	0.379
GT3	0.323	0.325	0.353	0.774	0.510	0.377	0.309	0.306	0.357	0.472	0.403	0.562	0.379
GPA1	0.606	0.520	0.497	0.625	0.838	0.369	0.454	0.358	0.553	0.583	0.541	0.568	0.469
GPA2	0.568	0.650	0.616	0.673	0.907	0.490	0.506	0.522	0.543	0.590	0.649	0.640	0.597
GPA3	0.496	0.483	0.490	0.523	0.844	0.526	0.435	0.463	0.516	0.524	0.589	0.527	0.443
GRE1	0.207	0.430	0.471	0.363	0.443	0.914	0.290	0.084	0.218	0.236	0.429	0.451	0.357
GRE2	0.301	0.517	0.526	0.415	0.481	0.924	0.350	0.252	0.255	0.340	0.524	0.454	0.461
GRE3	0.388	0.522	0.665	0.547	0.540	0.919	0.473	0.282	0.338	0.466	0.645	0.653	0.534
GPDI1	0.373	0.278	0.137	0.168	0.360	0.199	0.742	0.497	0.379	0.225	0.361	0.492	0.364
GPDI2	0.422	0.313	0.330	0.378	0.424	0.290	0.889	0.674	0.413	0.249	0.508	0.573	0.488
GPDI3	0.331	0.422	0.555	0.424	0.485	0.458	0.836	0.685	0.283	0.384	0.549	0.603	0.489
GPDI4	0.318	0.426	0.569	0.393	0.450	0.354	0.694	0.522	0.109	0.326	0.461	0.413	0.519
GPCI1	0.269	0.232	0.277	0.399	0.473	0.282	0.644	0.835	0.356	0.445	0.434	0.375	0.376
GPCI2	0.198	0.272	0.297	0.406	0.362	0.100	0.634	0.87	0.208	0.344	0.378	0.391	0.361
GPCI3	0.465	0.504	0.419	0.407	0.448	0.184	0.595	0.777	0.453	0.479	0.516	0.503	0.474
GMGI1	0.399	0.283	0.133	0.424	0.506	0.216	0.229	0.282	0.925	0.544	0.421	0.432	0.277
GMGI2	0.530	0.297	0.309	0.495	0.539	0.259	0.374	0.425	0.932	0.538	0.525	0.468	0.393
GMGI3	0.536	0.348	0.233	0.518	0.678	0.350	0.443	0.444	0.939	0.581	0.516	0.525	0.408
GMAI1	0.479	0.249	0.335	0.463	0.517	0.257	0.208	0.227	0.625	0.685	0.360	0.356	0.326
GMAI2	0.312	0.317	0.391	0.507	0.566	0.322	0.375	0.571	0.477	0.883	0.535	0.486	0.514
GMAI3	0.345	0.324	0.441	0.457	0.510	0.380	0.339	0.443	0.284	0.838	0.516	0.404	0.537
GMAI4	0.412	0.498	0.373	0.510	0.464	0.255	0.224	0.337	0.509	0.719	0.499	0.518	0.408

Table 5. *Cont.*

Indicator/ Variable	GA	GR	GS	GT	GPA	GRE	GPDI	GPCI	GMGI	GMAI	EP	SP	ECP
EP1	0.474	0.508	0.609	0.489	0.634	0.591	0.513	0.471	0.519	0.612	0.906	0.723	0.645
EP2	0.498	0.475	0.602	0.546	0.633	0.494	0.614	0.578	0.435	0.554	0.950	0.738	0.621
EP3	0.519	0.493	0.610	0.596	0.636	0.539	0.536	0.489	0.469	0.599	0.926	0.736	0.568
EP4	0.481	0.484	0.597	0.579	0.628	0.512	0.540	0.480	0.531	0.634	0.910	0.716	0.703
EP5	0.439	0.484	0.499	0.539	0.588	0.536	0.492	0.424	0.429	0.353	0.839	0.648	0.549
SP1	0.587	0.668	0.668	0.597	0.675	0.511	0.605	0.512	0.508	0.618	0.790	0.891	0.745
SP2	0.351	0.540	0.566	0.541	0.546	0.549	0.557	0.374	0.375	0.347	0.626	0.866	0.442
SP3	0.480	0.655	0.611	0.554	0.596	0.511	0.544	0.501	0.520	0.582	0.696	0.895	0.654
SP4	0.473	0.550	0.566	0.490	0.571	0.484	0.656	0.436	0.410	0.430	0.681	0.920	0.600
ECP1	0.448	0.444	0.512	0.354	0.521	0.210	0.491	0.390	0.408	0.458	0.541	0.529	0.827
ECP2	0.500	0.540	0.556	0.390	0.498	0.375	0.539	0.482	0.380	0.407	0.631	0.684	0.807
ECP3	0.449	0.470	0.652	0.296	0.388	0.374	0.405	0.265	0.169	0.403	0.557	0.524	0.812
ECP4	0.433	0.577	0.700	0.487	0.531	0.535	0.490	0.456	0.314	0.592	0.582	0.591	0.886
ECP5	0.330	0.542	0.631	0.430	0.554	0.574	0.548	0.475	0.317	0.551	0.590	0.575	0.861
ECP6	0.364	0.387	0.515	0.270	0.441	0.413	0.440	0.379	0.363	0.456	0.509	0.561	0.817

The Fornell–Larcker criterion method is based on comparing the square root of the (AVE) with latent variable correlations. Moreover, the square root of each construct's (AVE) should be more than the highest correlation with other constructs. Table 6 shows the results of this test, and it can be determined that the Fornell–Larcker discriminant validity criterion was established.

Table 6. Fornell–Larcker criterion.

	GA	GR	GS	GT	GPA	GRE	GPDI	GPCI	GMGI	GMAI	EP	SOP	ECP
GA	0.808												
GR	0.627	0.842											
GS	0.554	0.758	0.899										
GT	0.426	0.534	0.581	0.865									
GPA	0.645	0.642	0.622	0.706	0.864								
GRE	0.333	0.537	0.611	0.488	0.535	0.919							
GPDI	0.455	0.449	0.498	0.432	0.54	0.412	0.794						
GPCI	0.383	0.411	0.404	0.489	0.521	0.232	0.756	0.828					
GMGI	0.529	0.334	0.246	0.517	0.621	0.299	0.382	0.418	0.932				
GMAI	0.482	0.437	0.489	0.615	0.655	0.388	0.372	0.516	0.595	0.786			
EP	0.532	0.539	0.645	0.606	0.688	0.589	0.595	0.54	0.526	0.611	0.907		
SOP	0.537	0.68	0.678	0.612	0.672	0.574	0.662	0.515	0.512	0.562	0.786	0.893	
ECP	0.504	0.594	0.713	0.447	0.587	0.498	0.583	0.492	0.39	0.573	0.682	0.693	0.836

Another method used to verify discriminant validity is the heterotrait–monotrait ratio of correlations (HTMT). According to Henseler et al. [84], an HTMT ratio of less than 1 is acceptable and indicates good reliability. All HTMT values are listed in Table 7, and it is clear that all values are less than 1, which demonstrates the discriminant validity of this test.

Table 7. Heterotrait–monotrait ratio (HTMT).

	GA	GR	GS	GT	GPA	GRE	GPDI	GPCI	GMGI	GMAI	EP	SOP	ECP
GA	-												
GR	0.812	-											
GS	0.664	0.893	-										
GT	0.537	0.640	0.666	-									
GPA	0.814	0.785	0.723	0.843	-								
GRE	0.368	0.610	0.672	0.551	0.612	-							
GPDI	0.599	0.561	0.599	0.526	0.666	0.472	-						
GPCI	0.531	0.507	0.484	0.602	0.644	0.268	0.956	-					
GMGI	0.633	0.392	0.266	0.583	0.704	0.316	0.434	0.479	-				
GMAI	0.650	0.558	0.586	0.763	0.813	0.447	0.464	0.640	0.708	-			
EP	0.620	0.615	0.704	0.677	0.776	0.626	0.682	0.626	0.559	0.703	-		
SOP	0.628	0.783	0.753	0.709	0.764	0.621	0.767	0.604	0.548	0.652	0.839	-	
ECP	0.594	0.686	0.791	0.514	0.668	0.535	0.685	0.578	0.419	0.671	0.731	0.745	-

4.3.2. Assessment of the Structural Model

After confirmation of the measurement reliability and validity, the next step is to assess the structural model and examine the relationships between constructs. The main criteria used in PLS-SEM in the assessment of the structural model is the coefficient of determination (R^2), which is the most common measure used to evaluate the structural model. It represents the model's predictive accuracy; the value of R^2 ranges from 0 to 1, where a higher value indicates a higher level of predictive accuracy. In general, values of R^2 for endogenous latent variables of 0.75, 0.50, or 0.25 can be described as high, moderate, or weak, respectively [80]. Furthermore, the effect size (f^2) expresses the effect of excluding a specified exogenous construct on the endogenous constructs. Based on Cohen 1988, the values of f^2 equal to 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects of the exogenous latent variable. In addition, Q^2 (or Stone–Geisse's Q^2) is an indicator of the model's predictive relevance in the structural model. A value of Q^2 of more than zero for a specified reflective endogenous latent variable indicates the model's predictive relevance for this construct. A blindfolding procedure was used to obtain the value of Q^2. The resulting goodness of fit (GoF) for the model was 0.741, which is more than 0.36 and indicated a large fit [85]. Table 8 summarizes the results for these tests.

Table 8. R^2, communality, and redundancy.

Construct	R^2	R^2-Adjusted	Result	Q^2	f^2	
					GHRM Practices	**Green Innovation**
Sustainable performance	0.743	0.733	High	0.423	0.581 Large effect	0.261 Medium effect
EP	0.842	0.840	High	0.645	-	-
SOP	0.816	0.812	High	0.603	-	-
ECP	0.781	0.777	High	0.505	-	-
Green innovation	0.515	0.506	Moderate	0.193	-	-

After running the PLS-SEM algorithm, the structural model was estimated to test the relationships among the study models. A path coefficient test was used for this purpose.

The results from bootstrapping procedures (5000 subsamples were used in the bootstrapping procedures, as shown in Figure 3) are listed in Table 9, where the β values, standard deviation values, T-values, and *p*-values for direct relations were tabulated.

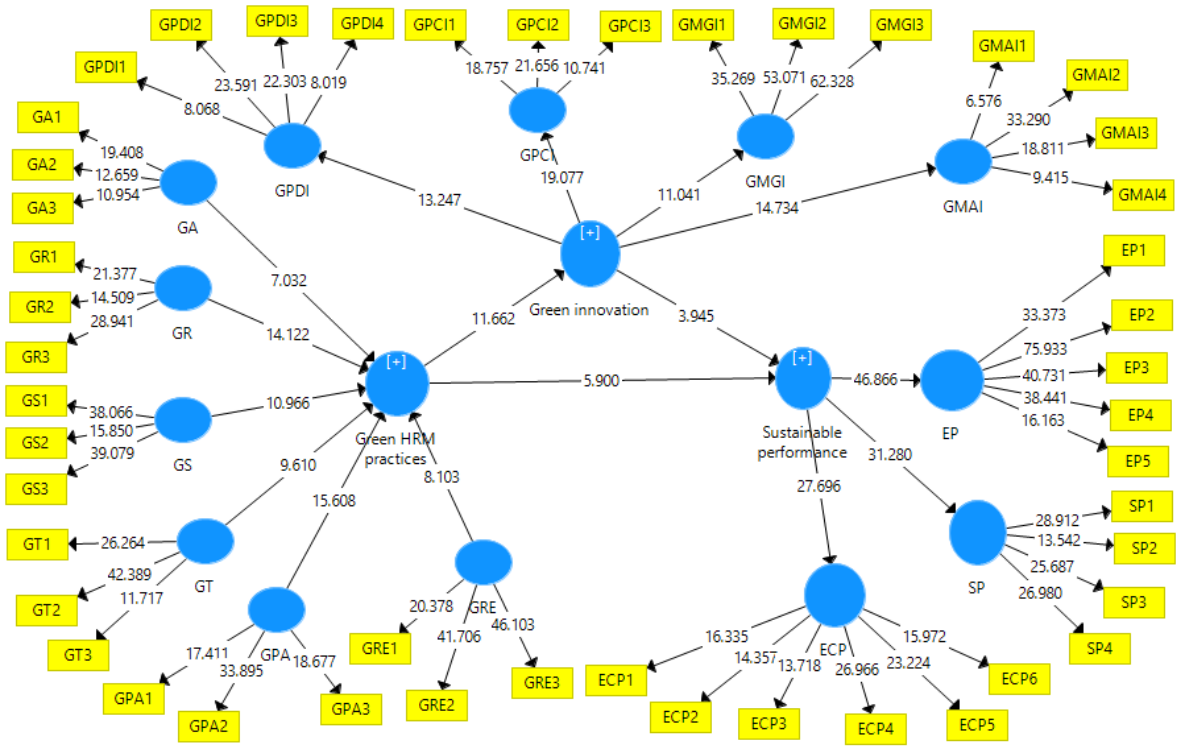

Figure 3. PLS bootstrapping procedures.

Table 9. The results of direct relations.

Path	Hypothesis	Original Sample (β)	Standard Deviation (STDEV)	T-Value	*p*-Value	Result
Green HRM practices → sustainable performance	H1	0.555	0.094	5.900	0.000	Supported
Green HRM practices → Green innovation	H2	0.718	0.062	11.662	0.000	Supported
Green innovation → sustainable performance	H3	0.372	0.094	3.945	0.000	Supported

It is clear from Table 9 that there is a significant positive relationship between GHRM practices and sustainable performance, and a positive relationship between green innovation and sustainable performance; additionally, there is a positive and significant relationship between GHRM practices and green innovation. It can be concluded that the analysis results for the proposed hypothesis H1 are (β = 0.555, t = 5.900, *p*-value = 0.000), meaning that the hypothesis is supported. The analysis results for H2 are (β = 0.718, t = 11.662, *p*-value = 0.000), so the hypothesis is supported, and the analysis results for H3 are (β = 0.372, t = 3.945, *p*-value = 0.000), hence this hypothesis is also supported.

4.4. Mediating Test

By using the Smart-PLS v 3.2.8 software, the mediation relationship was examined; the investigation of mediating relationship is one of this study's significant contributions. Table 10 lists the indirect relation results, where (β = 0.267, t = 3.835, *p*-value = 0.000),

meaning that the indirect effect is significant. Hence, the results reveal that green innovation mediates the relationship between GHRM practices and sustainable performance, so H4 is supported. According to Preacher and Hayes [86], there are two steps in a mediating analysis: (1) Bootstrap the indirect effect (total effect). For this step, the relationship between the independent variable and the dependent variable, via the mediator, must be significant. In this study, the relationship between GHRM practices and sustainable performance via green innovation was significant, as shown in Table 10. (2) The confidence interval was bootstrapped for the lower and upper levels. Table 10 lists the total effects relation results, where (β = 0.718, t = 11.662, *p*-value = 0.000) for path $P_{12,}$ which is significant, and (β = 0.372, t = 3.945, *p*-value = 0.000) for path $P_{23,}$ which is significant. The specific indirect effects from the Smart-PLS report were also used to investigate the mediating effect [21]. The results affirmed the significant mediating effect of green innovation in the relationship between GHRM practices and sustainable performance. Table 10 presents the results of the indirect relation.

Table 10. Indirect relation (mediation) results.

Indirect Effects						
Path	**Path No.**	**Original Sample (β)**	**Standard Deviation (STDEV)**	**t-Value**	***p*-Value**	**Result**
Green HRM practices → sustainable performance	path P_{13}	0.267	0.070	3.835	0.000	Significant
Bootstrap the Indirect Effects (Total Effects)						
Green HRM practices → green innovation	Path P_{12}	0.718	0.062	11.662	0.000	Significant
Green innovation → sustainable performance	path P_{23}	0.372	0.094	3.945	0.000	Significant
Specific Indirect Effects						
Green HRM practices → green innovation → sustainable performance	-	0.267	0.068	3.911	0.000	Significant

The bootstrapped confidence interval ranges from 0.130 to 0.404; the value of zero does not fall within the confidence interval. This constitutes further confirmation that the indirect effect is significant, based on the Preacher and Hayes criterion [86]. In order to determine the strength of the mediating effect, the variance accounted for the (VAF) value is used; this represents the ratio between the direct and indirect effects, in which a value of VAF above 80% indicates full mediation. A value of VAF between 20% and 80% represents partial mediation, and a value below 20% shows no mediation. The calculation of VAF for this study is illustrated as follows:

Direct effect of GHRM practices on sustainable performance = 0.718 × 0.372 = 0.267;

Indirect effect of GHRM practices on sustainable performance via green innovation = 0.267;

Total effect of GHRM practices on sustainable performance = 0.267 + 0.267 = 0.534; and

VAF = Direct effect/Total effect = 0.267/0.534 = 0.50.

Consequently, 50% of the total effect of GHRM practices on sustainable performance was explained via green innovation, which points to partial mediation [81].

4.5. Discussion of Results

The results from assessing the data collected indicate that the total level of implementation of GHRM practices in Palestinian manufacturing organizations is moderate, which is similar to the findings from other studies performed in Palestinian manufacturing organizations [13,78] and healthcare organizations [19], as well as in other developing

countries such as Jordan [65]. More specifically, the implementation level for all GHRM practices in the targeted manufacturing sectors ranges from 2.2414 for green performance assessment, which is the lowest score, to 2.5574 for green analysis and description of the job position, which is the most influential green practice, followed by green recruitment. The implementation level of all of the GHRM practices is considered moderate, except those of green performance assessment and green rewards, which are considered low. These results comply with the results from Mousa and Othman's [19] study, which was implemented in healthcare organizations, and which concludes that the most influential green practice was green hiring and the least influential was green performance management and compensation, considering that this study treats GHRM practices as bundle. This indicates that the organizations still do not make green practices a priority in workplace activities. This therefore suggests that, if manufacturing firms in Palestine invest more in the implementation of GHRM practices, then they will be able to move the level of implementation from moderate to high. For example, although the overall level of implementation of environmental training is moderate, there are some aspects tha need to be developed, such as making environmental training a continuous priority in manufacturing organizations; it is difficult to achieve a high level of environmental performance without improving this factor [18]. A positive and significant association was also found between GHRM practices and sustainable performance. Moreover, there is evidence that GHRM practices have a positive and significant effect on green innovation. These results are in line with the results obtained by Singh et al. [17] in a study performed in 309 manufacturing sector SMEs; they are also similar to the results obtained by Al-Shammari et al. [35] in SMEs operating in the Kingdom of Saudi Arabia. It is notable that our study attempted to conduct an inclusive investigation of GHRM practices and green innovation practices. Moreover, the study of Sobaih et al. [34] collected 525 valid forms from Egyptian small lodging enterprises. However, the overall finding that the culture of green human resources needs more investment in order to become sufficiently mature can be interpreted in the context of industrial firms in Palestine, a developing country. Most of the companies under consideration are not large companies, so recognition of financial needs and awareness is necessary to attain the greatest benefit from the implementation of environmental programs. For example, in response to the last question on our questionnaire, which is a space for comments about the questionnaire for the research, one manager stated that s/he is confident that chemicals can often be replaced with less harmful or green materials, but that the harmful chemicals cannot be dispensed with because there are no other alternatives at the present time. Another respondent stated that it is necessary to educate companies, institutions, and individuals so that they can implement green innovation.

One of the most important contributions of this study was to measure the extent to which green innovation practices are applied in the Palestinian context as an indicator of the context in developing countries. This research goal complements the results of Al-Shammari et al. [35], which did not mention the level to which green innovation was implemented in a manufacturing context. Additionally, we sought to elucidate the relationship between GHRM practices and green innovation on the one hand, and the relationship between green innovation and sustainable performance on the other hand. Moreover, we examined the relationship of the expected mediation effect of green innovation to GHRM practices and sustainable performance; we suggest that no such study has previously been conducted in Palestinian manufacturing firms. In terms of green innovation practices, the results demonstrated that the total implementation level of green innovation is moderate. Specifically, the implementation levels for green product innovation, green process innovation, and green managerial innovation are considered moderate, with means of 3.444, 3.1264, and 2.6264, respectively. Meanwhile, the level of implementation of green marketing innovation is low. It is clear that green product innovation is the most influential aspect of green innovation, which indicates that companies generate green products through the use of materials that reduce pollution, which also significantly reduces energy usage. It is also clear that industrial companies need to develop management and marketing processes

in the field of green innovation. The results showed that the companies need greater incentives to adopt more environmentally friendly standards in order to audit and control managerial programs and green supply chains. It is not surprising that results relating to the environmental labeling of green products is the weakest among the four variables that were chosen to measure green marketing innovation; this area of green marketing requires more attention. As mentioned above, the results showed that there is a significant relationship between GHRM practices and green innovation. In addition, there is an important positive relationship between green innovation and sustainable performance; therefore, this study proved the existence of a mediation relationship of green innovation between GHRM practices and the sustainable performance nexus. The results of this study complement the study of Singh et al. [17], which proved that GHRM factors (employees' green abilities, employees' green motivations, and employees' green opportunities) indirectly affect firms' environmental performance through the mediating role of green process and product innovation. The mediating analysis results also concur with the study conducted by Rehman et al. [76], which confirmed the mediating role of green innovation between GHRM and environmental performance. Moreover, the results proved that green innovation positively and significantly influences sustainable performance. The results bolster and emphasize the results from the study conducted by Al-Shammari et al. [35] by investigating more GHRM practices and providing a general scale for green innovation and sustainable performance pillars in the sector of manufacturing firms. It can be concluded from the results of the study that green innovation plays a vital role in the relationship between GHRM practices and sustainable performance. Hence, manufacturing organizations should pay attention to green innovation practices in order to maximize their positive effects in terms of environmental, social, and economic performance. In addition, this study's results suggest that green innovation can be referred to as greening the traditional products/services, processes, and managerial and marketing innovation practices to reinforce sustainable performance practices.

The results of the data analysis showed that there is a significant positive relationship between GHRM practices and sustainable performance in its environmental, economic and social dimensions; the same relationship was found regarding the impact of green innovation on sustainable performance. Moreover, the results showed that the overall sustainable performance level of implementation is moderate. More specifically, the level of implementation for the sustainable performance pillars (i.e., the environmental, social, and economic dimensions) was 3.0138, 3.0819, and 2.6034, respectively; these values are considered moderate. Through these results, it can be determined that the management of green human resources, which enables the selection of more efficient employees from an environmental point of view, as well as supporting increased environmental awareness and commitment, plays a major role in influencing individuals' behaviours towards the environment and motivates the development of sustainable performance. In terms of environmental performance, the results showed that the average response to the question "Our company respects environmental policies in order to counteract harmful emissions from processes" was 3.4655, which is the highest value among the questions; this was followed by the assertion that environmental activities reduce waste in the supply chain by an average of 3.051. Meanwhile, the average response rates for managers who believe that environmental activities improve the company's reputation and product/process quality were 2.9655 and 2.9310, respectively. These results represent a call for managers and decision makers in companies to pay more attention to enhancing the role of GHRM practices in supporting the environmental friendliness of institutions, which is consistent with many previous studies that have demonstrated the role of GHRM practices and their impact on environmental management, such as [9,13,14,40,61,78]. Referring to the results of economic performance, the decrease in cost for the energy consumption indicator has a mean of 2.8793, which is the highest score among those for the economic performance indicators. All of the other indicators range from 2.4310 to 2.7069: results that are considered moderate. However, those institutions that integrate environmental management programs

into their work also need to focus on them, and pay attention to improving economic performance, which constitutes one of the pillars of sustainable performance. According to the findings of the research into social performance, the average response rate to its indicators was between 2.8621 and 3.3103. This suggests that organizations are making considerable progress in the context of social performance, as evidenced by the findings of an examination of the responses of managers from diverse manufacturing firms. The aspects that were examined represented the social performance of improving the health and safety of workers and the community, as well as the relationship between society and stockholders, in addition to the firms' ability to provide job opportunities in the community.

The results demonstrated that there is a significant and positive relationship between GHRM practices and sustainable performance, which concurs with the results from other studies ([13,14,30,78]); hypothesis H1 is therefore supported. Furthermore, the findings showed a positive and significant relationship between GHRM practices and green innovation; this is in line with the results of previous studies [30,72], which confirmed that GHRM has a positive impact on green innovation. As such, H2 is supported. Meanwhile, the results for the relationship between green innovation and sustainable performance showed that there is a positive and significant correlation between them, which is consistent with other studies [30,57]; hence, H3 is supported. Finally, the proposed mediating effect of green innovation on the relationship between GHRM practices and sustainable performance is confirmed in this study, so H4 is supported. This study deals with the mediating effect of green innovation on the relationship between GHRM practices and sustainable performance in its three dimensions (i.e., environmentalism, economics, and social performance), whereas other studies, such as [29,55,72], have demonstrated the existence of the mediating effect of green innovation on the relationship between GHRM practices and environmental performance only.

4.6. Theoretical Implications

The study contributes to a deepened understanding of GHRM practices, green innovation practices, and their relationship to sustainable performance. It provides a comprehensive discussion of the most important practices in the Palestinian context, especially in the field of manufacturing, and thus expands the literature in this field. This study adds to previous studies that examined the relationship between GHRM practices and sustainable performance by adding a third variable—green innovation. It also considers the benefits that might result from integrating these variables in improving the level of sustainable performance in manufacturing companies. This study provides empirical evidence of the level of implementation for GHRM practices and green innovation, as well as sustainable performance. In addition, this study examines the mediating effect of green innovation in the relationship between management and the three pillars (environmental, economic, and social) of sustainable performance. This is thought to be the first study to address this topic in such a comprehensive manner, especially in the context of Palestine as a developing country.

4.7. Practical Implications

This study also has some practical implications for the managers and owners of manufacturing firms. If top management took an interest in environmental management, it would reduce the unwanted effects of the various manufacturing processes on the environment. As such, considering their influence in green innovation practices and sustainable performance, investment in GHRM practices will improve the competitive advantages of companies. For instance, selecting staff who have environmental values encourages them to improve their environmental skills, which in turn develops the firm's capacity for environmental management; therefore, rewarding employees for their environmental initiatives is important for ensuring the continuity of green behavior. In addition, the results showed that companies should work towards integrating the organization's environmental goals with GHRM practices in order to support and sustain green production, processes, and

managerial and marketing innovation. This study shows that it is not only GHRM practices that have an impact on sustainable performance, but that green innovation also plays a role. Therefore, paying attention to making products and services more environmentally friendly would not only improve companies' reputations, but would also help to preserve the environment, along with developing green processes and activating managerial systems and environmental marketing innovation.

5. Conclusions

Concern about environmental issues is growing across the world, leading organizations to adopt green technologies and green tools to continuously improving their ability to protect the surrounding environment, minimize waste, and reduce energy consumption. This research aimed to explore the effect of GHRM practices on a firm's sustainable performance, in addition to investigating the mediating effect of green innovation on the relationship between GHRM practices and sustainable performance in the context of Palestinian manufacturing companies (specifically, those in the chemical industry, the pharmaceutical industry, the food industry, and the metal and engineering industry). In addition, the study also measured the level of implementation of GHRM practices, green innovation, and sustainable performance. According to the results obtained from this study, green innovation explained 50% of the total effect of GHRM practices on sustainable performance as a partial mediator. Moreover, the results indicate that there is a positive and statistically significant association between GHRM practices and sustainable performance. GHRM practices are implemented at a moderate level, demonstrating that, if firms are engaged with GHRM practices, they will exhibit more acceptable levels of sustainable performance. It was also found that GHRM practices positively affect green innovation, and that the total level of implementation of green innovation is considered moderate; therefore, improving the green capabilities of employees enables organizations to offer greener products and services through reducing waste and pollution in manufacturing processes and by fostering green managerial innovation and green marketing innovation, at the same time as enhancing firms' competitive potential. The manufacturing industry has to recognize the value of green innovation for the various aspects of sustainable performance. The results of this study confirm the significant and positive effects of green innovation on manufacturing firms' sustainable performance. Accordingly, customers who are concerned about the environment and its value will be attracted to these firms. Furthermore, the use of various green innovations would allow enterprises to make greater savings, and the social aspect of environmental performance would also be maximized and recognized by customers who pay attention to the corporate social responsibility of firms. The results relating to sustainable performance revealed a moderate level of implementation. To the best of the authors' knowledge, this is one of the first empirical studies to examine the impact that green innovation may have on the relationship between GHRM practices and sustainable performance in Palestinian manufacturing firms. Hence, the findings obtained here may contribute significantly to our understanding of how green innovation can occur in the manufacturing industry. The study has a few limitations; for instance, the small sample size means that it is not advisable to generalize our results. Future research may further refine the study model by taking a larger sample size of industrial companies, or by applying it in other sectors. Future research may also investigate other variables, such as environmental organizational culture, as mediating variables, or else examine the impact of environmental beliefs as a control variable.

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