Sustainability and Quality Management in Healthcare During COVID-19

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This study aims to examine the relationships between healthcare organizations' sustainability performance and 1) green sustainability practices, 2) organizational culture, and 3) quality management practices. We proposed a conceptual model of the relationships and formulated three hypotheses. The findings showed that green initiatives and quality management practices affect healthcare organizations' sustainability performance, specifically social and environmental performance. The findings did not support the contribution role of organizational culture on sustainability performance. This study provides important strategic guidance for healthcare professionals who work to balance the implementation of corporate green practices and the triple bottom line dimensions of sustainability performance. The results showed that positive sustainability outcomes can be achieved when healthcare organizations commit to environmental issues and strategically invest in cost-efficient and eco-friendly initiatives.

Keywords: sustainability, healthcare, quality management, organizational culture

INTRODUCTION

Almost every industry and aspect of society has been affected by the COVID-19 pandemic, but the healthcare industry, in particular, saw some of the most significant changes. While healthcare organizations have an economic responsibility toward their ownership, the pandemic and its aftereffects have revealed how intertwined financial sustainability is with consumer and employee accommodation (Carroll, 2021, McAdam et al., 2021). Therefore, as economic responsibility to these groups could be healthcare organizations' most fundamental basis for success, we should prioritize closer scrutinization of those factors during and post-pandemic.

Not surprisingly, the pandemic continues to affect our daily lives and impact worldwide service industries, particularly healthcare environments (Chen et al., 2022). During this time, some especially spotlighted areas in healthcare are operational approaches taken by hospitals, medical clinics, and healthcare facilities. We cannot afford to ignore the state of hospital system wellness, current healthcare employees, and the general well-being of all organizations in this industry.

COVID-19 cases continue to ravage our nation, and physicians, nurses, and other medical personnel continue to wear full PPE, much of which is single-use and made of plastic. Unfortunately, at this point, environmental concerns regarding the use of PPE gears are probably not at the top of the priority list of most entities, even though many have been increasingly looking at environmental sustainability in their practices (Hawkey, 2020). Although the chances to create ways to reduce, reuse, and recycle are small currently, medical organizations will need to continue balancing a greener practice while keeping business afloat. In addition, hospitals, clinics, and other healthcare facilities will need to consider how the world has changed in the last few months (British Dental Association, 2020) and continue to lobby for environmental sustainability.

The authors find that healthcare literature lacks a comprehensive framework for measuring performance concerning specific sustainability elements. Therefore, this research aims to address the healthcare sector by examining sustainability factors contributing healthcare organizations' sustainability performance. In particular, we look at the relationships between organizational sustainability practices, organizational culture, quality management, and sustainability performance. These elements all have great potential to affect healthcare organizations' general well-being and performance level.

This study attempts to contribute to both theory and practice by addressing the research gap with the following research question: Do organizational green practices, culture, and quality orientation have significant positive relationships with sustainability performance among healthcare organizations?

The remaining sections are organized as follows: Section 2 comprises the literature review explaining the key constructs, underlying theory, hypotheses, and model development; Section 3 demonstrates the research model; Section 4 outlines the methodology; and Section 5 details the results. Finally, we conclude the study by discussing theoretical and practical implications, limitations, and future research directions in Sections 6 and 7.

LITERATURE REVIEW

Stakeholders' awareness of increasing response to corporate sustainability issues is rising because competitive advantage and profitability rank high on all organizations' top priorities. Many companies implement various sustainability programs to enhance their business model and transform sustainability into a competitive advantage. By expanding sustainability programs, one can gain an edge over their industry peers and translate those efforts into greater profitability and performance. Organizations have many available approaches and options to increase sustainability to improve economic value, professional success, and outcomes for clients, employees, and patients. Environmental sustainability initiatives often offer significant financial benefits for healthcare organizations and work to benefit hospitals' long-term prosperity (Wagner, 2017).

Factors Affecting Sustainability Performance in Healthcare

The following sections present an overview of the three independent variables of concern in our research: green practices, organizational culture, and Quality Management (QM). Various factors affect performance and contribute significantly to an organization's sustainability goals. This paper examines three factors that influence healthcare organizations' sustainability performance: green sustainability practices, organizational culture, and QM. The main objective of this research is to explore the relationships between green initiatives implemented in a healthcare organization, the use of quality management programs, and employee perceptions of sustainability performance.

Sustainability in the Healthcare Industry

According to Kaplan et al. (2012), the U.S. healthcare industry could save roughly $15 billion by adopting more sustainable practices. Hospitals can save millions of dollars by being energy-efficient conscious through waste reduction efforts and environmentally responsible purchasing. To be environmentally and socially sustainable, healthcare organizations must evaluate their building infrastructure, organizational practices, and related systems to implement measures in line with their

budgets. In addition, they need to incorporate reliable and resilient engineering systems to ensure patient safety (Bison & Dahl, 2016).

The current COVID-19 pandemic events are unprecedented in all healthcare operations. Researchers and stakeholders of medical organizations seek to understand how the pandemic will shape the future in terms of the ways we implement sustainability measures. In light of current and potential impacts, environmental sustainability practices can help organizations more constructively manage the current crisis (Sarkis, 2020). Not only are individuals feeling the social and emotional impact of the current crisis, but economic change has also influenced and reshaped systems and procedures at the individual and organizational levels. Healthcare organizations must endeavor to soften the financial blow, among other consequences resulting from the pandemic.

One way of approaching the issue is by considering sustainability efforts and programs. Sustainability is the concept of maintaining the balance between people and the environment (Nourbaha, 2020). One common way of implementing measures to meet and support that balance is to "go green" by modifying their energy consumption, waste disposal, chemical safety, and purchasing and energy sourcing decisions to lessen the impact on the environment (White, 2014). Going green can potentially help protect the environment and improve hospitals' bottom lines simultaneously.

Green practices involve management procedures and technological improvements that further develop and refine environmental and organizational performance and improve firms' competitive potential (Wang et al., 2021). Some researchers believe that green practices comprise distinct or changed systems, procedures, methods, and results that are environmentally beneficial and support the viability of firms (Xie et al., 2019, Wang et al., 2021). Based on the above findings, we propose the following hypothesis:

H1. *Green practices have a significant positive relationship with sustainability performance.*

Organizational Culture

Assessing and working to comprehend healthcare organization culture is essential for achieving improved performance goals. Previous studies indicate that organizational culture is critical for improved management efficiency and meeting or exceeding goals (Prodromou & Papageorgiou, 2020). Authors from different academic disciplines defined the phenomenon derived from organizational culture as the driving force responsible for an organization's success or failure (Cameron, 2008). Organizational culture is critical, particularly for healthcare organizations, which often require intense work schedules and constant attention to the quality of care received and reported by patients (Prodromou & Papageorgiou, 2020).

To cultivate high-quality outputs, managers must establish appropriate expectations and habits that link quality culture to performance (Polites & Karahanna, 2013). The organization should embed employees in a strong culture that can increase adherence to quality processes (Fok, Morgan, & Zee, 2021). There is a positive association between employee behaviors and organizational goals concerning actual habits and how that leads to positive or negative performances (Neal et al., 2012). To secure a culture that supports sustainability and leads to better performance, leaders and employees require an understanding of the deeply rooted behaviors in a culture that encourages individuals to act a certain way (Rashid & Aslam, 2012). Employers should reward individuals when they successfully identify product and process improvement opportunities. Such reward systems can help instill cultures that emphasize continuous improvement (Warren & Szostek, 2017). In addition, healthcare organizational leaders need to identify information that ensures compliance by integrating regulations and standards into the organizational culture while maintaining a high level of performance (Valmohammadi & Roshanzamir, 2014).

Naturally, employees of the same organization often display similar values and attitudes due to sharing the same workplace and interests related to their professional roles and responsibilities. In turn, these employees might eventually grow to display similar behaviors. Therefore, organizational culture is a valuable tool for implementing company strategies as it considers employee experience, expectations, and workplace synergy. When a sustainability movement becomes part of organizational strategy, the culture that binds members of the organization also impacts the level of success of green sustainability initiatives.

Healthcare organizations incorporating these initiatives within part of their organizational culture could reach a higher level of sustainability and profitability (Acharya et al., 2014).

H2. *Organizational culture has a significant positive relationship with sustainability performance.*

Quality Management and Sustainability

Contemporary healthcare organizations encounter various obstacles as they endeavor to provide excellent services, attain more robust performance levels, accommodate, and exceed patients' expectations, and maintain and nurture their competitive viability in ever-changing environments (Alkhaldi & Abdallah, 2021). As with almost all industries, systems for managing and advancing healthcare quality continue to change rapidly. In recent years, most hospitals have started prioritizing quality management (QM) (Alkhaldi & Abdallah, 2021), a philosophy in healthcare that seeks to set and reach an overall performance standard and increase the efficiency and efficacy of healthcare provision (Gadolin & Andersson, 2017). QM involves systematically satisfying patient expectations, recognizing and methodically resolving problems, and performing frequent quality improvement checks (Beuran et al., 2014).

A QM system makes quality issues the responsibility of all administrators and providers within the healthcare organization (Ali and Johl, 2021, Balasubramanian, 2016). In the healthcare industry, this translates to preventing clinical problems, increasing patient satisfaction, continuously improving the organization's processes, and providing services as good, if not better, than competitors. Customer focus, error prevention, company-wide participation, and continuous quality improvement are the universal TQM concepts transferable to any organizational setting.

QM is rooted in the integrative approach to customer satisfaction and a company's overall success (Hu et al., 2022). Applying QM to healthcare environments means providing the best possible care through continuously improving service to stakeholders and exceeding their needs and expectations (Grossu & Kalkis, 2019). The entire healthcare ecosystem – patients, providers, staff, and the community – can benefit from QM practices (Morgan, Fok, & Zee, 2020).

Addressing environmental deterioration is necessary to create sustainable development within healthcare organizations. Xie et al. (2019) defined sustainable development as the ability of an organization to adapt to change in the business environment to deploy the best contemporary methods to achieve and further maintain superior performance. Their take on sustainability development implies competitiveness, and an organization's competitiveness partly depends on its quality management practices. Sustainability is a new tool in company planning and a fundamentally important concept that should influence all policy developments within a firm (Hu et al., 2022).

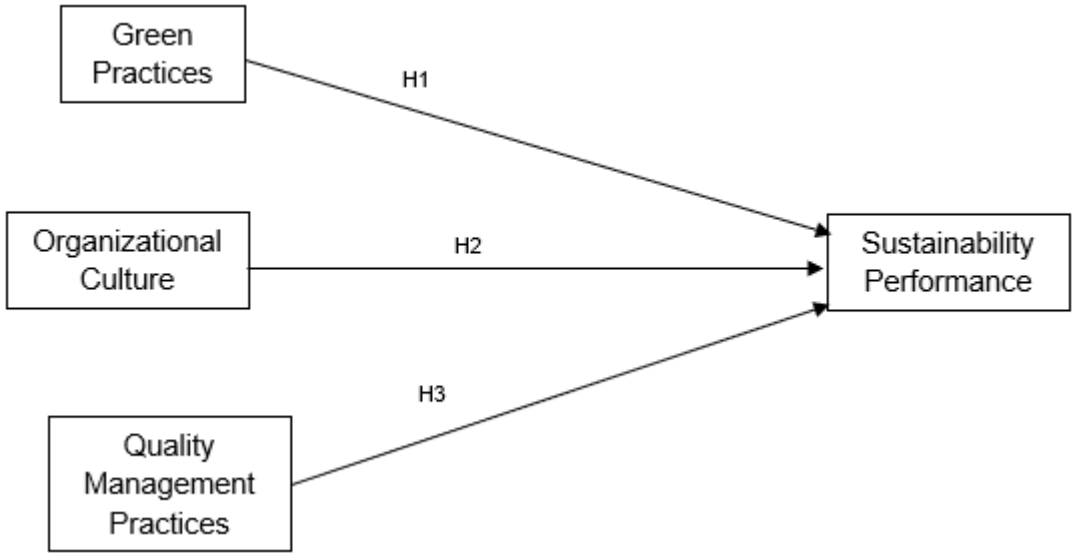
H3. *Quality management practices have a significant positive relationship with sustainability performance.*

THE RESEARCH MODEL

In this research, we examine sustainability performance issues to extend beyond the current scope of most studies and consider the impact of organizational culture, employee perceptions of organizational commitment to green practices, and QM practices of the organization. In addition, this research aims to examine the factors that may affect sustainability performance in healthcare organizations.

As shown in Figure 1, we expect green practices adopted by the organization to have a positive relationship with the triple bottom line sustainability performance (H1). Furthermore, a strong organizational culture should be positively related to Sustainability Performance (H2 in Fig. 1). Additionally, organizations with quality management systems and practices should directly and positively impact sustainability performance (H3 in Fig. 1).

FIGURE 1
RESEARCH MODEL



METHOTHODOLOGY

Research Design, Sample, and Data Collection

The study quantitatively explored the relationships among the variables depicted in Figure 1 in the context of the healthcare industry. A structured questionnaire was developed by following the procedures suggested by the literature (Brace, 2018). The research team comprised four academic experts who reviewed existing scales, adopted the relevant items, and developed new items based on current literature. Section 4.2 explains the items and scales used for each construct. In addition, we pre-tested the questionnaire with five healthcare practitioners, and their feedback helped discard ambiguous or irrelevant items. The final electronic questionnaire was developed using Qualtrics and included five sections. One section included demographic data and COVID-19 questions, and four additional sections contained questions related to each of the four constructs.

Initially, we contacted 175 companies via personal referrals to seek participation in the study. Upon approval from the companies, we distributed questionnaires and collected 59 valid questionnaires. The questionnaire asked the respondents about their perceptions and experiences about the green practices, sustainability performance, quality management, organizational culture, and impact of COVID-19 in their own companies. The quantitative data in this study provided the evidence to support the relationships among the factors impacting sustainability performance in the healthcare industry.

The respondents were 59 full-time managers from different healthcare organizations in the several regions of the United States. These respondents averaged 24.8 years of working experience and 12.11 years in management positions. They reported that their healthcare organizations averaged 7.27 years of sustainability experience. Most of these healthcare companies did not have substantial business closure due to COVID-19 (61.0% with no closure and 22.0% with 1% to 25% of closure), employed large numbers of people (44.1% with more than 500 employees, 15.3% with 251 to 500 employees, and 16.9% with 51 to 250) and had high annual revenue (27.1% with over $500 million, 16.9% $101 to $500 million, and 11.9% $25 to $100 million (Table 1).

TABLE 1
DEMOGRAPHIC INFORMATION

Variable	Frequency	Percent
Business Closure during COVID-19		
No closures	36	61.0
1% to 25% temporary closures	13	22.0
26% to 50% temporary closures	8	13.6
Over 50% temporary closures	2	3.4
Number of Employees		
Fewer than 50	14	23.7
51 to 250	10	16.9
251 to 500	9	15.3
Over 500	26	44.1
Annual Revenue		
Less than $25 Million	11	18.6
$25 to $100 Million	7	11.9
$101 to $500 Million	10	16.9
Over $500 Million	16	27.1
Unknown	15	25.4

Instrument

Organizational Green Practices

Typical green practices (GP) include emissions-reducing systems or processes, minimizing waste or pollution equipment and technology, and eco-friendly energy sources. The Li et al. (2009) study measured GP using twenty-one organizational green initiatives and experiences items. Despite the extensive research done in the last two decades, there is no conclusive way to measure the GP construct. Based on previous research (Abdul-Rashid et al., 2017; Afum et al., 2020; Cabral and Lochan Dhar, 2019; Green et al., 2019), this study measured GP by gauging the perceived levels of use of eight green sustainability initiatives with a 5-point Likert scale. After an exploratory factor analysis (EFA), we retained two factors explaining 61.5% of the total variance (Table 2). The first factor, "Green Processes," included items related to producing environmentally friendly, easily recyclable products with unharmful materials. The second factor, "Green Strategies and Policies," related to companies' commitment to eliminate all business policies and practices harmful to the environment inside and outside of the company and proactively lead policy changes to develop a greener community.

TABLE 2
FACTOR ANALYSIS ON GP ITEMS

Rotated Component Matrix		
	Component	
	1	2
Produces and designs environmentally friendly goods and services	0.360	0.539
Reduces environmentally dangerous materials in the production of goods and services	0.255	0.754
Reuses or safely disposes of products and supplies	0.009	0.830
Eliminates business practices that harm the environment	0.716	0.286
Promotes environmentally friendly goods and services	0.751	0.278
Leads and supports green activities inside and outside of the organization	0.842	0.005

Quality Management Practices

QM embraces the technical and behavioral management systems to gain a competitive advantage (Jiménez-Jiménez et al., 2020; Kaur et al., 2020; Nadae et al., 2021; Siva et al., 2016). In this study, the QM construct focused on the "hard aspects" of QM, measuring the *degree* of QM tools and initiatives implemented in an organization. Previous research has shown (Al-Dhaafri & Al-Swidi, 2016; Castello et al., 2020; Green et al., 2019; Isa et al., 2016) that the QM construct can be measured by examining the perceived use of quality improvement techniques, procedures, and tools. These ideas assume that if an organization has embraced a quality management philosophy more completely, the QM practices should be used throughout the organization and in various functional areas rather than in isolation. Moreover, if "quality is indeed everyone's job," where quality management is more fully adopted, managers should be aware of the various QM tools and techniques in use. To test this construct, respondents were asked about their perception of seven quality tools and activities being used by their organization their organization uses with a 5-point Likert scale. After conducting an EFA, we retained all seven items into one factor, Quality Management Practices," explaining 65.1% of the variance.

Organizational Culture

Organizational culture is an emotional/belief system of different values, hidden assumptions, and symbols shared by the members of the organization that represents a general pattern of all dynamic interactions among the psychological and social elements (Brenyah & Darko, 2017; Cadden et al., 2020). Based on previous research (Ababneh, 2021; Hartman et al., 2009), the Organizational Culture (OC) construct was operationalized and included a series of paired opposite items that asked whether the organization emphasizes quality or speed, being innovative or traditional, being proactive or reactive, and the like, using a 7-point Likert scale. To lessen the sensitizing effect on the respondents, the two opposite ends are both labeled as "3" with "0" in the middle. Table 3 provides the items and shows the results of our factor analysis. We obtained a two-factor solution explaining 66.8% of the variance of the OC items. The first factor, "Quality and Green Promoting Culture," includes team-oriented cultural dimensions, emphasizing quality, proactivity, and environmental mindfulness. The second factor, "Employee-Friendly Culture," includes items for collaborative culture, informal organization structure, and decentralized decision-making."

TABLE 3
FACTOR ANALYSIS ON OC ITEMS

Rotated Component Matrix		
	Component	
	1	2
Company culture that is competitive or collaborative		0.599
Organization structure that is formal or informal		0.768
Decision-making that is centralized or decentralized		0.778
Team-Oriented or Individualistic	0.870	
Emphasize Quality or Speed	0.847	
Proactive or Reactive	0.798	
Environmentally Mindful or Environmentally Unaware	0.868	

Sustainability Performance

For an organization to be sustainable, achieving a balance in economic, social, and environmental success is necessary. Based on previous research (Abdul-Rashid et al., 2017; Agyabeng-Mensah et al., 2020, 2021a, b; Fuzi et al., 2020; Hami et al., 2015; Sahoo & Vijayvargy, 2021; Singh et al., 2020; Yu et al., 2019), we measured sustainability performance (SP) in triple bottom line perspectives: environmental, social, and economical. This study asked respondents to rate fourteen SP items on a 5-point Likert scale. SP items include "Have better relationships with employees," "Have better relationships with the community," "Have better relationships with customers," "Increase sales," "Increase profits," "Reduce costs," "Improve productivity," "Decrease the use of environmentally harmful materials or production processes," "Minimize the negative environmental impacts of business activities," and "Increase corporate sustainability commitment." After an EFA, ten out of fourteen items were retained for the two sustainability performance factors explaining 69.2% of the variance. The first factor, "Social and Environmental Performance," includes social outcomes, like better relationships with suppliers, employees, and the community that lead to a safer work environment; and environmental outcomes, such as decreasing the use of harmful materials, minimizing negative environmental impacts, and increasing corporate sustainability commitment. The second factor, "Economic Performance," concerns increasing sales and profits.

TABLE 4
FACTOR ANALYSIS ON SP ITEMS

Rotated Component Matrix		
	Component	
	1	2
Have better relationships with suppliers	0.732	
Have better relationships with employees	0.757	
Have better relationships with the community	0.875	
Provide a safer and healthier work environment	0.875	
Decrease the use of environmentally harmful materials or production processes	0.803	
Minimize the negative environmental impacts of business activities	0.634	

Reduce waste of energy and materials	0.785	
Increase corporate sustainability commitment	0.699	
Increase sales		0.907
Increase profits		0.905

RESULTS AND DISCUSSION

Our hypotheses suggested that organizations in the healthcare industry will have significant positive relationships with Organizational Green Practices (*H1*), Organizational Culture (*H2*), and QM Practices (*H*) towards sustainability performance. To test the hypotheses, we performed two regression analyses with "Green Processes," "Green Strategies and Policies," "Quality and Green Promoting Culture," "Employee-Friendly Culture," and "Quality Management Practices" as independent variables. "Social and Environmental Performance" was the dependent variable in the first regression and "Economic Performance" in the second.

The regression model with Social and Environmental Performance as the dependent variable is significant at a .000 level with an R2 of 0.52. Three factors had significant positive relationships with Social and Environmental Performance (Table 5). In particular, Quality Management Practices have the strongest relationship with Social and Environmental Performance, based on the standardized regression coefficient (beta), while Green Processes and Green Strategies and Policies have the second and the third strongest relationship. The results supported *H1* and *H3* but not *H2* when using Social and Environmental Performance as the sustainability outcome. The second regression model with Economic Performance as the dependent variable is not significant, implying that Economic Performance does not seem to be affected by Green Practices, Organizational Culture, and Quality Management Practices. The results did not support the hypotheses for Economic Performance.

TABLE 5
FACTORS AFFECTING SOCIAL AND ENVIRONMENT PERFORMANCE

Predictor variable	Beta	S.E.	p-value
Green processes	0.261	0.108	0.019*
Green strategies and policies	0.223	0.102	0.033*
Quality and green promoting culture	0.092	0.101	0.367
Employee-friendly culture	0.087	0.100	0.389
Quality management practices	0.499	0.114	0.000**

* Significant at the 5% level
** Significant at the 1% level

Çankaya and Sezen (2019) found that green supply chain management practices were related to at least one of the sustainability performance dimensions. Agyabeng-Mensah et al. (2020, 2021a, b) found positive relationships between green practices and social and environmental performance in the manufacturing firms in Ghana. Sahoo and Vijayvargy (2021) found similar impacts of green supply chain practices on the sustainability performance of Indian manufacturers. Baah et al. (2020, 2021) showed significant positive relationships between green practices and financial and economic sustainability performance. In line with the previous research, this study shows that sustainable development initiatives in healthcare are positively related to social and environmental performances but not economic performance during the COVID-19 pandemic. We posit that this is due to the need for healthcare organizations to survive and thrive in business environments that no longer focus on low costs and high quality or short delivery times but also on effective response to supply chain disruption (Kumar, 2022).

Organizational culture (OC) did not show a positive relationship with sustainability performance posited in *H2*. An organizational culture supporting environmentally friendly values motivates companies to become conscious of resources used, waste produced, and energy consumed. The results relate to Khalil and Muneenam's (2021) study that the impact of OC on sustainability performance depends on several interrelated factors, such as top management engagement, knowledge, and capitalization of modern technologies, and infrastructure. In general, OC governs the broad business environment and is considered a prerequisite for implementing sustainability initiatives (El Baz & Iddik, 2022). OC and other management systems are possible strategic initiatives that may indirectly affect sustainability performance through green practices.

The results also show that quality management practices (QMP) positively affected social and environmental performances but not economic performance. These findings are similar to several recent studies (Fuzi et al., 2020; Ghadimi et al., 2021; Green et al., 2019; Thanki & Thakkar, 2019; Wang, 2019), in that green practices improved environmental and social performance when the organizational culture supported sustainability and quality improvement. QMP had a minimal direct impact on economic performance, which may be because QMP focuses mainly on the broad business environment and less on the operational level economic-oriented activities, such as productivity improvement and cost reduction (Carvalho et al., 2021; Lasrado & Kassem, 2021). The minimal impact of QMP might also be due to its potential to affect sustainability performance indirectly through the successful implementation of green practices. Future studies with a large sample size will give deeper insights into the intricate relationships between various organizational cultures and management systems and sustainability outcomes.

CONCLUSIONS

The current pandemic is causing enormous problems across industries and disrupting economies worldwide. If sustainability is considered a development objective, healthcare organizations must modify policies to make them affordable and results-oriented. In this paper, we identified various factors that improve sustainability performance. We conclude that innovative green policy mechanisms need to be adopted and care need to be administered to grow and succeed.

Environmental sustainability initiatives supposedly lead to increased operating costs, but it may just be the opposite. With small capital investments, hospitals and other healthcare facilities could significantly improve relationships with employees, suppliers, and the community. Our results showed that commitment to quality management and implementation of green initiatives focusing on developing green processes and adopting green corporate strategies and policies significantly influence healthcare sustainability performance.

Healthcare facilities are positioned to make sustainability a part of their mission and long-term strategic plan, which will ensure the organizations' longevity and increased profitability.

IMPLICATIONS AND LIMITATIONS

Implications

It is increasingly pertinent for businesses today to deploy sustainability strategies in addition to those typically implemented to stay competitive. Based on our research, there appears to be a lack of studies addressing the complexity of sustainability in the healthcare industry. These results from the current study are consistent with the existing literature; that is, green practices and quality management practices were found to positively impact sustainability performances (Agyabeng-Mensah et al., 2021b; Fuzi et al., 2020; Ghadimi et al., 2021; Green et al., 2019). These results can help guide healthcare practitioners in the strategic adoption of green practices and quality management practices. Implementation of sustainability and quality programs in the healthcare industry is a challenge; however, the top managers in healthcare must align their strategic goals with internal and external sustainability dimensions.

Limitations and Future Research Studies

The present research is limited to healthcare organizations from a geographical location in the United States. Follow-up studies focusing on several key industries, such as healthcare, retail, and finance and banking, would allow the development of industry-specific sustainability strategies and best practices. Future research should also include other countries, allowing us to see if findings can be generalized across countries. In addition, this study has a small sample size of 59 respondents. A follow-up study should be done with a large sample size to provide deeper insights into the intricate relationships between various organizational cultures and management systems and sustainability outcomes. Since the current study's data was collected during the COVID pandemic, the results may be skewed in the healthcare industry. Once the working environment has been "normalized," we advise implementing additional studies comparing how healthcare companies perform during and after the pandemic.

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