

## Green Occupational Health, Safety and Performance of Devolved Healthcare Services in Kenya

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### ABSTRACT

*Green human resource management is the adoption of policies and practices to attain sustainable use of a firm's resources while enhancing environmental sustainability, which also boosts employee morale and satisfaction with firm performance. Level Five hospitals in Kenya are increasingly expected by law to implement environmentally sustainable practices. This study aimed to determine the effect of green occupational safety and health on the performance of devolved healthcare services in Kenya. A mixed-methods research design was used, whereby the researchers combined the elements of quantitative and qualitative approaches. The study targeted 5,960 employees working in 12 Level Five hospitals in Kenya. This study applied multi-stage random sampling, which refers to dividing the population into units or smaller and smaller groups and selecting the sample. In the first stage, simple random sampling was used to select four of the 12 Level Five hospitals with an accessible population of 1310. In the second stage, purposive sampling was used to select a sample of 131 respondents, representing 10% of the accessible population. Data collection tools were questionnaires, interviews, and document analysis. The study applied descriptive and inferential statistics to analyze data. The findings revealed a strong positive and significant relationship between green occupational safety, health and the performance of devolved healthcare services in Kenya. The study concluded that green occupational safety and health had a significant effect on the performance of devolved healthcare services. The study recommended that devolved healthcare services should improve if they continuously used green occupational safety and health management systems that reduce accidents and injuries; utilized paperless offices so as to create a clean and safe work environment; applied eco-friendly medical waste disposal methods such as waste minimization, segregation, and recycling; used eco-friendly safety gadgets; and conducted regular safety and health audits.*

**Keywords:** Devolved Healthcare Services, Green Human Resource Management, Green Occupational Safety and Health, Human Resource Management, Human Resource

### I. INTRODUCTION

Green HRM is the application of HRM policies and practices by management to attain sustainable utilization of organizational resources in an eco-friendly environment, which also enhances employee motivation for organization performance (Mampra, 2013). Hospitals are experiencing a growing expectation to incorporate environmentally sustainable practices into their performance operations. This expectation is supported by both regulatory mandates and the need to balance economic and social factors in a fiercely competitive industry. Thus, attainment of hospital objectives within an environmentally conscious setting is contingent upon the efficacy of its green human resource management practices. Many scholars have directed their attention toward the relationship between human resources and environmental management because of the important role green human resource management (GHRM) practices play in attaining organizational development (Aggarwal & Agarwala, 2023). The main purpose of linking HR management with environmental management is to help organizations engage in environmental protection and conservation while at the same time improving organizational performance.

According to Mwita (2019), Green Human Resource Management (GHRM) involves utilizing employees to accomplish organizational objectives, while also actively encouraging them to contribute to environmental protection and conservation. Green HRM offers several advantages to different organizations most of which are associated with business performance such as attracting more customers, corporate social responsibility through compliance to legal and ethical standards, and environmental sustainability such as clean and safe environment (Bhutto & Auranzeb, 2016). The guidelines of the World Health Organization (WHO, 2012) provide that it is the duty and responsibility of the employer to ensure the occupational safety and health of her employees against diseases and injury because a healthy and safe work environment promotes work productivity and is a key element of worker human dignity (International

Labour Organization [ILO], 2010). Hameed et al. (2020) opined that green safety and health are very important in promoting the safety and health of employees while at the same time providing a green environment that has less stress and reduces harmful effects. Organizations, according to Sharaf and Khalil (2021), are striving to enhance sustainability by implementing effective employee safety and health policies, which can also extend to address environmental issues.

Shah (2019) explained that a lot of effort is required to reduce occupational stress and sickness and initiate activities that protect the environment and livelihoods of communities. Green occupational safety and health practices tend to reduce harmful consequences in order to avoid health concerns and improve the well-being of employees. Green occupational safety and health is, therefore, very important in promoting the safety and health of employees while at the same time providing a green environment that has less stress and reduces harmful effects (Hameed et al., 2020).

### 1.1 Statement of the Problem

The recent growing interest in environmental issues (Aburahma et al., 2020) and increasing concern about the impact of our day-to-day activities on the environment and the depleting natural resources have triggered individuals and organizations to go green, including healthcare service organizations. The stakeholders of firms are getting more and more concerned about sustainable use of resources, climate change, and a sustainable environment, and so there is a growing need to integrate green abilities into HRM practices. It is the HRM function that can enable organizations to align their HR policies to the green goals and drives green practices to be ingrained in the culture of an organization so as to enhance performance and environmental sustainability (Obeidat et al., 2020; Pham et al., 2019). Incorporating green human resource management practices, such as green occupational safety and health, in Level Five Hospitals will greatly improve the safety and health of the employees and patients and enhance performance and environmental sustainability. Although devolved healthcare services offered by Level Five Hospitals in Kenya could be practicing green occupational safety and health (GOSH), only a few studies, if any, have considered how this factor affects their performance in developing countries like Kenya. Therefore, the focus of this study was to determine the effect of green occupational safety and health practices on the performance of devolved healthcare services in Kenya.

### 1.2 Research Objective

To examine effect of green occupational safety and health on performance of devolved healthcare services in Kenya.

### 1.3 Research Hypothesis

H<sub>01</sub>: Green occupational safety and health has no significant effect on performance of devolved healthcare services in Kenya.

## II. LITERATURE REVIEW

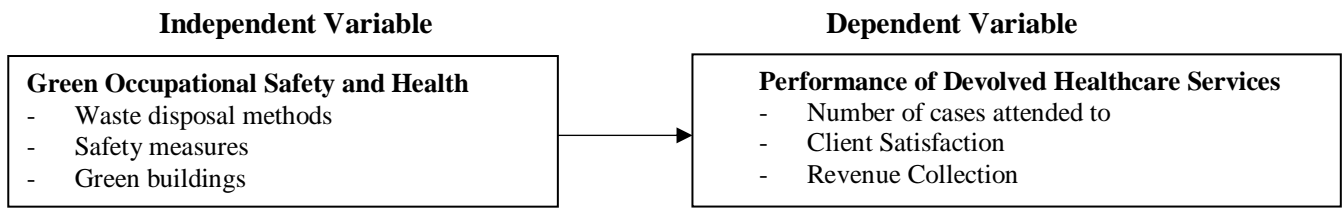
### 2.1 Theoretical Review

The study was anchored on the Ability, Motivation, and Opportunity (AMO) theory that was developed by Vroom (1964) and later expounded by Boxall and Purcell (2003). The theory suggests that people need ability, motivation, and opportunity to perform well. AMO theory stresses that employees' abilities, motivations, and opportunities can contribute to organizational performance through an integrative perspective so as to promote firm performance (Alnajdawi et al., 2017; and Mwita, 2019). Green occupational safety and health refers to a workplace that is free from hazards and occupational diseases that may affect employee health. The AMO framework provides a structured approach for assessing GHRM efficacy to ensure that employees have the ability and are motivated to participate in eco-friendly activities (Kellner et al., 2016). Furthermore, Renwick et al. (2013) suggested that organizations should ensure that new employees know and practice their environmental responsibilities, safety, and health concerns, embrace corporate environmental culture, and adopt the organization's environmental policies and practices. Employee green involvement, the establishment of a safe and clean work environment, and green employee passion and motivation all contribute to opportunity-enhancing green occupational safety and health practices, enabling employees to engage in environmental management while providing quality healthcare services to their clients. For Level-Five hospitals to create a sustained competitive advantage over other hospitals, they should adopt green occupational safety and health practices that emphasize a safe and clean work environment while discharging their healthcare services. Investment in greening the health workers is likely to increase their skills and value in service delivery to Level Five hospitals, enhance the performance of devolved healthcare services, and lead to an improved reputation in matters of environmental management.

### 2.2 Conceptual Framework

An Independent variable is the presumed cause of the dependent variable while the dependent variable is the presumed effect thought of as consequence of the change in the independent variable (Kothari, 2019). According to this

study, occupational safety and health is the independent variable operationalized using three indicators and performance of devolved healthcare services is the dependent variable operationalized using three indicators as shown in Figure 1.



**Figure 1**  
*GOSH and Performance of Devolved Healthcare Services*

## 2.3 Empirical Review

### 2.3.1 Green Occupational Safety and Health

According to the WHO (2017), the health sector is a major contributor to environmental pollution and the emission of health-risk hazards such as toxic chemicals, radioactive materials, and water waste. Adopting energy-efficient methods and reducing waste generation can lead to reduced energy costs and a reduced carbon footprint, while sustainable use of water and water quality regulations protect human health and the environment. Hameed et al. (2020) opined that green safety and health are significant in promoting the safety and health of employees while at the same time providing a green environment that has less stress and reduces harmful effects. Organizations, according to Sharaf and Khalil (2021), are striving to enhance sustainability by implementing effective employee safety and health policies, which can also extend to address environmental issues.

One of the biggest concerns for the public's wellness is the prevalence of illnesses and injuries at the workplace (Konijn et al., 2018). In 2017, the ILO released a report that stated that injuries and illnesses linked to the workplace claim the lives of more than 2.78 million employees annually. Prolonged impairments, diminished capacity to execute job responsibilities, premature retirement, healthcare costs, presenteeism, absenteeism, and fatalities are the gravest adverse effects of workplace injuries and accidents. These effects resulted in a loss of global gross domestic product, which accounted for 1.8 percent to six percent of GDP in different countries (Caffaro et al., 2018). Furthermore, we can reduce occupational illnesses, accidents, and their adverse effects through two distinct types of measures: medication and preventive measures. Although environmental management incurs some costs, it improves the health of employees and local communities, enhances the organization's image as a better green employer, and improves corporate citizenship (Arulrajah et al., 2015).

Shah (2019) explained that a lot of effort is required to reduce occupational stress and sickness and initiate activities that protect the environment and livelihoods of communities. Green occupational safety and health practices tend to reduce harmful consequences in order to avoid health concerns and improve the well-being of employees. Therefore, green occupational safety and health are important in improving client satisfaction, firm image, and sustainable performance. The Occupational Safety and Health Act (2007) allows employees and stakeholders to participate in workplace decisions that may affect their safety and health, while managers will consult with employees on safety and health matters in accordance with agreed procedures. According to Pillai and Sivathanu (2014), HR personnel can spearhead green initiatives like recycling campaigns, paper drives, and educational programs, as they not only contribute to a cleaner environment but also save time and money. This study conceptualized green occupational safety and health as independent variables, and the performance of devolved healthcare services as a dependent variable. This is shown in Figure 1.

### 2.3.2 Performance of Devolved Healthcare Services

Employee performance is a measure of their competence and responsiveness in performing their duties, and it has a direct impact on the quality, availability, demand for, and use of health services (WHO, 2012). The green performance of employees is the main input for minimizing the harmful impact on the environment of the organization. Each employee's green performance usually leads to group green performance, which is referred to as organization green performance (Arulrajah et al., 2016). Opatha and Arulrajah (2014) argue that green performance of the organization can be achieved by ensuring green processes in HRM practices that lead to green results, for example, green innovations in environmental initiatives that bring green solutions for reducing waste and pollution, and green outcomes such as the number of hours worked by an employee using natural light or a reduced amount of waste of inputs and the attainment of performance targets related to the environment. Haridas and Sivasubramanian (2016) opine

that some of the benefits of implementing GHRM practices include reduced cost, improved public image, reduced carbon emissions, and the establishment of an environmentally friendly work space.

Arulrajah et al. (2016) found that employee green performance includes efficient use of input resources by employees when performing their day-to-day functions, the application of innovative environmental initiatives, and the employee contribution to company environmental management initiatives. Cherian and Jacob (2012) found that the greening of human resource functions by firms may generate positive performance and lead to increased productivity. On the contrary, firms that do not pay attention to involving their employees in greening activities might be ineffective in their environmental performance (Renwick et al., 2013). Organization Performance, therefore, can be viewed in terms of sustainability, which means stability and growth achieved through the provision of quality goods and services with stable revenue resources; efficiency of operations; organizational legitimacy, which is regarded as compliance with the law, regulations, and social and environmental responsibility; and employee entitlement in terms of employee safety and health, organizational climate, employee commitment, and performance (Aburahma et al., 2020).

### III. METHODOLOGY

The study applied positivism philosophy because the researcher's role in positivism studies is limited to data collection and interpretation through an objective approach, and the research findings are usually observable and quantifiable. Ongoncho (2019) and Langat (2016) used positivism philosophy in their studies with a lot of success. A mixed-methods research design with a combination of qualitative and quantitative approaches was used in this study.

The method was used because it allows researchers to consolidate data and seek a wider perspective of their study phenomenon (Shorten & Smith, 2017), and it helps to overcome any weakness that may arise from using a single method in a research study (Plano & Ivankova, 2016).

This study targeted 5,960 employees working in 12 Level 5 hospitals in Kenya (Ministry of Health, 2018). This study applied multi-stage random sampling, which refers to dividing the population into units or smaller and smaller groups and selecting the sample (Kothari, 2019). In the first stage, simple random sampling was used to select four of the 12 Level Five hospitals with an accessible population of 1310. These hospitals were homogenous and manageable, and every respondent had an equal chance of being selected. In the second stage, purposive sampling was used to select a sample of 131 respondents, representing 10% of the accessible population (Mugenda & Mugenda, 2013). Purposive sampling was suitable because respondents were selected into a sample held in management positions and had the desired level of knowledge needed to respond to questionnaire items (Saunders *et al.*, 2016). These respondents consisted of managers and supervisors, as they are the ones who implement GHRM policies and practices. Table 1 shows a sample of respondents from different levels of management. The sample size of 131 employees was suitable, as it is supported by other studies such as Makhamara (2017), Kuria and Mose (2019), and Mandago (2019).

**Table 1**  
*Sample Size*

Level Five Hospital	Top-Level Management	Middle-Level Management	Bottom-Level Management	Sample
Machakos Level Five Hospital	5	17	11	33
Mama Lucy Kibaki Level Five Hospital	5	15	9	29
Embu Level Five Hospital	5	17	10	32
Nakuru Level Five Hospital	5	19	13	37
<b>Total</b>	<b>20</b>	<b>68</b>	<b>43</b>	<b>131</b>

A questionnaire and interview were used to collect primary data, while document analysis was used for secondary data. A questionnaire has the ability to collect a large amount of data within a short time and give respondents anonymity and the freedom to express their opinions more objectively (Kothari, 2019). Questionnaires were distributed to the respondents after they were sensitized to GHRM practices and requested informed consent. An interview that lasted for ten minutes was conducted with three top management employees of each hospital at different times within the data collection period. Document analysis was used to collect data from documents for a period of six years between 2014 and 2019. A descriptive statistical analysis was conducted to summarize the study findings, and the results were presented using tables and figures. Content analysis was used to analyze qualitative data (Mugenda & Mugenda, 2013). Correlation analysis was conducted using Pearson's product-moment correlation coefficient (PPMC) to establish the strength and direction of the relationship (Kothari, 2019); simple regression analysis was conducted to determine the cause-and-effect relationship between the independent and dependent variables (Kothari, 2019). A one-way ANOVA



was applied to determine whether there were significant differences between two or more groups of samples at a selected probability level (Mugenda & Mugenda, 2013).

## IV. FINDINGS & DISCUSSIONS

### 4.1 Descriptive Findings

#### 4.1.1 Descriptive Statistical Findings for Green Occupational Safety, Health and Performance of Devolved Healthcare Services in Kenya

Green occupational safety and health in devolved healthcare services is an important component of traditional HRM practices. It affects the level at which the hospital can provide employee safety and health to improve performance while being sensitive to the environment. The respondents were requested to provide their honest opinion on green occupational safety and health statements based on the following scale: 1: Strongly Disagree (SD); 2: Disagree (D); 3: Undecided (UD); 4: Agree (A); and 5: Strongly Agree (SA). The results were analyzed and presented in Table 2. The mean (M) was used as a measure of central tendency, and the standard deviation (Sd) was reported as a measure of variability from the mean.

**Table 2**

*Descriptive Statistical Findings for Green Occupational Safety and Health*

GOSH Statements	1	2	3	4	5	M	Sd
Occupational safety and health management system reduce accidents and injuries and boost hospital performance.	1.8%	1.5%	10.2%	54.2%	32.2%	4.14	0.77
Paperless offices are encouraged in the hospital to create a clean and safe work environment.	1.2%	3.5%	11.7%	45.4%	38.2%	4.18	0.81
Eco-friendly disposal methods such as waste minimization, segregation, and recycling are encouraged among healthcare employees.	0%	3.4%	15.3%	36.4%	44.9%	4.23	0.83
The employees are provided with eco-friendly safety gadgets (e.g., gloves) to enhance performance.	0%	1.8%	9.2%	48.3%	40.7%	4.28	0.70
Green occupational safety and health audits are conducted to ensure safe work environment.	0.6%	1.7%	12.7%	42.6%	42.4%	4.26	0.74
Hospital buildings are spacious with ventilation and natural lighting to save energy and reduce infection.	0%	1.8%	12.5%	43.5%	42.2%	4.19	0.71
Green Occupational safety and health greatly affect the performance of devolved healthcare services.	0.8%	1.6%	14.3%	51.4%	31.9%	4.12	0.74

From Table 2 findings, the majority the majority of the respondents, 86.4%, with a mean (M) of 4.14 and a standard deviation (Sd) of 0.77, agreed that occupational safety and health management systems reduce accidents and injuries and boost hospital performance. This shows that when there are minimal accidents and injuries at work, employees execute their duties very well, thereby increasing the performance of healthcare services. This study finding is in line with a study conducted by Chaudhary (2020), which revealed that green occupational safety and health significantly influence employee behavior and hence may reduce accidents and injuries and boost organizational performance. Respondents representing 3.3% disagreed with this statement, while 10.3% remained undecided. The employees who disagreed or remained undecided with the statement show that they were either unaware of the occupational safety and health management system or had not interacted with it.

The majority of respondents, 83.6%, with a mean of 4.18 and SD of 0.81 agreed that Level Five hospitals encourage paperless offices to create a clean and safe work environment. This finding implies that paperless offices reduce the cost of printing paper and enhance electronic healthcare services. In paperless offices, patients are encouraged to pay for services online through M-pesa and electronic money transfers (via Visa). The finding concurs with that of Ahmad (2015), who opined that e-business and e-learning have converted ordinary offices into paperless offices, which reduces the consumption of paper and minimizes the cost of paper-related activities. On the other hand, the use of paper leads to the generation of clutter and environmental pollution, with associated waste disposal costs. Those respondents who disagreed and remained undecided with this statement were 4.7% and 11.7%, respectively.

Eco-friendly disposal methods such as waste minimization, segregation, and recycling are encouraged among healthcare employees, according to 81.3% of respondents, with an M of 4.23 and a SD of 0.83. This result shows that the majority of the respondents agreed with the statement. The healthcare employees are well informed about waste



disposal methods that are in line with the OSH Act (2007). Respondents representing 15.3% remained undecided, and the remaining 3.4% of respondents disagreed with the statement. The findings further revealed that hospital employees are provided with eco-friendly safety gadgets, for example, gloves, to enhance performance, as supported by the majority of the respondents, representing 89% with an M of 4.28 and a SD of 0.70, who agreed with the statement. Respondents representing 9.2% were undecided, while the remaining 1.8% disagreed with the statement. The respondents were further asked to rate the statement that green occupational safety and health audits are conducted to ensure a safe work environment, and the majority of respondents, representing 85% with M of 4.26 and SD of 0.74, agreed with the statement. Those who remained undecided were 12.7%, while those who disagreed with the statement were 2.3%.

The findings revealed that spacious hospital buildings with ventilation and natural lighting save energy and reduce infection, as supported by respondents 85.7% with M of 4.19 and SD of 0.71. This result shows that the majority agreed with this statement. The use of spacious buildings reduce overcrowding, conserve energy, and enhance employee health and safety, which boosts employee morale and productivity. Further, Wargoeki et al. (2000) stated that green buildings can improve employee health and well-being and enhance productivity. Employees representing 12.5% were undecided, while 1.8% disagreed with the statement. The employees who were undecided or disagreed imply that they were either ignorant or unaware of the meaning of green buildings and how they can boost employee health and safety. Finally, regarding the findings regarding the effect of occupational safety, health, and performance of devolved healthcare services, 81.3% of respondents with M of 4.12 and SD of 0.74 agreed. The findings of this study imply that when the work environment is clean and safe, employees tend to improve performance and report a few cases of accidents and injuries. This study finding concurred with a previous study conducted by Hameed et al. (2020), who found that green safety and health are very important in promoting the safety and health of employees while at the same time providing a green environment that has less stress and reduces harmful effects. Shah (2019) explained that a lot of effort is required to reduce occupational stress and sickness and initiate activities that protect the environment and livelihoods of communities. Other employees, representing 14.3%, were undecided, while 2.4% disagreed with the statement.

The respondents were further requested to provide ways that would improve green occupational safety and health for the purpose of enhancing the performance of devolved healthcare services. Forty-three responses were provided, arranged in themes, analyzed, and presented in Table 3.

**Table 3**

*Suggestions for improvement of green Occupational Safety and Health Practice*

Responses	F	%
Devolved healthcare services should continue to embrace paperless offices.	23	53.5
There is need to provide spacious offices to enhance employee’s safety and health	13	30.2
There is need for Hospitals to supply adequate personal protective equipment	7	16.3
<b>Total</b>	<b>43</b>	<b>100.0</b>

The findings in Table 3 show that a majority, 53.5% indicated that devolved healthcare services should continue to embrace paperless offices to reduce paper use and minimize the cost of printing paper. Employees who use electronic gadgets to provide services usually enhance the speed and efficiency of service delivery, while at the same time, patients are encouraged to use electronic methods to pay for services, for example, through M-pesa and other electronic money transfers such as visa cards. Employees should use less time to locate patient reports and other associated information that is in paper form, which will reduce pollution of the environment with waste paper. The finding is in agreement with that of Ahmad (2015), who found that e-business and e-learning have converted ordinary offices into paperless offices, which reduces the consumption of paper and minimizes the cost of paper-related activities. Other respondents (30.2%) suggested that hospitals should provide adequate and spacious offices so as to reduce congestion and enhance the safety and health of employees. Spacious offices usually promote fresh air circulation and minimize infection, which means that employees should be in good health to provide continuous healthcare services. Finally, respondents representing 16.3% suggested that there is a need for hospitals to supply adequate personal protective equipment. Employees who are provided with adequate protective gear feel safe and committed to discharge their services.

The study sought to check and record the types of safety measures implemented in the period between 2014 and 2019. It was found that Level Five hospitals provide protective personal equipment, such as gloves, dust coats, and shoes that are environmentally friendly. Further, installation of emergency safety and warning signs at entry or exit points; fire extinguishers and fire assembly; and provision of standard operating procedures (SOPS) in all work areas were noted to be in place. The study also sought to check and record the number of available annual environmental audit reports for the past six years (2014–2019). It was found that most devolved healthcare services had not conducted any annual environmental audits for the period under study, but they have a health environmental policy statement

committing the hospitals towards continuous improvement and nurturing a safe and healthy lifestyle among employees that respects the environment.

The study also checked and recorded types of eco-friendly waste disposal methods for the period (2014–2019). From the records provided by the hospitals' public health officers, it was noted that the devolved healthcare services have trained their employees to use waste segregation bins to separate different types of waste so as to maintain a safe and clean work environment. The incineration method is used to destroy biological waste and cemetery was used to dispose unclaimed bodies; waste food is given to pig farmers; garbage is deposited at the dumpsite; wastewater is released to sewer ponds for treatment; plastic chairs and empty cans are sold for re-use or recycling; and in some cases, the burning method is used. It was further noted that whenever these methods are used, environmental sustainability is taken into consideration. In recording the types of disciplinary actions imposed on employees for non-compliance with GOSH activities for the past six years (2014–2019), the study found that any disciplinary matter related to non-compliance with GOSH was handled under the general disciplinary procedure of the hospitals.

The study conducted an interview with managers, and the findings are indicated in the section that follows. Respondents were requested to explain how GOSH affects the performance of devolved healthcare services. From the study findings, all twelve managers indicated that a clean and safe environment was provided to both employees and customers. Provision of a clean and safe environment enhances the protection of employees against risks arising out of or connected with their activities, and this makes them perform well. The findings are aligned with those of the World Health Organization (2012), which found that protection and promotion of workers' health by preventing and controlling occupational diseases and accidents; development and promotion of healthy and safe work; work environments; and work organizations enable workers to conduct socially and economically productive lives and hence contribute positively to sustainable development. This result is further supported by Hameed et al. (2020), who opined that green safety and health are very important in promoting the safety and health of employees while at the same time providing a green environment that has less stress and reduces harmful effects.

The managers were asked to explain if the hospitals had a committee that specifically dealt with the daily health issues of employees and their safety at work. All 12 managers said that each Level Five hospital has an established infection prevention and control committee that deals with daily safety, health, and welfare issues that affect employees and other persons lawfully present at workplaces. This finding indicates that the hospitals are compliant with the Occupational Safety, Health, and Welfare Act (2007) of Kenya. Sharaf and Khalil (2021) support this idea of compliance by arguing that organizations are making efforts to improve sustainability through effective employee safety and health policies, which can also encompass environmental issues. In answering the question on how managers manage their staff to ensure environmental sustainability, all 12 managers said that staff are managed through duty allocation and the provision of induction training in areas of waste management, infection prevention, and control. Green occupational safety and health practices tend to reduce harmful consequences in order to avoid health concerns and improve the well-being of employees. Therefore, green induction for new staff and continuous awareness tend to give employees the ability, motivation, and opportunity to manage waste properly and hence protect and conserve the environment. In the same vein, Shah (2019) explained that a lot of effort is required to reduce occupational stress and sickness and initiate activities that protect the environment and livelihoods of communities.

The managers were asked to explain if they used paperless offices and the extent to which that practice affected the performance of devolved healthcare services. Nine out of 12 managers explained that most of their operations and offices were paperless, while three argued that their offices were partly paperless and partly not. This finding is supported by Ahmad (2015), who found that e-business and e-learning had changed ordinary offices into paperless offices, which to a large extent reduced the consumption of paper and substantially reduced the cost of paper-related activities. Further, paperless offices save time spent searching for paper documents, which leads to increased speed of service delivery and reduced fraud in revenue collection. Reduced printing paper led to reduced waste paper in the environment and the protection of trees that produce paper, and it also led to cost savings, which translates into increased revenues for the hospital.

#### **4.1.2 Descriptive Statistical Findings for Performance of Devolved Healthcare Services**

The performance of devolved healthcare services is important because it enables a hospital to achieve its desired objectives and enhances environmental sustainability. This section, therefore, requested the respondents to provide their honest opinion on the statements below based on the following scale: 1- Strongly Disagree (SD); 2- Disagree (D); 3- Undecided (UD); 4- Agree (A); and 5- Strongly Agree (SA). The results were analyzed and presented in Table 4. The mean (M) and standard deviation (Sd) were applied to describe central tendency and dispersion respectively.

**Table 4**  
*Performance of Devolved Healthcare Services*

Statements	1	2	3	4	5	M	Sd
The number of patients attended to has increased for the past six years.	2.5%	1.7%	9.3%	51.7%	34.7%	4.14	0.85
The eco-friendly processes developed by the hospital reduce the consumption of energy.	4.2%	3.4%	6.8%	54.2%	31.4%	4.05	0.95
Hospital clients are satisfied with the provision of eco-friendly healthcare services.	2.5%	0%	11.9%	46.6%	39%	4.19	0.84
The hospital encourages the use of an electronic payment system (e.g. M-pesa) for healthcare services as it improves client satisfaction.	1.7%	4.2%	15.3%	45.8%	33.4%	4.03	0.90
Management supports the use of eco-friendly electronic resources and web materials.	0%	0.8%	9.3%	50%	39.8%	4.29	0.67
Revenue collection in this hospital has increased for the past six years.	0.8%	5.1%	16.1%	44.9%	33.1%	4.04	0.88
The green operations developed by the hospital effectively reduce the emission of hazardous substances.	3.4%	1.7%	7.6%	47.5%	39.8%	4.19	0.91

The findings in Table 4 show that the majority of the respondents, 86.4% ( $M = 4.14$ ,  $Sd = 0.85$ ), agreed with the statement that the hospital had seen an increase in the number of patients receiving treatment over the past six years. The number of patients seeking treatment increases when employees are trained and work using electronic gadgets to retrieve patient information, receive payments, and conduct diagnoses. The result is supported by Omune and Nyang'au (2021), who found that green human resource management practices significantly and positively affected employee performance at Kenyan public universities. The remaining 9.3% were undecided, while 4.2% disagreed with the statement. The employees who disagreed or remained undecided imply they are not aware of increased patient numbers or lack access to information.

On whether the hospital has implemented eco-friendly processes that decrease energy consumption, the majority respondents, 85.6% ( $M = 4.05$ ,  $SD = 0.95$ ), agreed with the statement; 6.8% were undecided; and 7.6% of the respondents disagreed with the statement. Eco-friendly processes practiced by employees reduce carbon emissions by ensuring efficient use of energy and turning off artificial light and electronics when not in use. A recent study that supports this finding is that of Ren *et al.* (2018), who argued that an effective approach to organization sustainability requires employee compliance with formal rules and acceptance to voluntarily engage in green initiatives such as lowering consumption of energy and paper and using stairs in place of elevators.

Hospital clients are satisfied with the provision of eco-friendly healthcare services, according to 85.6% ( $M = 4.19$ ,  $SD = 0.84$ ), of the respondents who agreed to the statement. The other respondents, 1.9%, were undecided, while the remaining 2.5% disagreed with the statement. The majority of the respondents, 79.2% ( $M = 4.03$ ;  $Sd = 0.90$ ), agreed with the statement that the hospital encourages the use of electronic payment systems, for example, M-pesa, for healthcare services because it improves client satisfaction and revenue collection. Respondents, 15.3%, were undecided, while 5.9% disagreed with the statement.

Further, the majority of the respondents, 89.8% ( $M = 4.29$ ,  $SD = 0.67$ ), agreed that hospital management strongly encourages the use of online or electronic resources that are environmentally friendly. This means that employees can efficiently access their HRM services online through their portals and hospital websites. This reduces the cost of printing paper and minimizes carbon emissions. This finding concurs with that of Ahmad (2015), who opined that e-business and e-learning have converted ordinary offices into paperless offices that have minimum use of paper or have eliminated the use of paper by changing all important official paper documents into automated documents and workflows. Other respondents (9.3%) were undecided, and the remaining 0.8% of the respondents disagreed with the statement. As per 78% ( $M = 4.04$ ,  $SD = 0.88$ ) of the respondents, the hospital's revenue has consistently increased for the last six years due to its implementation of green performance initiatives. The use of electronic payment systems lowers fraud and improves efficiency, which at the same time increases revenue collection. This result was supported by Mutisya *et al.* (2019), who alluded to the fact to the fact that management in public hospitals should be effective so as to improve revenue collection. The hospital with more revenue will be allocated more expenditure resources as they are perceived to be performing better. Other respondents (16.1%) were undecided, and 5.9% of the respondents disagreed with the statement.

Finally, the majority of the respondents, 87.3% ( $M = 4.19$ ,  $SD = 0.91$ ), agreed that the hospital has implemented environmentally friendly practices that efficiently minimize the release of harmful substances. The environmentally friendly practices ensure that employees are safe and in good health to consistently provide healthcare services. A past study that enforces this finding is that of Shah (2019), who explained that a lot of effort is required to initiate activities that protect the environment and livelihoods of communities. Green occupational safety and health practices tend to reduce harmful consequences, avoid health concerns, and improve the well-being of employees. Other respondents



(7.6%) were undecided, and 5.1% of the respondents disagreed with the statement. The study finding implies that the standard deviation value is closely dispersed around the mean.

In addition to the above, respondents were asked to suggest possible ways in which performance can be improved in devolved healthcare services. In making their suggestions, the 47 responses were recorded, arranged in themes, analyzed using content analysis, and presented in Table 5.

**Table 5**  
*Suggestions for Improvement of Performance of Devolved Healthcare Services*

Responses	Frequency	Percentage
Implement evidence-based customer satisfaction survey	26	55.3
There is need to increase the number of health professionals.	12	25.5
Rewarding of employees' performance	9	19.2
<b>Total</b>	<b>47</b>	<b>100.00</b>

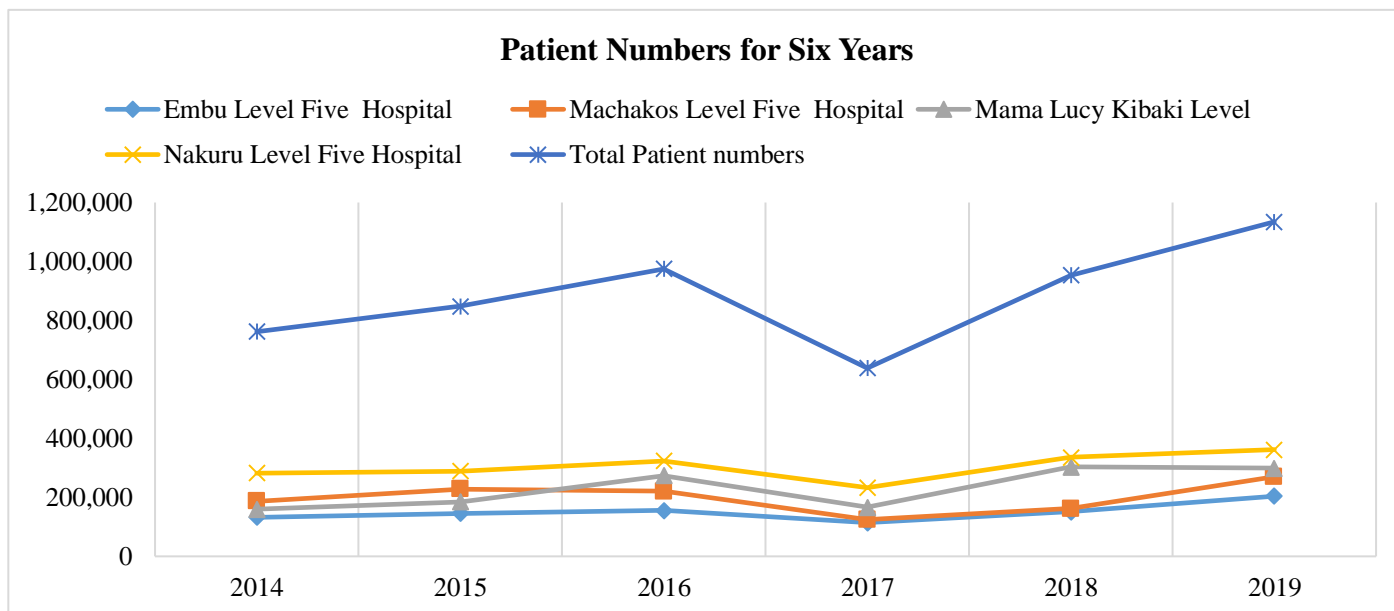
The findings in Table 5 indicate that the majority, representing 55.3%, proposed the implementation of an evidence-based customer satisfaction survey; 25.5% suggested the need to increase the number of health professionals to cater for an increased number of patients; and 19.2% suggested rewarding employees based on their performance and scheme of service. The finding implies that employees in devolved healthcare services can perform better if an evidence-based customer satisfaction survey is carried out. A past study carried out by Al-Abri and Al-Balushi (2014) recommended that healthcare managers should efficiently allocate resources efficiently enhance patient satisfaction. These results concur with those collected from interviews with key informants who opined evidence-based that hospitals do not conduct customer satisfaction surveys but rely on complaints and compliments books to assess the areas to improve and those that the hospital has excelled at.

Further, document analysis conducted on the current study found no records on client satisfaction indices for the past six years, but the hospitals largely depend on compliment and complaint books to assess customer satisfaction. There was, however, clear evidence in the compliment/complaint book on particular actions the hospitals' management have taken regarding complaints or compliments from their customers. A document analysis guide was used in this study to check and collect data from records about the performance of devolved healthcare services in Kenya. The study collected data from the Health Information Department in order to analyze the number of patients attended to for the past six years (2014–2019). The Level Five Hospitals provided the data, which was combined per year, analyzed, and displayed in Table 6 and Figure 2.

**Table 6**  
*Number of Patients Attended (2014-2019)*

Name of Level Five Hospital	2014	2015	2016	2017	2018	2019
Embu Level Five Hospital	132,263	146,053	156,049	114,362	151,252	203,912
Machakos Level Five Hospital	187,419	228,000	220,489	124,666	162,331	270,028
Mama Lucy Kibaki Level Five Hospital	160,061	185,068	274,150	166,309	303,613	298,575
Nakuru Level Five Hospital	282,750	289,524	324,304	232,986	336,275	362,052
<b>Total Patient numbers</b>	<b>762,493</b>	<b>848,645</b>	<b>974,992</b>	<b>638,323</b>	<b>953,471</b>	<b>1,134,567</b>

Descriptive statistics in Table 6 and Figure 2 show that patient numbers increased from 762,493 in 2014 to 1,134,567 in 2019, apart from the year 2017 when the number of patients dropped to 638,323. Further inquiry indicated that in 2017, there was a countrywide strike of healthcare employees for six months which led to the decline in the number of patients seeking devolved healthcare services.



**Figure 2**  
*Number of Patients Attended (2014-2019)*

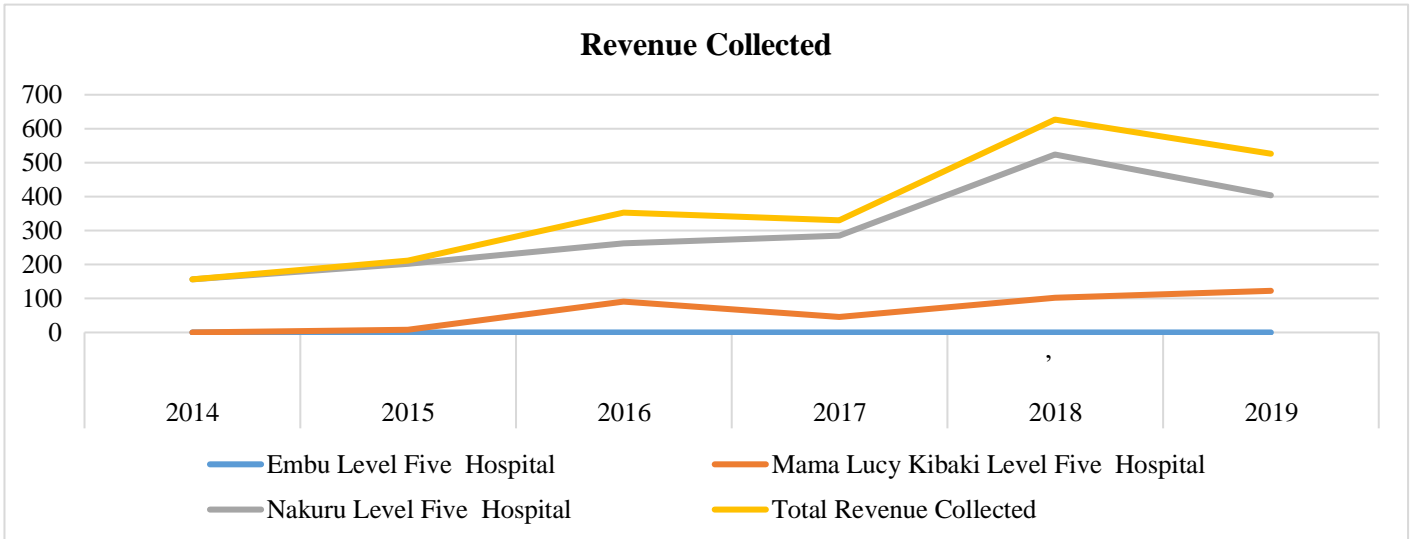
The implication is that the performance of devolved healthcare services largely depends on employees offering their services in an eco-friendly environment. Because most Level Five hospitals have gone paperless, especially in patient registration, the capture of health information about the patient and sharing that information online among healthcare workers at different service areas within the hospital has improved devolved healthcare services. Online services reduce the cost of printing paper and improve the performance of health information employees because they do not waste time recording, storing, retrieving, and moving physical files from one service area to another. These findings are supported by a study conducted by Kumar and Mann (2020) which found that if human resource practices are in line with environmental management activities, then business firms are likely to enjoy better performance and environmental sustainability.

A document analysis guide was further used to record the amount of revenue collected for the past six years. This was regarded as an important indicator of the performance of devolved healthcare services for the past six years (2014–2019). The study targeted collecting data on the amount of revenue collected by the finance department of each Level Five hospital to get the total revenue collected by the four Level Five hospitals per year for the past six years. Two Level Five hospitals provided the data, while the other two declined. The data collected was analyzed and presented in Table 7 and Figure 3.

**Table 7**  
*Revenue Collected (2014-2019)*

Name of Level Five Hospital	2014 Ksh'M'	2015 Ksh 'M'	2016 Ksh 'M'	2017 Ksh 'M'	2018 Ksh 'M'	2019 Ksh 'M'
Embu Level Five Hospital	00	00	00	00	00	00
Machakos Level Five Hospital	00	00	00	00	00	00
Mama Lucy Kibaki Level Five Hospital	00	8.7	90.3	46.2	102.9	122.6
Nakuru County Referral Hospital	156.4	202.5	262.7	284.6	524.0	404.3
<b>Total Revenue Collected</b>	<b>156.4</b>	<b>211.2</b>	<b>353.0</b>	<b>330.8</b>	<b>626.9</b>	<b>526.9</b>

The results in Table 7 and Figure 3 show that the amount of revenue collected for the period under study increased from Ksh. 156.4M in 2014 to Ksh 526.9M in 2019, apart from the year 2017 when the amount of revenue collected dropped to Ksh. 330.8M.



**Figure 3**  
*Revenue Collected (2014-2019)*

Further inquiry indicated that during 2017, there was a countrywide strike of employees in the healthcare services sector, which led to a decline in the amount of revenue collected. These findings correspond to a decline in the number of clients attended to during the same period. The study found that when employees in the finance department work online in an eco-friendly environment, the amount of revenue collected increases, indicating the performance of devolved healthcare services.

Major top-level or key respondents of Level Five hospitals were interviewed regarding the performance of devolved healthcare services, and their responses were recorded. The respondents were asked to explain how e-business affects the performance of devolved healthcare services, and they explained that hospitals have embraced E-business and customers are encouraged to pay for services through M-pesa and electronic money transfers. The respondents argued that this had improved the speed of service delivery, reduced fraud, and improved accountability for revenue collected. Electronic business in hospitals saves time for the employee to retrieve information, for example, patient records, and saves printing paper, for example, in the use of an NHIF biometric machine by employees to verify customer details. This finding is aligned with that of Ahmad (2015), who found that e-business and e-learning have converted ordinary offices into paperless offices that have minimum use of paper or have eliminated the use of paper by changing all important official paper documents into automated documents and workflows. Teleconferencing and telecommuting among senior managers is encouraged, while telemedicine is practiced in sharing and interpreting medical imaging scans in Level Five hospitals. This implies that services are offered quickly and efficiently, and this could improve revenue collection by the devolved healthcare services in Kenya.

**4.1.3 Correlation Analysis Finding for Green Occupational Safety, Health and Performance of Devolved Healthcare Services in Kenya**

Correlation analysis was conducted to determine the strength and direction of the relationship between GOSH and the performance of devolved healthcare services. Pearson’s product moment correlation coefficient (PPMC) formula was applied to conduct correlation analysis which shows the strength and direction of the relationship between independent variables (Mugenda & Mugenda, 2013). The result of the analysis is in Table 8.

**Table 8**  
*Correlation Analysis for GOSH and Performance*

		Performance	
Performance		1	
GOSH	Pearson Correlation	.731**	1
	Sig. (2-tailed)	.000	
	N	118	

\*\* Correlation is significant at the 0.01 level (2-tailed).



From Table 8, correlation test results indicated a strong positive relationship between green occupational safety, health and performance of devolved healthcare services in Kenya. This relationship was statistically significant ( $r_{xy} = 0.731$ ,  $n = 118$ ,  $p = 0.000 < 0.05$ ). This shows that GOSH positively influences performance of devolved healthcare services. These findings align with a previous study conducted by Owino and Kwasira, (2016), which found that green occupational safety and health significantly impacted environmental sustainability at Menengai Oil Refinery in Nakuru, Kenya. In addition, a study by Chaudhary (2020) revealed that green occupational safety and health significantly influence employee behavior. Therefore, green occupational safety and health management system reduces accidents and injuries and boost organizational performance.

**4.1.4 Simple Linear Regression Analysis Finding for Green Occupational Safety, Health and Performance of Devolved Healthcare Services in Kenya**

Simple linear regression analysis was conducted to determine the effect of green occupational safety and health on the performance of devolved healthcare services in Kenya. According to a study by Omondi-Ochieng (2018), there is empirical evidence to support the use of regression analysis as a statistical tool in data analysis. A simple linear regression model for green Occupational Safety, Health and performance of devolved healthcare services took the following format:

$$Y = \beta_0 + \beta X_3 + e$$

The statistical significance of the effect of green occupational safety and health (independent variable) on performance of devolved healthcare services (dependent variable) was analyzed and presented in Table 9.

**Table 9**  
*Regression Coefficients of Green Occupational Safety and Health and Performance of Devolved Healthcare Services*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.731	.534	.530	.63741

a. Predictors: (Constant), Green occupational safety and health

From the findings in Table 9, green occupational safety and health had an  $R^2$  squared of 0.534 which implies that 53.4% variations in performance of devolved healthcare services is explained by green occupational safety and health. The remaining unexplained 46.6% variations in performance of devolved healthcare services could be explained by other green human resource management practices which were not included in the model.

**Table 10**  
*Regression Coefficients for Green Occupational Safety, Health and Performance of Devolved Healthcare Services*

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
1 (Constant)	.792	.233		3.399	.001
GOSH	.862	.075	.731	11.529	.000

a. Dependent Variable: performance of devolved healthcare services in Kenya

From the regression coefficients as shown in Table 10, the findings revealed that there was a positive statistically strong significant relationship between green occupational safety, health, and performance of devolved healthcare services, as supported by a beta coefficient of  $\beta = 0.862$  and a  $p = 0.000 < 0.05$ . Hence,  $Y = 0.792 + 0.862 x 3$ .

The results imply that a unit increase in green occupational safety and health other factors held constant increased the performance of devolved healthcare services in Kenya by 0.862 units. Further in support to the findings,  $t_{cal} = 11.529 > t_{critical} = 1.96$  at a 95 percent confidence level. Because of this result, the null hypothesis ( $H_0$ ) was rejected and the alternative hypothesis was accepted. To test the study hypothesis, the study compared means using a one-way ANOVA. The test results are in Table 11.

**Table 11**  
*One Way ANOVA Hypothesis Testing for GOSH*

		Sum of Squares	df	Mean Square	F	Sig.
X	Between Groups	47.324	26	1.820	6.540	.000
	Within Groups	25.325	91	.278		

X= Green Occupational Safety and health (GOSH)



The findings displayed in Table 11 indicate a significant difference in the means of different study variables; hence, green occupational safety and health showed a significant effect on the performance of devolved healthcare services.  $F_{(26, 91)} = 6.540, p = 0.000$ . The study found that green occupational safety and health had a P value of 0.000, which was less than the 0.05 level of significance (Table 11). This implies that GOSH practice significantly influenced the performance of devolved healthcare services in Kenya. The null hypothesis ( $H_0$ ) was rejected, and the alternative hypothesis was accepted.

Thus;  $H_1$ : Green occupational safety and health has a statistically significant effect on the performance of devolved healthcare services in Kenya.

## V. CONCLUSIONS & RECOMMENDATIONS

### 5.1 Conclusions

The study concluded that green occupational safety and health had a strong positive relationship with the performance of devolved healthcare services in Kenya. The study concluded that GOSH had a statistically significant effect on the performance of devolved healthcare services. Use of GOSH systems reduces accidents and injuries. The use of paperless offices creates a clean and safe work environment. Utilization of eco-friendly waste disposal methods such as waste minimization and segregation can also lead to a clean work environment.

### 5.2 Recommendations

This study recommends use of eco-friendly safety gear by employees. It also recommends regular green safety and health audits for sustainability. The study also recommends provision of spacious hospital buildings which are well ventilated and lid to save energy and reduce infections.

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