

# Ergonomic Principles and Its Application on Physical Equipment Used in Hotel Establishment in Lagos State, Nigeria

P.E. Ibe<sup>1</sup>, F.C Arowosafe <sup>2</sup>, S.O. Oladeji<sup>3</sup>

<sup>1</sup>Department of Hospitality Management, Yaba College of Technology, Lagos State, Nigeria

<sup>2</sup>Department of Ecotourism and Wild Life Management, Federal University of Technology Akure, Ondo State, Nigeria

doi: <https://doi.org/10.37745/ejht.2013/vol13n23139>

Published July 26, 2025

**Citation:** Ibe P.E., Arowosafe F.C., Oladeji O.S. (2025) Ergonomic Principles and Its Application on Physical Equipment Used in Hotel Establishment in Lagos State, Nigeria, *European Journal of Hospitality and Tourism Research*, 13(2), 31-39

**Abstract:** *This study focus on the effect of Ergonomic principles and its application on physical equipments used in selected hotels in Lagos state Nigeria. The specific objectives were to examine the awareness of types of physical equipment used among staffs in the selected hotel, determine Ergonomic-related hazards in the hotel and recommend better ways of using physical equipments in hotels. The researchers adopted cross sectional survey research design. The study population consist of all the three thousand, four hundred and eighty-seven (3,487) hotels from the five (5) administrative divisions, often referred to as zones, these are Ikeja, Badagry, Ikorodu, Lagos Island and Epe which comprising different categories/classes Accessibility sampling technique was use for the study. The researchers made use of well-structured questionnaire in obtaining the needed information from the respondents. . The Krejcie and Morgan table was used to select the sample size for the study. To ensure reliability of the instrument, it was subjected to Cronbach Alpha reliability test. Simple descriptive statistics such as frequencies, percentage, mean and standard deviation was used to analyze respondents' personal data and research questions while correlation analysis was used to test the hypotheses. The findings showed that majority of the hotels in lagos State are aware of the types physical equipment with regards to ergonomics practices with the highest response of 336(74,7%)in training on the use of physical equipment in their workplace. Hotels should conduct comprehensive ergonomic assessments of their workspaces to identify potential hazards and areas for improvement. These assessments should be performed regularly to adapt to any changes in the work environment and staff needs*

**Keywords:** ergonomics, staff, hotels, equipment, Lagos state, Nigeria

## INTRODUCTION

Ergonomics significantly impacts the well-being and performance of hotel staff, especially in high-demand departments such as housekeeping and kitchen operations. In the hotel industry, staff members often engage in repetitive tasks that require lifting, bending, and standing for extended periods. Without proper ergonomic practices, employees are at risk of musculoskeletal disorders, which can result in decreased performance, higher absenteeism, and increased turnover rates. Ergonomically designed workspaces and equipment can prevent such injuries and improve productivity. According to McCauley (2020), poor ergonomics lead to discomfort and increased risk of injuries, which can result in higher

workers' compensation claims and diminished morale. Similarly, research by Zhao et al. (2023) suggests that hotels with improved ergonomics experience better employee retention and lower turnover rates due to healthier work conditions.

Hotel is an establishment that provides paid lodging on a short-term basis (Muhammed, 2019). Facilities provided may range from a modest-quality mattress in a small room to large suites with bigger, higher-quality beds, a dresser, a refrigerator and other kitchen facilities, upholstered chairs, a flat screen television, and en-suite bathrooms. Small, lower-priced hotels may offer only the most basic guest services and facilities. Larger, higher-priced hotels may provide additional guest facilities such as a swimming pool, business centre (with computers, printers, and other office equipment), childcare, conference and event facilities, tennis or basketball courts, gymnasium, restaurants, day spa, and social function services (Rahman *et al.*, 2019).

Housekeeping personnel contribute to most vulnerabilities as their morbidity and mortality rates exceed the nation-wide average of other staff in different departments in hotel establishment (Amaechi and Elsie, 2019). Work is repetitive and routine, so movement is in the same motion throughout when performing activities such as bending to make beds, moving heavy trolleys and furniture, and the general cleaning of different areas (Liladrie, 2010). Helen *et al.*, (2016) reported that ergonomics cleaning tools such as powered linen carts that are highly manoeuvrable and can reduce the force involved in pushing them over carpeted areas, they should be replace old-fashioned manually driven and poorly designed carts. Housekeeping involves moving from one place to the other in the hotel, including the guest rooms, the lobby, and the corridors. The literature reviewed found that the poor design and arrangement of furniture force cleaners to over stretch or overexert their bodies while working, causing increased musculoskeletal burdens. In this regard, guestrooms should be designed to be easy to clean and furniture rearranged to reduce lifting, stretching, and bending (Joshi, 2019).

The hospitality industry, particularly in Lagos State, Nigeria, is characterized by a high demand for excellent service delivery and customer satisfaction. However, the well-being and performance of hotel staff are pivotal factors in achieving these objectives. Though, The absence of adequate ergonomic conditions in hotel workplaces may result in discomfort and potential health issues among staff, affecting their overall performance. There is limited understanding of the extent to which workplace ergonomics influences staff comfort, job satisfaction, and ultimately, their job performance in the hotel establishment.

### **Objectives of the Study**

The general Objective of this research study is to examine Ergonomics principles and its application on physical equipments used in selected hotel establishment in Lagos State, Nigeria. While the Specific objectives are to:

- Examine the awareness of types of physical equipment used among staffs in the selected hotel
- Determine Ergonomic-related hazards in the hotel
- Recommend better ways of using physical equipments in hotels

### **LITERATURE REVIEW**

Physical ergonomics studies about the human anatomy and the anthropometric, physiological and biomechanical traits in relation to the development of physical activities. This ergonomics studies the interaction between work teams and their users Vipin *et al.*, 2019).It is responsible for the design of products to treat or prevent physical conditions, such as carpal tunnel syndrome, deviations in the spine, among others. For example, you can create more comfortable chairs, desks and computer keyboards. It

should be noted that the creation of products is not the only task of physical ergonomics. It also studies elements concerning the correct position of the human body when performing an activity (Niels-Peter *et al.*, 2022).

Some examples of positions promoted by physical ergonomics are as follows”

- When performing any activity, it is necessary to maintain the natural curvature of the back. When standing, it is recommended to put one foot in front of the other, as this helps to have the correct position of the spine.
- When sitting, lumbar support is recommended. Otherwise, the back tends to curve in a C-shape, which can lead to problems in the future.
- Do not bend your back when picking up some object that is on the floor. The best thing would be to squat, supporting the weight of the body on the soles of the feet and lightening the load of the back (Rachel, 2022).
- At all times, the neck should be kept in line with the spine
- When sitting on a computer, the proper position of the arms is to form a 90 ° angle at the elbow.
- When typing on a computer keyboard, the wrists should be kept at the same level as the forearm.
- If you are sitting for many hours, it is recommended to adjust the seat from time to time, changing the position. In this way, the body does not get tired of being always in the same place.

### **Impact of Ergonomics on Staff Performance and Productivity in Hotels**

**Ergonomics saves money:** By employing ergonomics in the industry, ergonomic risk factors are reduced. Similarly, the prevalence rate of musculoskeletal disorders is lowered, and lower labour costs. The hospitality industry is infiltrated with high turnover rates, which result in huge expenses emanating from training new employees time and again (Joshi, 2019). By improving the work conditions, turnover and the excessive expenses can reduce.

**Ergonomics improves productivity:** Ergonomics results in the workstation’s convenience when designed to facilitate good posture, less exhaustion, fewer movements, and reduce the distances for lifting and reaching out for objects stored in elevated heights (Abarqhouei & Hasan, 2011). The housekeeping staff was more productive in their work as they will not get exhausted since their workstation was comfortable to work. The turnover of the housekeepers will reduce which increases efficiency hence productivity becomes higher. The physical and psychological needs of the housekeepers when met ensures good work performance as the staff was of good health (Bettye, 2018).

**Ergonomics promotes a safer workplace:** Ergonomics demonstrates a dedication to Occupational Safety and Health. Employees create a competitive advantage, and cultivating safety, and environmental culture will result in improved employee engagement (Jablonska & Trocka-Leszczyńska, 2020). Ergonomics ensures that there are less injuries and the turnover of the staff is reduced because the right tools and equipment are in place which ensures that the users are safe and can work for many years in the hotel. The hotel on the other hand reduces the time and cost of recruiting new staff often and will have staff who are dedicated to their work (Hannah and Charles, 2018).

**Ergonomics Improves engagement:** It will minimize attrition, delinquency, raise productivity, and improve employee engagement since the working conditions are favourable (Abarqhouei & Hasan, 2011). Encouraging employees to work in a poor working environment is difficult to them and they cannot be efficient. The housekeepers’ contribution in purchase of cleaning equipment and

materials was taken into place therefore, the right ones was purchased that will suit the worker and ergonomic aims was achieved. Feedback is gotten from the housekeepers which is used for continuous improvement.

Properly designed workspaces with ergonomic furniture and equipment can reduced physical strain on staff. Thus, the influence on staff performance is to improved comfort and reduced risk of musculoskeletal issues, leading to better focus and productivity such as:

**A. Comfortable and Functional Furniture:** Properly designed workspaces in hotels should include ergonomic furniture such as chairs, desks, and workstations. Comfortable chairs with lumbar support and adjustable features reduce physical strain, allowing staff to work for longer periods with less discomfort. This leads to improved staff performance as they can focus on their tasks without distraction (Elmansy, 2015).

**B. Layout and Flow:** The layout of hotel workspaces should promote efficient workflows. For example, reception desks should be designed to minimize congestion and facilitate easy guest interaction. This ensures that staff can serve guests quickly and professionally, enhancing overall guest satisfaction.

**C. Accessibility:** Accessibility is crucial in hotel design. Staff should have easy access to essential tools, equipment, and supplies. For housekeeping staff, this means having a well-organized supply room with easily reachable cleaning supplies. This streamlines their tasks and boosts efficiency, positively impacting staff performance.

The influence of training and education on staff performance is significant:

- i. **Reduced Risk of Injuries:** Properly trained employees are less likely to experience ergonomic-related injuries, such as back pain or repetitive strain injuries. This leads to fewer sick days and higher overall staff performance.
- ii. **Improved Efficiency:** Training empowers staff to work more efficiently by using ergonomic techniques, reducing wasted time and effort. This contributes to increased productivity.
- iii. **Enhanced Job Satisfaction:** When employees receive training and education that improves their comfort and safety, they tend to be more satisfied with their work. Higher job satisfaction is associated with better performance and employee retention.
- iv. **Consistency in Ergonomic Practices:** Training ensures that all staff members follow the same ergonomic guidelines, leading to a more consistent and ergonomic work environment.

**Adaptation to New Equipment:** In five-star hotels, equipment and technology may change. Proper education ensures that staff can quickly adapt to new ergonomic features or tools (Sheprak, 2021)

Ergonomics, including ergonomic furniture and equipment, are also a safety measure. Properly designed workstations and tools reduce the risk of musculoskeletal disorders, ensuring staff can perform their tasks comfortably and safely (McPhee, 2005; Sheprak, 2021).

The influence of safety measures on staff performance is significant:

- i. **Reduced Injuries:** Safety measures help prevent accidents and injuries in the workplace, resulting in fewer staff members being absent due to injuries and better overall performance.
  - ii. **Increased Confidence:** Staff members who feel safe and well-prepared in their work environment tend to be more confident and focused, contributing to their performance, especially in guest-facing roles.
  - iii. **Guest Satisfaction:** A safe and secure environment is crucial for guest satisfaction in five-star hotels. Staff who are trained in safety measures contribute to a positive guest experience.

- iv. **Regulatory Compliance:** Compliance with safety regulations is essential in the hotel industry. Ensuring safety measures are in place and followed leads to a better reputation and prevents legal issues that could impact staff performance.

These measures reduce the risk of accidents, ensuring staff can work safely and confidently, which positively impacts their performance. By prioritizing safety, hotels can create an environment that protects staff, enhances their confidence, and ultimately leads to improved staff performance and guest satisfaction (McPhee, 2005; Sheprak, 2021).

Staff members should be educated about the importance of ergonomic principles and how they apply to their specific roles within the hotel. This includes understanding the risks of poor ergonomics and the benefits of proper ergonomics in terms of their health and performance.

**B. Proper Use of Equipment:** Training ensures that employees know how to use ergonomic furniture, tools, and equipment correctly. For example, front desk staff should be trained on how to adjust their chairs and monitor heights for optimal comfort and posture (McPhee, 2005).

**C. Safe Lifting Techniques:** In hotels, tasks like lifting luggage or supplies can be physically demanding. Proper training on lifting techniques can prevent injuries and musculoskeletal strain.

**D. Task-Specific Training:** Different roles within a hotel have unique ergonomic challenges. Housekeepers may need training on the most efficient way to make beds and clean rooms with minimal physical strain. Restaurant staff may require training on serving techniques that reduce the risk of spills and strains.

**E. Periodic Refresher Courses:** Staff should receive ongoing training to reinforce ergonomic practices and address any new challenges or equipment changes. This ensures that employees maintain their knowledge and skills over time (McPhee, 2005).

According to Agbola and Agbola (2012), working conditions in most hotels in Nigeria especially the study area are as precarious as many hoteliers find it difficult to break even as a result of high operational costs. Housekeeping staff most often have to work with inadequate and in some cases ineffective personal protective equipment and cleaning solutions. A situation which can contribute to increased infections and injuries due to exposure to toxics such as ammonia and chlorine in some cleaning agents, and also bacterial infections due to contact with infectious pathogens in the cause of housekeeping operations. The physical demands placed upon hotel housekeepers encompass a variety of tasks, including the preparation of trolleys with linens and supplementary amenities, the disposal of waste, the removal and replacement of towels and bed linens, dusting, sanitizing restrooms, vacuuming, mopping floors, and replenishing amenities (Amaechi et al 2019). Based on all these identified gaps identified the researchers tend to examine the influence of ergonomics principles and its application on physical equipments used in selected hotel establishment in Lagos State, Nigeria.

## METHODOLOGY

The study was carried out in Lagos State, Nigeria. It lies in South Western Nigeria, on the Atlantic coast in the Gulf of Guinea. Lagos was created on the 27<sup>th</sup> May, 1969 with the total area of 3,577 square kilometre; 787 square kilometre is made up of Lagoons and creek. The state is the most populous in Nigeria and Africa. Lagos is one of the fastest growing cities in the world and a major financial centre in Africa. The megacity has the fourth- highest GDP in Africa, and houses one of the largest and busiest seaport and hotels (Oywole and Ajayi, 2016). Lagos State is located between Longitudes 20° 42' East and 32° 2' East of the Greenwich meridian and Latitudes 6° 22' and 6° 2' North of the Equator. Its



lies on the south- West part of Nigeria, on the narrow plain of the bright of Benin. The topography of Lagos is dominated by its systems of Islands, Sand bars and Lagoons.

Cross-sectional survey design was used for this study, as it allows you to collect data at a single point in time from a sample of participants based on the objectives of the study. The study population consist of all the three thousand, four hundred and eighty-seven (3,487) hotels from the five (5) administrative divisions, often referred to as zones, these are Ikeja, Badagry, Ikorodu, Lagos Island and Epe which comprising different categories/classes i.e. five-star, four star, three stars, two stars etc. in Lagos state Tijani *et al.*, (2012). Seventy-three (73) hotels were selected based on their rankings/categories. The Krejcie and Morgan table was used to selected the sample size for the study. Questionnaire was used to collect quantitative data on workplace ergonomics Questionnaire was used to collect quantitative data on workplace ergonomics. Descriptive Statistics were used to analyse the data. Correlation analysis was used to examine the relationship between ergonomic factors and staff comfort.

**Research Question One:** To what extent is awareness on the types of physical equipment used in hotels?

## RESULT PRESENTATION

Table 1: Awareness of the types of physical equipment used in hotels

Types of physical equipment	Yes (%)	No (%)
You have heard of work-related ergonomics in the hotel	204 (45.3)	246 (54.7)
Categories of equipment are of:		
Housekeeping Equipment (e.g., vacuum cleaners, laundry machines)	141 (31.3)	309 (68.7)
Kitchen Equipment (e.g., stoves, ovens, refrigerators)	137 (30.4)	313 (69.6)
Front Desk Equipment (e.g., computers, phones, key cards)	194 (43.1)	256 (56.9)
Maintenance Equipment (e.g., tools, repair kits)	115 (25.6)	335 (74.4)
Safety Equipment (e.g., fire extinguishers, emergency lighting)	223 (49.3)	227 (50.4)
You have received training or guidance on using any of the physical equipment in your workplace	336 (74.7)	114 (25.3)

Source: field survey:2025

Table 1 shows awareness of the types of physical equipment used in hotels. It shows that 45.3% of the hotel staff have heard of work-related ergonomics in the hotel. Also, on the categories of equipment, 31.3% had heard of housekeeping equipment (e.g., vacuum cleaners, laundry machines), 30.4% have heard of kitchen equipment (e.g., stoves, ovens, refrigerators) and 43.1% have heard of front desk equipment (e.g., computers, phones, key cards).the table shows that 25.6% have heard of Maintenance Equipment (e.g., tools, repair kits) and 49.3% have heard of Safety Equipment (e.g., fire extinguishers, emergency lighting).Lastly, the table shows that 74.7% of the hotel staff have received training or guidance on using any physical equipment in your workplace. This implies that majority of the hotels in lagos are aware of the types physical equipment with regards to ergonomics practices with the highest response of 336(74,7%)in training on the use of physical equipment in their workplace.

Table 2 Ergonomic-related hazards in the hotel

Issues	Yes (%)	No (%)
You are aware of any ergonomic related injuries or discomfort among hotel staff	222 (49.3)	228 (50.7)
<b>Ergonomic-related hazards you have experienced in your hotel:</b>		
Poorly designed desk or workstation	118 (26.2)	332 (73.8)
Improperly positioned equipment	119 (26.4)	331 (73.6)
Housekeepers' routine lifting and carrying of heavy objects	151 (33.6)	299 (66.54)
Proper lighting of work environment	225 (50.0)	225 (50.0)
Comfortable temperature	40 (8.9)	410 (91.1)
Spending long periods on your feet	109 (24.2)	341 (75.8)
Bending, twisting or reaching awkwardly while performing your tasks	54 (12.0)	396 (88.0)
Receive regular break to reduce physical strain	57 (12.7)	393 (87.3)

Source: field survey:2025

Table 2 shows the ergonomic-related hazards in the hotel. It shows that 49.3% of the staff were aware of any ergonomic related injuries or discomfort among hotel staff.

On the ergonomic-related hazards they have experienced in their hotel, 26.2% reported poorly designed desk or workstation, 26.4% have experienced improperly positioned equipment, and 33.6% had experienced housekeepers' routine lifting and carrying of heavy objects. Also, half of the hotel staff reported they have experienced proper lighting of work environment, 8.9% have experienced comfortable temperatures and 24.2% have experienced spending long periods on your feet. Finally, 12.0% of the hotel staff have experienced bending, twisting or reaching awkwardly while performing tasks and 12.7% have received regular break to reduce physical strain.

$H_0^1$ : The quality-of-service equipment condition in hotels does not significantly impacts employee job satisfaction levels.

Table 3: The association between the quality-of-service equipment and employee job satisfaction levels

You are satisfied with the current system for equipment maintenance and repair	The overall condition of the equipment used in your department			
	Poor (%)	Fair (%)	Good (%)	Excellent (%)
Very dissatisfied	4 (36.4)	-	7 (63.6)	-
Dissatisfied	2 (4.9)	9 (22.0)	25 (61.0)	5 (12.2)
Neutral	16 (18.0)	18 (20.2)	30 (33.7)	49 (18.9)
Satisfied	-	-	4 (9.3)	39 (90.7)
Very satisfied	27 (6.1)	43 (9.7)	255 (57.6)	118 (26.6)
$\chi^2_{12} = 187.573; p < 0.001$				

Sources: Field survey 2025

Table1 shows how the overall conditions of the equipment used in their department (a proxy to the quality-of-service equipment) are associated with the employee satisfaction with that equipment. It shows that for those satisfied with the equipment, 9.3% rated the condition good while 90.7% rated them excellent and those very satisfied with equipment, a cumulative 84.2% rated them either good or very good. The Chi square value obtained as a measure of association between the two concepts is 187.573 at 12 degrees of freedom with a p value < 0.001. The null hypothesis is there rejected, and it is

concluded that the quality-of-service equipment conditions in hotels significantly impacts employee job satisfaction levels ( $\chi^2_{12} = 187.573$ ;  $p < 0.001$ ).

## CONCLUSION

This study conclusively demonstrates that the quality of equipment, ergonomic design, safety management, and technological advancement are integral to enhancing job satisfaction among hotel staff. Staff perceptions of equipment condition closely align with their satisfaction levels, highlighting that well-maintained and reliable tools are essential not only for operational efficiency but also for fostering employee morale and a sense of organizational support. Ergonomically designed equipment significantly contributes to employees' feelings of safety and physical well-being, reflecting management's commitment to their welfare. The prioritization of safety by hotel management is pivotal, as evidenced by the regularity of equipment inspections, which in turn builds staff confidence and operational dependability.

## Recommendation

- Management should prioritize the procurement of ergonomic furniture, such as adjustable chairs and desks, as well as tools designed to minimize strain (e.g., computer stands, ergonomic keyboards, and mouse devices).
- Hotels should conduct comprehensive ergonomic assessments of their workspaces to identify potential hazards and areas for improvement. These assessments should be performed regularly to adapt to any changes in the work environment or staff needs.
- Develop and implement training programs focused on ergonomic practices and the importance of proper workstation setup.

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