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EGONOMICS AND EMPLOYEE PERFORMANCE OF PHARMACEUTICAL COMPAINES IN ANAMBRA STATE, NIGERIA

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Abstract

The study x-rayed the effects of Ergonomics on performance of Gauze Pharmaceutical company and specifically examine the relationship that exist between cognitive Ergonomics and job satisfaction, and also the relationship between physical Ergonomics and employee efficiency. A correlation research design was study adopted. The total population of the study was 152 while the sample size was 110 derived using the Taro Yamane. Data was collected using structure questionnaire and simple frequency table and arithmetic means was use to analyze the data formulated. Hypotheses were tested using Pearson product movement correlation coefficient with the aid of statistical packages for social sciences (SPSS 27). Findings revealed that there is a positive significant relationship between physical Ergonomics and employee efficiency, also there is a positive significant relationship between cognitive Ergonomics and employee job satisfaction. The study concluded that effective application of ergonomics in the design of the system can provide balance between jobs and characteristics of the employees. This can lead to labor force productivity, increased safety, physical and mental well-being, and job satisfaction of the employees. It was recommended that organization should identify jobs that put people at risk of musculoskeletal disease and create necessary reforms in them, this will help to improve productivity.

Keywords: *Ergonomics, employee performance, cognitive ergonomics, physical ergonomics*

Introduction

Ergonomics has become a bigger issue for the organization since the rise of safety and health at work. Every company in the world has put more thought into making their workplaces safer (Pun, 2011). Ergonomics in the workplace adds value to the business and makes employees more interested in their jobs. Organizations think that a healthy workplace can help foster a culture of innovation and creativity (Sabir et al., 2019). The government has passed a law to make sure that people have safe and healthy jobs. The goal of ergonomic standards is to make people feel safe and secure (Akinbola & Popoola, 2019). Ergonomics should be used to improve quality, productivity, and safety by making products, tasks, and environments fit people instead of the other way around. Ergonomics is based on the idea that the demands of a job shouldn't go beyond what a worker can do and what their limits are. This is to prevent stress at work, which can be dangerous to their safety, health, and productivity. The goal of an ergonomics program is to make the workplace safe and productive so that the organization can reach its goals (Neumann & Dul, 2005).

Ergonomics comes from the Greek words ergo, which means work, and nomos, which means health. It is the study of how people work and how to design the workplace so that people can easily adapt to it and be more productive. Ergonomics is the study of how a worker interacts with his or her working environment. This includes the physical space in which a person works, as well as the tools and materials, work practices, and work structure, whether the person works alone or as part of a team. Ergonomics means "the laws of work" because it comes from the words "work" and "natural laws." As Makhbul et al. (2013) explain, ergonomics is the design of a workplace, equipment, product, environment, and staff policies that take into account the biomechanical, physical, and psychological needs of employees. This improves the effectiveness and productivity of the work system while making sure the worker is safe, healthy, and happy.

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Basically, pharmaceutical firms implement ergonomic programs in order to reduce workplace injury costs, waste and the rate of absenteeism. This explains the possible reason

most researchers, business men, policy makers and ergonomics scholars have sought to investigate how ergonomics factors influence the performance of employees, over time (Ajayi & Fasae, 2019). Staff who work under inconvenient workplace ergonomic conditions are prone to end up with low performance and face occupational health diseases which will lead to high absenteeism and employee turnover. The present study examines the effect of ergonomics on the performance of employees in pharmaceutical firms in Anambra State.

1.3 Objectives of the Study

The broad objective of the study is to X-ray the effect of ergonomics on the performance of Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state. Specifically the study seeks:

1)To ascertain the nature of relationship between cognitive ergonomics and job satisfaction in Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state.

2)To determine the degree of relationship between physical ergonomics and employee efficiency in Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state.

Research Questions

1)To what extent does cognitive ergonomics relate to job satisfaction in Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state?

2)To what degree does physical ergonomics relate to employee efficiency in Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state?

Research Hypotheses

H_{o2}: There is no significant relationship between Cognitive Ergonomics and Job satisfaction in Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state.

H_{o3}: There is no significant relationship between physical Ergonomics and Employee Efficiency in Gauze Pharmaceutical and Laboratory Limited in Awka, Anambra state.

REVIEW OF RELATED LITERATURE

Conceptual /theoretical clarifications

Cognitive Ergonomics

Cognitive ergonomics refers to aspects of ergonomics such as mental processes which entails perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. The cognitive aspect of ergonomics is generally considered to be one of the most important issues in contemporary and future societies. It entails the interactions between the environment and working conditions, organizational conditions, functions and content of the work, effort, workers' individual characteristics and those of members of their families (Maina & Gitahi, 2015). Therefore, the nature of the cognitive ergonomics is complex, covering issues relating to the workers attitudes, feelings and perceptions. (Nuttall, 2015) in their work first identified with the definition of cognitive ergonomics by the Ergonomics and Human Factors society (2019), which see the construct as an intercession that centres on human factors and practices that aim to ensure suitable relationship between work, product and environment, and human needs, capabilities and limitations within workplace.

Physical Ergonomics

Physical ergonomics is concerned with human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to physical activity (Olabode, Adesanya & Bakare, 2017). The physical ergonomics deals with components of the tangible workplace environment that comprise spatial layout and functionality of the surroundings (Maina & Gitahi, 2015). In a broader perspective, the physical ergonomics include but not limited to the comfort level, ventilation, heating, natural lighting and artificial lighting. Sabir, Iqbal, Rehman, Shah &. Yameen (2012) opine that the conditions of physical workplace environment influence the employees' functions and it will determine the well being of organizations. They add that the physical work environment includes the internal and external office layout, temperature, comfort zone and also the work setting or arrangement. The physical workplace environment factors also include lighting (both artificial and natural), noise, furniture and spatial layouts in workplaces (Vischer, 2017). The physical workplace environment includes comfort level, ventilation and heating, lighting. These

features assist on functional and aesthetic side, the decor and design of the work place environment that ultimately help improve the employees' experience and necessitate better performance. Vischer (2017) stressed that conducive workplace environment should be prioritized as it provides support to the employees in carrying out their jobs. It should be conducive enough to enable performance of tasks by employees.

Employee Job Satisfaction

Abun, et al (2018) conceived job satisfaction as a feeling of an employee towards her/his job, which often serves as a source of motivation to him/her. Here, job satisfaction do not particularly refer to self-satisfaction and self-contentment, but it is about the feeling of the employees on the job. According to Sari (2018) Job satisfaction is an expression of one's feelings or attitudes towards work, promotion opportunities, relationships with co-workers, supervision and feelings of satisfaction with the work itself. An individual with a significant level of job satisfaction holds uplifting frames of mind towards their activity while an individual who is less satisfied with their jobs holds negative dispositions about the job (Obiekwe, Obibhunun and Omah, 2019).

According to Abdallah, et al., 2017), job satisfaction is an observable expression of an affective reaction to a particular work that is the satisfaction of a person with the employment job satisfaction is very vital to the performance and satisfaction of an organization. According to Fernandez-Salinero et al., (2020), today organizations are more concerned about improving worker welfare and employee satisfaction. It is the organizations duty to build the highest levels of job involvement and job satisfaction among all workers. According to Astuti & Iverizkinwati (2018) Job satisfaction is a general attitude towards a person's job, indicating the difference between the number of awards a job receives and the amount they believe they should receive. Job satisfaction reflects a person's feelings towards his job. This can be seen in the positive attitude of employees towards work and everything that is faced in the work environment.

Employee Efficiency

Employee efficiency refers to knowing how to do a task, and doing it right with less time and resources. It shows the level of result of work that is or can be achieved by an employee or a group of people in an organization according to their competency and responsibilities in order to legally attain organizational goals (Wehelmina, 2015). Employee efficiency is a general term used to explain the whole or partial actions or activities of an employee within a period in relation to a number of standards such as past or projected costs (Gaol, 2014). In simple terms, employee efficiency is the best use of different resources (as the inputs of the system), in the fulfillment of organizational goals. Efficiency level of employees is influenced by a wide variety of skills, characteristics and attitudes (Attah, 2017).

Theoretical Review

This study is anchored on System Theory propounded by Ludwing Von Bertalanffy (1956). System theory states that an organisation is a system and therefore should show reasonable qualities such as dynamism, adaptation, supportive and interaction (Adeyoriju & Agbadudu, 2018). The proponents of this theory defined a system as an organized whole comprising of several subsystems for effective functioning. Adeyoriju and Agbadudu (2018) interpreted a system as an interdependent part which together forms a unitary whole to carry out a task. Upon the basis of system approach, managers perceive functional areas as a subset of the organisation where the activity of one segment affects the activities of others and the performance of the whole organisation.

The systems approach is based on the premise that every organization consists of the people, the technical system and the environment. People (the social system) use tools, techniques and knowledge (the technical system) to produce goods or services valued by consumers or users (who are part of the organization's external environment). Therefore, an equilibrium among the social system, the technical system and the environment is necessary to make the organization more effective (Ajayi & Fasae, 2019). The environment must be conducive and equipment user friendly for the people to operate optimally. This theory clearly shows the unavoidable interaction between employee and workplace

ergonomics. Against this background, System Theory is the theoretical anchor of the study since it has definitely explained the theoretical link between employee performance and ergonomics.

Review of Empirical literature.

Adesanya, (2024) investigated the effects of ergonomics on performance of academic staff in selected tertiary institutions in lagos state. The study population is four thousand two hundred and sixtynine (4,269) academic staff in selected tertiary institutions in Lagos State. While using Yamane, a sample size of three hundred and sixty- seven (367) was drawn. The sample was stratified. A five-point Likert scaled questionnaire was designed for data collection. The results from testing the hypothesis above shows that there a positive relationship (73%) between workplace design ergonomics and work-related disorder among academic staff in selected tertiary institutions in Lagos State. The study concluded that the main focus of the policies implemented by the management of the institutions in Nigeria is on the workplace design to meet the NUC minimum required standard. It was recommended that management of the institutions should strategically balance their ergonomics decision policy by identifying which indicators will cause a significant change in the performance of academic staff in Nigeria.

Baleshzar et al (2022) studied the effects of ergonomic features and anxiety on the productivity of office workers. In this descriptive-analytical cross-sectional study, 176 office workers (133 female and 43 male) of a university with three years of work experience were randomly selected Data collection tools included demographic surveys, an inspection checklist, Rapid Upper Limb Assessment (RULA) checklist, the productivity measurement questionnaire, and Beck anxiety. The study results showed that 70% of workstations need to be changed through ergonomic interventions and changes. According to the results obtained from the linear regression model between productivity and Working posture, anxiety and work environmental factors, there is a positive relationship between working environment conditions and productivity (P=0.002). The main contribution of this research is that productivity should receive attention through

changing working environment. The chairs are a vital element of an ergonomic and productive work office.

Ilo and Kosisochukwu (2022) assessed the impact of ergonomics in office buildings with a view to suggestive measures of enhancing productivity in the work environment towards enhancing productivity in office buildings. The source of information for this research includes case study, questionnaire, personal observations and journals. 65 questionnaires were Shared, 65 questionnaires were returned and the result showed the impact of ergonomics on productivity and that most users were satisfied with the spatial configuration of their space. The study recommended that employees have control over the physical aspect their workspace such as lighting, noise, temperature and that organizations training sessions for new hires on ergonomic issue.

Shiliki Bhatia et al (2021) analyses and tests the effect of Job Design and Ergonomics on Employee Performance and the relatedness of Job Design and Ergonomics. The research was conducted in 32 organizations, having managers and supervisors at about 64 categories of designations handling teams of workers in the manufacturing units, of the automotive sector of India. This quantitative study, based on a sample collected through 5 points Likert scale questionnaires, was analysed using Confirmatory Factor Analysis (CFA), correlation, and multivariate regression analysis. The results manifested that CFA model and regression analysis described a significant impact of Job Design and Ergonomics on Employee Performance. The correlation outcomes revealed that Job Design and Ergonomics were well connected having p-value of .00, $p < .005$. The findings suggested, while focusing on improving the employee upshot, it becomes necessary for organizations to include Ergonomics in Job Design as a Design for Safety.

Ravindran (2020) studied the impact of ergonomics on the performance of employees. The research was conducted among 80 employees selected using convenience sampling method, in tube products of india, Chennai to identify the factors of ergonomics that support the employees to work efficiently and effectively in tube products of india Chennai. The research design considered for the study is descriptive research design. From

the study, it is observed that the satisfaction level of respondents on workplace ergonomics is highly satisfied with office design.

Nesreen Ali Alzahrani (2019) studied the relationship between workplace ergonomics (Temperature, furniture arrangement, facilities, lighting, noise, equipment) and academic staff performance in Umm Al-Qura University (UQU) at Makkah is the aim of this study. Study sample consisted of (154) academic staff at the College of Education in UQU. The descriptive relational approach was used to detect the level of workplace ergonomics satisfaction and employee's performance. The study concluded that the workplace ergonomics satisfaction level was medium. The performance level of academic staff at the College of Education in UQU, regarding the workplace ergonomics is high. Finally, there is no statistical significance difference regarding the correlation coefficients of workplace ergonomics satisfaction relationship with its dimensions and academic staff performance according to gender.

Methodology

Research Design

In determining the effect of ergonomics on the performance of employees, the author deployed descriptive survey research design. According to Onyeizugbe (2017), this research design is appropriate since the study seeks to describe the characteristics of certain groups, estimate the proportion of people who have certain characteristics and make predictions.

Population of the Study

The target population of the study consists of all the operational staff who work full-time in Gauze Pharmaceuticals and Laboratory Nigeria Limited in Awka south, Anambra state. According to survey visitation to the organization under study, the staff position and staff strength are presented below.

Gauze Pharmaceuticals and Laboratory Nigeria Ltd, Departments and Staff Strength

SN/Name of Firm	DEPARTMENT	STAFF STRENGTH
Gauze Pharmaceuticals and Laboratory Nigeria Limited	Production and Purchasing department	52
	Marketing & sales department	18
	Administrative department	9
	Finance department	11
	Research and Development department	23
	Human Resource Department	6
	Packaging department	33
Total		**152**

Sample Size and Sampling Technique

From a population size of 152, the researcher adopted Taro Yamane's (1967) formula to obtain the sample size. This is demonstrated as follows;

Formula: Sample size (n) = $\frac{N}{1+N(e)^2}$

n =? (Unknown)

N = 152

e = 0.05

Therefore, sample size (n) is obtained thus:

n = 152 / 1 + 152 (0.05) ²

n = 152 / 1 + 152 (0.0025)

n = 152 / 1 + 0.38

n = 152 / 1.38

n = 110.1449

Approximately, n = 110

Data Presentation and Analysis

Test of Hypothesis I

H_{o2}: Cognitive ergonomics does not significantly relate to job satisfaction.

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

		Cognitive Ergonomics	Job Satisfaction
Cognitive Ergonomics	Pearson Correlation	1	.623**
	Sig. (2-tailed)		.000
	N	86	86
Job Satisfaction	Pearson Correlation	.623**	1
	Sig. (2-tailed)	.000	
	N	86	86

Correlational Result for Test of Hypothesis I

The test of hypothesis ascertained whether cognitive ergonomics relates to job satisfaction. The result shows that r = 0.623, n=86 and p value of 0.000 ($p<0.05$). which implies that the degree of association between cognitive ergonomics and job satisfaction is moderate and positive.

Decision Rule:

The correlational test was conducted at a 5% level of significance. The null hypothesis is to be accepted if the *p-value* of the test is greater than 0.05 while the alternate hypothesis is rejected. Otherwise, the alternate hypothesis is accepted while the null hypothesis is rejected. In this test, $P>$IrI = 0.000 is less than 0.05; thus, the alternate hypothesis was accepted.

H_{o3}: Organizational ergonomics has no significant relationship with employee turnover.

Correlational Result for Test of Hypothesis II

		Organisational Ergonomics	Employee Turnover
Organisational Ergonomics	Pearson Correlation	1	731**
	Sig. (2-tailed)		.000
	N	86	86
Employee Turnover	Pearson Correlation	731**	1
	Sig. (2-tailed)	.000	
	N	86	86

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

The test of hypothesis ascertained whether organizational ergonomics relates to employee turnover. The result shows that r = 0.731, n=86 and p value of 0.000 ($p<0.05$). Which implies that the degree of association between organisational ergonomics and employee turnover is moderate and positive.

Decision Rule:

The correlational test was conducted at a 5% level of significance. The null hypothesis is to be accepted if the *p-value* of the test is greater than 0.05 while the alternate hypothesis is rejected. Otherwise, the alternate hypothesis is accepted while the null hypothesis is rejected. In this test, $P>\text{IrI}$ = 0.000 is less than 0.05; thus, the alternate hypothesis was accepted.

Summary of findings

1)Physical ergonomics significantly and positively relates to employee efficiency (r = 0.780, $P>\text{IrI}$ = 0.000).

2)Cognitive ergonomics significantly and positively relates to employee job satisfaction (r = 0.623, $P>\text{IrI}$ = 0.000).

Discussion of the findings

The study revealed that there is a significant positive relationship between Physical ergonomics and employee efficiency and significant positive relationship between Cognitive ergonomics and employee job satisfaction, this is in agreement with the work done by Adesanya, (2024), Baleshzar et al (2022) and Shiliki Bhatia et al (2021) . When ergonomics at work are improved, employees work better and are less likely to miss work or quit (Kahare, 2014). Risk factors in ergonomics include lighting, noise, temperature, vibration, heavy lifting, repetitive motion, workstation design, tool design, machine design, chair design, and shoe design (Merino-Salazar et al., 2017). Ergonomics takes into account employees' physical, mental, social, organizational, and environmental factors when designing the workplace, jobs, products, environment, and systems to make sure they fit their needs, abilities, and limitations (Akinbola & Popoola, 2019). Ergonomics tries to improve both human health and the overall performance of a system by using theory, principles, data, and techniques. It is a scientific system that focuses on how people interact with other parts of a system (Ahmadi et al., 2015). So, ergonomics is a way to organize work so that tools are easy for employees to get to and the work environment is good for them. This leads to more work getting done (Mihartescu et al., 2021). Notably, it is difficult for an employee to be efficient when he/she is physically uncomfortable. Any office provisions including furniture fittings, level of noise, workstations, lighting, temperature, among others, that make an employee uncomfortable in the short or long period can affect the efficiency of such employee (Daniel, 2019). On the other hand, ergonomics contributes vitally to improving the wellbeing, safety and efficiency of workers by fitting the environment to them and not the other way around. This subsequently enhances the productivity, job satisfaction and employee retention since adequacy in ergonomics design is a source of motivation to employees (Nzewi, 2021).

Conclusion

Effective application of ergonomics in the design of the system can provide balance between jobs and characteristics of the employees. This can lead to labor force productivity, increased safety, physical and mental well-being, and job satisfaction of the employees. In organizational perspective, ergonomics causes productivity, increased production, increased efficiency and prevention from absenteeism and fatigue at work if implemented at all organizations. Thus, it increases national income of countries. Ergonomics factors in the workplace such as poor physical layout or overcrowding can lead to common types of workplace accident such as tripping or striking against objects. There are also some other ergonomics factors that could influence the employee performance in pharmaceutical firms such as noise. Noise from some pharmaceutical equipment used in making drugs can give rise to discomfort on the employees and thus reduce the productivity since it is a source of distraction to the employees.

Policy Recommendations

1)The organization should identify jobs that put people at risk of musculoskeletal disease and create necessary reforms in them, this will help to improve productivity.

2) Employees should become familiar with their job's ergonomics and work-related musculoskeletal complications and ways of controlling them.

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