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Effects of Ergonomic Factors on Employees' Performance in the Brewery Industry: A Study of Nigeria Breweries Plc, Ama Enugu State, Nigeria

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Abstract: *The study examined the effect of ergonomic factors on employees' performance in the brewery industry, using Nigerian Breweries PLC, Ama, Enugu State, Nigeria as the study area. The study adopted a descriptive survey design. Major statistical stools of analysis were summary statistics of percentages, Pearson correlation, and multiple regression analysis. Findings suggest that having adequate office workspace significantly and positively affects employees' performance. The study reveals too that adequate office furniture motivates employees and as a result, it positively influences their performance. Similarly, organizational welfare facilities/incentives were found to be having significant and positive effects on employees' performance. The study concludes that employees' performance in an organization is affected by the level of ergonomic factors in the organization. Therefore, it is erroneous to think that employees are motivated only by enhanced remuneration. It was recommended among others that the work environments (offices) should be designed in a way that permits easy navigation of employees for safety and optimal performance.*

Keywords: Ergonomic Factors, Employee Performance, and Brewery Industry.

INTRODUCTION

1.1 Background to the Study

Employees have been described as the most valuable asset of any organization, whether in the public or private sector organization, whether profit or non-profit oriented organization. The assertion has continued to be relevant in modern days organizations where machines are seemingly taking over the roles of humans in the production processes. The reason for the development is not far-fetched as everything that machine (roborts) can do or achieve, depends on human coordination through the expertise (Yankson, 2012). Therefore, there is need for deliberate efforts to be made to ensure that workplace conditions under which employees perform their duties are conducive enough to permit such expected improved performance from the workforce.

But on the contrary, many employers have rather been more interested in what the employee can contribute to the organization to facilitate the realization of set goals and objectives without considering the conditions of physical environment and incentives of the workplace such as workspace availability, adequate furniture, weather /temperature, noise level/vibration, ventilation, premises hygiene, welfare facilities, etc (Gowthami and Sagayaraj, 2021), even when it has been shown. But it has to be noted that poor workplace design leads to fatigued, frustrated and hurting workforce which culminates in diminished productivity of the employees. Having an appropriate physical work environment conditions help in reducing the amount/rate of absenteeism, lateness/tardiness, turnover and other negative work attitudes.

According to Silva and Dissanayake (2019), employees' efficiency and optimal performance are direct functions of conducive workplace environment. The positive effect of comfortable working atmosphere can never be overemphasized as having the opposite is outright invitation to employee job dissatisfaction with its attendant consequences. As Yankson (2012) has opined, two fundamental factors that affect employees' performance and productivity are management driven factors as well as those that are within work premises. The management driven factors are the development of organizational plans such as allocation of responsibilities at all levels of the organization, the definition of job description, degree of access to the management and the administrative support needed to complete tasks, working patterns, break times, health measures, safety policies, etc. While the other factors which comes from work premises are office or factory design, machinery and workshop tools, lighting/proper office illumination, weather, noise level/vibration, standard of office furniture, hygiene and other necessary facilities that enhance employees' performance (Britain, 2014).

Appropriate office/workplace ergonomics serves as a means of equipping employees to effectively perform their duties while ensuring that their safety is guaranteed within the work environment. In the opinions of Vimalanathan and Babu (2017), ergonomics helps to create alignment between the physical office work environment and the business objective as well as the mission of the organization. They stressed that the measure of success of the alignment, however, is referred to as organizational effectiveness. In the light of the above, this study examines the effect of some selected ergonomic factors on employees' performance in the brewery industry, using Nigeria Breweries PLC Ama, Enugu State, Nigeria as the study area.

1.2 Statement of the Problem

A good number of employers, especially in the private sector organizations have the belief that employees' enhanced performance can only be promoted by attractive financial compensation packages. It is a presumption which has been widely criticized because financial reward as one of the extrinsic rewards has limited or short term effect on employees' motivation unlike the intrinsic factors which includes but not limited to conducive physical workplace environment which is assumed to have greater impact on employees as it makes them produce better results. Due to the fact that many organizations, including those in the brewery industry appears not to be paying sufficient attention to the ergonomic factors in their workplace environment, employees have come down with various degrees of ailments which have negatively affected their performance. This being the case in many organizations, this study tries to examine the positive effect of some ergonomic factors on employees' performance and among the identified factors are workspace, furniture and welfare facilities.

1.3 Objectives of the Study

The broad objective of the study is to examine the effect of selected ergonomic factors on employees' performance in the brewery industry by using the employees of Nigeria Breweries PLC, Ama, Enugu State, Nigeria as the study area. Specifically however, the study intends to:

(i) Determine the effect of adequate workspace on employees' performance in the organization.
(ii) Ascertain the effect of adequate furniture on employees' performance in the organization.
(iii) Evaluate the effect of welfare facilities on employees' performance in the organization.

1.4 Research Questions

The following research questions were raised to guide the study:

(i) What is the effect of adequate workspace on employees' performance in the organization?
(ii) How does adequate furniture affect employees' performance in the organization?
(iii) What is the effect of welfare facilities on employees' performance in the organization?

1.5 Statement of Hypotheses

The following null hypotheses were formulated to guide the objectives of the study as well as strengthen the analysis:

(i) Adequate workspace does not have significant and positive effect on employees' performance in the organization.
(ii) Adequate furniture does not have significant and positive effect on employees' performance in the organization.
(iii) Welfare facilities do not have significant and positive effect on employees' performance in the organization.

1.6 Significance of the Study

This study will among other things bring attention of the management to office ergonomic factors which hi-ther-to have been relegated to the background or outrightly neglected. But more formally, the study has both theoretical and empirical significance. Theoretically, the body of literature would be significantly enriched and as such, the frontiers of knowledge would be substantially expanded. On the other hand, the empirical significance stems from the fact that many categories of people will benefit immensely from the findings of the study. For instance, the management would be given sufficient insight on how positive ergonomic factors can lead to enhanced employees' performance in their organizations. Another category of people are the employees who would enjoy conducive work environment for efficient delivery if the recommendations are adhered to. Finally, the students or researchers who might want to carry out further studies in the area would find the report very useful as it will serve as a good starting point.

1.7 Scope of the Study

The study is taking place in the brewery industry and Nigeria Breweries PLC Ama, Enugu State, Nigeria is the study area. Office ergonomic factors such as workspace, furniture and welfare facilities are the independent variables and the study tries to establish the influence/effect of the variables on employees' performance in the selected organization.

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 The Concept of Office Ergonomics

The word ergonomics comes from the Greek word "ergon" which means work and "nomos" which means laws. It is essentially the "laws of work" or "science of work". Good ergonomic design removes incompatibilities between the work and the worker and creates the optimal work environment necessary for desired productivity level in any organization (International Ergonomics Association, 2012). To Pawar and Khedkar (2016), Ergonomics is an applied science concerned with designing and arranging the

things that employees use so that interaction becomes most efficient towards enhanced performance in the organization. Goldenson Longman Dictionary of Psychology and Psychiatry (1984) cited in Shalleh and Sukadarin (2018) defines ergonomics as a branch of psychology concerned with the design of environments and equipment that promote optimum use of human capabilities and optimum efficiency and comfort in the workplace. In otherwords, it is the science of designing the job and the environment to fit the workers, rather than physically forcing the workers' body to fit the job while taking account of their capabilities and limitations (Humantech, 2016).

2.1.2 Concept of Employee Performance

Profit seeking organizations in today's highly competitive business environment are desirous of having high performing employees that can facilitate the realization of set goals and objectives. Consequently, it has become very necessary to conceptualize what employees' performance is so that outcome can actually be measured. Accordingly, employee performance involves factors such as quality, quantity and effectiveness of work as well as the behaviours the employees show in the workplace (Ellinger, Ellinger and Keller, 2013). Tripathy (2014) defines job performance in the context of task performance as effectiveness with which job occupants execute their assigned tasks, that realizes the fulfillment of organization's vision while rewarding organization and individual proportionately. In the opinion of Al Mehrzi and Singh (2016), performance comes from the word "job performance or actual performance which means work performance or actual achievement achieved by someone. They hinted that performance is the result or level of success of a person as a whole during a certain period in carrying out tasks compared to various possibilities, such as work standards, targets or targets of predetermined criteria that have been mutually agreed upon. In other words, employees' performance implies organizational improved productivity targeted at achieving its set goals.

2.2 Extant Literature

An ergonomic work environment takes into consideration not only the physical aspects of the job but the psychological impacts as well. Some of the physical elements that may affect performance/productivity either directly or indirectly include the office furniture, lighting, temperature as well as office workplace. Studies have it, that maintaining an appropriate temperature and comfortable office space allow employees to concentrate on their jobs and that they affect productivity level by 10 to 15 percent (Larsson, 2014). In particular, Bernstein and Turban (2018) posit that good office space allows the employee to properly coordinate his/her work efficiently with better output at last. In their opinion, single office with sufficient space for effective navigation by the employee is far more better than an open large office meant to accommodate many workers of different backgrounds. According to them, the dissatisfaction that often associate with such office designs has been a major factor in lowering employees' performance.

On the effect of office furniture, especially as it concerns chairs and tables, O'Neill and Albin (2012) observe that chair is one of the important parts of office ergonomics. This, according to them, is because it determines posture of the back, arms and legs while sitting and also encourages good circulation of blood if well arranged. In their opinion, an office chair should be adjustable and it should equally be of standard height of about 16 to 21 inches off the floor. Such a comfortable chair should be able to facilitate easy body movement while on duty. Sohbat, Oly, Haider and Probha (2015) were also of the opinion that desks or tables for office use should be comfortable and spacious enough to be able to handle the paper works, carry the desktop, mouse, keyboard and other accessories. Oborah (2011) notes that office furniture includes also the facilities for regulating room temperature among which are air conditioning, fan, etc, which are supposed to make work environment conducive for the desired optimal performance to be produced. It must be noted that employees rate the value management place on them through the standard of offices provided for them. When it is substandard, it demotivates them and vice verser (Baba, Baba and Oborah, 2021).

Human resource management encourages introduction of human elements in the management process. For instance, incorporation of welfare facilities such as break time, lunch or subsidized meals during office hours, medical retainership, etc, could be some great motivating factors for the employees to release their inner abilities for enhanced performance. Oladeinde, Ejejinduomoregie and Aguh (2015) posit that employees' workplace environment, which includes the condition of service, is a key determinant of their level of performance. That is to say, how well the workplace environment engages the employees, impact their level of motivation to perform. Omoneye (2016) observes that there are ergonomic hazards such as headache, neck pain, wrist pain and visual fatigue which management ought to prevent by putting out some safety measures accompanied by adequate hazard allowances for those affected. In his opinion, performance is encouraged by motivation and such gestures from the management reassures the employees of the value management place on them. He remarked that good welfare measures from the management boosts employees morale for greater commitment to the organization.

2.3 Theoretical Framework

The underpinning theory for this study is the Reinforcement theory developed by Skinner in 1938. Skinner, a psychologist developed the theory which is very interesting but also a controversial technique for motivating employees. Thus, the approach is called positive reinforcement behaviour modification. Skinner postulates that individuals or employees can be motivated through proper design of their work environment and praise for their performance and that punishment for poor performance produces negative result. Skinner

and his followers analyze work situation to determine what causes workers to act the way they do and then they initiated changes to eliminate troublesome areas and obstructions to performance. Specific goals are then set with the workers' participation and assistance, prompt and regular feedback of results is made available and performance improvement are rewarded. Even when performance does not equal goals, ways are found to help people and praise them for the good things they do. From all indications, the strength of this approach lies in the fact that it is so closely related to the requirements of good management as it emphasizes the removal of obstructions to effective performance. If nothing else, Skinner's recognition of effect of Congenial working environment on employees' performance makes the theory suitable for analyzing the issues involved in the study.

2.4 Empirical Review

Asogwa and Ndubuisi-Okolo (2020) conducted a study on effects of ergonomic factors or employees' performance in the Nigeria's banking sector. The study adopted descriptive survey design. The statistical tool of analysis was Chi-square (χ^2) test of independence. Major findings from the study indicate that physical work environment significantly affects employees' performance in the Nigeria's banking sector. The study found equally that engaging on repetitive task assignment and insufficient rest time hinders employee performance. The study therefore concludes that having work/task design that are repetitive in nature, makes employees feel tired and bored and as such, there is need for task redesign. In another study, Pickson, Bannerman and Ahwireng (2017) investigated the effect of ergonomics on employees' productivity in butchering and trimming line of pioneer food cannery in Ghana. The study adopted descriptive survey design and the result showed that all indicators of work ergonomics have significant and positive correlation with employees' productivity in pioneer food cannery in Ghana. In a similar vein, Taiwo (2010) examined the effect of work environment on employees' performance by using selected oil and gas industries in Lagos State, Nigeria as the study area. The study was a cross-sectional survey. The results revealed that the elements of workplace environment of the organization is strongly correlated with the performance of the organization. The study concludes that the state of workplace environment in an organization is a true reflection of the value management places on the employees. Lusa, Kapykangas, Ansio and Uitli (2019) did a cross-sectional study in a multi-space office on employee satisfaction with working space and its association with well-being. The major statistical tool of analysis in the study was Pearson's Chi-Square (χ^2) test of independence at 0.05 level of significance. The results showed that employees were most satisfied with the workspace furniture (82 percent of respondents) and most dissatisfied with workspace acoustics (44 percent). Workspace satisfaction was associated with self-satisfaction, good self-perceived future work ability and good recovery. The result showed also that good workspace provided good atmosphere and social capital for effective performance. The study concluded that good work atmosphere, social capital work satisfaction and enhanced performance were as a result of good workspace provided in the organization.

RESEARCH METHODOLOGY

3.1 Research Design

The study made use of descriptive survey design because a fraction of the population was to be studied with the intension of generalizing the results for the entire population of interest. Besides that, Obasi (2000) notes that survey method is always useful in the collection of primary data for studies of this nature, especially when the necessary data cannot be found in any statistical record in form of secondary data (official statistics).

3.2 Area of the Study and Population

The study took place in the brewery industry and Nigeria Breweries PLC Ama, Enugu State was used as the study area. The population consisted of senior employees of the organization and a total of 591 of this category of employees were identified from a pilot study commissioned by the researcher.

3.3 Sample Size Determination and Selection Procedure

Taro Yameni's statistical formula was used in determining the sample size as follows:

$$n = \frac{N}{n + N(e)^2}$$

Where:

n = Sample size to be determined
N = Entire population of interest
e = Error margin (0.05)
1 = Constant (unity)

Substituting in the formula, we have:

$$n = \frac{591}{1 + 591(0.05)^2}$$

$$= 238.5469223$$

$$= 239\ (Nearest\ whole\ number)$$

Thus, the sample size for the study is 239 senior personnel of the organization.

Concerning the selection method, systematic sampling technique was used in place of other methods for obvious reasons. The method has unique attributes which include random start and sampling interval which helps it to spread the sample evenly across the entire population of interest.

3.4 Instrument for Data Collection and Reliability Test

An item structured instrument designed to reflect the modified five (5) points Likert Scale of strongly agree, agree, disagree, strongly disagree and undecided developed by the researcher was sued in eliciting information from the respondents. The instruments reliability was ascertained through a test re-test method. The process involved giving 20 copies of the instrument to a group of people in the brewery firm outside the study area to complete. After an interval of two weeks, the same instrument was administered to them a second time. The first and second responses were collated and analyzed through the application of Spearman rank order correlation. The analysis returned coefficients of 0.90, 0.83 and 0.80 (see details of estimation in Appendix II) for the three research questions with an average coefficient of 0.84 thus meaning that the instrument is 84 percent reliable.

3.5 Method of Data Collection and Analysis

Direct data collection method was deployed and it involved administering the instrument directly by the researcher. It is a process that enabled the researcher to assess if the respondents actually understood the questionnaire items. The method equally reduced the volume of non-response which often associate with surveys of this nature. Out of the 239 copes of the questionnaire issued out, 225 were completed and returned thus showing a response rate of 94.1 percent and it was considered very adequate for the study.

3.6 Model Specification

The relationship between ergonomic factors as identified in this study and employees' performance is stated as follows:

$$EP = f(AWS, AFN, OWF) \quad (1)$$

Specifying the relationship econometrically we have:

$EP = \alpha_o + \alpha_1 AWS + \alpha_2 AFN + \alpha_3 OWF + \mu_t$ (2)

Where: EP = Employee Performance

α_o = The intercept

μ_t = Stochastic error or white noise

AWS = Adequate workspace

AFN = Adequate office furniture

OWF = Organizational welfare facilities

$\alpha_{i's}$ = The coefficients of the independent variables.

The excepted signs or a priori of the independent variables are as follows:

$\alpha_1 > 0$, $\alpha_2 = > 0$ and $\alpha_3 > 0$

or

$\alpha_{i's} > 0$

The interpretation of the *a priori* is that all the independent variables will have positive relationship with the dependent variable (employee performance).

DATA PRESENTATION AND ANALYSIS

4.1 Personal Data of the Respondents

Respondents' personal data such as gender, age, highest level of education and length of time in the organization, were presented and analyzed in this section of the analysis to determine the suitability or otherwise of the respondents in the study in terms of capacity to adequately address all issues relating to the subject matter of the study.

Table 4.1: Personal Data of the Respondents

S/N	Demographic Features	Responses	Frequency	Percentage of Total
1.	Gender:	Male	153	68.0
		Female	72	32.0
		Total	**225**	**100.0**
2.	Age Interval:	18 – 27 years	11	4.9
		28 – 37 years	37	16.4
		38 – 47 years	79	35.1
		48 – 57 years	57	25.3
		58 & above years	41	18.2

		Total	**225**	**100.0**
3.	Educational Qualification:			
		WAEC	7	3.1
		NCE/OND	49	21.8
		HND/First degree	55	24.4
		Masters degree	55	24.4
		Ph.D	3	1.3
		Total	**225**	**100.0**
4.	Length of time:	<5 years	18	8.0
		5 – 10 years	71	31.6
		11 – 15 years	89	39.6
		16 & above years	47	20.9
		Total	**225**	**100.0**

Source: Field Survey, 2022

The analysis of respondents' personal data presented in Table 4.1 showed that there are more male respondents in the sample than there are females. The table showed further that in terms of age bracket, 38 to 57 years are 136 and it represents about 60.4 percent of the sample. Concerning the educational attainment, 111 of the respondents which represents 49.3 percent of the entire sample said they have either first degree or its equivalent while 58 of them representing also 25.7 percent of the sample said they have qualifications ranging from masters degree to Ph.D. Finally, the organizational tenure analysis showed that 207 respondents representing 92 percent of the sample have worked in the organization for 5 years and above. The implication of the analysis is that the respondents have the capacity to effectively discuss all issues surrounding the subject matter of the study, especially when we consider their educational background and work experience.

Table 4.2: Correlation Analysis

Correlation Matrix

Variable		Employee Performance	Adequate Workspace	Adequate Office Furniture	Organizational Welfare facilities
Employee performance	Pearson Correlation	1	.601**	.597**	.562**
	Sig. (2-tailed)		.000	.000	.000
	N	225	225	225	225
Adequate Workspace	Pearson Correlation	.601**	1	.405**	.393**
	Sig. (2-tailed)	.000		.000	.003
	N	225	225	225	225
Adequate Office Furniture	Pearson Correlation	.597**	.405*	1	.675**
	Sig. (2-tailed)	.000	.022		.000
	N	225	225	225	225
Organizational Welfare facilities	Pearson Correlation	.563**	.393*	.675**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	225	225	225	225

** Correlation is significant at 0.05 level (2-tailed).

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

As could be seen from the above correlation matrix, there are more strong and positive relationships between and among the variables than there are weak relationship. It is equally interesting to note that the matrix did not suggest presence of multicollinearity or orthogonal conditions in the results presented.

Table 4.3: Summary of ANOVA for the Regression

ANOVA[b]

Source of Variation	Df	Sum of Squares	Mean Square	F-ratio	Sig.
Regression	4	1217.381	304.345	24.798	.000[a]
Residual	70	859.105	12.273		
Total	74	2076.486			

a. Predictor: (constant), adequate workspace, adequate office furniture and organizational welfare facilities.
b. Dependent variable: Employee performance.

From Table 4.3, the analysis of variance result showed that with F-Statistic value of 24.798, the model is statistically significant because $P_{0.000}$ is less than $P \leq 0.05$. Therefore, the model is valid and fit for statistical predictions.

Table 4.4: Summary of Regression Results

Model	R	R^2	Adjusted R-Square	Standard Error of the Estimate	Durbin Watson Stat.
I	0.691[a]	0.635	0.587	0.43561	2.709

a. Predictor: (constant), adequate workspace, adequate office furniture and organizational welfare facilities.

As could be seen from Table 4.4, regression coefficient is represented by 'R' in the table and it has a value of 0.691 which means that 69.1 percent relationship exists between the dependent and independent variables. Similarly, the coefficient of determination represented by 'R^2' in the table with a value of 0.635 means that 63.5 percent variation in the dependent variable can be explained by the regressors. The Durbin Watson Statistic of 2.709 is an indication that there is no serial autocorrelation in the model.

Table 4.5: Unstandardized and Standardized Coefficients, t-value and Significant Level

Model	UnStandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	.168	.207		-.605	.425
Adequate Workspace	.361	.069	.581	10.203	.000
Adequate office furniture	.419	.054	.673	3.305	.000
Organizational Welfare Facilities	.503	.048	.705	4.106	.000

b. Dependent Variable: Employee Performance

Table 4.6: Multicollinearity Test Result

Model	Eigen Values	Condition Index	Variance Proportion			
			Constant	AWS	AFN	OWE
1.	3.426	1.003	.00	.00	.00	.00
2.	.069	6.435	.08	.23	.03	.06
3.	.085	7.501	.05	.07	.22	.08
4.	.057	8.109	.14	.24	.25	.21

b. Dependent Variable: Employee Performance

Multicollinearity test is a measure of model's stability. The specification for measurement are that the eigen values that are close to zero only explain little or no variance and for the condition index, whenever the values are more than 15 for any of the variables, then there is presence of multicollinearity problem in the model. But for the current study as presented in Table 4.6, the values of 2 to 4 are close to zero and it means there is little or no variance in the model. As for the condition index, the values are in the range of 6.435, 7.501 and 8.109 which are not close to 15. Therefore, there is no multicollinearity relationship in the model.

4.2 Test of Hypotheses

Re-Statement of Hypotheses

1. H_o: Adequate workspace does not have significant and positive effect on employees' performance the organization.

   H_1: Adequate workspace has significant and positive effect on employee performance in the organization.

2. H_o: Adequate office furniture does not have significant and positive effect on employees' performance in the organization.

H_1: Adequate office furniture has significant and positive effect on employees' performance in the organization.

3. H_o: Organizational welfare facilities do not have significant and positive effect on employees' performance in the organization.

H_1: Organizational welfare facilities have significant and positive effect on employees' performance in the organization.

Interpretation of Regression Results

The coefficient of adequate workspace presented in Table 4.5 is 0.581 and it means that when the independent variable is increased by one unit, the dependent variable will increase by 58.1 percent when other variables in the model are held constant. The t-value associated with the coefficient is 10.203 and the corresponding significant level is 0.000 which means that the coefficient is significant because $P_{0.000}$ is less than $P \leq 0.05$. Consequently, the null hypothesis was rejected while the alternative which suggests that adequate workspace has significant and positive effect on employees' performance in the organization was accepted.

In the same vein, the coefficient of adequate office furniture represented in the model by α_2 has a value of .673 and it means that if the value is increased by one additional unit, employee performance will increase by 67.3 percent if other variables in the model are held constant. The t-value for the coefficient and its corresponding probability level shows that the coefficient is significant because 0.000 is less than $P \leq 0.05$. Hence the null hypothesis was rejected while the alternative which suggests that adequate office furniture has significant and positive effect on employee's performance was accepted.

Concerning organizational welfare facilities, the coefficient is represented in the model by α_3 and its value is 0.705 which means that when the value is increased by one unit, the dependent variable will increase by 70.5 percent if other factors in the model are not allowed to vary. Similarly, the t-value and its corresponding probability level indicate that the coefficient is significant since $P \leq 0.05$ is greater than 0.001. As a result of that, the null hypothesis was rejected while the alternative which suggests that organizational welfare facilities have significant and positive effect on employee performance was accepted.

4.3 Discussion of Research Results

The result of the first test of hypothesis showed that adequate workspace has significant and positive influence on employees' performance in the organization. The result as could be seen is consistent with that of Lusa et al (2019) when they found from their study of effect of working space on employees' satisfaction and commitment to the organization, that good working space in the organization provide employees with the needed atmosphere to achieve enhanced performance. Sufficient workplace makes work in an organization a great delight. In essence, not many individuals like it when office accommodation is shared, especially among the senior personnels of the organization because it does not permit privacy as well as deep thinking about the assigned duty. Apart from the lack of storage space which poor working space bring about, it also leads to lack of concentration, noise and irrelevant speeches which reduces productivity of an individual. Therefore, the importance of good working space/workspace to employee performance in an organization cannot be over-emphasized.

Similarly, the result of the second test of hypothesis showed that adequate office furniture, as positive ergonomic factor has significant and positive effect on employees' performance in the organization. The result supports substantially that of Sultan, Asim and Asif (2020) when they found from their study of role of office furniture in office ergonomics and employees' performance in faculty of higher educational institutes of Karachi that office chairs have significant impact on employee performance. The use of chairs and tables/desks in the office is to make people more comfortable and effective at work. Therefore, it is a requirement of management that furniture must be ergonomically sound to make employees motivated because furniture portend enough to affect performance when it is adequately provided. The state of office furniture equally explains to a large extent the value management places on the employees of the organization.

The result of the third test of hypothesis indicate that organizational welfare facilities, significantly and positively affect employees' performance in the organization. The result is in line with that of Awotidebe (2018) when he found from his study of effect of incentives as a form of welfare measure on employees' performance, that incentives have significant positive effect on employees conduct and output in the organization. Welfare measures are motivating factors and they come in different forms, depending on the particular organization's welfare policy. Welfare packages in form of subsidized meals during office hours launch break, payment of medical allowance or hospital retainership, housing subsidy, are highly cherished by employees and their provision make them to release their inner ability while on duty.

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The preliminary results from the study showed that the model is statistically significant based on the value of F-Statistic. The value of the regression coefficient 0.691 means that 69.1 percent relationship exists between the dependent and independent variables. Similarly, the coefficient of determination with a value of 0.635 indicate that 63.5 percent variation in the dependent variable (employees' performance) can be traced to the regressors. Other findings in the study are as stated below:

1. Adequate workspace has significant and positive effect on employees' performance in the organization.
2. Adequate office furniture has significant and positive effect on employees' performance in the organization.
3. Organizational welfare facilities/incentives have significant and positive effect on employees' performance in the organization.

5.4 Conclusion

The study examined the effect of ergonomic factors on employees' performance in the brewery industry, using Nigeria Breweries PLC Ama, Enugu State, as the study area. Employees' performance in an organization are affected by the ergonomic factors depending on their level of provision. Three of such factors were identified in this study and they include workspace, office furniture and organizational welfare facilities or incentives. Adequate provision of the mentioned factors were found to be significantly and positively affecting employees performance in the organization. Employees want to work in a conducive work environment both internal and physical to be able to function effectively. It is erroneous to think that all that matters to the employees is enhanced remuneration, as they are also concerned with the physical conditions of the workplace.

5.3 Recommendations

Based on the findings made in the study and the conclusion drawn from them, the following recommendations were suggested:

1. Workspace was found to be significant in employees' optimal performance. The management is therefore adviced to ensure that offices are adequately designed to guarantee sufficient workspace necessary for enhanced productivity by the employees.
2. Office furniture was found to be having significant influence on the performance of the employees. Consequently, it is the responsibility of management to ensure that good office furnitures are provided to motivate the employees for superior performance.
3. Management is encouraged to have a good policy towards welfare facilities or incentives for the employees. Work environment must be made conducive enough to enlist the cooperation of the employees by enjoying their commitment to the organizational goals.

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Appendix I

Instruction: Please read each statement carefully and with a tick [√] indicate the option that best describe your choice

SECTION A: Demographic Information

1. State of residence: write the name…….
2. Gender: Male [1]; Female [2]
3. Age:
   (a) 18 – 27 years [ ]
   (b) 28 – 37 years [ ]
   (c) 38 – 47 years [ ]
   (d) 48 – 57 years [ ]
   (e) 58 and above years [ ]
4. Educational Qualification:
   (a) WAEC [ ]
   (b) NCE/OND [ ]
   (c) HND/Frist degree [ ]
   (d) Masters degree [ ]
   (e) PhD[ ]
5. Length of time:
   (a) <5 [ ]
   (b) 5 – 10 years[ ]
   (c) 11-15years [ ]
   (d) 16&above years [ ]

SECTION B: Adequate Workspace and Employee Performance

S/N	Items of the Questionnaire	Alternative Responses					Total
		SA	A	D	SD	UND	
1.	Ergonomic does not only consider physical aspect of work but also psychological aspect which even appears to be more impacting.						
2.	Workspace is one of the ergonomic factors is considered very important by the employees because it determines extent of movement in the office						
3.	Senior employees would want to have separate offices because it helps to maintain privacy and reduces level of distraction.						
4.	Sufficient office or workspace is desirable because it helps to reduce obstructions and hence less injuries while on duty.						
5.	Good office space allows the employee to properly coordinate his/her work efficiently with better output, just as sharing of office brings about dissatisfaction.						
	Total						

Note: (SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree and UND = Undecided).

SECTION C: Adequate Office Furniture and Employee Performance

S/N	Items of the Questionnaire	Alternative Responses					Total
		SA	A	D	SD	UND	
1.	Chairs and desks/tables are part of the important office ergonomic because they determine how comfortable or otherwise an employee sits in the office.						
2.	Office chair should be adjustable and of standard height of about 16 to 21 inches off the floor.						
3.	Chairs should be made in such a way that they facilitate easy body movement while on duty.						

4.	Desks/tables in the office should be comfortable and spacious enough to handle paper works carry desktop, keyboard, mouse and other office accessories.						
5.	Office furniture such as facilities for regulating room temperature such as fans, air conditioning are necessary for a conducive office.						
	Total						

Note: (SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree and UND = Undecided).

SECTION D: Organizational Welfare Facilities and Employees' Performance

S/N	**Items of the Questionnaire**	**Alternative Responses**					**Total**
		SA	**A**	**D**	**SD**	**UND**	
1.	Conducive office/work environment has psychological effect on employees of an organization.						
2.	Welfare packages such as launch break or subsidized meals during office hours encourages employees.						
3.	Employees' job satisfaction level increases when management provides hospital retainership for them.						
4.	Employees are always ready to go extra mile if they are provided with incentives such as transport allowance and subsidized housing rent.						
5.	Hazard allowance and other safety measures are signs that management care about the employees' welfare and they lead to employees commitment and loyalty.						
	Total						

Note: (SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree and UND = Undecided).

Section E: Dependent Variable: Employee Performance

S/N	Items of the Questionnaire	Alternative Responses					Total
		VGE	GE	ME	LE	VLE	
1.	To what extent do you think adequate office workspace can lead to employees' enhanced performance?						
2.	To what extent do you believe adequate office furniture can influence employees' enhanced performance?						
3.	To what extent do you think having organizational welfare facilities in place can lead to employees performance.						
	Total						

Note: (VGE = Very great extent; GE = Great extent; ME = Moderate extent; LE = Little extent and VLE = Very little extent)

Appendix II

Estimation Reliability Coefficients through the Spearman Rank Order Correlation Coefficient

$$r = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

Where:

r = the coefficient to be estimated
n = number of response options
d = difference in rank order
1 and 6 = constants

The value of the coefficient 'r' ranges from -1 to +1.

Reliability Estimation for Research Question I

Response Option	Results of 1st responses	Results of 2nd responses (y)	Rx	Ry	Rx – Ry (d)	d^2
Strongly	7	6	1	1	0	0
Agree	6	5	2	2	0	0
Disagree	4	3	3	4	1	1
Strongly disagree	2	4	4	3	1	1
Undecided	1	2	5	5	0	0
Total	20	20				2

$$r - 1 = \frac{6(2)}{5(5^2-1)}$$
$$= 0.90$$

Reliability Estimation for Research Question II

Responses	Result of 1st Responses (x)	Result of 2nd Responses (y)	R_X	R_Y	R_X – R (d)	d^2
Strongly Agree	6	7	2	1	1	1
Agree	7	5	1	2.5	-1.5	2.25
Disagree	4	5	3	2.5	0.5	0.25
Strongly Disagree	2	2	4	4	0	0
Undecided	1	1	5	5	0	0
	20	20				3.5

$$r = 1 - \frac{6(3.5)}{5(5^2-1)} = 1 - \frac{21}{120} = 0.83$$

Reliability Estimation for Research Question III

Responses	Result of 1st Responses (x)	Result of 2nd Responses (y)	R_X	R_Y	R_X – R (d)	d^2
Strongly Agree	5	6	2	1	1	1
Agree	7	5	1	2	-1	1
Disagree	4	3	3	4	-1	1
Strongly Disagree	3	4	4	3	1	1
Undecided	1	2	5	5	0	0
	20	20				6

$$r = 1 - \frac{6(4)}{5(5^2-1)} = 1 - \frac{24}{120} = 0.80$$