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APPRAISING OFFICE ERGONOMIC MEASURES IN THE SCHOOL OF ENVIRONMENTAL TECHNOLOGY OF FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

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ABSTRACT

Accidents that occur in offices are frequently due to poorly designed office environment and improper office procedures. From 1991-2004 the Workplace Safety and Insurance Board reported that musculoskeletal disorders accounted for nearly 42% of all lost time. This accounts for only lost time which underestimates the true nature of problems as many individuals continue to work with pain and discomfort. The study aimed at appraising office ergonomic measures in the school of environmental technology of federal university of technology, Minna, the objective of this study is to provide such information to improving human health, safety and performance at workplace through the application of sound workers and workplace principles. The study is criteria – based in which questionnaires were administered to selected 65academic staffers who met the research criteria. Correlation analysis was used to determine the relationship between Staff Assessment of Ergonomic Measures and Standard Ergonomic Measures. Regression analysis was used to determine the impact of SEM on SAEM. The Pearson correlation reveals a positive moderate significant relationship between standard ergonomic measures and staff assessment of ergonomic measures (r is 0.561, while its $P < 0.001$). Findings reveals that standard ergonomic measures contributes additional benefits of unstandardized coefficient = 0.527, $t = 8.135$ and $P < 0.005$. It can be concluded that a reasonable correlation exists between staff assessment of ergonomic measures and standard ergonomic measures practice at workplace. The regression prediction findings indicate that additional improvement on the level of staff's assessment of ergonomic measures will spring up enormous benefit to prevent musculoskeletal disordersat workplace. The study recommends adequate training and awareness of staffers as regard to office ergonomic measures.

Keywords: Appraising, Correlation,SAEM, SEM and Regression.

1.0 INTRODUCTION

The importance of ergonomics as a health and safety concern in terms of medical expenses, employee absenteeism, and human suffering has drawn management's attention in recent years. Sprains, strains, and musculoskeletal issues may result from activities that involve lifting, moving components or other materials, repeated action, odd postures, or steady positions. Ergonomics is the science of creating a job that fits the worker rather than making the person fit the job, according to the Occupational Safety and Health Act (OSHA) of 1994. It takes into account the worker's talents and limitations, both mental and physical, while interacting with tools, equipment, tasks, work techniques, and the working environment. The design of instruments, machinery, workspaces, and job duties is examined by ergonomics. It also examines the way that work is arranged, including how quickly and how many people do a job at a time. An ergonomically structured employment minimises the risks associated

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with occupational injuries, especially in offices. The area of ergonomics that focuses only on the workplace setting is called office ergonomics.

Office equipment is often designed to suit a broad variety of users. As such, it has to be adjusted and arranged appropriately for each user to guarantee work activities are accomplished with the least amount of risk of damage. According to data from the Workplace Safety and Insurance Board (WSIBS), about 42% of lost time claims in Ontario between 1991 and 2004 were related to musculoskeletal diseases (MSDs). Since many people continue to work through pain and suffering, this number understates the real nature of difficulties since it only takes into account missed time that has been reported. Although there hasn't been much focus on ergonomics in Nigeria up to this point, the study's findings indicate that musculoskeletal diseases were a common cause of workplace absenteeism. Additionally, there wasn't enough research done on SET safety performance at work. For this reason, the study evaluated office ergonomic measures at the Federal University of Technology Minna's School of Environmental Technology. Its goal was to provide information on how to apply sound workplace and worker principles to improve human health, safety, and performance at work. Numerous It is possible to reduce musculoskeletal discomfort with a quite easy and affordable remedy. The workers' participation in the change process will determine the effectiveness of the intervention, and the psychological work and environmental variables need to be given the attention they need.

2.0 Literature Review

According to Shamsul, Mohd NorFarham, Mohd, Zahiruddin, and AdibAsymawi (2014), the office has historically been seen as a reasonably safe and healthy place to work. However, the contemporary office setting provides a number of potential risks that may be avoided by adopting basic measures. This idea may be quantified in terms of sick leave, absenteeism, and work turnover, and it is expressed in complaints of discomfort, anxiety, annoyance, and overall job discontent (Shamsul et al., 2014). workplace accidents are often the result of poorly planned workspaces and ineffective workplace protocols. workplace workers who are aware of possible dangers and safe work procedures see a decrease in the occurrence of workplace accidents (Shamsul and Mohammed, 2015). Effective ergonomic risks are dependent upon the following, according Mark and James (2007):

1. Identifying ergonomic dangers often entails looking for symptoms. physical strains and tensions on the body, mental strains, and general aches and pains.

2. Information gathering and assessment to assist in identifying the problem's location and scope.

3. Control methods implemented in light of the available data pertaining to jobs. Adopting engineering controls, such as creating and using ergonomically sound workstations and workplace arrangements, is the recommended course of action.

Shamsul and Mohammed (2015) suggested that employees get training on general safety measures in order to lower the frequency and severity of incidents that occur in offices. Employees and their managers should have a grasp of the following via such training:

i. Legal obligations for health and safety
ii. The types of hazards that exist in the workplace
iii. The methods for identifying, evaluating, and controlling risks
iv. The protocols for reporting
v. Events that might give rise to hazards
vi. The justifications for and safe applications of the risk management techniques used at work
vii. Safe work procedures.

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An employee is more likely to be exposed to risks that might result in musculoskeletal injuries if their employment is not a good match for them. The following are the primary ergonomic risk factors in the workplace, according the Office Ergonomic Handbook (2008):

i. REPETITION: repetitive motions or actions using the same muscles and tendons that are performed for hours on end, such as typing, stapling, hole punching, clicking a mouse, and so on.
ii. AWKWARD POSTURES: Non-neutral body postures include bending your neck to look at your display or reaching for your mouse.
iii. STATIC FORCES: holding a posture for an extended length of time (e.g., sitting for extended periods of time, bending over to see a display, or reaching for the keyboard). Muscle stress and decreased circulation brought on by immobility may exacerbate injuries.
iv. CONTACT STRESS: interaction between the skin, blood vessels, tendons, and nerves with a harsher or sharper surface as a result of workstation design.
v. EXCESSIVE FORCE/LOAD: Higher mechanical stress on the muscles, ligaments, tendons, and joints results from excessive force. Fatigue and bodily harm may result from this. There is a higher risk of MSDs the more force that must be used to complete a job or the longer the force must be applied.
vi. ENVIRONMENTAL FACTORS: Insufficient illumination will force the staff to stoop in order to see better. The likelihood of working in uncomfortable positions may be reduced by upgrading workstation design and adding sufficient illumination.

A higher risk of injury may arise from the combination of certain risk factors at work (US Department of Health and Services, 1997). Office ergonomics' primary objective is to lower the prevalence of musculoskeletal diseases (MSDs). Many MSD risk factors that are present in the office environment may be identified and addressed by using office ergonomic solutions, which will reduce the likelihood of MSD harm. Musculoskeletal diseases (MSDs) are injuries and illnesses that result from exposure to risk factors in the workplace. It entails the softening of bodily tissues that come into touch with work-related elements, including muscles, tendons, nerves, cartilage, and other supporting components. MSDs are often brought on when an employee's skills cannot keep up with the demands of their job. Every person is unique in terms of their knowledge, experience, physical strength, flexibility, and body type. Each of these factors contributes to the development of MSDs and explains why one person may sustain an injury while doing a job, whereas another person won't Because of their demanding nature, several MSDs at work develop gradually over time (Hoozenmans, *et al.*, 2004). As stated by Nahit and colleagues (2001). Workers may be more susceptible to MSDs if their jobs demand them to hold uncomfortable or static bodily positions for extended periods of time. According to the National Research Council and the Institute of Medicine (2001), several extracurricular activities with high physical demands have the potential to either induce or worsen multiple sclerosis (MSDs). Eriksen *et al.* (1999) and the National Research Council and Institute of Medicine (2001) concur, however, that age, gender, and other variables, as well as hereditary reasons, may have a role in the development of MSDs. Finally, there is evidence that some psychosocial characteristics including work discontent, boredom, and restricted job control may be connected to reports of MSDs, according to National Research Council and Institute of Medicine (2001). The process of identifying ergonomic risks often include looking for signs of the condition, such as general complaints or discomforts, psychological pressures, and

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physical strains and stresses on the muscles (Mark and James 2007).

3.0 Materials and Methods

A mixed method, or using both qualitative and quantitative measurements, approach was used to enhance human health, safety, and performance via the use of good people and workplace concepts. Mohammed and Ajala (2017) state that qualitative research looks at objects in their natural environments and tries to explain or interpret the occurrences in terms of the meanings that individuals assign to them. Consequently, the degree to which ergonomic preventative measures are being implemented at work may be disclosed to workers and decision makers via the use of qualitative research. Academic staff members at the Federal University of Technology, Minna's School of Environmental Technology who fit the study's requirements were given a well crafted questionnaire. The requirements were:

i. The respondent must be a staff of School of Environmental Technology (SET) of Federal University of Technology Minna.
ii. He or She must be an academic staff.
iii. The staff must be in the current workplace for at least one year.
iv. He or She must have at least 15hrs per week on the workplace.

The respondentwas drawn from the total population of the academic staffers within the SET that met the above research criteria. A total number of 65 staffers met the above criteria and were selected (100% sample). Correlation analysis was used to determine the relationship between Staff Assessment of Ergonomic Measures (SAEM) and Standard Ergonomic Measures (SEM). Regression analysis was used to determine whether SEM can be used as a predictor of ergonomic assessment.

4.0 Result and Discussion

4.1 Discussion of qualitative Data

All the 65 questionnaire that were administered to the SET academic staffers were retrieved making it 100% respondent. The questionnaire was processed using Statistical Product and Service Solutions (SPSS) in order to transform it into quantitative values using five points likert scale. The analysis was conducted using correlation to determine the relationship between staff assessment of ergonomic measures (SAEM)and Standard Ergonomic Measures (SEM), and regression to predict the impact of SEM on SAEM.

4.1.1 Correlation and Regression Analysis

The result of the correlation analysis used in determining the relationship between Staff Assessment of Ergonomic Measures (SAEM) and Standard Ergonomic Measures (SEM) is presented in Table 1.

Table 1: Standard Ergonomic Measures

Component	.r	P
SAEM	0.561	0.001

Likewise, N = 56

Where

SEM: Standard Ergonomic Measures

SAEM: Staff Assessment of Ergonomic Measures

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The table shows the result of the correlation analysis used in determining the type and strength of the relationship. It reveals that the correlation of staff assessment of ergonomic measures and standard ergonomic measures is moderately significant ($P < 0.001$, $r=0.561$ and $N=56$).This means that as the level of standard ergonomic measures improves, there is corresponding improvement on the staff awareness of ergonomic measures.Following the existing positive relationship between the variables, there is need to model the outcome of the variables as such simple linear regression is used. The coefficient of the simple linear regression is provided in Table 2. which shows the contribution that standard ergonomic measuresmake to the staff assessment of ergonomic measures, the result reveals that standard ergonomic measurescontribute additional benefits of unstandardized coefficient = 0.527, $t = 8.135$ and $P < 0.005$. In the model the system ($t=8.135$, $P<0.005$) is a predictor of staff assessment of ergonomic measures and clearly make a great significant contribution to this model. Based on the fact that thet-statistic is greater than 2(rule of thumb) is a confirmation of the reliability of the proposed model. The t-test determine whether each β differ significantly. The β – value has an associated standard error which is used to determine whether or not the β – value differ significantly from zero. The t – test associated with β – value is significant at $P < 0.005$. This means that the predictor is making a significant contribution to the proposed model. According to Field, (2005) the smaller the significant value the greater the contribution of the predictor. From the magnitude of the t – statistic, the level of standard ergonomic measures has a great impact on staff assessment of ergonomic measures. As indicated further in Table 2, the independent variable accounts well for the variation in the level staff assessment of ergonomic measures. The positive β of 0.527 confirms the positive relationship between standard ergonomic measures and staff assessment of ergonomic measures.This result implies that further improvement of standard ergonomic measures will provide more understanding of staff assessment of ergonomic measures.

Just as mentioned in our introduction that no much study or literature is in existence as regards to SET workers safety performance at workplace, the findings of this research as regards the two variables SAEM and SEM can be used to compare other works of similar nature.

Table 2: Coefficient Analysis

Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig	95.0% Confidence Interval for B	
		B	std. Error	Beta			Lower Bond	Lower Bond
1.	(constant)	3.661	.444		11.888	.000	3.180	4.142
	SEM	.527	.070	.460	8.135	.000	.409	.644

a. Dependent Variable: SAEM

$$SAEM= 3.661+ 0.527SEM$$

Table 3: Analysis of Variance (ANOVA)

ANOVA[a]

	Model	Sums of Squares	Df	Mean Square	F	Sig.
1.	Regression	8.496	1	8.496	58.902	.000[b]
	Residual	57.080	342	.167		
	Total	**65.575**	**343**			

a. Dependent Variable: AVGTMR
b. Predictors: (Constant), AVGCMR

The model's usefulness as a predictor of effective standard ergonomic measures is demonstrated in Table 3, or the ANOVA table test, where results of F = 58.902 and P< 0.005 show that the model significantly contributes to SET staff members' perceptions of the benefits of standard ergonomic measures. Large residual sums of squares relative to regression sums of squares show that some variance in the dependent variables cannot be explained by the model. There's a chance that certain factors not included in the model are responsible for this fluctuation in the independent variables.

The results of this research are consistent with those of Shamsul *et al.* (2014) and are characterised by complaints of discomfort, anxiety, annoyance, and overall work discontent, which may be quantified by absenteeism, sick leave, and job turnover.

However, there are no comparable studies or publications available on how SAEM and SEM affect SET workers' performance in terms of workplace safety. Because this discovery may be utilised to compare other research of a similar sort, it is necessary to domicile the study in Nigeria and in the study area.

5. Conclusion and Recommendation

As this In order to lower or completely eradicate the prevalence of health and safety issues, particularly musculoskeletal disorders, an effective evaluation of basic ergonomic workplace measures is required (MSD). The research came to the following conclusions based on its findings:

I. By putting office ergonomics techniques into practice, many MSD risk factors that are prevalent in the workplace may be identified and managed, reducing the likelihood of MSD harm.

ii. The results showed a decent association between the ergonomic measures that employees evaluate and the conventional ergonomic measures used in the workplace.

iii. The results of the regression models show that further enhancements to the staff's evaluation of ergonomic measures among employees will have a significant positive impact on workplace ergonomic illnesses and injuries.

The research also comes to the conclusion that enhancing employee knowledge of common ergonomic precautions will enhance workplace safety and health measures. Therefore, the total advantages of the safety management system (ergonomic measures) at work are greatly impacted by adherence to basic ergonomic measures.

It is crucial that employees follow ergonomic guidelines since this will motivate management to create and put into place a successful safety management system at work.

The research recommended the following because the models might assist those involved in ergonomics in creating an efficient safety management system, particularly in the area of workplace ergonomics:

i. Adequate training of staffs as regard to office ergonomic measures.

ii. Provision of ergonomic furniture's and equipment's to the workers.
iii. There should be adequate provision of lightning and ventilation in all offices.
iv. Adequate cleaning and regular maintenance should be carried out within all the office's in SET.

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