Macrothink Institute™

Journal of Public Administration and Governance
ISSN 2161-7104
2024, Vol. 14, No. 1

Work Environment and Job Performance: The Mediating Role of Office Ergonomics

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Received: Aug. 1, 2022 Accepted: Jan. 31, 2024 Online published: May 1, 2024

doi:10.5296/jpag.v14i1.20125 URL: https://doi.org/10.5296/jpag.v14i1.20125

Abstract

This study aimed to address the influence of the Work Environment on employees' health and safety, comfort, and task accomplishment by investigating office ergonomics as the possible underlying mechanism. The study was conducted in Dodoma City Council, specifically in the ward and Mitaa offices. Data were collected from 79 respondents through a questionnaire. Data were analyzed quantitatively using the Pearson correlation coefficient and regression analysis, and the Sobel test was performed to assess if the mediator variable was significant enough to mediate the relationship between variables. The study has found that work environment and ergonomics have a linear and positive relationship ($r = 0.5433$, $p < .0001$). The results have also indicated that ergonomics is related to employee health and safety, comfort, and task accomplishment. The study revealed that most offices in lower local government authorities in Dodoma City Council need ergonomically designed chairs and tables, adequate quality air, and lighting. Inadequacy of these elements risks the office bearers' health and safety, comfort, and performance. Therefore, ergonomics should be a strategic aspect in enhancing work efficiency and productivity in lower local government in Tanzania.

Keywords: work environment, ergonomics, job performance, health and safety, comfort, task accomplishment

1. Introduction

Job performance is the world's central agenda for all organization's ventures to maintain their sustainability in the competitive environment. Employees are the most critical assets organizations need to keep in pursuing business competitiveness and advantage. To achieve job performance and maintain organizational productivity, organizations need to provide the best working environment to their employees as expected.

Based on Saiful, Wan, Zakaria, & Pauzi (2019), employees' performance is mainly influenced by a decent work environment, such as office layout, work conditions, office equipment, and furniture. Moen et al. (2020) state that continued socioeconomic development is only possible if organizations provide their workers with a decent working environment. Sedarmayanti (2003) defines a respectable working environment as a condition where employees can perform their jobs in the ideal, secure, healthy, and comfortable ways. As a decent working environment provides a good impression on employees' performance, organizations thus must ensure adequate workplace environment management. This may entail making the work environment attractive, comfortable, satisfactory, and motivating, giving employees a sense of pride and purpose in performing their duties (Humphries, 2005).

The apprehension for decent work environments to provide for employees' safety, health, and security has attracted the concern of governments, organizations, and the international community. For example, Sustainable Development Goal 8 wishes to Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all. Moreover, sub-goal 8.8 of the exact wishes to protect labour rights and promote safe and secure working environments for all workers worldwide (UN, 2015). It is, thus, an obligation of organizations to provide an enabling work environment to stimulate employees' performance. Aligned with sustainable development strategies, countries worldwide have also been concerned with the health and safety issues of employees in the workplace. Initiatives like the Occupational Safety and Health Authority (OSHA) in Tanzania have been established to promote occupational health and safety (OHS) workplace practices to prevent occupational injuries and diseases and improve productivity. However, despite these initiatives, most employees, especially in Lower Local Government Authorities, have poor and hazardous working conditions. Evidence on occupational safety and health in Tanzania, Mrema & Ngowi (2015) shows that hazards emanating from work in all sectors of the economy have increased and varied as most workers are suffering from illness and injuries. However, they need to be provided with adequate occupational health services. Besides, services provided in that respect are scanty and limited to a few enterprises that can afford them. Even the existing laws and regulations must be more comprehensive to cover the entire population (Mrema & Ngowi, 2015).

Moreover, the focus of OSHA is to prevent physical risks and injuries in workplaces, which most studies, such as Mrema & Ngowi (2015) and Saiful et al. (2019), proved to be limited to most workers. However, one element which has not been covered in most of the literature in Tanzania and which is the focus of this study is the design of a workplace, equipment, product, environment, and staff policies, taking into consideration employee biomechanical,

physical, and psychology (Tekserv, 2020). Literature has demonstrated that there is a growing number of workers who have work-related musculoskeletal disorders in developing countries due to poor working environments and the absence of prevention programmes (Zakerian et al., 2013).

The job can affect the employee body in different ways because they spend more than 50 per cent of their time at work in a sedentary seated position. On average, most employees spend eight or more hours daily in their workplaces (Jin, Chua, Ali, Ee, & Lim, 2016). Therefore, it is medically proved that prolonged sitting can lead to cardiovascular problems, back pains, stiff neck pains, increases in musculoskeletal discomfort (muscles, tendons, and ligaments), and decreases in productivity (Bailey et al., 2019; Daneshmandi et al., 2017). Poor design of office workstations to fit and allow employees a comfortable working environment for maximum productivity and efficiency, including the design of office products such as desks, chairs, keyboards, computer monitors, and everything else in between, has been the source of this problem (Amer, 2020).

Current practices in workplace management require employees to cope with the working environment, interact with machines, and, in general, negotiate their work surroundings (Scheer & Mital, 1977). Also, studies such as Amabile et al. (2012; and Taiwo (2010) demonstrate that a desirable work environment has been related to high worker motivation and productivity and increased creativity and innovation. However, there needs to be evidence in Tanzania, especially in lower local government authorities, on whether employees use office tools, including furniture, or participate in the design of their work environment in a manner that suits their preferences. In addition, the extent to which the human factor (ergonomics) positively contributes to the performance of employees, especially in lower local government authorities has yet to be known. Moreover, ergonomics emphasizes fitting the job to employees to avoid subjecting them to risk factors that may lead to musculoskeletal injury (Henning, 2009). However, the extent of this is still determined by the lower local government authorities in Tanzania. Studies such as Richardson et al. (2016) have suggested that a proper working environment coupled with employees being equipped with office tools improves employee well-being and performance. However, there needs to be more literature in Tanzania concerning this fit.

This study, therefore, intends to establish the relationship between work environment, job performance, and the mediating effect of office ergonomics at the lower local government in the City of Dodoma. Research such as Felekoglu & Tasan (2020) and Kalakoski et al. (2020) indicate enhanced workplace ergonomics is related to increased job performance. Therefore, this study adopts a motivation perspective and proposes an integrated theoretical model, arguing that the work environment can enhance employee performance by fostering workplace ergonomics, health and safety, comfort, and task accomplishment.

2. Theory and Hypotheses

2.1 Office Ergonomics

To maintain high-performance levels and function effectively, organizations must ensure their

employees invest their energy into accomplishing tasks. Allan et al. (2020) argue that a positive change in productivity and organizational performance is inherently concomitant to the office ergonomics, including conditions of safety and comfort that organizations provide for employees. Moreover, (Oborah, 2021) proposes that the working environment should be self-designed around the workers.

Fernandez and Marley (1998) define ergonomics as the workplace design, equipment, product, environment, and staff policies concerning employee biomechanical, physical, and psychological status. The aim is to optimize the work system's effectiveness and productivity while assuring employees' safety, health, and wellbeing. Office ergonomics is a field of study that provides a framework for designing office work environments to optimize employees' health, safety, comfort, and effectiveness (Brand, 2007). Ergonomics is the science concerned with the adaptation of work to the employee in terms of its features and mental and physical characteristics and the need to create and ensure optimal working conditions to improve their performance and comfort abilities (Binczycki, 2013). Wilson (1995) simplifies the definition by saying that ergonomics is learning about human characteristics and then using that understanding to improve people's interaction with the environment. Briefly, this definition informs that ergonomics embraces the relationships between humans (employees), machines, job design, and the work environment.

Tekserv (2020) provides three ergonomics types: physical, cognitive, and organizational. He states that while physical ergonomics emphasizes individual comfort, organizational ergonomics inspects methods to optimize the work environment. This involves finding ways to enhance teamwork, advance communications, increase output and strengthen the total quality of a product. On the other hand, Cognitive ergonomics is a scientific path that studies, evaluates, and designs products, tasks, environments, and systems and how they interact with human beings and their respective cognitive abilities (Hollnagel and Woods, 2007). In addition, (Kata and Prasad, 2020) summarize that cognitive ergonomics is concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other system elements.

Generally, ergonomics aims to maximize workers' capabilities while concurrently ensuring their safety, comfort, efficiency, and effectiveness in task accomplishment. In this endeavour, a work environment should be designed in a way that supports the needs of the workers and their abilities. To this end, organizations are compelled to match workplace processes with the individual who performs the tasks. Makhbul, Rebi, and Rani (2007) consider that to improve job performance and comfort, organizations should design the job to fit the employees rather than physically forcing the workers' bodies to fit the job. Therefore, this study concurs with Dempsey et al. (2004) that workplace design from an ergonomics perspective can effectively enhance job performance and productivity and relieve employee stress through the interaction between the various system components.

2.2 Work Environment and Office Ergonomics

The working environment that allows people to perform their work optimally under comfortable conditions is the primary concern of every employed person. Much emphasis,

therefore, is placed on the comfortability of people working in office environments. Previous studies have demonstrated that the work environment influences employee performance and organizational productivity. A great deal of literature review (e.g. Clements-Croome & Li (1997; Grage & Mall, 2021; Rahman & Badayai, 2012; and Roelofsen, 2002) agree that investing in the quality of the working environment is the most effective way of combating loss of performance.

Cahyani (2020) describes the work environment as anything around workers that can affect them in performing their duties. Spector (1997) opined that a work environment comprises physical and social employees performing their daily duties. Amusa et al. (2014) describe the work environment as the physical, social, psychological, and technological conditions in the workplace which influence employees' job performance. Studies like DeCremer (2012) in Oyerinde (2020) noted that though many managers find it challenging to design a conducive work environment for their employees because it drains capital, the quality of the work environment positively impacts the employee's performance. Akinyele (2012) emphasizes that more than 80% of the problems associated with organizational effectiveness result from a poor work environment.

Moreover, Mehmeti and Telaku (2020) describe the working environment as a composition of working conditions such as temperature, humidity, ventilation, lighting, noise, workplace cleanliness, and adequate tools and equipment. Further, Sofia (2014) provided a comprehensive definition of the work environment, which includes physical, psychological, and social aspects that mark the working conditions. The definitions give a concrete picture that the work environment embraces all elements that act upon and respond to an employee's body and mind.

Jain and Kaur (2014) opine that a work environment involves all the aspects that act and react on the body and mind of an employee. In this scenario, if the environment is friendly, fatigue, monotony, and boredom will lead to employee's poor performance. Since the work environment includes aspects of physical, psychological, and social working conditions, it may harm employees' health, safety, and performance if not adequately handled. It is, therefore, important for an organization to provide a decent work environment to improve job performance and enhance employees' commitment to the organization. In this regard, the work environment should include aspects, which enable employees to be comfortable, safe, and healthier and accomplish their tasks well. Sofia (2014) summarizes that a decent and attractive work environment helps make employees more committed, enhances their motivation, and helps them perform their duties well. The best fit of work environment and office ergonomics is the preferred approach this study intends to pursue to check the existing linkage to employees' highest level of performance at the lower local government levels. Therefore, this study proposes the following:

Hypothesis 1 (H1): Work Environment is positively related to office ergonomics.

2.3 Office ergonomics, Health and safety, Comfort, and Task Accomplishment

Roelofsen (2002) argues that the fundamental human requirement is a working environment

that allows people to perform their work optimally under healthy, safe, and comfortable conditions. This implies that the working environment should be designed to support employee health and safety, comfort, and task accomplishment. Chandrasekar (2011) opines that most public and private organizations' workplace environment is unsafe and unhealthy. Most of them are poorly designed because of unsuitable furniture, lack of ventilation, inappropriate lighting, excessive noise, insufficient safety measures in fire emergencies, and the necessary personal protective equipment. These factors could make the work environment uncomfortable and stressful, adversely affecting the quality of employees' performance and leading to poor performance. However, Azadeh and Saberi (2009) argue that the principal purpose of ergonomics is to ensure a good fit between workers and their jobs, to enable them to achieve the highest level of comfort, safety, health, productivity, and efficiency.

Considering office ergonomics is paramount in ensuring employees stay healthy, safe, and comfortable and accomplish their tasks effectively. Workplaces should consider ergonomics as a matter of agency by designing the workstations, such as furniture and equipment, in a manner that suits the abilities and personalities of employees. Studies (e.g. Kelley, 1999; Bailey et al., 2019; Reinhold et al., 2008) report that the most common work-related health problems, such as Musculoskeletal Disorders (MSDs), are the results of poorly ergonomically designed workstations. Therefore, a well-designed ergonomic workplace reduces strain, fatigue, and injuries by adequately positioning office chairs, keyboards, monitors, and other working equipment by improving product design and workspace arrangements.

Evidence shows the usefulness of certain ergonomic products at workplaces, for instance, negative-tilt height-adjustable keyboard trays, an adjustable chair, sit-stand height-adjustable workstations, padded forearm support, and an adjustable flat panel monitor (Gilson et al., 2012; Hedge et al., 2015; Lurati, 2017). The efficacy of these products is essential in reducing the frequency and intensity of musculoskeletal discomfort and improving employees' health and safety, comfort, and task accomplishment. Emita & Sugeng (2021) Concludes that the condition of the work environment is said to be good when employees carry out activities in an optimal, healthy, safe, and comfortable manner. Therefore, this study proposes the following:

Hypothesis 2a (H2a): Office ergonomics positively affects employee health and safety.

Hypothesis 2b (H2b): Office ergonomics positively affects employee comfort.

Hypothesis 2c (H2c): Office ergonomics positively relates to task accomplishment.

2.4 The Mediating Role of Office Ergonomics

Job performance is closely tied to a conducive and quality work environment. In many organizations, the work environment provides security and allows employees to work optimally. In that case, providing a conducive and enabling working environment enables employees to carry out their duties effectively. Studies such as Bambang (2005) suggest that the work environment is one of the factors that affect an employee's performance. In this regard, an employee who works in an environment that supports him to work optimally will

display outstanding performance.

Emita and Sugeng (2021) argue that the organization's effectiveness depends solely on the human factor (ergonomics). Therefore, it is difficult to separate the success and setbacks of an organization's work environment from the workplace ergonomics. This lies in the fact that office ergonomics relates to employees' health and safety, comfort, and task accomplishment. Prior research supports the positive relationship between work environment and employees' health and safety, comfort, and task accomplishment (Campus et al., 2007; Fadier & Garza, 2006; Ikonne & Yacob, 2014; Lehr & Bierwirth, 2011; Umugwaneza et al., 2019). These studies suggest that office ergonomics underlies this positive influence. Specifically, a supportive and well-designed work environment enhances employee performance, ensures employees' health and safety, provides comfort, and enables them to accomplish their tasks effectively.

Moreover, the ergonomically designed workplace allows employees to invest their physical, cognitive, and emotional energies in performing their duties. This study proposes that office ergonomics will mediate the positive relationship between work environment, health and safety, comfort, and task accomplishment. Again, this study proposes the following:

> **Hypothesis 3a (H3a):** Office ergonomics mediates the positive relationship between the office environment and employee health and safety.
>
> **Hypothesis 3b (H3b):** Office ergonomics mediates the positive relationship between the office environment and employee comfort.
>
> **Hypothesis 3c (H3c):** Office ergonomics mediates the positive relationship between workplace environment and task accomplishment.

3. Materials and Methods

3.1 Study Area

The study was conducted in the lower local government offices in the City of Dodoma. Specifically, the study investigated the offices of Ward and Mtaa Executive Offices. The City of Dodoma had 42 Wards and 222 Mitaa. In this case, Ward Executive Officers (WEOs) and Mtaa Executive Officers (MEOs) were the unity of inquiry.

3.2 Sample and Procedures

Data were collected from the ward and Mtaa Offices in Dodoma. We collected data from those in charge of the office (WEOs and MEOs). In this case, a simple random sampling technique was employed to select participants from 20 wards.

3.3 Measures

This study was conducted with five measures (variables). Ten questions with four levels (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree) were prepared for each measure. The total score for each measure is calculated by totalling the responses. A higher total score for a measure means that most respondents strongly agreed or agreed on many

questions assessing the measure. Figure 1 and Table 1 show that the measure of employee health and safety had the highest score (the majority agreed and strongly agreed on the questions assessing the measure). It is followed by Work environment and task accomplishment. The measure with the lowest score was office ergonomics, followed by comfort as the second last measure.

Figure 1. Total scores for each measure

Table 1. Total scores for each measure

MEASURE	TOTAL SCORE
Health and Safety	2188
Work Environment	1773
Task Accomplishment	1209
Comfort	1204
Office Ergonomics	818

3.4 Data Analysis

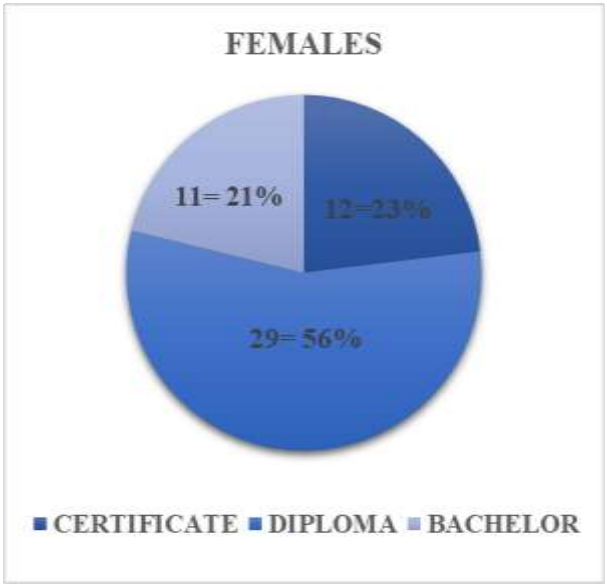
Data from this study were collected using a questionnaire, which was designed on a Likert scale. We analyzed data quantitatively where the person correlation coefficient was employed to determine the relationship between variables for H1, H2a, H2b and H2c examined by Pearson's correlation. A scatter plot was employed to visualize. Regression analysis was

employed to check the effect of the variables on the outcome variable and calculate coefficients and standard error. Testing of coefficients was also used to check if the mediating variable has any impact on the predictor variable and if the effect will be reduced in the absence of the mediating variable.

4. Results

4.1 Preliminaries

This study involved 79 respondents, of which 52 (66%) were female and 27 (equivalent to 34%) were males. 21% of female respondents were bachelor holders, 23% were certificate holders, and 56 were diploma holders. Out of 27 male respondents, 45% were bachelor holders, 7% were certificate holders, and 48% were diploma holders, as shown in Figure 1.



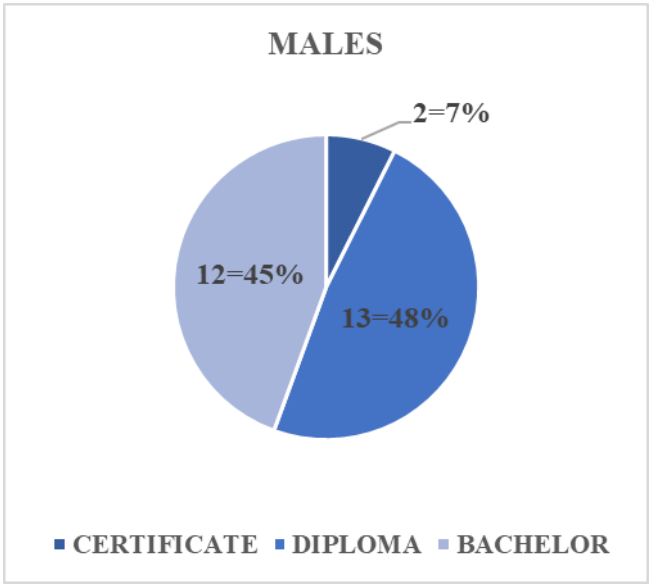


Figure 1. Respondents education level by sex

Figure 2 shows the range of years the respondents spent in the office (tenure in office) at the time of data collection for this study. 11% of respondents spent 1-5 years in office, 51% spent 6-10 years, and 38% spent 11-15 years in office.

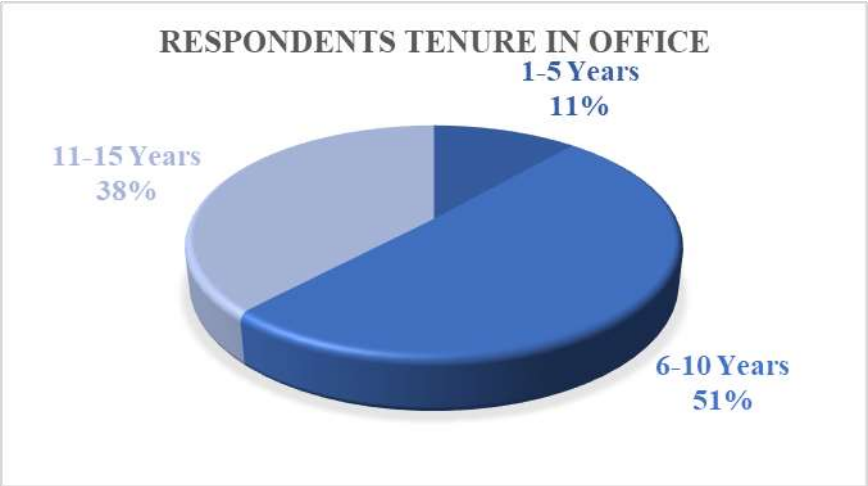


Figure 2. Respondents tenure in office

Analysis of H1, H2a, H2b and H2c

The relationship between variables for H1, H2a, H2b, and H2c was examined using Pearson's correlation coefficient and a scatter plot to visualize.

Pearson's correlation coefficient, r, measures the strength of the relation between two continuous variables. The equation gives it;

$$r = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{[N\sum x^2 - (\sum x)^2][N\sum y^2 - (\sum y)^2]}}$$

Where;

N = the number of pairs of scores

$\sum xy$ = the sum of the product of paired scores

$\sum x$ = the sum of x scores

$\sum y$ = the sum of y scores

$\sum x^2$ = the sum of squared x scores

$\sum y^2$ = the sum of squared y scores

Pearson's correlation assumption

The two variables involved in the analysis should be continuous to perform Pearson's correlation. The variables for hypotheses H1, H2a, H2b, and H2c were office ergonomics,

work environment, employee health and safety, employee comfort, and task accomplishment. Ten questions for each variable (Office ergonomics, Work environment, Employee health and safety, Employee comfort and Task accomplishment) were designed and were scaled in four levels; 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The total score for ten questions for each individual was calculated, and all the involved variables were continuous and assumptions satisfied.

Hypothesis 1 (H1): Work Environment is positively related to office ergonomics.

Analysis shows that the two variables have a moderate positive relation. The Value of r was 0.5433 (r = 0.5433). This implies that, as the work environment improves, office ergonomics increase, as shown in Figure 3.

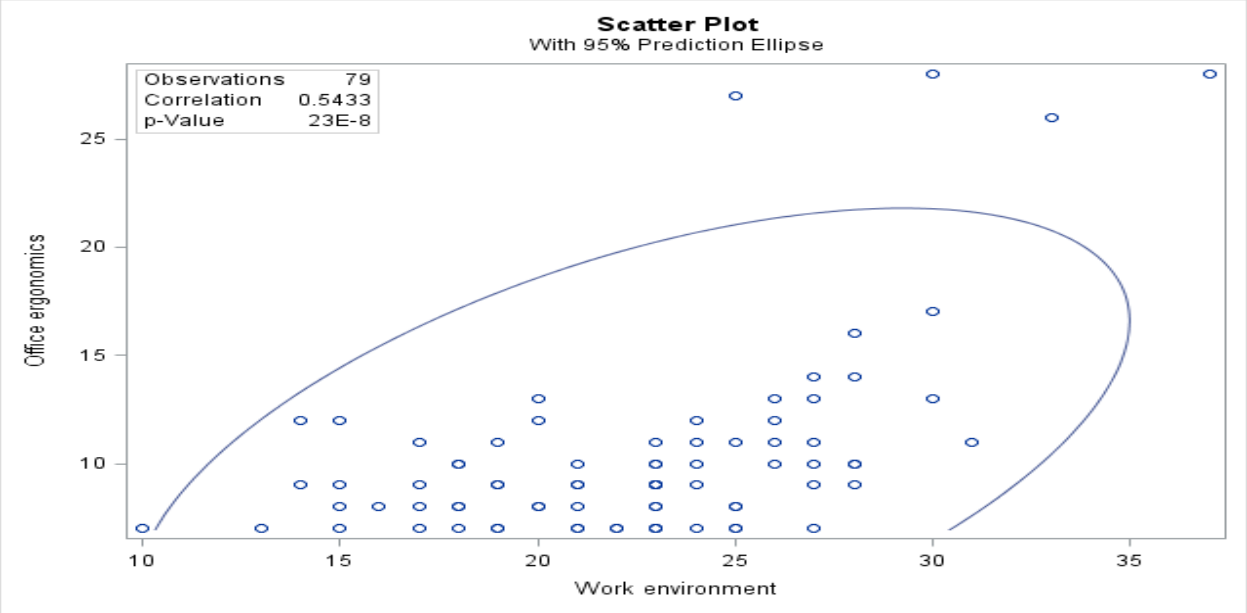


Figure 3. Scatter plot of Office ergonomics against Work environment

Work environment and Ergonomics have a statistically significant linear relationship (r = 0.5433, p < .0001). The direction of the relationship is positive (i.e., Work environment and Ergonomics are positively correlated), meaning that these variables tend to increase together (i.e., greater Ergonomics is associated with more excellent Work environment).

Table 1. Pearson correlation coefficient and p-value (Ergonomics and Work environment)

Pearson Correlation Coefficients, N = 79	
Prob > |r| under H0: Rho=0	
	Office ergonomics
	0.54331
Work environment	<.0001

Hypothesis 2a (H2a): Office ergonomics is positively related to employee health and safety

Pearson correlations were used to analyze this hypothesis, as done for hypothesis 1. Pearson's correlation coefficient was employed to determine the strength of the relationship between ergonomics and employee health and safety. Analysis shows that the two variables (Office ergonomics and employee health and safety) were positively related. Pearson's correlation coefficient (r) was 0.6421, a moderate relation (significant at 1% LOS). The increase in office ergonomics is strongly related to employee health and safety, as presented in Figure 4.

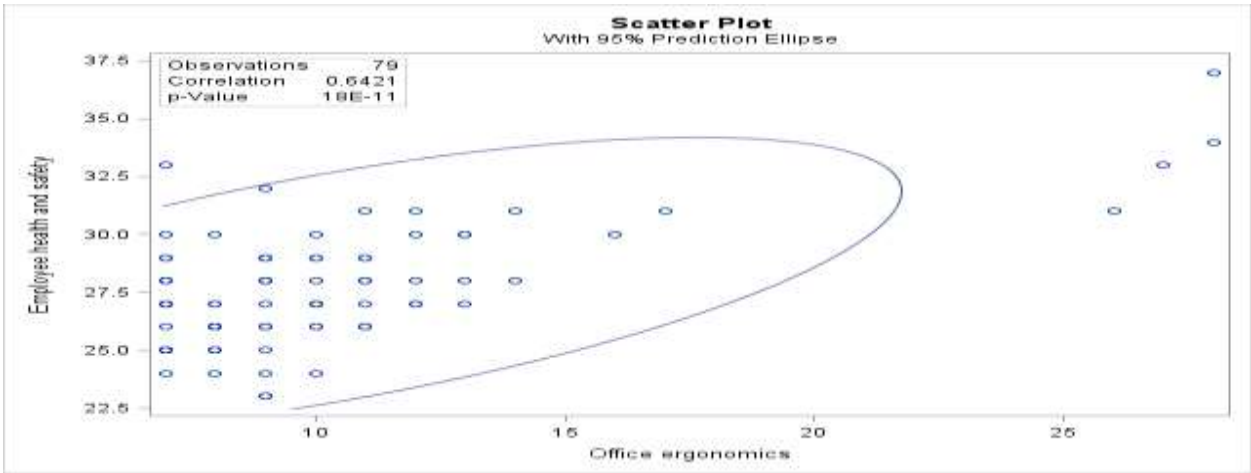


Figure 4. Scatter plot of Employee health and safety against Office ergonomics

Table 2. Pearson correlation coefficient and p-value (Office ergonomics and Employee health and safety)

Pearson Correlation Coefficients, N = 79	
Prob > |r| under H0: Rho=0	
	Office ergonomics
	0.6421
Employee health and safety	<.0001

Hypothesis 2b (H2b): Office ergonomics positively affects employee comfort.

The total scores from the questions designed to measure office ergonomics and employee comfort were calculated on a scale of 4. After that, Pearson's correlation coefficient r was used to estimate the strength and direction of the relationship between the two variables. The two variables (Office ergonomics and employee comfort) were positively related. Pearson's correlation coefficient was 0.949, significant at 1% LOS, as shown in Figure 5 and Table 3. This implies that office ergonomics is strongly positively related to employee comfort.

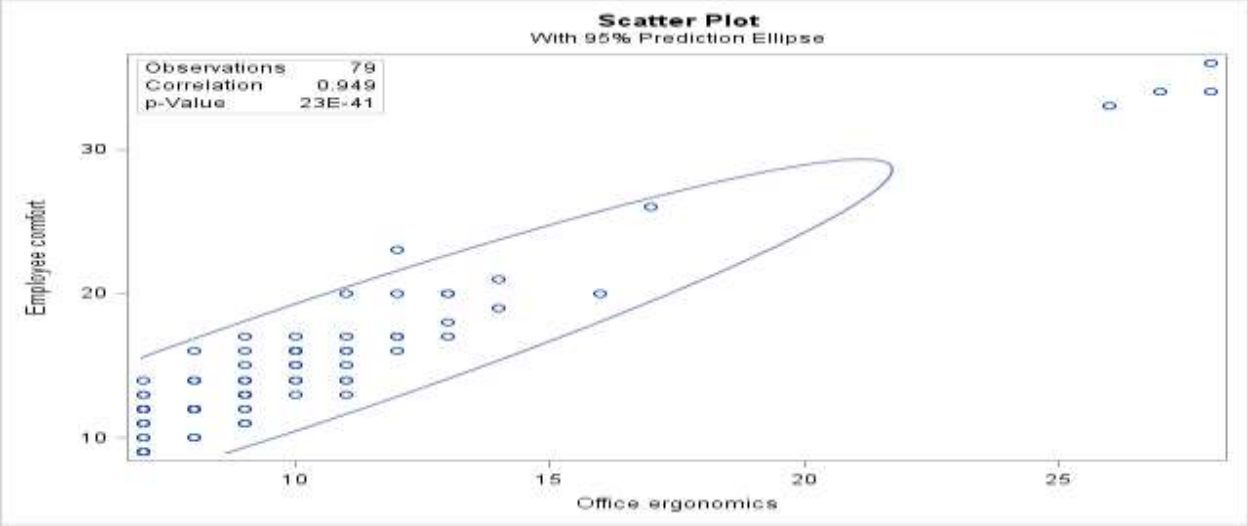


Figure 5. Scatter plot of Employee comfort against Office ergonomics

Table 3. Pearson correlation coefficient and p-value (Office ergonomics and Employee comfort)

Pearson Correlation Coefficients, N = 79	
Prob > |r| under H0: Rho=0	
	Office ergonomics
	0.94904
Employee comfort	<.0001

Hypothesis 2c (H2c): Office ergonomics is positively related to task accomplishment

Pearson's correlation was performed to check the strength and the direction of the relationship between the two variables (Office ergonomics and task accomplishment). The coefficient r was 0.8563, which indicates a positive and robust relationship. The correlation coefficient, r, was significant at 1% LOS, as presented in Figure 6 and Table 4. Implying that office ergonomics and task accomplishment are positively related (increase together), $p<0.0001$.

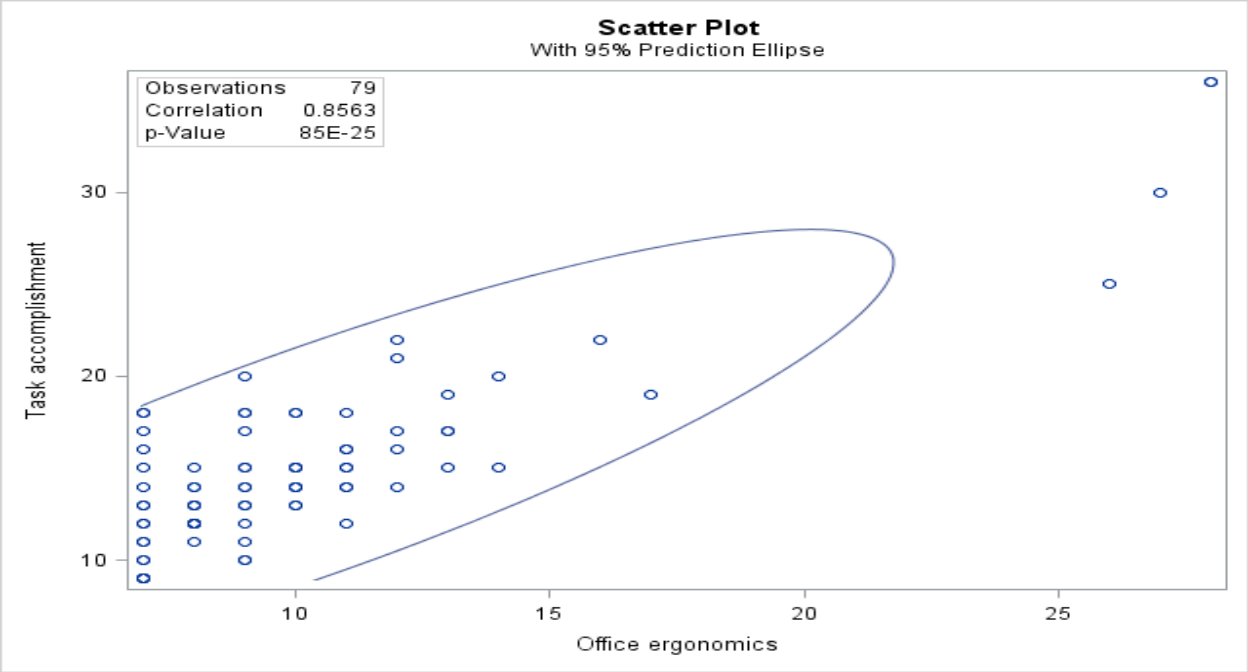


Figure 6. Scatter plot of Task accomplishment against Office ergonomics

Table 4. Pearson correlation coefficient and p-value (Task accomplishment and Office ergonomics)

Pearson Correlation Coefficients, N = 79	
Prob > |r| under H0: Rho=0	
	Ergonomics
	0.85629
Task accomplishment	<.0001

Analysis of H3a, H3b and H3c

Statistical analysis involving mediating variable(s).

Hypotheses 3a, 3b, and 3c involved mediating variables (office ergonomics). Analysis involving mediating variables involves three steps. Step one requires a correlation of the variable involved in the analysis. Step two involves regression analysis to check the effect of the variables on the outcome variable and calculation of coefficients and standard error. Step three involves testing coefficients to check if the mediating variable has any effect on the predictor variable and if the effect will be reduced in the absence of the mediating variable.

Suppose IV and MV predict the variable DV. IV must be correlated with DV, MV must be correlated with DV, and any direct effect of IV on DV must be held constant. When the effect of MV on DV is removed, IV is no longer correlated with DV (complete mediation) or the correlation between IV and DV is reduced (partial mediation).

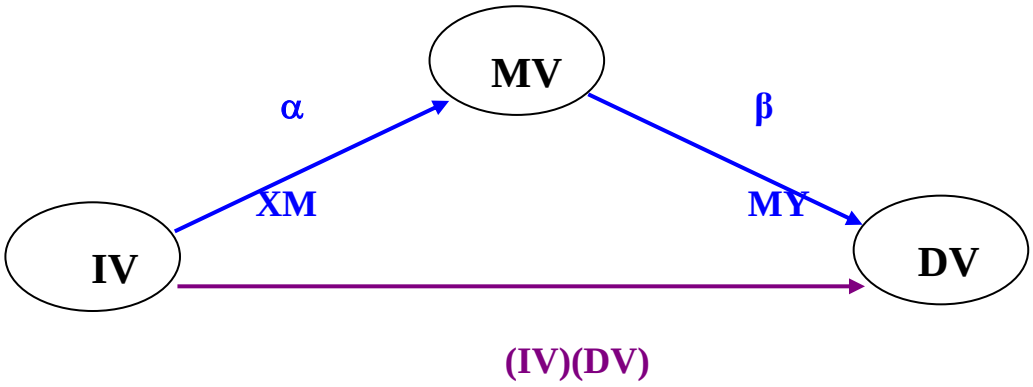


Figure 7. Statistical analysis involving mediating variable(s)

If the variables are correlated, step two can be performed. Step two involves simple regression of the DV with IV as a predictor, simple regression of DV with MV as a predictor and multiple regression of DV with predictor variables IV and MD to obtain the regression coefficients and stand error, which are then used in step three—necessary regression assumptions test for the variables involved in each hypothesis.

Hypothesis 3a (H3a): Office ergonomics mediates the positive relationship between the office environment and employee health and safety.

In this hypothesis, employee health and safety are the outcome variables predicted by the office environment. Office ergonomics is a mediating variable. The aim is to assess if office ergonomics mediates the relationship between office environment and employee health and safety.

Step one of mediation analysis involves comparing the variables involved. There was a weak positive correlation between work environment and employee health. Pearson's correlation coefficient r was 0.2635, significant at 5% LOS, as shown in Table 5 and Figure 8.

Table 5. Pearson correlation coefficient and p-value (Work environment and Employee health and safety)

Pearson Correlation Coefficients, N = 79	
Prob > |r| under H0: Rho=0	
	Work environment
	0.2635
Employee health and safety	0.019

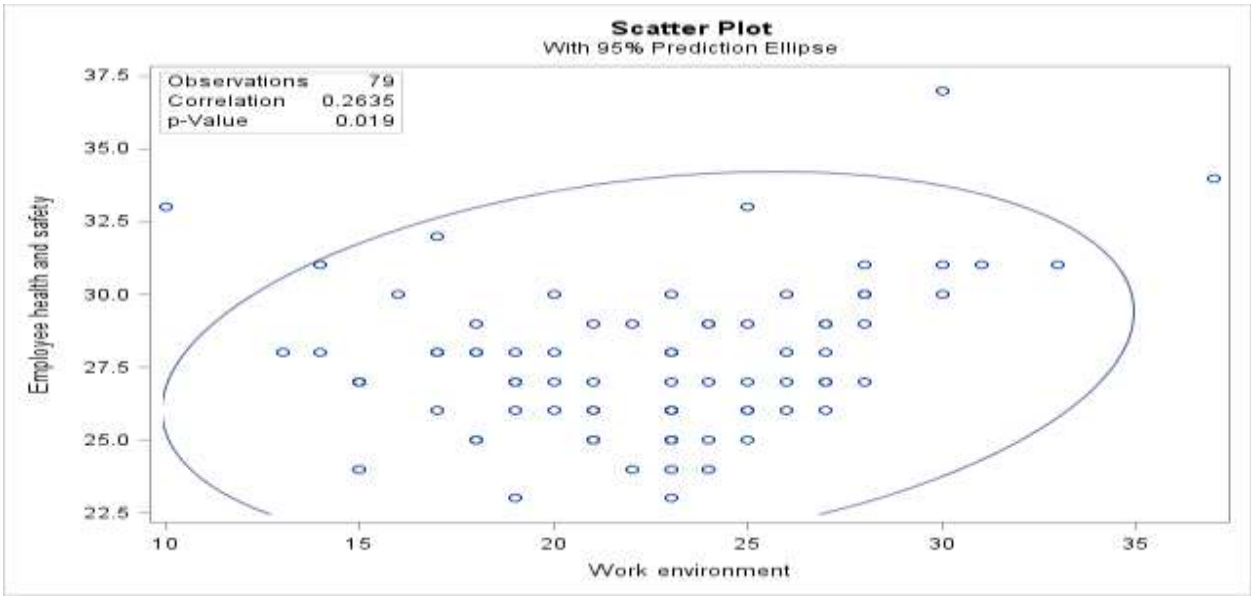


Figure 8. Scatter plot of Employee health and safety against Work environment

The correlation between work environment and office ergonomics is presented in Table 1 and Figure 1. The two variables are positively moderately correlated with a correlation coefficient of r = 0.54331. Similarly, from Table 2 and Figure 4, Office ergonomics and employee health and safety positively correlate with Pearson's correlation coefficient r = 0.6421. Step one (correlation of the variables) was satisfied, allowing regression coefficient estimation.

Table 6 gives the information of three regression models, their estimated parameters, and standard error. The first model predicted the variable employee health and safety with a predictor of work environment. The parameter is estimated to be 0.06338 with a standard error of 0.04345. The P-value was 0.1488, implying that the variables did not significantly predict employee health and safety. The Second model predicted employee health by a mediator office ergonomics. The model was significant with a value<.0001. The parameter is estimated to be 0.16537 with a standard error of 0.16537. The third model included both a Work environment and a mediator (Office ergonomics). This time, the work environment was significant at 10% LOS. Mediator (Office ergonomics) was again a significant predictor of employee health with p-value<.0001. In simple words, by removing a mediator in the model, the work environment cannot predict employee health and is not significant.

Table 6. Regression analysis of employee health and safety as predicted by work environment and Office ergonomics as a mediator

Variable	DF	Parameter Estimate	Standard error	t Value	Pr > |t|	Variance Inflation
Parameter Estimates (Work environment predicts Employee health and safety)						
Intercept	1	1.35572	0.05838	23.22	<.0001	0
Work environment	1	0.06338	0.04345	1.46	0.1488	1
Parameter Estimates (Office ergonomics predict Employee health and safety)						
Intercept	1	1.27724	0.02544	50.21	<.0001	0

Office ergonomics	1	0.16537	0.02549	6.49	<.0001	1
Parameter Estimates (Work environment and Office ergonomics predict Employee health and safety)						
Intercept	1	1.34065	0.04718	28.41	<.0001	0
Work environment	1	-0.06385	0.04017	-1.59	0.1161	1.31193
Office ergonomics	1	0.18778	0.02891	6.5	<.0001	1.31193

The Sobel test assesses whether a mediator variable is significant to mediate the relationship between office environment and employee health and safety. The Sobel test was conducted using the Sobel test only with the values from Table 6. The Sobel test is presented in Table 7, and it shows that the Sobel test statics was -3.45428384 with a p-value of 0.00055176, implying that the mediator was significant. Since the Sobel test proves that the mediator variable was significant, office ergonomics is significant for a positive relationship between work environment and employee health and safety.

Table 7. Sobel test for hypothesis 3a

Test	Test statistic	Std. Error:	P-value:
Sobel test	-3.45428384	0.00890713	0.00055176

Table 8 presents the normality test of the variables involved in the analysis. The p-values for Shapiro-Wilk and Kolmogorov-Smirnov were greater than the significant level, implying that the variables involved in regression models drown for normal distribution.

Table 8. Normality test of the variables Work environment, Office ergonomics and employee health and safety

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.991244	Pr < W	0.8723
Kolmogorov-Smirnov	D	0.05345	Pr > D	>0.1500
Cramer-von Mises	W-Sq	0.042775	Pr > W-Sq	>0.2500
Anderson-Darling	A-Sq	0.2753	Pr > A-Sq	>0.2500

Hypothesis 3b (H3b): Office ergonomics mediates the positive relationship between the office environment and employee comfort

The first procedure was to correlate the variables. Table 9 presents the correlation analysis of the variables. Work environment and office ergonomics were positively correlated by a factor of 0.54331. Work environment and employee comfort were positively correlated by a factor of 0.51169. A strong positive correlation was observed between the variable's office ergonomics and employee comfort; Pearson's correlation coefficient was 0.94904 with a p-value<.0001. Since all the variables to be included were correlated, regression analysis was performed.

Table 9. Pearson's correlation coefficients of work environment, office ergonomics and employee comfort

Pearson Correlation Coefficients, N = 79			
Prob > |r| under H0: Rho=0			
	Work environment	Office ergonomics	Employee comfort
Work environment	1	0.54331 <.0001	0.51169 <.0001
Office ergonomics	0.54331 <.0001	1	0.94904 <.0001
Employee comfort	0.51169 <.0001	0.94904 <.0001	1

Regression analysis was performed to assess if the work environment with office ergonomics predicts employee comfort as a mediator. Simple regression analysis was performed to assess whether the variable work environment significantly predicts employee comfort. The analysis presented in Table 10 shows that the work environment, when standing alone, is a significant predictor of employee comfort. The parameter is estimated to be 0.59521 with a p-value<.0001. The second regression model involved office ergonomics as a predictor of employee comfort. Also, the variable was a significant predictor with p-values<.0001 of the parameter estimate.

The third model was multiple regression with one predictor (work environment) and one mediator (office ergonomics). Analysis shows that the variable work environment was not a significant predictor this time. P-value of the variable was 0.751>SL. At the same time, office ergonomics remained a significant predictor of employee comfort. The two variables that ables (work environment and office ergonomics) can stand alone. The variable office ergonomics did not significantly influence the work environment to predict employee comfort. Rather, the two variables can stand alone to predict employee comfort.

Table 10. Regression analysis of employee comfort as predicted by work environment and Office ergonomics as a mediator

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard error	t Value	Pr > |t|	Variance Inflation
Parameter Estimates (Work environment predicts Employee comfort)						
Intercept	1	0.36358	0.17627	2.06	0.0425	0
Work environment	1	0.59521	0.13119	4.54	<.0001	1
Parameter Estimates (Office ergonomics predict Employee comfort)						
Intercept	1	0.31729	0.04264	7.44	<.0001	0
Office ergonomics	1	0.85398	0.04272	19.99	<.0001	1
Parameter Estimates (Work environment and office ergonomics predict Employee comfort)						

Intercept	1	0.29566	0.08034	3.68	0.0004	0
Work environment	1	0.02178	0.0684	0.32	0.751	1.31193
Office ergonomics	1	0.84634	0.04922	17.19	<.0001	1.31193

Hypothesis 3c (H3c): Office ergonomics mediates the positive relationship between workplace environment and task accomplishment.

The three variables should be correlated to determine if office ergonomics mediates the relationship between work environment and task accomplishment. Pearson's correlation was performed, and the result is presented in Table 11. All three variables were positively correlated. Work environment and office ergonomics were correlated with a coefficient of 0.54331, p<.0001, work environment and task accomplishment were correlated with a coefficient of 0.46878, p<.0001 and task accomplishment and office ergonomics were correlated with a coefficient of 0.85629, p<.0001. Correlation of the variables allowed regression analysis to be performed. Here, the work environment predicts the outcome variable task accomplishment, while office ergonomics mediates the relationship.

Table 11. Pearson's correlation coefficients of work environment, office ergonomics and task accomplishment

Pearson Correlation Coefficients, N = 79			
Prob > |r| under H0: Rho=0			
	Work environment	Office ergonomics	Task accomplishment
Work environment	1	0.54331	0.46878
		<.0001	<.0001
Office ergonomics	0.54331	1	0.85629
	<.0001		<.0001
Task accomplishment	0.46878	0.85629	1
	<.0001	<.0001	

Regression analysis was performed to check if the work environment predicts work accomplishment while office ergonomics mediate the relationship. Table 12 presents the result, which shows that the work environment was a significant predictor of task accomplishment with a parameter estimated to be 0.48538 and a p-value of 0.0002 (sig. at 1% LOS). The second regression modelled work accomplishment as a mediator (office ergonomics) predicted. The parameter for a mediator variable is estimated to be 0.66549 with a p-value<.0001, which implies that a mediator predicts task accomplishment. The third regression included a predictor variable (work environment) and a mediator (office ergonomics) with the outcome variable task accomplishment. Work environment was not a significant predictor this time since its p-value was above the significance level (i.e., p = 0.6447). A mediator variable still was a significant predictor of work accomplishment with a

parameter estimated to be 0.64962 and p-value<.0001.

From three regression models, a conclusion was made that the variable office ergonomics is not a mediator to the relationship between work environment and task accomplishment, instilled that both work environment and office ergonomics are standalone predictors of work accomplishment, as shown in Table 11.

Table 11. Regression analysis of task accomplishment as predicted by work environment and Office ergonomics as a mediator

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard error	t Value	Pr > |t|	Variance Inflation
Parameter Estimates (Work environment predicts Task accomplishment)						
Intercept	1	0.51642	0.16592	3.11	0.0026	0
Work environment	1	0.48538	0.12348	3.93	0.0002	1
Parameter Estimates (Office ergonomics predict Task accomplishment)						
Intercept	1	0.50921	0.06095	8.35	<.0001	0
Office ergonomics	1	0.66549	0.06107	10.9	<.0001	1
Parameter Estimates (Work environment and Office ergonomics predict Task accomplishment)						
Intercept	1	0.46428	0.11475	4.05	0.0001	0
Work environment	1	0.04524	0.0977	0.46	0.6447	1.31193
Office ergonomics	1	0.64962	0.07031	9.24	<.0001	1.31193

5. Discussion

This study addresses the influence of the Work Environment on employees' health and safety, comfort, and task accomplishment by investigating office ergonomics as the possible underlying mechanism. We propose that the work environment exhibits social features and conditions that enable employees to perform better. The significant features impact well-being, workplace relationships, collaboration, efficiency, comfort, and employee health and safety. The findings of this study suggest that the office environment is meaningful if the tools and furniture are ergonomically designed to support employees' health and safety, comfort, and task accomplishment. A compact working environment, therefore, significantly influences employee performance. Our findings support these statements and corroborate with various research in work environment and ergonomics (e.g. Clements-Croome & Li, 1997; Grage & Mall, 2021; Rahman & Badayai, 2012; and Roelofsen, 2002) which postulate that investing in the quality of the working environment is the most effective way for improving employee performance. Emita and Sugeng (2021) presuppose that the work environment's condition is good when employees carry and accomplish their tasks optimally, healthily, safely, and comfortably. (Kingsley, 2012) argues that the quality of the employee's

workplace environment significantly impacts the employee's motivation, productivity and subsequent performance. However, Garg & Dutta (2021) submit that a poorly ergonomically designed workplace has a negative impact on employees' health and safety, comfort, innovation and collaboration and the level at which they accomplish their assigned tasks.

Our findings have revealed a more significant association between ergonomics and work environment with a statistically significant linear relationship ($r = 0.5433$, $p < .0001$). This means that the direction of the relationship is positive. The findings are consistent with others (e.g., Samuel, 2019). Ergonomics provides a conducive work environment by reducing injuries, stress, and other long-term conditions that may affect an employee's well-being and performance. A working environment with ergonomically designed conditions is the fundamental human requirement that allows people to perform their work optimally (Roelofsen, 2002). The office environment is not complete in the absence of workplace ergonomics. Therefore, the performance of employees in the organization is built on the complete set of the work environment and the human factor. Studies such as DeCremer (2012) consider that it is expensive to design a workplace with ergonomically designed tools and equipment; the quality of work and employee performance largely depends on such duality. (Fadier & Garza, 2006) suggest that employee and organizational performance can only be reduced with a deal of careful account of human factors.

Moreover, the fact that ergonomics and subsequent variables (health and safety, comfort and task accomplishment) have a positive relationship proves the utility on the performance of employees. Ergonomic problems in the workplace and poor work organization are contributing risk factors to workplace health and safety (Niu, 2010). Besides, studies (e.g. Makhbul et al., 2007; Kelley, 1999; Punnett, 2009) reveal that most health problems in most organizations in recent years, such as work-related musculoskeletal disorders, more than 50% are a result of poor ergonomically designed workstations. In addition, studies have revealed that employees may perform well if they use tools such as adjustable computer sitting tables and chairs that provide comfort (Lehr & Bierwirth, 2011). Moreover, (Gabriel & Gabriel, 2010) argue that task accomplishment depends mainly on the level of comfort, secured work environment and ergonomically designed workplaces.

Based on this reality, organizations should, therefore, consider creating an environment where the tools, including machines and furniture of the organization, fit the employee's abilities and physical conditions. Organizations, especially local government authorities, consider ergonomics a strategic aspect in enhancing work efficiency and productivity. Fitting the employees with the working tools may increase their performance. This may protect them from injuries, discomfort and failure to accomplish their tasks.

6. Conclusion

This study aimed to address the influence of the Work Environment on employees' health and safety, comfort, and task accomplishment by investigating office ergonomics as the possible underlying mechanism. We propose that the work environment exhibits social features and conditions that enable employees to perform better. The findings of this study have revealed that work environment and ergonomics have a linear and positive relationship. The results

implied that the work environment needs to be more complete to induce employee performance without ergonomics. In this case, ergonomics produces a working environment where employees work in a safe and healthier environment to accomplish their tasks well. The results have also indicated that ergonomics is related to employee health and safety, comfort and task accomplishment. The positive relationship between these variables suggests that fitting employees to the tools they use to interact with the organization's other elements yield positive performance. Despite the association of the study's variables, the study revealed that most offices in lower local government authorities in Dodoma City Council have poor work environments. However, there needs to be more fit between workers and the equipment, such as chairs and tables they use. Most offices need ergonomically designed chairs and tables and adequate and quality air and lighting. Inadequacy of these elements risks the office bearers' health, safety, comfort, and performance. Therefore, we propose that local government authorities consider ergonomics a strategic aspect in enhancing work efficiency and productivity. Fitting the employees with the working tools may increase their performance. This may protect them from injuries and discomfort and enhance their chances of accomplishing their tasks.

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