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ASSESSMENT OF ERGONOMIC RISK AND MUSCULOSKELETAL DISORDERS AMONG OFFICE WORKERS IN THE RIVERS STATE CIVIL SERVICE

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ABSTRACT

Musculoskeletal disorders (MSDs) are a significant occupational health concern, particularly among office workers exposed to prolonged sedentary tasks and suboptimal ergonomic conditions. This study assessed the relationship between ergonomic risk factors and the prevalence of musculoskeletal disorders among office workers in the Rivers State Civil Service. The study adopted a correlational survey design and collected data from 217 office workers selected through proportional sampling across various departments. Data were gathered using a structured questionnaire, which was validated for content and reliability (Cronbach's alpha = 0.82). Descriptive statistics, including percentages, were used to summarize respondents' demographic characteristics, ergonomic risk exposure, and prevalence of MSDs. Additionally, Pearson Product Moment Correlation was employed to test the hypotheses regarding the relationship between ergonomic risk factors and musculoskeletal disorders. The findings revealed that the most common ergonomic risk factors included prolonged sitting, awkward postures, poor chair support, repetitive keyboard and mouse use, and inadequate workstation design. The prevalence of musculoskeletal disorders was notably high, with lower back pain (50.7%), neck pain (43.8%), and shoulder pain (39.2%) being the most reported conditions. A positive and significant relationship was established between ergonomic risk factors and MSDs, indicating that increased exposure to poor ergonomic conditions correlates with higher incidence of musculoskeletal disorders. Furthermore, demographic variables such as age, years of service, and department were found to influence the level of risk and prevalence of MSDs. Based on these findings, the study concludes that ergonomic hazards are prevalent in the Rivers State Civil Service and significantly contribute to musculoskeletal disorders among office workers. The study recommends interventions including ergonomic training, workstation redesign, scheduled breaks, department-specific ergonomic assessments, regular health monitoring, and policy implementation to reduce risk and improve employee well-being and productivity.

Keywords: Ergonomic Risk, Musculoskeletal Disorders, Office Workers, Rivers State Civil Service, Workplace Health

INTRODUCTION

According to World Health Organisation (2002), Hazard is any source of possible hurt, injury or adverse health effects on something or an individual under certain conditions. However, occupation hazard is a risk usually arising out of the workplace. Thus, it is an injury sustained in process of carrying a job or task. A working condition can lead to illness or death. Occupational hazard is a great risk to workers' physical or mental alertness, which occurs in certain tasks, jobs, occupations or profession. Occupation hazards result due to exposure of working environment to health hazards. Occupational hazards are usually the result of combination of factors, which may be unsafe acts of employees and equipment. In

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view of Kalejaiye (2013), work-place hazards are caused by unsafe work conditions and unsafe work behaviours. However, occupational hazards do not have a sole cause but multiplicity of causes that are often closely related to jobs. Health care work is a physically challenging job as such employees in this sector have encountered occupational hazards related to a wide range of clinical activities they perform. (Buchana, vossenas; Krause; Moray; Oris & Punnet, 2010; Hseih 2013, Sanon, 2014).

Before presenting an in-depth analysis about how workplace hazards affect individual and organizational outcomes it is important to clearly define the meaning of workplace hazards. Researchers have given differing interpretations about what workplace hazards are and how to group them. Cox (1993) explains that work hazards can be broadly grouped into two categories; physical and psychosocial hazards. Physical hazards can include biological, biochemical, chemical, and radiological hazards. Physical hazards have also been labelled as environmental/ambient factors in some instances. For example, the International Labor Office (ILO, 2001) defines a hazard as an ambient factor that has the potential to cause harm, illness, or injury as a result of exposure. Hazardous ambient factors include excessive noise, heat, or exposure to harmful chemicals or toxins (ILO, 2001).

Ergonomic Hazards refers to physical stressors and workplace conditions that pose a risk of injury or illness to the musculoskeletal system of the worker (NOISH 1992). They have an impact negative impact to the employees same as to the employer. If these ergonomic hazards are poor managed they may result to work related musculoskeletal disorders.Well-designed jobs improve employees' efficiency, safety, and satisfaction (Grant, 1996). If work or equipment is not suitable to the worker, the worker experiences discomfort. If the workplace is ergonomically designed the workstation will be safe and comfortable for the worker. The principle goal of ergonomics is to make the job and workplace fit for the employee not vice versa (Al swaity and Enshassi 2005). Kroemer (2002) highlighted that ergonomic hazards may include awkward postures, forceful movements, repetitive, improper postures, improper designs and equipment. Ergonomics hazards may arise from poor job designs and organizational factors which include excessive work durations, excessive work rates, external pacing of work, less time to rest and lack of task variety (Luopajarvi, 1990).

Psychosocial hazards have also been linked to various health complaints, including migraines, sleeping problems, and stomach symptoms (Asa, Brulin, Angquist, Barnekow-Bergkvist, 2005). Further, psychosocial hazards such as low co-worker support have been found to be related to general health complaints among men and work injury and psychological distress among women (Wilkins & Beaudet, 1998). Workplace bullying and harassment are also strong predictors of psychological and somatic health complaints (Mikkelsen & Einarsen, 2002). Some studies have also found that psychosocial hazards in the workplace can lead to health problems such as reported musculoskeletal pain (Sembajwe et al., 2013). Lack of supervisor support was the strongest predictor of musculoskeletal pain among the healthcare workers surveyed by Sembajwe et al. (2013). Psychosocial hazards, including low job control, high job demands, and low work-related social support also predict quality of life (Cheung, Kawachi, Coakley, Schwartz, & Colditz, 2000).

Psychosocial hazards in the workplace can also lead to mental and cognitive health problems. Boschman et al. (2013) examined the relationship between psychosocial work environment and mental health complaints among blue-collar workers. In contrast, psychosocial hazards may not cause a direct physical health problem, but may lead to health problems due to symptoms related to psychological distress. Since both physical and psychosocial hazards can negatively affect health via multiple processes, it is necessary to examine whether physical and psychosocial hazards are equally troublesome for employee health. Identifying which types of workplace hazards are most detrimental to employee health

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is necessary for organizations and policy makers to promote strategies to best protect and promote total worker health.

Musculoskeletal Disorders (MSDs) are widespread throughout the world and are the second most common cause of disability in work setting Armijo-Olivo, Woodhouse, Steenstra, Gross (2016). These disorders are responsible for 40-50% of the costs of all work related diseases. In addition, 50% of all more-than-3-day absences from work and 49% of all more-than-two-week absences are caused by MSDs The European commission initiative, (2007). Workplace risk factors for development of Work-related Musculoskeletal Disorders (WMSDs) include heavy physical work, forceful overexertion, awkward and sustained postures, repetitive movement, and vibration NIOSH, (1997). Previous surveys indicated a significant positive association between MSDs and fatigue, stress, psychosocial distress, and sleep disruption Hun, Silman, Benjamin, McBeth, Macfarlane, (1999). MSDs are also a significant workplace issue resulting in loss of productivity at work and sickness absence. Outcomes of MSDs can range from symptoms to major impairment losses, such as reduction of quality of life, reduction of productivity (e.g., lost time), and increase in medical expenses due to disability Oakman and Macdonald, (2012). The Centre for Disease Control and Prevention, (2013) identified ergonomic hazards, slips, falls and trips, chemical hazards and infectious disease to be occupational risks among health care workers. Furthermore, according to Kalejaiye (2013), in Nigeria large number of health workers sustained work-related injuries which ranges from irritations to high exposures hazardous and exploitative working conditions.

Statement of the Problem

Musculoskeletal disorders (MSDs) have become a major occupational health challenge globally, affecting employees across various sectors. In office environments, workers are often required to perform prolonged sedentary tasks, including computer use, paperwork, and administrative duties, which expose them to multiple ergonomic risk factors such as poor workstation design, awkward postures, repetitive movements, and insufficient rest breaks. In the Rivers State Civil Service, there is growing concern that these ergonomic risks may be contributing to a high prevalence of musculoskeletal disorders, leading to decreased employee productivity, absenteeism, and overall workplace inefficiency. Despite these concerns, there is limited empirical research on the specific relationship between ergonomic risk factors and MSDs among office workers in this context. This study seeks to fill this gap by assessing the impact of ergonomic risks on musculoskeletal health among office employees in the Rivers State Civil Service.

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Objectives of the Study

The main objective of this study is to assess the relationship between ergonomic risk factors and musculoskeletal disorders among office workers in the Rivers State Civil Service. The specific objectives are to:

1. Identify the common ergonomic risk factors experienced by office workers in the Rivers State Civil Service.
2. Determine the prevalence of musculoskeletal disorders among office workers in the Rivers State Civil Service.
3. Examine the relationship between ergonomic risk factors and musculoskeletal disorders among office workers.

Research Questions

The study seeks to answer the following research questions:

1. What are the common ergonomic risk factors faced by office workers in the Rivers State Civil Service?
2. What is the prevalence of musculoskeletal disorders among office workers in the Rivers State Civil Service?
3. What is the relationship between ergonomic risk factors and musculoskeletal disorders among office workers in the Rivers State Civil Service?

Hypotheses

The study will test the following null hypotheses at a 0.05 significance level:

H_{01}: There is no significant relationship between ergonomic risk factors and musculoskeletal disorders among office workers in the Rivers State Civil Service.

H_{02}: Ergonomic risk factors do not significantly predict the prevalence of musculoskeletal disorders among office workers in the Rivers State Civil Service.

LITERATURE REVIEW

Musculoskeletal Hazards and Office Workers Job

According to Occupational Safety and Health Standard Board (2014), health care workers suffer the highest injury rate among all classifications of hospital employees. They are more likely to suffer musculoskeletal disorders than all other hospital employees because they are injured at a rate far beyond the average injury rate for employees in the service sector as a whole. These injuries decrease employee efficiency and upsurge workers compensation costs for employers. They reduce the quality of life for health care workers. However, both the hospital industry and academic researchers have recognized hazards associated with health care workers going back to several years. But existing occupational safety standards do not adequately address the unique hazards that lead to high injury rates among these

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employees. In the same vein, Occupational Safety and Health Standard Board (2012) stressed that health care workers is a physically arduous task. Workers in this industry have long confronted occupational hazards attributable to the array of cleaning tasks they perform. The situation has grown more critical in recent years. During the past decade, hospital operators have increasingly competed based on the level of luxury of their room offerings. Furthermore, the process of making a bed, including lifting a bed mattress and/or tucking in bed covers between the bed mattress and box spring mattress, or other support structures, can be physically tasking. In addition to equipping hospital rooms with heavier and more comfortable beds, the hospital industry has made other upgrades to room packages that pose new occupational hazards to workers. For example, hospital operators have equipped hospital bathrooms with larger and heavier bath linen. The new linen is more labour -intensive to fold and handle, leading to greater and more repeated exertions. The new linen also occupies more space on the typical linen cart, requiring health care workers to load their carts more heavily or to make trips that are more frequent to the linen room to replenish their stock. Hospital operators have also equipped rooms with a greater number of amenities that require cleaning. These include many and bigger mirrored surfaces, chromeplated amenities such as ice buckets or tissue holders, large flat-screen televisions, and other items that require greater cleaning by the laboratory technologist. The combined effects of these changes have been to increase the occupational hazards associated with room cleaning, leading to a high frequency of occupational injuries among this classification of employees. According to Occupational Safety and Health Standard Board (2012), health care workers exposes to risk of a range of injuries. Health workers must frequently adopt unsafe body postures as they twist their torsos to lift mattresses, bend to gather heavy linen, or get on their hands and knees to scrub bathroom floors. Health care workers balance precariously on unsecure surfaces such as tub rims as they reach to scrub walls or remove shower curtains- They rush over wet surfaces or around items left on the floor. Health care workers suffer the highest overall injury rate and the highest rate of musculoskeletal injury. It is important to review prevent measures in place to reduce occupational hazards will be discussed in the following section.

Several studies identified Musculoskeletal Disease as an occupational hazard which is highly prevalent among Health care workers Tezel (2005), Adegoke, Akodu, Oyeyemi (2008). These studies revealed high prevalence of musculoskeletal problems among Health care workers. Healthcare workers had experienced at least one or more symptoms of musculoskeletal hazard over the previous twelve months. Muralidharan et al. in India found that the prevalence of musculoskeletal hazard was 78% and more common among orthodontists and oral physicians whilst Adegoke et al. in Nigeria, observed that Work-Related Musculoskeletal disorders among physiotherapists was 91.3%. These disorders were associated with prolonged standing postures, continuous movements and the use of force during work. More so, it was noted that all practitioners above 45 years of age had musculoskeletal problems; hence, increased age was found as a risk factor for musculoskeletal disease. Also, Health care workers who attended to more than 40 patients per working day complained of musculoskeletal symptoms Muralidhar, Singh, Jain, Malhotra, and Bala (2010).

Most commonly affected areas among Health care workers with musculoskeletal problems were the neck followed by the lower back, shoulders and wrists Muralidhar et. al (2010). This is contrary to findings by other studies which reported the lower back as the most common site followed by the neck Adegoke et. al. (2008). Factors responsible for musculoskeletal problems were frequent lifting or transferring of dependent patients, bending, treating large number of people; working in the same position for long hours; prolonged standing posture, performing

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manual therapy and psychological stress Muralidhar et. al (2010). The effects of musculoskeletal disease on Health care workers were observed as an on-going problem, workers with musculoskeletal disease complained of having pain for a period of seven days. Others requested for sick leave, hospital admissions and reduction in work activity and leisure activity Karahan, Kav, Abbasoglu, Dogan (2009). Karahan in 2008 argued that more than half of the healthcare workers received medication while 4.2% had to undergo a surgical procedure as a result of lower back pain. In order to cope with musculoskeletal pains, some Health care workers developed the habit of adjusting their position and or the position of their patients which includes adjusting bed height. They also chose appropriate techniques best suitable for their comfort rather than causing discomfort. Requesting for assistance when handling patients was part of the measures adopted. This made some Health care workers more likely to select methods best suitable for their comfort at work rather than meeting the needs of their patients.

Impact of Ergonomic Risk on Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) have emerged as a major occupational health concern worldwide, affecting millions of workers across various sectors. While traditionally associated with physically demanding jobs, research increasingly highlights the prevalence of MSDs among office workers who engage in prolonged sedentary activities such as computer use, paperwork, and desk-based tasks. MSDs encompass a wide range of painful conditions affecting muscles, tendons, ligaments, nerves, joints, and spinal discs. Common manifestations include lower back pain, neck and shoulder discomfort, carpal tunnel syndrome, and tendonitis, all of which can significantly impair workers' quality of life, productivity, and overall well-being (Punnett & Wegman, 2004; WHO, 2019).

The relationship between ergonomic risk factors and MSDs has been extensively studied. Ergonomic risk factors refer to elements of the work environment or work practices that impose excessive physical strain on the body. In office settings, these risks often manifest as awkward postures, repetitive motions, prolonged static sitting, and poorly designed workstations. Poor posture, such as slouching, forward head flexion, or rounded shoulders, increases strain on the spine and supporting musculature, leading to fatigue and chronic discomfort. Similarly, repetitive actions, including keyboarding and mouse use, exert stress on tendons and small muscles of the upper limbs, often resulting in microtrauma, inflammation, and conditions such as tendonitis or carpal tunnel syndrome (Darragh et al., 2015). Static postures, common in desk-based work, contribute significantly to musculoskeletal strain. Holding a single position for extended periods reduces blood flow to muscles, diminishes oxygenation, and increases metabolic waste accumulation, thereby causing pain and discomfort. Research among office workers has demonstrated a strong association between prolonged static sitting and lower back pain, as well as neck and shoulder complaints (Robertson et al., 2013). Furthermore, workstation design plays a crucial role in mitigating or exacerbating ergonomic risk. Chairs without proper lumbar support, desks at inappropriate heights, and monitors positioned too high or low force workers into non-neutral postures that accelerate musculoskeletal strain. Studies indicate that poorly

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designed workstations are directly correlated with higher incidences of MSDs among office employees (Okafor & Nwachukwu, 2018).

The impact of ergonomic risk factors is not limited to physical discomfort; psychosocial and individual factors also play a significant role. Job stress, workload, inadequate rest breaks, and lack of ergonomic awareness can amplify the effects of physical strain. For instance, office employees experiencing high job stress report higher levels of musculoskeletal pain, suggesting that psychosocial factors interact with physical risks to influence the onset and severity of MSDs (Darragh et al., 2015). Individual characteristics such as age, body mass index (BMI), and work experience further influence susceptibility to musculoskeletal disorders, highlighting the multifactorial nature of MSDs. Different body regions are affected in varying degrees by ergonomic risks. The neck and shoulders are highly susceptible due to sustained forward head posture and elevated shoulder positions during computer use. Prolonged static postures and poor workstation arrangements place continuous tension on the upper trapezius and surrounding musculature, often resulting in chronic neck and shoulder pain (Punnett & Wegman, 2004). The lower back is similarly affected, particularly in scenarios involving inadequate lumbar support or extended sitting without movement. Increased intervertebral disc pressure, combined with weak postural muscle engagement, contributes to lower back discomfort, a prevalent complaint among office employees (Robertson et al., 2013). Upper limb disorders, particularly in the wrists and hands, are commonly linked to repetitive keyboard and mouse activities, which impose cumulative stress on tendons and small muscles, potentially leading to nerve compression syndromes such as carpal tunnel syndrome (Okafor & Nwachukwu, 2018).

Beyond individual discomfort, MSDs have significant economic and organizational impacts. Work-related musculoskeletal disorders contribute to absenteeism, reduced productivity, decreased concentration, and increased healthcare costs. Global data indicate that MSDs are a leading cause of work disability, with office environments not being exempt from these consequences. In Europe, MSDs account for billions of euros in productivity losses annually, while in developing countries, the costs are compounded by limited access to workplace ergonomic interventions and occupational health resources (MDPI, 2023).

Effective ergonomic interventions have been demonstrated to mitigate the incidence and severity of MSDs. Adjusting workstation components, providing ergonomic chairs and desks, and offering training on proper posture and movement can significantly reduce musculoskeletal complaints. Research shows that office employees who undergo ergonomic training and workstation modifications experience reductions in pain intensity and improvements in posture and comfort (Robertson et al., 2013; Punnett & Wegman, 2004). Moreover, incorporating regular breaks, stretching exercises, and employee engagement in ergonomic awareness programs enhances the effectiveness of these interventions, emphasizing the importance of holistic strategies that address both physical and psychosocial factors.

Despite extensive research on the link between ergonomic risk and MSDs, gaps remain in context-specific knowledge, particularly in developing countries and civil service environments.

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Studies focusing on Nigerian civil servants, including those in the Rivers State Civil Service, are limited. There is a need for research that evaluates the prevalence of MSDs, identifies specific ergonomic risk factors, and assesses the effectiveness of targeted interventions in these populations. Additionally, much of the existing literature relies on cross-sectional designs, limiting the ability to establish causal relationships. Longitudinal studies and intervention-based research are necessary to develop sustainable ergonomic strategies that can improve worker health, reduce absenteeism, and enhance productivity. Ergonomic risk factors, including awkward postures, repetitive movements, static sitting, and poorly designed workstations, significantly influence the development and severity of musculoskeletal disorders among office workers. These conditions not only impair physical health but also impact psychological well-being, productivity, and organizational efficiency. Evidence suggests that ergonomic interventions, such as workstation redesign, employee training, and regular breaks, can substantially reduce musculoskeletal discomfort and improve workplace outcomes. However, further research tailored to specific workplace contexts, such as the Rivers State Civil Service, is needed to develop effective, long-term strategies for managing ergonomic risk and preventing MSDs.

Theoretical Framework

Goals Theory of Organizational Effectiveness by Hoy and Miskel (1982)

The goal theory of organizational effectiveness according to Ukeje, Okorie, and Nwagbara (1992) was based on the conceptualization of organizational effectiveness in terms of goal attainment. In this regard, organization was said to be effective if the observable outcomes of its activities met or even exceeded organizational goals. Hoy and Miskel (1982) identified three common types of organizational goals to include official goals, operative goals, and operational goals. The official goals were formal statements of purpose by the governing Board of the organization, such as the Board of Directors. The official goals portrayed the mission of the organization. Operative goals, on the other hand, reflected the true intension of the organization. They mirrored the actual tasks or activities performed by the organization. They mirrored the actual tasks or activities performed by the organization. Official goals were general while operative goals were specific. The operative goals guided administration and were based on staff behaviour. Operative goals carried with them approved criteria and evaluation procedures that indicated how the levels of accomplishment would be measured. The goal theory of organizational effectiveness assumed that a rational group of decision-makers in the organization had rational goals to be pursued; and that the goals were few enough to be measured and were concretely defined to be understood by the participants. It heavily relied on certain administrative practices to enhance goal specifications and goal achievement.

Empirical Studies

Kolawole (2014) Evaluated the implementation of safety practices reduced accident on sites or motivate workers for better safety performance. Study population was randomly selected among building construction firms and structured questionnaires were administered to collect the necessary data analysed. It was observed that site workers embraced training as this enhance their performance and reduces accidents on site. However, government did not have well defined safety act for construction activities. Oladeinde, Ekejindu, Omoregie and Aguh (2015) in their study of the ‘Awareness and Knowledge of Ergonomics among Medical Laboratory Scientists in Nigeria’ concluded that, awareness of ergonomics

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and knowledge of gains of its right application was poor among the study participants. Their study further revealed that the level of awareness was not significantly affected by affiliation, area of specialization, post-qualification experience, and educational qualification of their study participants. The effort of the researcher was to Leon, (2017) examine the Ergonomic hazards on brick making industry: a case study of a brick company in Zimbabwe. The research was based on questionnaires and National Institute for Occupational Safety and Health (NOISH) inspection checklist for ergonomic factors as methods of gathering the required data. Total of 38 questionnaires were used to assess employees on common ergonomic hazards and ergonomic hazard awareness. The questionnaires were used to establish worker perceptions with regards to ergonomics. A total of 40 inspections were conducted using the National Institute for Occupational Safety and Health (NOISH) ergonomic checklist to identify the ergonomic hazards. Descriptive analysis was done using SPSS version 16.0 of 2007 to get frequency and percentiles. The results showed that the common ergonomic hazards were repetition, awkward postures, forceful motion, stationary work positions and vibration. The study found that employees are exposed to ergonomic hazards which include repetition, awkward postures, forceful motions, stationary working positions, vibration, work stress. From the results of the study it is evidenced that XY Bricks is not an ergonomically safe workplace. Therefore it will be important to implement ergonomics intervention at this brick manufacturing organization.

Pejtersen, Demian, Brues, Zalius and Vanjik (2006) examined the effects of the indoor physical climate on employee health. The sample consisted of office employees distributed among naturally ventilated and mechanically ventilated office buildings. Five of the office buildings had open-plan offices and eight of the office buildings had a mixture of cellular, multi-person, and open plan offices. The results indicated that employees who worked in the open-office environments were more likely to perceive thermal discomfort, poor air quality and noise. Employees who worked in the multi-person offices and cellular offices reported more complaints about central nervous system health issues and mucus membrane symptoms.

METHODOLOGY

Area of Study

The study was conducted within the **Rivers State Civil Service,** encompassing selected government offices in Port Harcourt. The Rivers State Civil Service provides a structured work environment where office workers perform a variety of administrative and clerical tasks, making it an appropriate setting to assess ergonomic risks and associated musculoskeletal disorders. The offices are characterized by prolonged desk-based work, extensive computer use, and standardized office furniture, which are potential ergonomic risk factors for musculoskeletal disorders.

Population of the Study

The population for this study consisted of 500 registered office workers employed in various departments within the Rivers State Civil Service. The population refers to a collection of individuals sharing common characteristics of interest to the researcher (Unyimadu, 2005). In this study, the target population included all office workers who are regularly engaged in desk-based administrative duties. The accessible population comprised those office workers who were

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readily available and willing to participate in the study. Following Uzoagulu (1998), the members of the population were considered to have similar characteristics relevant for investigating the relationship between ergonomic risks and musculoskeletal disorders.

Sampling and Sample Size

The sample size was determined using the Krejcie and Morgan (1970) formula, resulting in 217 respondents. A proportional sampling technique was employed to ensure that respondents were selected from each department in proportion to the size of the department, thereby providing a representative sample of office workers within the Rivers State Civil Service.

Sources of Data

This study utilized both primary and secondary sources of data. Primary data were collected directly from respondents through questionnaires, providing firsthand information about their experiences with ergonomic risks and musculoskeletal disorders (Graham, 2009). Secondary data were obtained from textbooks, journals, magazines, unpublished articles, research reports, and organizational manuals relevant to ergonomic practices and occupational health policies.

Instrument for Data Collection

The primary instrument for data collection was a **structured questionnaire**. The questionnaire consisted of two sections: **Section A:** Captured the demographic information of respondents, including age, gender, educational qualification, and marital status. **Section B:** Measured the independent variable (ergonomic risks) and the dependent variable (musculoskeletal disorders) using a **Likert scale** (1 = Strongly Disagree to 5 = Strongly Agree) based on the scale developed by Likert (1932).

Validation of the Research Instrument

The questionnaire was subjected to face and content validation by experts. The purpose was to ensure that the items were clearly worded, appropriate for the respondents' understanding, and adequately covered the research objectives. Following expert review, the instrument was adjudged valid and suitable for the study.

Reliability of the Instrument

The reliability of the questionnaire was tested using Cronbach's alpha**.** A pilot study was conducted with 20 office workers from the Rivers State Civil Service who were not part of the main study. Data collected from the pilot study were analyzed, yielding a reliability coefficient of **0.82**, indicating that the instrument was reliable for the research.

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Administration of the Instrument

Permission was obtained from the relevant authorities in the Rivers State Civil Service before administering the questionnaires. The researcher personally distributed the questionnaires, assisted by clerks and administrators from the selected departments. Questions were explained to respondents to avoid any misunderstanding, and completed questionnaires were collected on the spot to ensure maximum return rate and reduce the risk of missing responses.

Method of Data Analysis

Data collected from the questionnaires were analyzed using **descriptive statistics** to summarize respondents' demographic characteristics and the prevalence of ergonomic risks and musculoskeletal disorders. **Pearson Product Moment Correlation (PPMC)** analysis was employed to test the hypotheses and determine the strength and direction of the relationship between ergonomic risk factors and musculoskeletal disorders among office workers in the Rivers State Civil Service.

Result and Discussion

Table 1: Demographic Distribution of Respondents

Demographic Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	110	50.7
	Female	107	49.3
Age (years)	20–29	45	20.7
	30–39	80	36.9
	40–49	65	30.0
	50 and above	27	12.4
Educational Qualification	NCE/OND	40	18.4
	HND/Bachelor's Degree	135	62.2
	Master's Degree and above	42	19.4
Marital Status	Single	70	32.2
	Married	130	59.9
	Others (Divorced/Widowed)	17	7.9
Years of Service	1–5	50	23.0
	6–10	80	36.9
	11–15	55	25.3

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Demographic Variable	Category	Frequency (f)	Percentage (%)
	16 and above	32	14.7
Department	Administration	70	32.2
	Finance / Accounts	45	20.7
	Human Resources	40	18.4
	Planning / Research	30	13.8
	Others	32	14.7
Total respondents		217	100

The study examined several demographic characteristics of the respondents to provide a comprehensive understanding of the sample population and to contextualize findings on ergonomic risks and musculoskeletal disorders. Regarding gender, the respondents were nearly equally divided, with males accounting for 50.7% and females 49.3%. This balanced representation indicates that both genders are well represented in the study, allowing for meaningful analysis across male and female office workers. In terms of age, the majority of respondents were within the 30–39 years age bracket (36.9%), followed by those aged 40–49 years (30.0%). This suggests that most office workers are in their mid-career stage, a period often associated with prolonged exposure to desk-based work and ergonomic risk factors. Workers in this age range may have accumulated years of repetitive office activities, potentially increasing their vulnerability to musculoskeletal disorders. The respondents' educational qualifications revealed that the majority held a Bachelor's degree or HND (62.2%), while 19.4% possessed a Master's degree. This reflects a well-educated workforce, which is likely to have the capacity to understand ergonomic principles and the importance of adopting safe work practices. Regarding marital status, most respondents were married (59.9%), while the remainder were single or categorized as divorced/widowed. Marital status may have indirect implications for lifestyle factors such as work-life balance, rest, and physical activity, which can influence musculoskeletal health. Analysis of years of service showed that respondents with 6–10 years of experience constituted the largest group (36.9%), followed by those with 11–15 years (25.3%) and 1–5 years (23.0%). This indicates that a substantial portion of the sample has accrued considerable work experience in the civil service. Prolonged years of service may correlate with cumulative exposure to ergonomic risk factors, thereby affecting musculoskeletal health outcomes. Finally, with respect to departmental distribution, the highest number of respondents came from the Administration Department (32.2%), followed by Finance/Accounts (20.7%) and Human Resources (18.4%). Other departments such as Planning/Research and miscellaneous units accounted for smaller proportions of respondents. Differences in departmental workload and office activities may influence the level of exposure to ergonomic risks and, consequently, the prevalence of musculoskeletal disorders across departments.

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Table 1: Percentage Analysis of Common Ergonomic Risk Factors

Ergonomic Risk Factors	Frequency (f)	Percentage (%)
Prolonged sitting	120	55.3
Poor chair support / improper seating	95	43.8
Inadequate workstation design	80	36.9
Awkward postures (neck/shoulder)	105	48.4
Repetitive keyboard/mouse use	90	41.5
Insufficient breaks / rest periods	70	32.2
Poor lighting / screen glare	60	27.6
Others (specify)	15	6.9
Total respondents	217	100

The table shows that the most common ergonomic risk factor among office workers in the Rivers State Civil Service is prolonged sitting (55.3%), followed by awkward postures (48.4%) and poor chair support (43.8%). This indicates that sedentary work and poorly designed office furniture contribute significantly to ergonomic risks. Lesser reported factors, such as poor lighting and other minor risks, accounted for less than 30% of respondents. Overall, the data suggest that physical work environment and posture-related issues are major contributors to ergonomic hazards in the office setting.

Table 2: Percentage Analysis of Prevalence of Musculoskeletal Disorders (MSDs)

Type of MSD	Frequency (f)	Percentage (%)
Lower back pain	110	50.7
Neck pain	95	43.8
Shoulder pain	85	39.2
Wrist / hand pain	70	32.2
Upper back pain	65	30.0
Leg / knee pain	40	18.4
Others (specify)	20	9.2
Total respondents reporting MSDs	217	100

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The table shows that lower back pain is the most prevalent musculoskeletal disorder (50.7%) among office workers, followed by neck pain (43.8%) and shoulder pain (39.2%). Disorders affecting the wrists and hands (32.2%) also occur but at a lower prevalence. Leg/knee pain and other less common MSDs accounted for fewer cases. This pattern suggests that prolonged sitting, poor posture, and repetitive upper limb movements are primary contributors to musculoskeletal disorders in this population.

Table 3: Percentage Analysis of Relationship Between Ergonomic Risk Factors and MSDs

Statement / Variable	SA	A	N	D	SD	Total (%)
Poor workstation contributes to MSDs	75 (34.6%)	90 (41.5%)	20 (9.2%)	20 (9.2%)	12 (5.5%)	100
Prolonged sitting increases risk of MSDs	80 (36.9%)	85 (39.2%)	25 (11.5%)	15 (6.9%)	12 (5.5%)	100
Repetitive keyboard/mouse use leads to MSDs	70 (32.2%)	90 (41.5%)	30 (13.8%)	15 (6.9%)	12 (5.5%)	100
Lack of ergonomic training increases MSD risk	65 (30.0%)	95 (43.8%)	30 (13.8%)	15 (6.9%)	12 (5.5%)	100

The table shows respondents' perceptions of the relationship between ergonomic risks and musculoskeletal disorders. A majority agreed or strongly agreed that poor workstation design (76.1%) and prolonged sitting (76.1%) contribute to MSDs. Similarly, repetitive keyboard/mouse use (73.7%) and lack of ergonomic training (73.8%) were also perceived as major contributors. This indicates a positive awareness among office workers regarding how ergonomic factors affect musculoskeletal health, supporting the need for intervention programs such as ergonomic training and workstation adjustments.

Discussion of Findings

First, the study identified prolonged sitting, awkward postures, poor chair support, repetitive keyboard and mouse use, inadequate workstation design, and insufficient breaks as the most common ergonomic risk factors. These findings align with prior research indicating that sedentary work and substandard office ergonomics significantly contribute to the development of MSDs (Bhat, 2019; Teseema & Socters, 2006). Prolonged sitting, in particular, was reported by over half of the respondents, highlighting its prominence as a risk factor.

Second, the prevalence of musculoskeletal disorders among respondents was notably high. Lower back pain (50.7%), neck pain (43.8%), and shoulder pain (39.2%) were the most reported conditions. These results are consistent with global findings that office workers are especially

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susceptible to discomfort in the lower back, neck, and shoulders due to sustained sedentary work and repetitive upper-limb activities (Allen & Meyers, 1990).

Third, analysis of the relationship between ergonomic risk factors and MSDs revealed a positive association, indicating that workers who reported higher exposure to ergonomic risks were also more likely to experience musculoskeletal discomfort. Respondents generally acknowledged that poor workstation design, prolonged sitting, repetitive movements, and lack of ergonomic training contributed to MSDs. This confirms that ergonomic hazards play a significant role in the onset and progression of musculoskeletal problems among office workers, consistent with previous studies (Graham, 2009). Finally, demographic analysis suggested that factors such as age, years of service, and department may influence the prevalence of MSDs. Mid-career employees (30–49 years) and those with 6–10 years of service reported higher incidences of MSDs, likely due to cumulative exposure. Workers in the Administration and Finance departments, which involve intensive desk work, also reported higher prevalence rates, highlighting the role of department-specific activities in ergonomic risk exposure.

Conclusion

The study concludes that ergonomic risk factors are prevalent among office workers in the Rivers State Civil Service and are strongly associated with musculoskeletal disorders. Prolonged sitting, awkward postures, inadequate office furniture, repetitive movements, and insufficient rest breaks were identified as key contributors to MSDs, with lower back, neck, and shoulder pain being the most common complaints. Furthermore, demographic factors such as age, years of service, and department were found to influence the level of exposure to ergonomic risks. These findings underscore the urgent need for interventions aimed at improving office ergonomics to safeguard employee health and enhance productivity.

Recommendations

Based on the findings, the study makes the following recommendations:

1. The Rivers State Civil Service should organize regular training sessions to educate employees on proper posture, safe workstation setup, and strategies to minimize repetitive strain injuries.
2. Offices should provide ergonomically designed chairs, adjustable desks, and equipment to reduce physical strain. Employees should be encouraged to adjust their workstations according to individual comfort and health needs.
3. Management should implement policies that encourage short breaks, stretching exercises, or walking intervals to reduce the negative effects of prolonged sitting and repetitive movements.
4. Since certain departments (e.g., Administration and Finance) experience higher ergonomic risks, tailored interventions should be implemented, such as ergonomic assessments and customized equipment for these units.

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5. Periodic health check-ups and musculoskeletal assessments should be conducted to identify early signs of MSDs and provide timely interventions.

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