Ngr. J. Bus. Manag. vol-1, issue-1 (Dec-2025) pp-30-38

ISSN: XXXX-XXXX(Online)

Nexus Global Research Journal of Business and Management

Journal Homepage: https://nexusglobalresearch.com/journal/ngrjbm/

Research Article

# Perceived Influences of Office Ergonomics on the Job Performance of Confidential Secretaries in Government Ministries in Gombe State

**Musa Muhammad [1], Mohammed Ahmad Umar[2]**

[1,2]*Office Technology and Management Department, Gombe State Polytechnic, Bajoga*

**ABSTRACT:**

This study investigates the perceived influences of office ergonomics on the job performance of confidential secretaries in government ministries within Gombe State, Nigeria. With growing emphasis on workplace efficiency, office ergonomics has emerged as a key determinant of employee productivity, job satisfaction, and health. Using a descriptive survey design, data were collected from 120 confidential secretaries across ministries using a validated structured questionnaire. The study analyzed how workstation design, ergonomic furniture, lighting, noise control, and equipment placement affect performance outcomes such as accuracy, speed, and reduced fatigue. Findings reveal that ergonomic interventions significantly enhance job performance, reduce musculoskeletal discomfort, and improve efficiency. The paper recommends prioritizing ergonomic design in public offices, training secretaries in proper workstation use, and institutionalizing regular ergonomic audits. These measures could improve productivity and promote occupational well-being in government institutions.

***Keywords:*** *Office ergonomics, job performance, confidential secretaries, workplace productivity, Gombe State.*

## INTRODUCTION

Confidential secretaries in government ministries perform critical administrative tasks that require precision, focus, and prolonged hours at workstations. However, poor ergonomic conditions—such as uncomfortable seating, improper desk heights, and inadequate lighting—can negatively impact their performance. In Gombe State, where government offices often operate with limited resources, understanding the influence of ergonomics on secretarial efficiency is essential for policy improvements.

The efficiency of employees in modern organizations is influenced not only by their skills but also by the conditions of their work environment. Office ergonomics, which involves designing workspaces to fit human needs, is critical to reducing fatigue, enhancing comfort, and improving productivity (Hedge, 2016). Confidential secretaries in government ministries perform sensitive and repetitive tasks such as document preparation, records management, and information handling. Prolonged exposure to poorly designed workstations often leads to physical strain, reduced concentration, and lower output (Ejiogu, 2019).

In Nigeria's public service, infrastructure development has historically lagged behind ergonomic standards, resulting in workplace discomfort and inefficiencies (Osei & Adebayo, 2020). This study assesses how office ergonomics affect job performance specifically among confidential secretaries in Gombe State, with a view to identifying practical measures for improvement.

### Problem Statement

In many government ministries in Gombe State, confidential secretaries occupy crucial administrative positions that require prolonged sitting, constant use of computers, and engagement in repetitive clerical tasks. However, most of these offices are not ergonomically designed to support the physical and psychological well-being of employees. Observations show that many secretaries work with poorly designed chairs, inappropriate desk heights, inadequate lighting, and limited workspace arrangements.

**Corresponding author:** Musa Muhammad

**DOI:** 10.5281/zenodo.17946365

**Received:** 01 Dec 2025; **Accepted:** 14 Dec 2025; **Published:** 16 Dec 2025

Therefore, such unfavorable ergonomic conditions can lead to fatigue, musculoskeletal disorders, and reduced efficiency, which in turn affect the overall performance and productivity of secretarial staff. Despite the importance of ergonomics in enhancing job performance, limited empirical studies have examined how ergonomic factors influence the productivity and health of confidential secretaries in Gombe State.

Therefore, this study seeks to investigate the perceived influence of office ergonomics on the job performance of confidential secretaries in government ministries in Gombe State, Nigeria, with the aim of providing evidence-based recommendations for improving workplace design and employee output.

## OBJECTIVES OF THE STUDY

To examine the perceived influences of office ergonomics on the job performance of confidential secretaries in government ministries in Gombe State. The study specifically aims to:

1. Determine the extent to which workstation design affects the job performance of confidential secretaries in government ministries in Gombe State.

2. Examine the influence of office lighting and ventilation on the performance of confidential secretaries.

3. Assess the relationship between equipment arrangement and accessibility and the efficiency of secretarial duties.

4. Investigate the overall relationship between ergonomic practices and the job performance of confidential secretaries in government ministries in Gombe State.

## LITERATURE REVIEW

### Concepts of Office Ergonomics

Office ergonomics is the systematic application of ergonomic principles to office environments, aimed at aligning work demands with human capabilities. It integrates knowledge from biomechanics, physiology, psychology, and organizational science to create work settings that promote efficiency, comfort, and safety (Dul & Weerdmeester, 2016). For confidential secretaries in government ministries, where tasks include typing, filing, scheduling, and document management, ergonomic design has become increasingly essential. Poor ergonomics can lead to musculoskeletal disorders, fatigue, and reduced job performance (Visser & Van der Beek, 2019).

Ergonomic principles have been shown to directly impact a worker's physical and mental state, which in turn influences their productivity. Research by Smith (2018) highlighted that improper chair and desk height can lead to musculoskeletal disorders, such as back pain and carpal tunnel syndrome, which are major causes of absenteeism and reduced work output. Similarly, a study by Jones & Brown (2020) found that inadequate lighting causes eye strain and headaches, leading to decreased concentration and increased errors in documentation. The thermal environment also plays a role; extreme temperatures can cause discomfort and distract workers from their tasks.

Office ergonomics is the application of scientific principles to workplace design to ensure compatibility between workers and their environment (McCormick, 2017). Key elements include ergonomic furniture, optimal workstation layout, adequate lighting, proper ventilation, and noise reduction measures (Hedge, 2016).

Ergonomics involves designing workspaces to fit employees' physical and cognitive needs, reducing strain and enhancing productivity (Dul & Neumann, 2009). Key ergonomic factors include: Workstation design (adjustable chairs, proper desk height), Lighting and ventilation (reducing eye strain and fatigue), Equipment placement (keyboard, monitor positioning to prevent musculoskeletal disorders).

This review discusses key concepts of office ergonomics, including workstation design, posture and movement, environmental conditions, cognitive ergonomics, organizational support, adaptive and inclusive design, and integration with health and safety programs.

**Workstation Design**

Workstation design refers to the physical arrangement of office furniture and equipment to fit the user's needs. According to Robertson, Huang, and Lee (2013), inappropriate workstation setups are a primary cause of back, neck, and wrist injuries among office workers. Adjustable chairs with proper lumbar support, desks at elbow height, and monitors positioned at eye level reduce physical discomfort and enhance performance. Hedge and Price (2020) note that ergonomic accessories such as footrests and document holders also support proper alignment. For secretaries handling high volumes of typing and document preparation, a well-designed workstation directly impacts accuracy and reduces physical strain.

**Posture and Movement Practices**

Static sitting for extended periods is strongly linked to musculoskeletal discomfort and reduced productivity (Janwantanakul et al., 2015). Ergonomics emphasizes maintaining a neutral posture — where joints are naturally aligned — and incorporating dynamic movement into the workday. Training programs that teach correct sitting posture, monitor positioning, and the value of micro-breaks have been shown to decrease work-related fatigue (Robertson & Huang, 2015). Sit-stand desks and movement prompts also encourage regular postural changes, benefiting secretaries whose work requires prolonged computer use.

**Environmental Conditions**

The office environment — including lighting, temperature, ventilation, and noise — has a significant impact on workers' comfort and concentration. Poor lighting causes eye strain, while insufficient ventilation contributes to lethargy and errors in task execution (Hedge & Price, 2020). For confidential secretaries who require high attention to detail, a well-illuminated and thermally comfortable workspace is essential. Noise control through acoustic panels or quiet zones further reduces distractions, improving productivity and accuracy (Lee & Kim, 2019).

**Cognitive Ergonomics**

Cognitive ergonomics focuses on reducing mental workload by designing tasks, tools, and workflows that align with human information processing abilities. Wilson (2014) explains that overly complex interfaces or disorganized filing systems increase stress and error rates. Implementing user-friendly software, structured filing procedures, and clear task guidelines allows secretaries to process information efficiently. Ministries that prioritize cognitive ergonomics report improved decision-making and time management among administrative staff (Punnett & Wegman, 2015).

**Organizational Support and Training**

Providing ergonomic equipment alone does not guarantee improved outcomes. Konz and Johnson (2017) emphasize that employee training and management support are crucial for successful implementation. Ministries that conduct regular workshops on proper workstation adjustment and posture awareness see greater reductions in discomfort and performance issues (Robertson & Huang, 2015). Organizational policies that encourage employees to report discomfort and request adjustments also foster a culture of safety and productivity.

**Adaptive and Inclusive Design**

Adaptive ergonomics ensures that workplaces accommodate diverse body sizes, physical abilities, and individual needs. Adjustable desks, ergonomic keyboards, and specialized input devices promote inclusivity and sustained productivity (Lee & Kim, 2019). This approach is particularly valuable in public service environments where secretarial staff vary widely in age, gender, and physical condition. By providing flexible tools, ministries can ensure all secretaries work comfortably and effectively.

**Health and Safety Integration**

Ergonomics should be embedded into occupational health and safety programs to prevent long-term injuries such as repetitive strain injury (RSI) and carpal tunnel syndrome. Punnett and Wegman (2015) report that organizations conducting regular ergonomic risk assessments experience lower absenteeism and compensation claims. Integrating

ergonomics into health monitoring programs ensures that potential issues are detected early and corrective actions are implemented before they affect performance.

**Ergonomics and Job Performance of Confidential Secretaries**

Ergonomics, often referred to as human factors engineering, is concerned with designing work environments to fit human needs, thereby enhancing productivity, safety, and comfort (Dul & Weerdmeester, 2016). In office settings, where confidential secretaries perform extensive computer-based and clerical duties, ergonomics is critical in shaping both physical well-being and job performance (Visser & Van der Beek, 2019). Proper ergonomic interventions reduce work-related discomfort, improve efficiency, and promote sustained task accuracy.

Job performance refers to the effectiveness and efficiency with which employees execute their assigned tasks (Robbins & Judge, 2018). For confidential secretaries, performance indicators include typing speed and accuracy, timely information processing, and adherence to confidentiality standards (Okafor, 2019).

Studies show that ergonomic interventions improve efficiency, reduce absenteeism, and minimize work-related injuries (Robertson et al., 2017). Secretaries who experience discomfort due to poor ergonomics report lower job satisfaction and higher error rates (Smith & Bayeh, 2019).

**Ergonomics as a Determinant of Job Performance**

Job performance encompasses both the quantity and quality of tasks completed by employees within a specified period. Studies have shown that poor ergonomic conditions — such as poorly designed workstations, inappropriate seating, or excessive repetitive motion — lead to musculoskeletal disorders, fatigue, and reduced output (Punnett & Wegman, 2015). Conversely, ergonomic workplaces foster improved posture, reduced injury risk, and enhanced concentration, leading to higher productivity (Robertson et al., 2013).

For confidential secretaries, whose duties include document preparation, schedule coordination, and handling sensitive information, efficiency and accuracy are paramount. Research by Hedge and Price (2020) indicates that ergonomic interventions, such as adjustable chairs, sit-stand desks, and properly positioned monitors, directly improve typing speed, data entry accuracy, and sustained focus.

**Workstation Design and Secretarial Tasks**

A well-designed workstation is fundamental to preventing discomfort and supporting high performance. According to Lee and Kim (2019), adjustable office furniture and ergonomic peripherals reduce physical strain during prolonged sitting and typing. In government ministries, where secretaries handle high volumes of paperwork and electronic correspondence, such improvements translate into fewer errors and reduced absenteeism caused by work-related injuries.

**Posture Training and Movement Practices**

Training in posture awareness is a proven ergonomic strategy. Janwantanakul et al. (2015) found that employees educated on correct posture experienced fewer musculoskeletal complaints and performed tasks with greater consistency. For confidential secretaries, integrating micro-breaks and dynamic movement reduces fatigue and supports long hours of concentrated work.

**Environmental Ergonomics and Productivity**

Lighting, ventilation, noise control, and thermal comfort are key environmental factors that affect secretarial performance. Poor environmental conditions impair concentration and lead to increased mistakes in documentation and correspondence (Hedge & Price, 2020). A controlled office environment ensures that secretaries remain alert and efficient in handling sensitive materials.

**Organizational Support and Ergonomic Culture**

The effectiveness of ergonomic initiatives depends on management commitment and continuous

training. Robertson and Huang (2015) highlight that ergonomic policies — such as regular risk assessments, employee feedback systems, and workshops — lead to long-term performance improvements. When secretaries are empowered to adjust their workstations and report discomfort, ministries experience improved administrative workflow and lower health-related costs.

**Linking Ergonomics to Performance Outcomes**

The relationship between ergonomics and job performance is both direct and indirect. Ergonomics directly affects secretaries by improving physical comfort, reducing pain, and increasing efficiency. Indirectly, it enhances motivation, job satisfaction, and overall organizational effectiveness (Wilson, 2014). A secretarial staff that operates in an ergonomically optimized environment is better positioned to handle sensitive data accurately, meet deadlines consistently, and maintain professional confidentiality without the interference of physical discomfort.

**Ergonomic Challenges in Government Offices**

Government offices, particularly in developing nations, face unique ergonomic challenges that hinder employee productivity, health, and job satisfaction. Ergonomics — the discipline concerned with fitting work conditions to human capabilities — is often underemphasized in public institutions where budget constraints, bureaucratic procedures, and aging infrastructure limit workplace improvements (Visser & Van der Beek, 2019). For confidential secretaries, who perform repetitive clerical and computer-based tasks, inadequate ergonomic practices can lead to discomfort, musculoskeletal disorders, and reduced efficiency.

**1. Inadequate Workstation Design:** Many government offices still use fixed, non-adjustable furniture that does not accommodate varying body sizes or work postures. According to Robertson et al. (2013), improper desk and chair dimensions increase the risk of back, neck, and shoulder pain. Secretaries often work with outdated desks and non-ergonomic seating, forcing them into awkward positions that contribute to long-term injury.

**2. Prolonged Static Postures and Repetitive Tasks:** Typing, filing, and data entry require sustained sitting and repetitive wrist and finger motions. Janwantanakul et al. (2015) reported that prolonged static posture is a leading factor in musculoskeletal discomfort among office workers. In government offices, workload distribution and rigid schedules often prevent employees from taking micro-breaks, further exacerbating these issues.

**3. Poor Environmental Conditions:** Lighting, ventilation, and noise levels in many government offices are suboptimal. Hedge and Price (2020) found that poor lighting causes eye strain and headaches, while inadequate ventilation leads to fatigue and lowered alertness. In addition, open office layouts with limited noise control create distractions, reducing secretarial efficiency and accuracy in handling sensitive information.

**4. Lack of Ergonomic Awareness and Training:** Ergonomic equipment is ineffective if workers do not know how to use it correctly. Konz and Johnson (2017) emphasize that many public-sector employees receive little or no training on workstation adjustment or posture awareness. Without such training, secretaries may misuse available tools or fail to recognize early signs of strain.

**5. Budgetary and Policy Constraints:** Ergonomic interventions in government ministries are often delayed by limited funding and bureaucratic approval processes. Robertson and Huang (2015) note that unlike private organizations, public offices rarely allocate dedicated budgets for ergonomic upgrades. This results in continued use of outdated furniture, insufficient environmental controls, and inadequate occupational health programs.

**6. Limited Health and Safety Integration:** Punnett and Wegman (2015) highlight that few government offices conduct regular ergonomic risk assessments or integrate ergonomics into occupational safety policies. Consequently, early warning signs of repetitive strain injuries or visual fatigue are often overlooked until they become severe, leading to absenteeism and reduced productivity among secretaries.

**7. Inflexibility in Work Arrangements:** The rigid structure of government office hours and task schedules leaves little room for flexible or hybrid work models. While remote work or rotational systems could reduce physical strain, many ministries lack policies or infrastructure to support such initiatives (Wilson, 2014). This inflexibility forces secretaries to endure continuous on-site exposure to poorly designed work environments.

## METHODOLOGY

### Research Design

The study adopted a descriptive survey research design because it seeks to obtain respondents' opinions on the perceived influence of office ergonomics on the job performance of confidential secretaries. This design is appropriate as it allows the collection of data from a large population without manipulating variables.

### Area of the Study

The research was conducted in Gombe State, Nigeria, covering all government ministries where confidential secretaries are employed. Gombe State was chosen because of its strategic role as a state capital and the concentration of ministries and secretarial staff.

### Population of the Study

The target population consisted of 150 confidential secretaries working in various government ministries in Gombe State. These individuals perform administrative and secretarial duties and represent the population affected by ergonomic conditions in government offices.

### Sample and Sampling Technique

To ensure robust data, the sample size was rounded to 120 confidential secretaries. The stratified random sampling technique was employed to give all ministries proportional representation, and simple random sampling was then used within each stratum.

### Instrument for Data Collection

The primary instrument for data collection was a structured questionnaire designed by the researcher. It consisted of three sections:

- **Section A:** Demographic information of respondents (gender, age, years of experience, ministry).
- **Section B:** Questions on office ergonomics (furniture design, workstation layout, lighting, ventilation, and equipment positioning).
- **Section C:** Questions on job performance indicators (speed, accuracy, fatigue reduction, efficiency).

The questionnaire items were structured on a **5-point Likert scale**: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

### Validity of the Instrument

The draft questionnaire was validated by **three experts**—two from the Department of Office Technology and Management and one from Measurement and Evaluation. Their feedback ensured that the items were clear, relevant, and capable of measuring the variables of the study.

### Method of Data Collection

The researcher, with the help of trained research assistants, administered the questionnaires in person to ensure a high response rate. Respondents were given one week to complete and return the questionnaires. Follow-up visits were made to retrieve any unreturned copies.

### Method of Data Analysis

Descriptive statistics (mean, standard deviation) were used to summarize responses, while inferential statistics (Pearson correlation) determined relationships between office ergonomics and job performance.

### Data Analysis

**Response Rate**

Out of 120 copies of the questionnaire distributed to confidential secretaries across government ministries in Gombe State, 112 copies were properly completed and returned, representing a 93.3% response rate. This high response rate was attributed to the personal administration of the instrument and follow-up by research assistants.

**Table 1: Research Question One**

**What is the perceived influence of workstation design on the job performance of confidential secretaries?**

| Item Statement (Workstation Design) | Mean (x̄) | Std. Dev. (SD) | Remark |
|---|---|---|---|
| My chair and desk are adjustable to suit my posture. | 4.28 | 0.77 | Agreed |
| My monitor is placed at a comfortable viewing level. | 4.12 | 0.81 | Agreed |
| The workstation reduces back/neck strain during long tasks. | 4.36 | 0.72 | Agreed |

***Cluster Mean = 4.25*** → *Respondents strongly agree that workstation design positively influences job performance.*

**Table 2: Research Question Two**

**How do office lighting and ventilation affect the job performance of confidential secretaries?**

| Item Statement (Lighting/Ventilation) | Mean (x̄) | Std. Dev. (SD) | Remark |
|---|---|---|---|
| My office has adequate lighting to prevent eye strain. | 4.05 | 0.83 | Agreed |
| Natural ventilation or air conditioning improves my concentration. | 4.18 | 0.79 | Agreed |
| Poor lighting slows my typing and document preparation. | 4.42 | 0.68 | Agreed |

**Cluster Mean** = 4.22 → Respondents perceive lighting and ventilation as significant factors influencing performance.

**Table 3: Research Question Three**

**Does the placement of office equipment affect the job performance of confidential secretaries?**

| Item Statement (Equipment Placement) | Mean (x̄) | Std. Dev. (SD) | Remark |
|---|---|---|---|
| Frequently used tools are within easy reach. | 4.30 | 0.74 | Agreed |
| Proper arrangement of office machines reduces time wastage. | 4.46 | 0.61 | Agreed |
| I do not need to leave my workstation frequently to complete tasks. | 4.15 | 0.80 | Agreed |

**Cluster Mean = 4.30** → *Respondents agree that equipment accessibility improves efficiency.*

**Hypothesis Testing**

**$H_0$:** There is no significant relationship between office ergonomics and the job performance of confidential secretaries.

**$H_1$:** There is a significant relationship between office ergonomics and the job performance of confidential secretaries.

Using **Pearson Product-Moment Correlation (r):**

- **Ergonomics Index Mean = 4.26 (SD = 0.78)**
- **Job Performance Index Mean = 4.31 (SD = 0.74)**
- **Correlation coefficient r = 0.79, p-value = 0.000 (<0.05)**

**Decision:** Since $p < 0.05$, the null hypothesis ($H_0$) is rejected.

**Conclusion:** There is a strong positive relationship between office ergonomics and job performance of confidential secretaries in Gombe State ministries.

## SUMMARY OF THE STUDY

This study investigated the perceived influences of office ergonomics on the job performance of confidential secretaries in government ministries within Gombe State, Nigeria. The objectives were to:

1. Determine the influence of workstation design on the job performance of confidential secretaries.
2. Examine how office lighting and ventilation affect the job performance of confidential secretaries.
3. Assess whether the placement and accessibility of office equipment impact job performance.
4. Establish the relationship between office ergonomics and overall secretarial productivity.

A **descriptive survey research design** was adopted. The study population consisted of **150 confidential secretaries**, from which **120 respondents** were selected using stratified and simple random sampling techniques. A structured questionnaire, validated by experts and tested for reliability (Cronbach's Alpha = 0.89), was used to collect data. Descriptive statistics (mean and standard deviation) were used to answer the research questions, while Pearson correlation analysis was employed to test the hypothesis at a 0.05 level of significance.

**Findings revealed that:**

1. Properly designed workstations significantly reduce fatigue, musculoskeletal discomfort, and errors.
2. Adequate lighting and ventilation enhance focus, speed, and document processing accuracy.
3. Strategic placement of office equipment reduces time wastage and improves workflow.
4. There is a strong positive correlation ($r = 0.79$, $p < 0.05$) between office ergonomics and the job performance of confidential secretaries.

## CONCLUSION

Based on the findings, the study concludes that **office ergonomics has a substantial positive influence on the job performance of confidential secretaries in government ministries in Gombe State.** Ergonomically designed work environments — including proper furniture, adequate lighting, ventilation, and strategic equipment placement — not only improve efficiency but also enhance occupational health and job satisfaction.

## RECOMMENDATIONS

In light of the findings and conclusion, the following recommendations are made:

1. **Provision of Ergonomic Furniture:** Ministries should invest in adjustable chairs, desks, and modern office workstations to enhance comfort and reduce health risks.
2. **Regular Ergonomic Training:** Confidential secretaries should be trained on proper posture, workstation adjustment, and the use of ergonomic tools.

3. **Institutionalized Ergonomic Audits:** Government ministries should conduct periodic ergonomic assessments to identify and correct deficiencies in office layouts.
4. **Improved Lighting and Ventilation:** Offices should ensure sufficient natural and artificial lighting, as well as effective ventilation or air-conditioning systems, to boost staff alertness and productivity.
5. **Policy Implementation:** Government should develop and enforce ergonomic standards for office design across all ministries to safeguard staff welfare and promote service delivery efficiency.

## ACKNOWLEDGEMENT

The authors write to acknowledge the contribution of Tertiary Education Trust Fund (TETFUND) for funding this research work.

## REFERENCES

Adeyemi, T., & Ojo, L. (2020). Workplace ergonomics in Nigerian public offices. *African Journal of Management, 12*(3), 45–60.

Dul, J., & Neumann, W. P. (2009). Ergonomics contributions to company strategies. *Applied Ergonomics, 40*(4), 745–752.

Dul, J., & Weerdmeester, B. (2016). *Ergonomics for beginners: A quick reference guide.* CRC Press.

Hedge, A., & Price, A. D. (2020). Ergonomic considerations of office environments. *Work, 66*(3), 561–574.

Janwantanakul, P., Pensri, P., Jiamjarasrangsi, W., Sinsongsook, T., & Chansirinukor, W. (2015). The effectiveness of posture training on musculoskeletal symptoms in office workers. *Journal of Occupational Health, 57*(4), 339–346.

Konz, S., & Johnson, S. (2017). *Work design: Occupational ergonomics.* Waveland Press.

Lee, S. Y., & Kim, J. H. (2019). The impact of adaptive workstation design on employee performance. *Applied Ergonomics, 75,* 85–92.

McCormick, E. J. (2017). *Human factors in engineering and design.* McGraw-Hill Education.

Punnett, L., & Wegman, D. H. (2015). Work-related musculoskeletal disorders: The epidemiologic evidence and the debate. *Journal of Electromyography and Kinesiology, 25*(4), 567–572.

Robertson, M. M., Huang, Y. H., & Lee, J. (2013). Improvements in musculoskeletal health and performance with office ergonomics training and sit-stand workstations. *Human Factors, 55*(3), 461–474.

Robertson, M. M., & Huang, Y. H. (2015). The relationship between training and workstation ergonomics interventions. *Journal of Safety Research, 53*, 19–29.

Robertson, M., et al. (2017). Office ergonomics and productivity. *Journal of Occupational Health, 59*(2), 121–130.

Visser, B., & Van der Beek, A. J. (2019). The influence of ergonomics on office workers' health and productivity. *Occupational Medicine, 69*(2), 101–107.

Wilson, J. R. (2014). Fundamentals of systems ergonomics/human factors. *Applied Ergonomics, 45*(1), 5–13.