

## Ergonomic Risk Assessment for Laptop-Based Workers

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### Abstract

This study investigated ergonomic issues among laptop-based workers environments, focusing on musculoskeletal discomfort and workstation deficiencies. This paper is aimed to address health risks by identifying key ergonomic problems and implementing evidence-based solutions. Using the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), the Rapid Office Strain Assessment (ROSA), and participatory group discussions, the study evaluated 17 participants to assess discomfort levels, ergonomic related risk at workstation, and gather practical input for recommendations. The findings of CMDQ revealed significant musculoskeletal discomfort in the lower back (64.71%), neck (58.82%), and upper back (52.94%). Additionally, ROSA assessments categorized 58.82% of workstations as high risk, highlighting the need for immediate ergonomic interventions. Group discussions engaged employees, management, and HSE Corporate, ensuring the practicality and feasibility of proposed solutions while addressing specific workplace challenges. Key recommendations included using height-adjustable furniture, external keyboards, and mouse to improve posture, alongside ergonomic education and behavioral changes, such as applying the 20-20-20 rule to reduce eye strain. These interventions aligned with ergonomic guidelines to foster healthier and more productive work environments. This study underscored the importance of participatory approaches and data-driven solutions in mitigating health risks and improving workplace ergonomics in laptop-centric settings.

## 1. Introduction

The advancement of technology has transformed the modern workplace, making laptops an essential tool for professionals worldwide. Their portability and versatility have revolutionized the way work is performed, enabling productivity across various settings [4]. However, while laptops enhance efficiency, prolonged use introduces significant ergonomic challenges that often go unaddressed. Extended laptop usage can lead to physical strain, negatively impacting employee well-being and workplace productivity [11]. Addressing these ergonomic issues is essential to creating a sustainable and healthy work environment.

Ergonomics, derived from the Greek words "ergon" (work) and "nomos" (natural laws), focused on designing workspaces that aligned with human capabilities to minimize strain and maximize performance [4]. Simply put, ergonomics was defined as the practice of making the work environment safe and productive for the worker. Its goal was to improve the positive human-environment dynamic, which ultimately lowered the risk and made the workplace safer and more efficient [1]. Numerous studies highlighted the ergonomic challenges inherent in laptop design. Unlike desktop computers, laptops combining the screen and keyboard into a single

unit, preventing independent adjustments for optimal typing and viewing postures [6]. This design often compelled users into awkward positions such as hunching over screens or straining their necks and shoulders [7]. Over time, these postures contributed to musculoskeletal disorders (MSDs), repetitive strain injuries (RSIs), and other health issues [11]

Existing research underscores the severity of these challenges but reveals a gap in addressing the specific ergonomic risks faced by employees in laptop-centric office environments. Most studies focus on general office ergonomics or desktop setups, leaving a lack of targeted solutions for laptop users. Additionally, many organizations fail to implement comprehensive ergonomic interventions, further increasing the risks associated with prolonged laptop use [4]. Addressing this gap is critical in developing effective strategies that promote healthier and more sustainable work practices.

This study aims to examine the prevalence of ergonomic risks in laptop-centric workplaces and assess the effectiveness of targeted interventions. To achieve this, tools such as the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), the Rapid Office Strain Assessment (ROSA), and group discussions were employed as complementary methodologies. To achieve this, a combination of methodologies, including the *Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), the Rapid Office Strain Assessment (ROSA), and group discussions*, was employed. CMDQ and ROSA provided quantitative evaluations of musculoskeletal discomfort and workstation ergonomics, while group discussions offered qualitative insights into employees' challenges and experiences with prolonged laptop use. It is anticipated that this combined approach will highlight significant ergonomic deficiencies, particularly in areas such as lower back support, neck posture, and workstation design, which contribute to musculoskeletal discomfort and decreased productivity.

By combining these approaches, this paper seeks to answer key questions: What are the most common ergonomic issues employees face when using laptops for extended periods? What improvements can be implemented to mitigate the risks associated with prolonged laptop usage? By addressing these concerns, the study aims to provide actionable insights that enhance workplace safety, minimize health risks, and improve overall productivity.

## 2. Methodology

The study employed structured interviews using CMDQ, direct observation using ROSA, and group discussions as the primary tools for data collection. Posture using laptops was the central focus of the study, as laptops are widely used in professional settings and often contribute to ergonomic issues.

### 2.1 Data Collection

This study employed quantitative research design, using CMDQ and ROSA to evaluate workstation ergonomics among 17 office employees. The CMDQ captured participants' perceptions of physical discomfort, while ROSA provided observer-based evaluations through visual observation. Together, these methods offered a comprehensive overview of ergonomic risks in the office environment.

### 2.2 Cornell Musculoskeletal Discomfort Questionnaire

CMDQ was used to collect data. The survey form consists of questions which refer to nine body parts as shown in Figure 5. The nine body parts are three upper limb segments (shoulder, upper arm, and lower arm), three lower limb segments (hips/thighs, knees, ankles/feet), and three trunk segments (neck, upper back, and lower back). The workers need to fill in the information about any body part that they feel discomfort or pain over the past week. The scores outcome from the questionnaire can be analysed by grading the rating scores to more easily identify the most serious problems, as follows:

*Never = 0*

*1-2 times last week = 1.5*

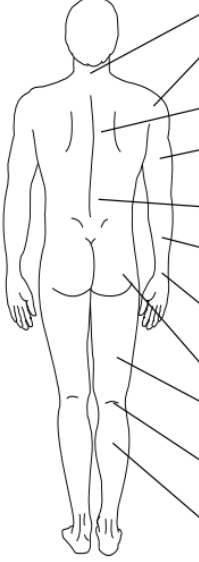
*3-4 times last week = 3.5*

*Once every day = 5 (Workday)*

*Several times every day = 10 (e.g., averaging 2 times per workday)*

This scale assists participants in identifying how frequently they experience discomfort or pain in specific body locations, which is useful for analysis and determining appropriate actions (Fig. 1).

The diagram below shows the approximate position of the body parts referred to in the questionnaire. Please answer by marking the appropriate box.



	During the last work week how often did you experience ache, pain, discomfort in:					If you experienced ache, pain, discomfort, how uncomfortable was this?			If you experienced ache, pain, discomfort, did this interfere with your ability to work?		
	Never	1-2 times last week	3-4 times last week	Once every day	Several times every day	Slightly uncomfortable	Moderately uncomfortable	Very uncomfortable	Not at all	Slightly interfered	Substantially interfered
Neck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shoulder (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upper Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upper Arm (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lower Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forearm (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wrist (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hip/Buttocks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thigh (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knee (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lower Leg (Right) (Left)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Fig. 1: Self-Assessment Musculoskeletal Pain by DOSH 2017

### 2.3 Rapid Office Strain Assessment (ROSA)

ROSA is a picture-based posture checklist that quantifies risk exposure in an office setting. ROSA is based on various picture-based checklists and chart grading systems. The ROSA process aims to act as a screening tool for identifying priority areas in large office-based organizations [7]. To use ROSA, an observer will choose the appropriate scores depending on the user as their workstation.

#### 2.3.1 ROSA Scoring Method

The Rapid Office Strain Assessment (ROSA) is an ergonomic evaluation tool designed to assess workstation setups and identify potential risks associated with prolonged office work. This method focuses on three main workstation components: *chair assessment, monitor and telephone positioning, and keyboard and mouse setup*. In the chair assessment, factors such as seat height, depth, armrests, and back support are evaluated. A well-adjusted chair should support a neutral sitting posture, allowing knees to bend at a 90-degree angle with proper lumbar support. If a chair lacks adjustability or forces awkward postures, it results in a higher ROSA score. The monitor and telephone positioning section evaluates whether the computer screen is at eye level and within arm's reach to prevent excessive neck bending. A poorly placed monitor or frequent phone use without a headset contributes to ergonomic strain. Lastly, the keyboard and mouse setup focus on wrist and arm positioning. An ideal setup ensures that wrists remain neutral while typing, and the mouse is placed within easy reach. Poor hand positioning, extended wrist angles, or improper keyboard height increase the ROSA risk level. Each section's scores are combined to determine the final ROSA score, with additional adjustments based on workstation usage duration. A low score (1-3) indicates minimal risk, a medium score (4-5) suggests improvements are needed, and a high score (6 or above) signals an urgent need for ergonomic adjustments. By implementing simple interventions such as adjusting chair height, using external keyboards, or elevating screens, organizations can significantly reduce strain and promote a healthier workplace [7].

### 2.4 Focused - group Discussion

A participatory approach was employed to develop the recommendations in this study, ensuring both practicality and acceptance among stakeholders. Employees actively contributed insights into ergonomic

challenges and potential solutions during facilitated group sessions. These discussions allowed workers to share firsthand experiences and highlight issues specific to their work environments.

Simultaneously, meetings with management and the Health, Safety, and Environment (HSE) Corporate team were conducted to ensure the proposed solutions aligned with organizational goals and adhered to established ergonomic standards, including compliance with the Department of Occupational Safety and Health guidelines. All feedback collected during these sessions was meticulously documented and integrated into the final set of recommendations.

## 2.5 Data Analysis

Microsoft Excel was used to examine quantitative data from CMDQ and ROSA to estimate the prevalence and severity of ergonomic risks and discomfort. To find trends in musculoskeletal discomfort and workstation dangers, descriptive statistics such as percentages and frequency distributions were calculated in Excel. The ROSA ratings were evaluated and classified into risk levels to identify what ergonomic modifications were required. Meanwhile, qualitative data from group talks were thematically examined to identify common themes and proposals. These themes were then combined into recommendations targeted at improving workstation layouts, lowering musculoskeletal discomfort, and increasing overall workplace ergonomics.

## 3. Results and Discussion

The CMDQ was used to identify musculoskeletal discomfort symptoms among workers, focusing on frequency, intensity, and interference across various body regions. It highlighted areas most affected by prolonged laptop use and sedentary work habits, providing insights into ergonomic issues requiring attention.

The ROSA methods assessed workstation's alignment with an ideal office setup by scoring key elements such as the chair, screen, keyboard, mouse, and telephone. During the evaluation, the worker was observed at their station, and the setup was documented using images as needed for further analysis.

In this study a total of 17 participants were evaluated using the CMDQ and ROSA method to explore musculoskeletal discomfort symptoms and to determine ergonomic risks in their workplace arrangements.

**Table 1:** Demographic Information of Participants (N=17)

	Category	Frequency (n)	Percentage (%)
<b>Gender</b>	Females	9	52.94
	Males	8	47.06
<b>Age</b>	20-29	9	52.94
	30-39	6	35.29
	40-49	2	11.76
<b>Marital Status</b>	Single	7	41.18
	Married	10	58.82

### 3.1 MDQ Finding

Table 2 shows the musculoskeletal symptoms among office workers, categorized by body areas. In this study, 17 participants experienced discomfort in a variety of bodily areas, including the neck, shoulders, upper back, upper arms, lower back, forearms, wrists, hips/buttocks, thighs, knees, and legs. The lower back was found as the most common cause of discomfort. The least reported discomfort was on the left forearm, left thigh, and left knee, with only 4 respondents reporting issues with each of these areas.

**Table 2:** Musculoskeletal Complaint Among Office Workers (N=17)

Body Part Area	Prevalence	Frequency				Intensity			Interference		
		1-2 times	3-4 times	once every day	Several Times a Day	Slightly	Moderately	Very Uncomfortable	Not at All	Slightly	Substantially
Neck	10	7	2	1	-	7	2	1	2	7	1
Right Shoulder	6	3	1	1	1	4	2	-	1	5	-
Left Shoulder	6	4	1	-	1	-	1	-	1	5	-
Upper back	9	7	-	1	1	5	3	1	5	3	1
Right Upper Arm	6	5	-	1	-	5	1	-	3	3	-
Left Upper Arm	5	5	-	-	-	4	1	-	2	3	-
Lower Back	11	8	-	1	2	7	3	1	7	3	1
Right Forearm	6	6	-	-	-	6	-	-	5	1	-
Left Forearm	4	4	-	-	-	4	-	-	3	1	-
Right Wrist	7	5	2	-	-	7	-	-	5	2	-
Left Wrist	5	4	1	-	-	5	-	-	3	2	-
Hip/Buttocks	5	4	1	-	-	4	-	1	1	2	2
Right Thigh	5	4	1	-	-	4	1	-	3	1	1
Left Thigh	4	3	1	-	-	3	1	-	2	1	1
Right Knee	5	5	-	-	-	5	-	-	2	3	-
Left Knee	4	4	-	-	-	4	-	-	2	2	-
Right Lower Leg	6	5	-	1	-	5	1	-	4	1	1
Left Lower Leg	5	4	-	1	-	4	1	-	3	1	1

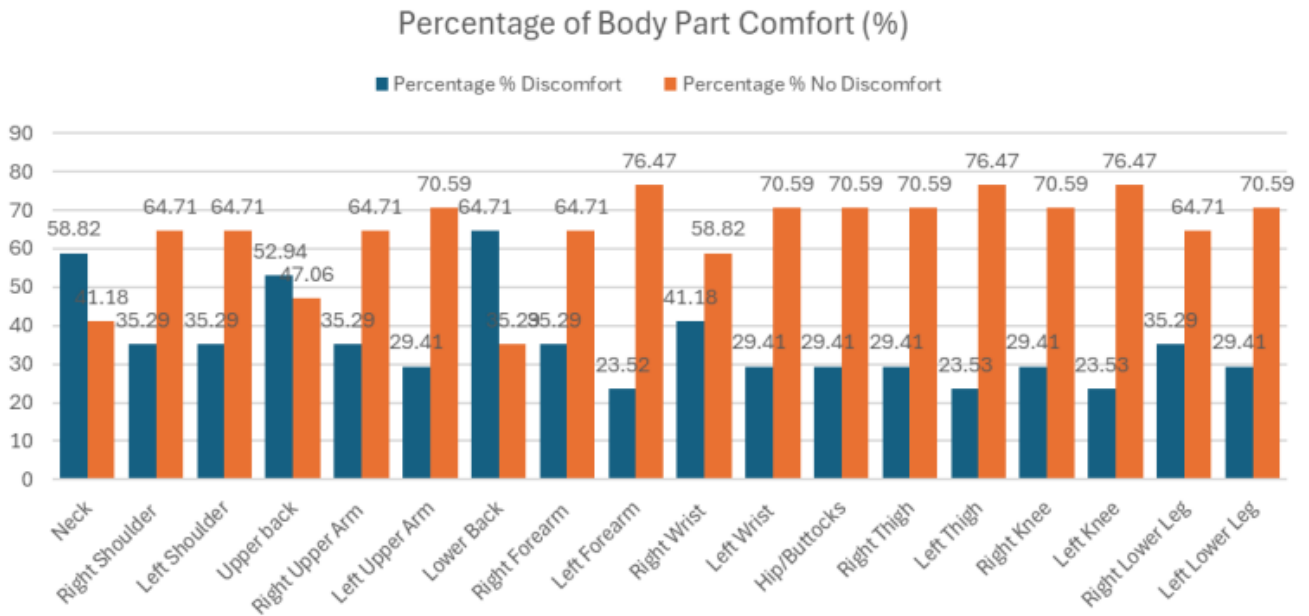
### 3.1.1 Percentage of Discomfort Complaints

Fig. 4 below shows the percentage of discomfort complaints collected from office workers. According to the data, the lower back was the most affected area, with 64.71% of participants reporting discomfort. This can be attributed to prolonged sitting and poor ergonomic practices, such as inadequate lumbar support or improper workstation setup. Followed by the neck area, which was 58.82%, then the upper back, with 52.94% discomfort, likely due to static postures and excessive screen time.

Discomfort in the *right wrist* was also significant, affecting 41.18% of participants, potentially due to repetitive hand movements and inadequate wrist support. Other commonly reported areas of discomfort included the *shoulder*, *right upper arm*, *right forearm*, and *right lower leg*, each at 35.29%. Additionally, 29.41% of workers reported discomfort in the *left upper arm*, *left wrist*, *hip/buttocks*, *right thigh*, *knee*, and *lower leg*.

The least reported areas of discomfort were the *left forearm*, *left thigh*, and *left knee*, each at 23.53%, suggesting less strain on these regions.

These findings highlight the importance of ergonomic interventions to reduce musculoskeletal discomfort among office workers, particularly those involving adjustments to workstation design, posture correction, and incorporating regular breaks.



**Fig. 3:** Percentage of Musculoskeletal Complaint Among Workers (N=17)

### 3.2 ROSA Finding

ROSA was used to evaluate workstation ergonomics, identifying key risk factors and areas requiring improvement. The findings from this assessment are presented below

#### 3.2.1 ROSA Risk and Action Levels

ROSA risk was evaluated using a scoring system ranging from 1 to 10, categorized into five levels of severity which was negligible, room for improvement, high, very high, and extreme. Each score corresponds to a specific risk level, guiding the necessary actions to mitigate ergonomic risks.

The framework used to assess ROSA risk and action levels is outlined in Table 3. This structured approach prioritizes ergonomic hazards and ensures the implementation of corrective measures, fostering workplace safety and compliance.

**Table 3:** ROSA Risk and Action Levels

Score	Risk	Level	Action
1	Negligible	0	No Action Required
1-4	Room for Improvement	1	Some Workstation Elements Can Be Improved
5	High	2	Action is Necessary
6-8	Very High	3	Action is Necessary as Soon as Possible
9-10	Extreme	4	Urgent action is Necessary

### 3.2.2 ROSA Final Score

Table 4 presents the distribution of participants across two ROSA risk levels. From a total of 17 participants, 7 participants (41.18%) fell under *Level 1 (Room for Improvement)* with a final score of 4. This indicates that while the overall risk was low, there were specific areas requiring ergonomic enhancements. Another 10 participants (58.82%) were classified under *Level 2 (High Risk)* with a final score of 5, suggesting that corrective actions were necessary to mitigate identified ergonomic risks. Notably, no participants were categorized under *Level 3 (Very High Risk)* or *Level 4 (Extreme Risk)*, indicating that none of the assessed workstations posed immediate or severe ergonomic hazards. The absence of such high-risk levels reflects a relatively safer workplace environment.

**Table 4:** Result on ROSA Final Score

Participant	Section A	Section B	Section C	Monitor & Peripherals score	ROSA final score	Risk Level
Person 1	5	2	3	3	5	2
Person 2	4	2	1	2	4	1
Person 3	4	1	5	1	4	1
Person 4	3	1	3	3	3	1
Person 5	4	1	3	3	4	1
Person 6	4	1	3	3	4	1
Person 7	5	2	5	5	5	2
Person 8	4	3	5	5	5	2
Person 9	4	2	3	3	4	1
Person 10	5	2	5	5	5	2
Person 11	5	2	5	5	5	2
Person 12	5	2	5	5	5	2
Person 13	4	2	3	3	4	1
Person 14	5	2	3	3	5	2
Person 15	5	1	4	4	5	2
Person 16	5	2	5	5	5	2
Person 17	4	3	3	3	4	1

### 3.2.3 Average Score of ROSA Score

Section A, chair assessment, received the highest score, indicating significant ergonomic concerns despite the chair being adjustable. The main issue was that essential components, such as seat pan depth, were non-adjustable and insufficient for all body types. Participants often had to lower the chair below their preferred height, causing misalignment and poor posture, particularly when their feet didn't reach the ground. This led to discomfort in the lower back, thighs, and hips during extended use

**Table 5:** Average Score of ROSA Score

Average Score: (Sum of Scores for all Participants)	
Section A	4.53
Section B	2.47
Section C	3.76
ROSA Grand Score	4.59
Action Level	Some Workstation Elements can be Improved

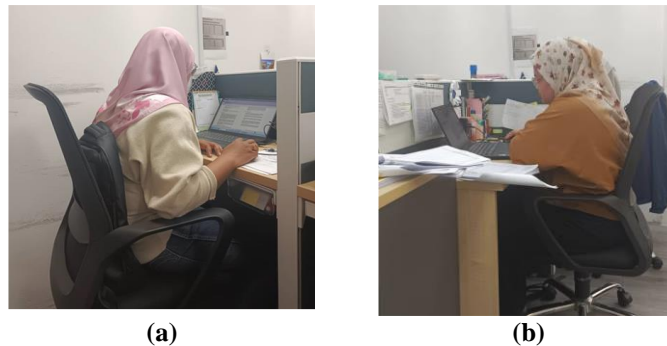
The seat pan depth was found to be another non-adjustable element. According to the National Institute for Occupational Safety and Health (NIOSH), proper seat depth ensures good sitting posture, supporting the low

back's natural curvature and preventing discomfort. Without this adjustment, participants experienced pressure on their thighs, reducing blood flow and contributing to musculoskeletal strain. Fixed-height worktables worsened the issue as participants lowered their chairs to match the table height, leading to awkward postures and strain on wrists, neck, and back, potentially causing long-term discomfort or injuries.



**Fig. 4:** Awkward Posture While Working

Section B (monitor and telephone), and section C (mouse and keyboard), the finding shows that some of the participants already used the laptop stands to elevate their screens to meet eye level. The employees that used laptop stands generally reported that neck discomfort reduced as this adjustment minimized the need to tilt the head downward to view the screen. However, many still experienced wrist and shoulder pain due to improper hand positioning while typing on raised laptops. The small size of the office tables further limited ergonomic hand placement, exacerbating discomfort and poor posture. The lack of space forced workers to handle materials at awkward angles, leading to additional neck strain and other ergonomic issues.



**Fig. 5:** (a) Awkward Hand Positioning; (b) Workers Need to Work with Materials at Awkward Angles

### 3.3 Discussion

The results of this study confirmed previous research on the prevalence of musculoskeletal discomfort among office workers, particularly in the lower back, neck, and upper back. [8] found that lower back pain was the most common complaint, while [12] noted that neck, lower back, and shoulder symptoms were the most prevalent. Additionally, the study's findings aligned with [9], who observed significant workstation deficiencies, including seating arrangement, monitor orientation, and keyboard setup. In this study, 58.82% of participants were categorized as "High Risk" (Level 2), which was consistent with these previous findings.

The impact of non-adjustable seating components on posture was supported by [10], who emphasized the importance of proper seat pan depth in ergonomic design. A well-adjusted seat depth ensured comfort, reduced pressure points, and prevented posture-related discomfort. Seats that were too deep or too shallow could lead to poor circulation or slouching, respectively.

Furthermore, challenges posed by fixed-height worktables, which led to awkward postures, aligned with the guidelines of the Department of Occupational Safety and Health [11]. These guidelines stressed the importance of workstation design, particularly table and chair height, to promote neutral postures and minimize musculoskeletal strain. Height-adjustable workstations were recommended for accommodating various body types and improving ergonomic comfort.

### 3.4 Developing Ergonomic Solutions

Group discussions were held to develop actionable recommendations for addressing the identified ergonomic challenges. These discussions, guided by data from the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) and the Rapid Office Strain Assessment (ROSA), involved employees, management, and the Health, Safety, and Environment (HSE) Corporate team. The CMDQ revealed discomfort in the neck, back, and wrist, while the ROSA highlighted risks such as poor screen positioning and lack of ergonomic peripherals.



**Fig. 6:** Discussion on recommendation

Based on these findings, the group proposed several solutions to improve workplace ergonomics and employee well-being:

- *Laptop Stands and External Peripherals:* Employees were encouraged to use laptop stands to elevate screens to eye level and adopt external displays, keyboards, and mice to reduce neck strain and wrist discomfort.
- *Workstation Upgrades:* Recommendations included using desks with enough depth for a 20-inch screen distance and installing height-adjustable laptop stands in shared workspaces
- *Behavioural Interventions:* The promotion of regular breaks and adherence to the 20-20-20 rule, which encourages taking a 20-second break every 20 minutes to focus on an object 20 feet away, helped address prolonged sitting and eye strain.

## 4.0 Conclusion

This study successfully identified ergonomic challenges associated with prolonged laptop use, including posture-related discomfort and repetitive strain injuries caused by improper workstation setups. Key issues such as non-adjustable worktables, misaligned chairs, and poorly positioned monitors contribute to musculoskeletal strain, particularly affecting the wrists, neck, shoulders, and back. The evaluation using the Rapid Office Strain Assessment (ROSA) highlighted critical shortcomings in ergonomic practices, especially in fixed-height tables and insufficient chair adjustability, which hinder optimal workstation alignment and increase discomfort.

To address these issues, several recommendations are proposed. Workstations should be equipped with adjustable furniture, including height-adjustable tables and ergonomic chairs with lumbar support and armrests. Monitors should be positioned at eye level, and external keyboards and mice should be utilized to promote a neutral wrist and arm posture. Additionally, implementing educational programs to raise awareness about proper ergonomic practices and encouraging regular breaks and posture adjustments can help mitigate the risk of strain injuries. By adopting these recommendations, workplaces can foster a healthier and more productive environment, reducing ergonomic-related discomfort and injuries while improving overall workplace well-being.

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## Conflict of Interest

It was declared that there were no conflicts of interest in relation to the publication of this paper. No financial or personal relationships had influenced the research or its findings.

## Author Contribution

The author affirms sole responsibility for all aspects of the research and manuscript preparation, including study conception and design, data collection, analysis and interpretation of results, and draft manuscript preparation. The author also reviewed and approved the final version of the manuscript.

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