

Staff Perceptions of Workplace Comfort and Working Postures within the Context of Office Ergonomics in an Information Technology Firm

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Abstract

Office ergonomics refers to an office setting that relates to items including chairs, desks, computers, and other elements that comprise an employee's workstation. Discomfort and injuries known as work-related musculoskeletal disorders (WMSD) are common issues among office staff due to poor office ergonomics. Office ergonomics issues can affect the productivity and work efficiency in various industries and business sectors. This study analysed the perception of staff on workplace comfort and working posture within the context of office ergonomics in an information technology (IT) firm. A questionnaire survey comprising of multiple section were used to collect the perception of staff on the office furniture provided and their working postures. In the survey, 51 (n) of 56 (N) staff members from selected departments of an IT company provided responses. The survey comprised three sections: staff perspectives on the working environment, nature of work, and its impact; a self-assessment of posture; and open-ended suggestions for workstation improvements. Results showed high comfort levels for the work environment, moderate comfort for job nature and conditions, and moderate influence of the work environment on staff. While most practiced proper posture, some were at risk for ergonomic issues due to poor practices. The majority agreed on the need for workstation improvements. As a result, it could be seen that the degree of comfort among office staff in the company is modest, and majority of staff are satisfied with the workstation and office chair that are provided by the organization.

1. Introduction

In most business premises, office worker tends to remain seated in a fixed position for a long time while working on their documents and computers. Hence, these workers need to be provided with a comfortable and efficient workspace. In ergonomics, comfort refers to a setting, tools, and systems that reduce discomfort, strain, and injury while continuing to optimize performance. Office workers are often in an awkward position for extended periods, which can cause musculoskeletal problems [1]. Ergonomic recommendations are proposed to avoid such issues [4]. Therefore, there is a significant need for evidence of ergonomic solutions' long-term

effectiveness. Nowadays, the concept of office ergonomics has gained significant attention in ensuring the well-being and productivity of employees [3, 5-7]. Office ergonomics plays a crucial role in reducing the prevalence of musculoskeletal disorders among office workers [2].

Therefore, this study sought to provide evidence on workplace comfort and working postures from the perspectives of office ergonomics among staff in an information technology (IT) company. Based on the initial study done in the company through observation, it was found that staff usually spent a long time at their desks and focused on the computer. In addition, the office chairs used were not uniform and not well maintained. Staff were not provided with ergonomically designed office equipment, and most staff lacked understanding and awareness of ergonomics. Hence, this study aims to identify workplace comfort levels among office staff in an IT firm, assess their views on the overall workplace comfort of office furniture provided by the organization, and examine their posture and work practices.

2. Methodology

This study involved several main phases in sequential activities. The activities are shown in Fig. 1 in the form of process flowchart.

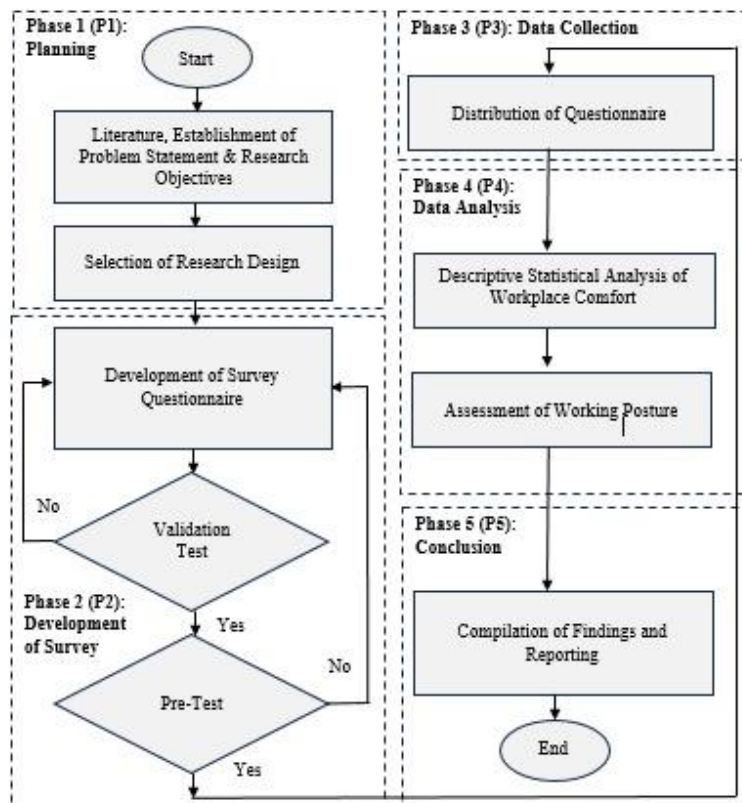


Fig. 1: Framework of studies implementation process

2.1 Research Design

Numerical data was used to convey the research findings. A quantitative research design approach was utilized for data collection and analysis. This approach employed survey questionnaires and statistical analysis to ensure objectivity and reliability, aiming to produce generalizable and replicable findings that contribute to a comprehensive understanding of the research problem. This study was conducted within an information technology (IT) firm located in Sri Petaling, Kuala Lumpur, Malaysia, that specialized in delivering state-of-the-art, web-enabled supervisory control and data acquisition (SCADA), security, and technological solutions for a wide range of industrial needs. This study focused on the office staff and ergonomic conditions of the headquarters office workplace in Sri Petaling. As an IT-focused firm, the staff primarily worked on computers for the entire working day. Despite having some staff working on-site, the majority were those who worked directly in front of computers. These staff included roles such as R&D software and hardware, software testing, quality assurance, staging, marketing IMS and SCADA, project software and hardware, procurement, and many more who were responsible for ensuring smooth operations, documentation, development, and processing. These employees were prone to ergonomic issues such as back pain due to spending entire working hours seated.

2.2 Data Collection Method

The primary data were gathered to assess the overall level of staff comfort at work based on staff perceptions and overall satisfaction. This data collection method was executed through a shared survey form via staff email, allowing staff to complete it at their preferred time. Survey questionnaire is particularly used in this study as it enables standardized responses that facilitate easy comparison and statistical analysis to draw conclusions about the surveyed population. The survey includes questions that covers respondent's demographic detail, staff perspective on the level of workplace environment comfortability and self - assessment of postures during work. The set of survey questionnaires are as shown in Appendix A.

2.3 Descriptive Analysis

This data analysis helps clarify, illustrate, and summarize data points, allowing patterns within the data to emerge as it provides insights into the distribution and characteristics of the data. The collected data based on items 1 - 15 of the questionnaire in the second section (workplace comfort) were computed as means and ratings of mean score. The level of mean scores were interpreted using the ratings method as shown in Table 1.

Table 1: Interpretation of mean score [3]

Mean Score	Level
4.30 - 5.00	Very high
3.50 - 4.29	High
2.70 - 3.49	Moderate
1.90 - 2.69	Low
1.00 - 1.89	Very low

The questions in the third section (working postures) focused on gathering information from office staff about their typical body positions during work tasks. This data signifies posture-related risks and ergonomic concerns within the workplace. The collected data for the purpose of assessment was then analysed and presented as frequencies and percentages. The analysis of staff suggestions for workstation improvements based on closed-ended questions of items 16 - 17 in the second section (workplace comfort) involved examining responses to specific and predefined questions about potential changes to the work environment. These questions typically asked office staff to rate a range of possible improvements including a better working station. The responses are quantified and presented in the forms of mean score.

3. Results and Discussion

This section presents the finding of the study and discusses their implications, structured to cover both the results and their interpretation.

3.1 Descriptive Analysis

A demographic analysis was conducted to examine the background information of the respondents. The survey was conducted with 56 staff and a total of 51 responses were successfully retrieved. Summary of the demographic profiles of the respondents (n = 51) in terms of frequency and percentage, based on the first section (staff demographics) of the questionnaire are shown in Table 2 of demographic profiles of respondents. This demographic breakdown provides a clear understanding of the composition of the respondents in this study.

Table 2: Demographic profiles of respondents

n = 51	Frequency (f)	Percentage (%)
Department:		
R&D Hardware / Software	39	76.47%
Software Testing	4	7.84%
QA	2	3.92%
IT	3	5.88%
Human Resources & Admin.	3	5.88%
Gender:		
Male	27	52.9%
Female	24	47.1%
Age (years):		

20 - 25	9	17.6%
26 - 30	14	27.5%
31 - 35	12	23.5%
36 - 40	5	9.8%
41 - 45	3	5.9%
46 - 50	5	9.8%
Above 50	3	5.9%
Length of employment (years)		
1 - 2	12	23.5%
3 - 5	13	25.5%
6 - 10	8	15.7%
Above 10	10	19.6%
Less than 1 year	8	15.7%
Working hours per day:		
8 hours	34	66.7%
Above 8 hours	15	29.4%
Flexible / Less than 8 hours	2	3.9%
Location where you spend most of your working hours:		
Unit 3, Ground floor	7	13.7%
Unit 1 & 3, Level 1	8	15.7%
Unit 1 & 3, Level 2	26	51%
Unit 15 & 17, Ground floor	3	5.9%
Unit 15 & 17, Level 1	5	9.8%
Unit 15 & 17, Level 2	2	3.9%

3.2 Analysis Result of Workplace Comfort, Working Postures and Workstation Improvements Suggestion

The descriptive analysis of workplace comfort in the first section of the questionnaire has been carried out and results are presented using mean score as summarized in Table 3 mean score of workplace comfort. Through the 51 responses received from the staff of the specific department that the survey was conducted; it could be seen that the staff find their comfort level at the workplace to be moderately comfortable. Meanwhile, the results for the second section of the questionnaire are presented as frequencies and percentages as shown in Table 4 working postures of office staff. For the third section, which were staff suggestions for workstation improvements that are retrieved from the first section of questionnaire, the results are presented as frequencies and percentages in Table 5 for staff suggestions of workstation improvements.

Table 3: Mean Score of workplace comfort

First Section (Workplace Comfort)	Mean Score	Level of Workplace Comfort
Items 1 - 7: Staff's perception on their work environment provided by the company	3.60	High
Items 8 - 12: Nature of work and the working conditions in the office	3.20	Moderate
Items 13 - 15: Impact of the work environment and conditions on the staff	2.70	Moderate

Table 4: Working postures of office staff

Second Section (Working Postures)	Category	Frequency (f)	Percentage (%)
Item 1: Dual – screen user			
Yes	Na	39	76.5%
No	Na	9	17.6%
More than 2	Na	3	5.9%
Item 2: Position of monitor			
Angle on right side	Na	25	49%

In the center	Na	16	31.4%
Angle on left side	Na	10	19.6%
Item 3: Knee angle while seating			
Knees at 90 deg.	Correct posture	43	84.3%
Knees too low < 90 deg.	Bad posture	1	2%
Knees too high > 90 deg.	Bad posture	5	9.8%
Foot not touching the floor	Bad posture	1	2%
Insufficient space under desk	Bad posture	1	2%
Item 4: Hand position when placed on arm rest			
Shoulders relaxed and elbows supported in line with shoulders	Correct posture	32	62.7%
Shoulders are shrugged due to armrest being too high, or arms are unsupported due to armrest being too low	Bad posture	12	23.5%
Hand is rested too wide	Bad posture	7	13.7%
Item 5: Back position when sitting or leaning			
Adequate lumbar support	Correct posture	23	45.1%
Chair not reclining	Bad posture	14	27.5%
Chair is angled too far back	Bad posture	10	19.6%
Chair is angled too forward	Bad posture	4	7.8%
Item 6: Position when looking at the monitor while sitting			
Screen at eye level and arm's length distance (40 – 75 cm)	Correct posture	26	51%
Screen is too low (below 30) and too far	Bad posture	12	23.5%
Screen is too high	Bad posture	2	3.9%
Neck is twisted to view the monitor	Bad posture	11	21.6%
Item 7: Hand position while using the mouse			
Mouse is in line with shoulder	Correct posture	37	72.5%
Have to reach for the mouse	Bad posture	12	23.5%
Mouse is on different surface	Bad posture	2	3.9%
Item 8: Hand position while using the keyboard			
Wrist straight and shoulder relaxed	Correct posture	26	51%
Wrist is extended and keyboard is at positive angle	Bad posture	20	39.2%
Hand deviated while typing	Bad posture	5	9.8%
Keyboard is placed too high	Bad posture	0	0%

Table 5: Staff feedback for workstation improvements

Staff feedback for Workstation Improvements within the First Section (Workplace Comfort)	Mean Score	Level of Mean Score
Item 16: I wish to have a better chair or working station	4.10	High
Item 17: I think better chairs and workstations can increase productivity at work	4.50	Very high

3.3 Key Findings

Through the study, it is evident that the office staff in an IT firm have a moderate level of workplace comfort. Three measures of respondents' comfort levels were recorded in the first section of the survey: high for staff perceptions of the company-provided work environment, moderate for the nature of work and office conditions, and moderate for the influence of work environment and staff conditions. It was evident from the second section of the survey, which asked office staff to rate their own posture, most staff work with proper posture and practice. Nonetheless, the results indicated that certain staff who participated in the study were at risk for ergonomic issues because of their poor work practices and posture. In addition, majority of staff agree that improvements should be made because they are thought to boost productivity at work, according to the third section of the survey, which asked open-ended questions about workstation improvements related to workplace comfort.

4. Conclusion

In conclusion, the degree of comfort among office staff in the company is modest, and majority of staff are satisfied with the workstation and office chairs that are provided. To accommodate the requirement for variety among the staff, the office furniture could be improved. Although most staff's responses were positive, the small percentage of non-comfortability responses should not be neglected. Basing on the key findings, it is recommended for the organization to conduct campaigns and training on the right working postures, inculcate awareness on impact of sedentary lifestyles, introduce adjustable table as part of the working area to promote more movements while working, provide chair with proper back support and adjustable arm rest and lastly to encourage staff taking a 5 to 15 minutes break after every 75 to 90 minutes of work.

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Conflict of Interest

Authors hereby declare that there is no conflict of interest regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Nurihan Zakaria, Rahim Jamian, Elya Atikah Ismail; **data collection:** Nurihan Zakaria; **analysis and interpretation of results:** Nurihan Zakaria, Rahim Jamian, Elya Atikah Ismail; **draft manuscript preparation:** Nurihan Zakaria, Rahim Jamian. All authors reviewed the results and approved the final version of the manuscript.

Appendix A: Employed Survey Questionnaire

Office Ergonomic Evaluation Among Staff

Name	:	
Department	:	
Designation	:	
Gender	:	

Staff's Demography Details

1. Age range
 - a. 20 – 25 years old
 - b. 26 – 30 years old
 - c. 31 – 35 years old
 - d. 36 – 40 years old
 - e. 41 – 45 years old
 - f. 46 – 50 years old
 - g. > 50 years old
2. How long have you been working for Willowglen? (If less than a year, kindly state the month)
 - a. 1 – 2 years
 - b. 2 – 5 years
 - c. 5 – 10 years
 - d. > 10 years
 - e. Other _____
3. Range of working hours per day (Not including break time)
 - a. 8 hours
 - b. More than 8 hours
 - c. Flexible – less than 8 hours
4. In the office, where do you mostly spend your time working?
 - a. Unit No. 3 Ground floor
 - b. Unit No. 1 & 3 Level 1
 - c. Unit No. 1 & 3 Level 2
 - d. Unit No. 15 & 17 Ground floor
 - e. Unit No. 15 & 17 Level 1
 - f. Unit No. 15 & 17 Level 2

Staff's Comfort Level at Work

This set of questions is using Likert Scale;

- 1 - Totally disagree
- 2 - Disagree
- 3 - Neutral, neither agree nor disagree
- 4 - Agree
- 5 - Totally agree

Kindly choose your answer from the scale below and ensure to choose based on your own state of comfortability at work.

No	Comfortability Description	Comfort level				
		1	2	3	4	5
1	My office chair is comfortable					
2	My office chair is in a good condition					
3	The height of my office chair can be adjusted					
4	When seating, my feet touch the floor					
5	There is an adequate back support on my office chair					
6	I have felt pain in my back/body during or after working hours					
7	I have felt pain in my neck while and after working hours					
8	The height of my workstation is suitable for me					
9	It is easy to reach the item and documents on my table					
10	I find myself slouching or leaning forward while working on my workstation					
11	I find myself shrugging my shoulders due to the table being too high					
12	I often have to cradle my phone between ear and shoulder while working					
13	I have felt pain in my wrist and hand due to my work					
14	While working, my hand/wrist/forearm is placed on the edges of the workstation					
15	I often had to perform tasks with an awkward wrist/elbow angle/hand placement for extended periods (>more than 2 to 3 hours with no break)					
16	I wish to have a better chair or working station					
17	I think better chair and workstation can increase productivity at work					

Staff's Posture Self – Assessment

Following the set of questions below, kindly choose the answers that depict your situation while working the best.

1. Are you a dual – screen user?

- a. Yes
- b. No
- c. More than 2

2. What is the position of your monitor?



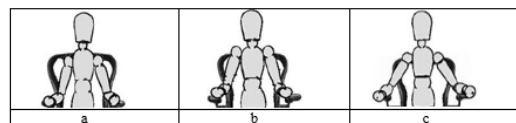
- a. Angled on right side
- b. In the center
- c. Angled on left side

3. What is your knee angle while seating?



- a. Knees at 90
- b. Knees too low <90
- c. Knees too high >90
- d. Foot not touching the floor
- e. Insufficient space under desk

4. What is your hand position when placed on arm rest?

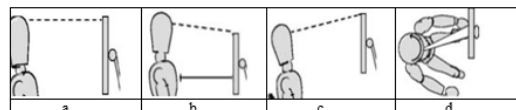


- a. Shoulders relaxed and elbows supported in line with shoulders
- b. Shoulders is shrugged due to armrest too high or arms is unsupported due to armrest being too low
- c. Hand is rested too wide

5. What is your back position when sitting or leaning?

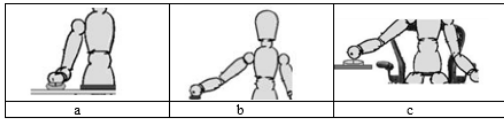
- a. Adequate lumbar support – Chair reclined between 95 – 110
- b. Chair not reclining
- c. Chair is angled too far back
- d. Chair is angled too forward

6. What is your position when looking at the monitor while sitting?



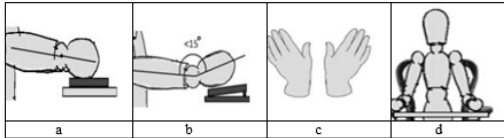
- a. Screen at eye level and arm's length distance (40 – 75 cm)
- b. Screen is too low (below 30) and too far
- c. Screen is too high
- d. Neck is twisted to view the monitor

7. What is your hand position while using the mouse?



- a. Mouse is in line with shoulder
- b. Have to reach for the mouse
- c. Mouse is on different surface

8. What is your hand position while using the keyboard?



- a. Wrist straight and shoulder relaxed
- b. Wrist is extended and keyboard is at positive angle
- c. Hand deviated while typing
- d. Keyboard is placed too high

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