

AN ERGONOMICALLY STUDY OF SEATED WORKSTATION

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ABSTRACT

This paper analyses sitting workstation ergonomics.. Ten subjective measurements (02 female and 08 male) are obtained for the college's used computer application lab, which has a computer and a red chair. Subjective work on a computer for two and four hours, and then they completed a Google form questionnaire with eleven questions, five of which were about their names, ages, and genders, as well as their physical pain levels while using the computer for those two and four hours. The final six questions centre on bodily discomfort indicators such back, neck, and foot swelling for working positions two and four. Results from a Google form analysis suggest that both men and women experience increased back discomfort. swelling in the neck rather than the feet.

Keywords: Ergonomic, male, female, operator

I. Introduction

Ergonomics concern how working condition and physical task effect on body of operator .Ergonomically design workstation improve performance of operator and increasing the productivity [1 and 2]. Two different temperature condition of overhead work period.No effect in MVC, as a sign of overall muscle fatigue [3].The study by comparing sick leave statistics shows that eight hour daily shift of 408 sewing machine operator have musculoskeletal complaints. [4] The decrease productivity and error is increasing in work of hospital nurses and harvesting worker when the working hours increase of extended work shiftsand overtime and night shift. [5-6].The current research finding that the long working hours causes an accidents and injuries to operators. [7] The study gives relationship between work time, job difficult gives to result positive and negative. The positive aspects focus on control work time and job complexity to give satisfaction and family balance .The negative aspect focus that increase work time and job complexity result to unsatification and work family balance. [8-9] 78% of worker of forest report that fatigue was experienced sometimes because of long working hours sleep reduce. [11] Laboratory have more than 25 computer and taken red chair having no adjustment of height of chair. Ten subjective 02 female and 08 males are participated in this study.

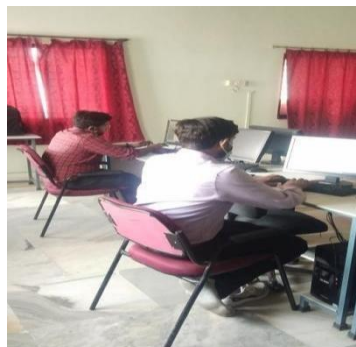


Fig. 1. Subjective Task doing on computer

II. Material

The study was conducted in the computer software Application Laboratory of the Mechanical Engineering Department of college.



Fig. 2. Red Chair used for Doing task oncomputer

III. Methodology

The selected task was given to ten subjective totyping the documents on Microsoft office words on computer using keyboard and mouse for two and four hours using only with red chair. Ten subjective done tasks without break having water bottle .All Tube light and fans areon in computer software laboratory. All ten Subjective age ranges from 21 to 60 Years. Google form with questionnaire send to ten subjective mobile what up number after task complete, they submit the Google form

A. Google Forms

The Google form have eleven question .out of eleven question five are like Name, age range, gender and following question about body pain are as

1)When you work on computer for two hour on red chair in computer software Application lab, then you have pain

- a) Head
- b) Neck
- c) Eyes
- d) Back
- e) Foot
- f) Knee

2)When you work on computer for four hour on red chair in computer software Application lab, then you have pain

- a) Head
- b) Neck
- c) Eyes
- d) Back
- e) Foot
- f) Knee

And Remaining six question out of eleven are used Scale are as follows

TABLE I. Table shows scale

Number of Scale	Description
01	strongly disagree

02	disagree
03	slightly disagree
04	neither agree nor disagree
05	slightly agree
06	agree
07	strongly agree

Following are six questions in Google formused scale
To given answer

- 1)If you have pain in Neck (Two hoursduration Works)
- 2)If you have pain in Neck (four hours durationWorks)
- 3)If you have pain in Back (two hours durationWorks)
- 4)If You have pain in Back (four hoursduration Works)
- 5)If You have swelling in foot (two hoursduration Work)
- 6)If you have swelling in foot (four hoursduration Works)

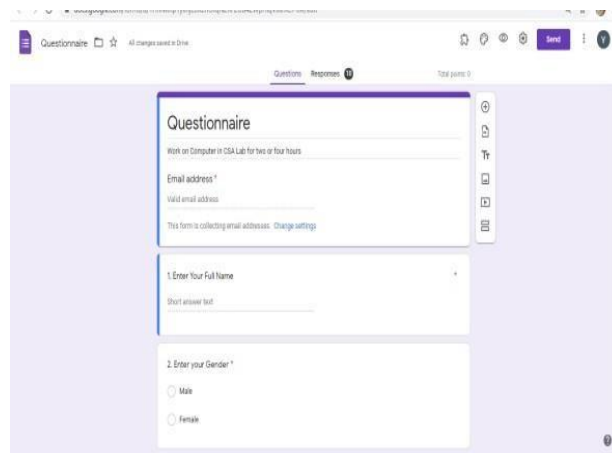


Fig. 3. Google form of Questionnaire

IV. Result And Discussion

After the task on computer of four hour completed by 10 subjective, they submit the Google form having eleven questions. Eleven question result and discussion are as follows

A. Work time from two to four hours

All 02 female and 08 male operator Reponses data were summarized in Table II and III using Google form responses shows that increasing the working from two to four hour’s body pain parameters like back ,Neck, hands, eyes, knee, foot, head also increases.

Figure 4 shows for two hours working of male and female operators have 70% back,50% Neck,40% eyes ,20% head ,0% knee,0% foot , 0% hands pain. Figure 5 shows for four hours working of male and female operators on computer have 90% back ,70 % Neck ,70% eyes,30% head ,20 % Hands,10% knee,10% foot pains.

TABLE II. Effect of Increasing working hourson female

Gender	Age	Work for two hours	Work for four hours
Female	41-50	Neck, Back, Head	Neck, Back, Foot, Head, Eyes
Female	31-40	Eyes	Eyes

TABLE III. Effect of Increasing working hourson male

Gender	Age	Work for two hours	Work for four hours
Male	31-40	Back, Head	Neck, Back, Head, Eyes
Male	31-40	Neck, Eyes	Neck, Back, Eyes, Hands
Male	21-30	Neck, Back, Eyes	Neck, Back, Knee, Eyes, Hands
Male	31-40	Back	Back, Eyes
Male	21-30	Neck, Back	Neck, Back, Eyes
Male	41-50	Eyes	Back
Male	41-50	Back	Neck, Back, Head
Male	31-40	Neck, Back	Neck, Back

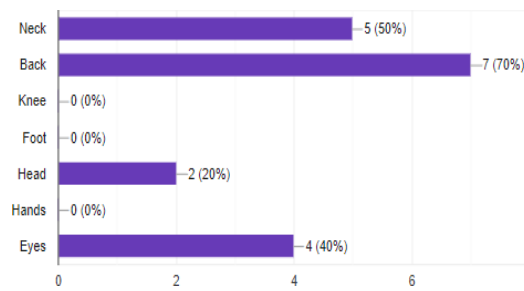


Fig. 4. Effect of body pain in percentage fortwo hour work.

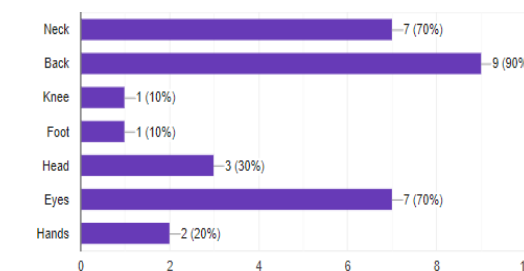


Fig. 5. Effect of Body pain in percentage forfour hour work

B.Effect of Working works using Scale

Six question ask in Google form to 10 subjective using scale have 01 to 07 number using three main parameter Back , Neck , Foot Swelling pain for two to four hours working.

1)Neck pain: Figure 6 indicate the neckpain effect on 08 male and 02 female operators working on computer for two hours shows 30

% agree,30% Slightly agree, 10% strongly agree have neck pain ,20% neither agree nor disagree. 10% disagree Figure 7 neck pain effect on 08 male and 02 female operators working on computer for four hours shows 50 % Slightly agree, 30% strongly agree ,10% agree have neck pain ,10% neither agree nor disagree.

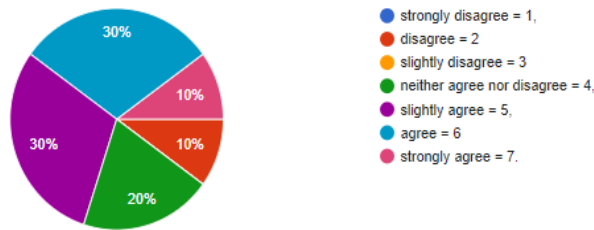


Fig. 6. Effect of Neck pain in for two hour work

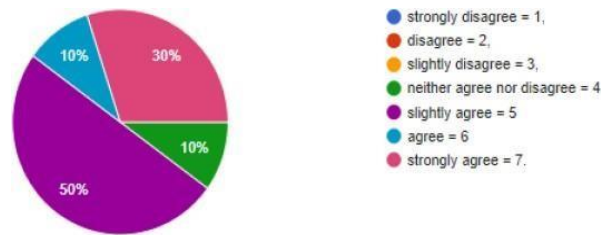


Fig. 7. Effect of Neck pain in for four hour work

2) Back pain: Figure 8 shows the nback paineffect on 10 subjective working on computer for two hours shows 40 % agree,30% Sligtly agree, 20% strongly agree have neck pain ,10% neither agree nor disagre. Figure 9 neck pain effect on 08 male and 02 female operators working on computer for four hours shows 30 % Sligtly agree, 50% strongly agree ,20% agree have back pain .

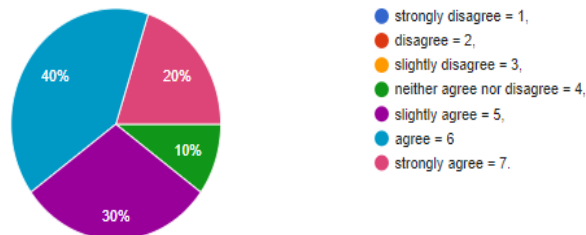


Fig. 8. Effect of back pain in for two hour work

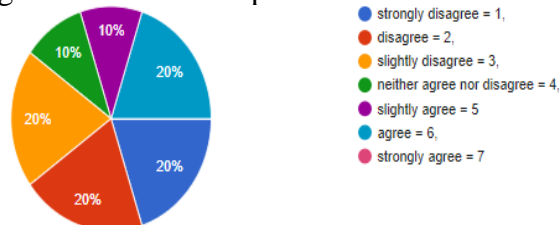


Fig. 9. Effect of back pain in for four hour work

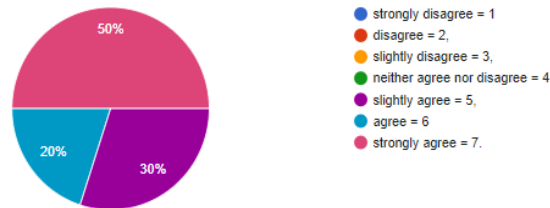


Fig. 10. Effect of foot swelling for two hour work

3)Foot Swelling: Figure 10 indicate the of foot swelling in 10 subjective for two hours shows 20 % agree,10% Slightly agree, have foot swelling pain ,10% neither agree nor disagree and 20% strongly disagree, 20% disagree,20% slightly disagree have not foot swelling.Figure 11 shows the effect of foot swelling 08 male and 02 female operators working on computer for four hours indicate 10% strongly agree ,20 % agree ,10 % Slightly agree, have foot swelling and 20% neither agree nor disagree 20% disagree ,20% strongly disagree have not foot swelling.

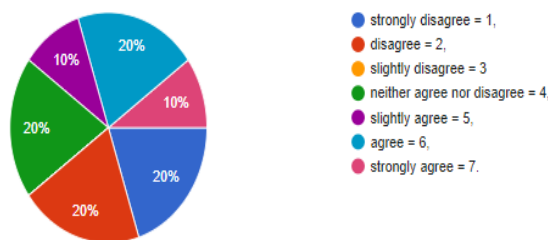


Fig. 11. Effect of foot swelling for fourhour work

V. Conclusion

After the analysis of Google forms of Questionnaire are following are conclusions

1. Conclude that from table II and III body pain parameter increase by working hours.
2. From figure 4 and 5 say that 70 % means 07 subjective suffering from back pain for two hours and 90 % means 09 subjective suffering from back pain.
3. From figure 6 and 7 say that 70 % agree for neck pain in two hours of work and 90% agree for four of work.
4. From figure 8 and 9, say that 90 % back pain for two hour work and 100 % backpain for four hour work.
5. There is slightly effect in knee, foot, head pain parameter.

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