Health Related Problems Due to Prolonged usage of Computers

S. Sathiyamoorthi 1, Dr. K. Mohan Kumar 2
1Research Scholar, Department of Computer Science, Rajah Serfoji Government College, Thanjavur, INDIA
2Research Guide & Head, Department of Computer Science, Rajah Serfoji Government College, Thanjavur, INDIA

ABSTRACT
Computers are used each and every walk of our life. People are using computers for long time in improper posture. It affects human being in lot of ways like neck pain, shoulder pain, thump pain, finger pain, obesity, vision problems etc. People get these problems without knowing the root cause for these problems. This research paper analyzes how people are affected by using computers and give some solutions to avoid those problems.

Keywords---- Electromagnetic Field, Carpal Tunnel Syndrome, Computer Vision Syndrome and Musculoskeletal problems

I. INTRODUCTION
Every electronic device including computers and laptops produce a form of Electromagnetic Field (EMF). This EMF is actually a non ionizing radiation which release energy from these electronic devices that is not enough to ionize the atoms, hence instead of removing electrons it only excites the electrons. This energy brings negative effects to human health. By using computers, laptops or even sitting in computerized workplaces an individual is exposed to the dangerous waves. These radiations may cause rapidly or slowly several health hazards. It means that individuals especially employees spending number of hours for working on computer are directly exposed to the harmful effects of EMF [1].

In the past three decades computers have significantly changed the working environment, simplifying and speeding up many tasks across many work areas. However, with these advances have come some potential health issues.

The following are the four potential health issues are associated with computer work [2][3]
1. Physical discomfort, pain or injury
2. visual discomfort
3. Stress
4. Fatigue

Physical discomfort
These are the problems that may affect muscles, connective tissues, tendons, ligaments, joints, bony structures, the blood supply, nerves and the skin.

Symptoms of Physical discomfort include:
• Pain
• Fatigue
• muscle discomfort
• Stiffness
• burning sensations
• Weakness
• Numbness
• Tingling

Visual Discomfort
It is estimated that globally, about 45 to 70 million people spend hours staring into a video display terminal, popularly known as computer screen. Several studies, mainly in developed countries, have shown an association between computer use and visual health related symptoms in both children and adults. Eye discomfort is a common health problem experienced by computer users.

The symptoms of visual discomfort include:
• Sore eyes
• red eyes
• Watery eyes
• Dry eyes
• eyes feeling ‘heavy’ or ‘gritty’
• blurring of vision
• Headaches

Stress
Stressors are events or circumstances that may lead to the perception that physical or psychological demands are about to be exceeded. Stress can occur in a wide range of computer use situations.

Symptoms of stress include:
Increasing distress and irritability;
- Physical aches and pains;
- Difficulty relaxing, concentrating or sleeping;
- Difficulty thinking logically and/or making decisions;
- Decreased enjoyment of work and/or feeling less commitment to work;
- Feelings of tiredness, depression or anxiety.

**Fatigue**

Fatigue is the temporary inability or decrease in ability to respond to a situation because of previous over-activity. This over-activity may be physical, mental or emotional in nature.

Another way of classification computer related health problems are Carpal Tunnel Syndrome, Computer Vision Syndrome and Musculoskeletal problems. This is the main notable medical problems that can arise from using computers. [4]

**Carpal Tunnel Syndrome**

CTS is a stress-related injury caused by repetitive movement of joints, especially the wrist, and can lead to numerous musculoskeletal problems. It has become very common among Computer professionals due to poorly placed computer components and extensive typing over a long period of time. Studies conducted show that one in eight computer professionals suffer from CTS. This study was conducted over 21 companies and the majority of sufferers said that they experienced acute and in some cases severe pain due to CTS. The main cause of CTS is acute positioning of the wrist while typing. This problem is exacerbated by the need for the user to be crouching towards the screen while typing. Different research conducted cites the mouse as being the main cause of CTS as it was found that among the fingers the right thumb was revealed to be more susceptible to CTS due to the acute position of the thumb while using the mouse. CTS, although prevalent, seems to be very difficult to ameliorate or cure due to the consistency in the design of computer components such as the mouse and the keyboard, but some companies are leading the way with technologies such as touch screen monitors which will reduce stress on the hand and wrist. [5] [6]

**Computer Vision Syndrome**

In many cases, frequent computer users suffer from computer vision syndrome, which is a degenerative eye problem which can result in severely reduced eyesight (Myopia), blurred vision, overall eye tiredness and even Glaucoma. Computer Eye Syndrome is an umbrella term for many problems but the causes of these problems can be easily identified. When using a computer due to the size and setup of the monitor and components it is necessary for the user to be within at least two feet of the monitor when performing any type of computational work. This presents many problems especially in older monitors due to an elevated amount of monitor glare; poor display quality and insufficient picture display refresh rates. Although these problems are more evident in older computers the newer models are not free from these problems either. Studies have been conducted into the correlation between computers and eye problems and it was found that the Ionizing radiation given off by monitors has severe detrimental effects on the eye and eyesight on a whole. They also state “Treatment requires a multidirectional approach combining ocular therapy with adjustment of the workstation” which shows these problems are quite easily solved with minimal investment from computer manufacturers through producing higher quality monitors with better resolution and refresh rates.

The most common form of Computer Vision Syndrome is a condition termed Dry Eye, which results in itchy, sore and even the illusion that something is stuck in the eye. This condition is often caused by extensively long period looking at a computer screen. [7]

**Musculoskeletal problems**

Another medical issue caused by the use of computers is back and posture problems. These problems relate to musculoskeletal disorders caused by the need for the user to be crouched and hunched towards the monitors and computer components due to the design and positioning of these particular computer peripherals. This hunching forward of the user causes posture and back problems but is also the cause of severe and acute pain in the upper back, particularly pain in the neck and or shoulders. A study was conducted where 2146 technical assistants installed a computer program to monitor the musculoskeletal pain they suffered and answered questionnaires on the location and severity of the pain. The study showed interesting results, as it detailed how in the majority of cases any pain suffered was aggravated and exacerbated by the use of computer peripherals like the mouse and keyboard but overall the pain did not originate from using computers. "Moreover, there seems to be no relationship between computer use and prolonged and chronic neck and shoulder pain". This is a positive study for computer manufacturers but although the pain may not originate from computer peripherals there is no doubt that the pain is exacerbated by their use and this revelation alone should lead computer manufacturers to pioneer new technologies that reduce the risk of posture or musculoskeletal problems aggravated by the use of poorly designed and linearly designed computer peripherals. [8]

So, special care should be taken by the people who use computers for long time. This research deals with the health related problems due to the prolonged usage of computers.

**II. MATERIALS AND METHODS**

For this research the following questionnaire (Figure-1) prepared and given to different category of computer users in our district. Based on the questionnaire...
method human health related problems due to prolonged usage of computers are analyzed.

III. FEEDBACK FORM

1. Name :
2. Address :
3. Gender : ☐ Male   ☐ Female
4. Age :
5. Category of users : ☐ Student   ☐ Business Man   ☐ Employee   ☐ Others
6. Purpose of using computers
   ☐ For Educational purpose   ☐ For Entertainment (Hearing songs, Watching Others (Specify) .................
   ☐ For Social Medias

If Business man( ☐ Small ☐ Medium ☐ Large Scale)
   ☐ Mailing Purpose
   ☐ For Social Medias
   ☐ For their website updating
   ☐ Others (Specify) .................

If Employee ( ☐ Teacher ☐ Professor ☐ Bank ☐ Rail way ☐ Others)
   ☐ For their office work
   ☐ For Social Medias
   ☐ For their personal work
   ☐ Others (Specify) .................

7. Frequency of usage per day
   ☐ < 1 Hour   ☐ > 1 and <3 Hours   ☐ 3 and < 5 Hours   ☐ 5 Hours
8. Problems
   ☐ Carpal Tunnel Syndrome (Disorder in wrist and fingers)
   ☐ Computer Vision Syndrome (reduced eye sight (myopia), blurred vision, eye tiredness)
   ☐ Musculoskeletal disorder(neck, back and posture problems)
   ☐ Others(Specify) .......................

9. Treatment details
   ☐ Physiotherapy
   ☐ Consuming Tablets
   ☐ Others(Specify) .......................
IV. RESULTS AND DISCUSSIONS

**Usage category**

The different category of computer users is shown in following Table-1.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>CATEGORY</th>
<th>NO.OF PEOPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMPLOYEE</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>STUDENT</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>BUSINESS MAN</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>OTHERS</td>
<td>14</td>
</tr>
</tbody>
</table>

Table-1: Category of computer users

The following Figure-2 shows the graphical representation of different category of users (Table-1) participated in this analysis.

**CATEGOR OF USAGE**

The above Figure-2 shows that the employees are using the computers (43%) for more hours continuously.

**Treatment taken detail**

The following Table-2 give the details about how many people affected (age-wise) and how many of them are taking treatment.

<table>
<thead>
<tr>
<th>AGE BETWEEN</th>
<th>NO.OF USERS</th>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-29</td>
<td>34</td>
<td>12</td>
</tr>
<tr>
<td>30-40</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>41 AND ABOVE</td>
<td>36</td>
<td>27</td>
</tr>
</tbody>
</table>
Table- 2: Age-wise affected and under treatment

The following Figure-2 is the graphical representation of above table.

<table>
<thead>
<tr>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-29</td>
</tr>
<tr>
<td>20%</td>
</tr>
</tbody>
</table>

Figure-2: Treatment taken age-wise

This Figure-2 gives the following information.

# People at the age above 41 are affected more and taking more care about their health.
# Young people are affected more in the next level but half of the affected young people taking treatment.

Gender wise affected detail

The following Table-3 gives the information about which gender of people is affected very much.

<table>
<thead>
<tr>
<th>Category</th>
<th>Participated</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>60</td>
<td>45</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>48</td>
</tr>
</tbody>
</table>

Table-3: Gender-wise of affected people

The following Figure-3 is the graphical representation of above table.

<table>
<thead>
<tr>
<th>AFFECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
</tr>
<tr>
<td>52%</td>
</tr>
</tbody>
</table>

Figure-3: Gender-wise affected percentage

This Figure-3 gives the following information.

# Female category is affected very much.
# Male category is participated in high but female affected more.
**Prolonged usage**

The following Table-4 gives the details about which kind of people using computers continuously.

<table>
<thead>
<tr>
<th>User Type</th>
<th>Prolonged users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>11</td>
</tr>
<tr>
<td>Business man</td>
<td>14</td>
</tr>
<tr>
<td>Employee</td>
<td>32</td>
</tr>
</tbody>
</table>

Table-4: People using continuously

The following Figure-6 shows the graphical representation of the above Table-4.

![Prolonged usage](image)

**Figure-6:** People using continuously

The Figure-6 gives the following information.

# Employees working in bank, railways are using computers for long time.

# Compare with others students using less time

**Health problem Types**

The following Table-4 gives the details about which kind of health problems comes to the users.

<table>
<thead>
<tr>
<th>Health Problems</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpal Tunnel Syndrome</td>
<td>19</td>
</tr>
<tr>
<td>Computer Vision Syndrome</td>
<td>29</td>
</tr>
<tr>
<td>Musculoskeletal disorder</td>
<td>48</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
</tr>
</tbody>
</table>

Table-5: Health problem status

The following Figure-7 shows the graphical representation of the above Table-4.
The Figure-6 gives the following information:

- Musculoskeletal disorder is coming to the most of the people.
- Computer vision syndrome is in next level.
- Another interesting result of this analysis is given below:
  - Students use computers for social medias like whatsapp, facebook etc.
  - Business man use computers for mailing purpose.
  - Employees use computers for their day to day office work.

   - People using yoga and physiotherapy for their health problems. Most of the people not willing to take tablets for their problems.

**Practical Tips to avoid the health problems**

If the people take precautions measure most of the problems due to prolonged usage of computers won’t come. The following Figure-6 and Figure-7 shows correct and incorrect environment for sitting while using computers.
• Sit Properly with suitable environment as in Figure-6
• When a computer and a telephone have to be used at the same time, it is recommended for the operator to use a head set
• Perform mousing and the keyboard operation at the same height
• Take mini breaks from work and stretch a bit or go for a short walk.
• Make sure the lighting in the room is comfortable on the eyes
• Adjust the contrast and brightness of computers in such a way that eyes are not strained
• Circle the neck a bit to release the strain
• Adults who work for 7-8 hours should avoid spending time on computer after reaching home.
• Doing yoga exercise for the eye, shoulder, neck and legs

V. CONCLUSION

Normally employees are using the computer for more hours continuously. People at the age above 41 are affected more so they should take more care about their health. Young people are affected more in the next level. This analysis shows that only half of the affected people are taking treatment others not taking care about their fact. Female category people affected more compare with male category. Employees working in bank, railways are using computers for long time. Musculoskeletal disorder will come for the persons who work computers for long time. If the computer users follow the given suggestions they will avoid the problems completely.

REFERENCE

[4] "Top 4 Health Problems Caused By Computer Use". Alex from heheli.com