

Treatments for Occupational Hazards: A Survey

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Abstract—This research has been undertaken to examine the treatments for occupational hazards on health of Computer professional and also to understand and differentiate their extent of perception towards treatment for occupational hazards. The outcome of this study has come up with a conclusion that normally computer professionals have symptoms of Computer Vision Syndrome, Repetitive Strain Injuries, Carpal Tunnel Syndrome & Internet & social media addiction due to habits of longer screen timings.

This study has examined and differentiated factors to understand occupational hazards and has put forth certain remedies to cure such hazards. This study deals with the precautionary measures and treatments for the occupational health hazards faced by Computer professionals.

Keywords—Carpal Tunnel, Hazards, Health, Syndrome, Repetitive Strain

I. INTRODUCTION

The objectives of this study are to examine and differentiate the impact of occupational hazards on general health, to understand and differentiate extent of perception towards impact of occupational hazards on general health and to offer suitable suggestions to protect health from the impact of occupational hazards.

A person's health is more often affected by conditions in which he/she lives or works. Working condition has strong impact on employee's health. Non supportive and uncomfortable working environment can affect an individual's health if not addressed. This non supportive and uncomfortable working environment is termed as occupational health hazards. More precisely, occupational health hazards could be referred as probable risks to health and safety for those who work outside the home. So occupational hazards could be elaborated more as the danger to life and health of an individual. These hazards may cause loss of life, small injuries or social and mental disruption [1].

As the saying goes, "a disease known is half cured." When the symptoms of any health hazard related to working environment are noticed, early treatment might prove beneficial. The Second section of this paper deals with treatments for Computer Vision Syndrome, third section with treatments for Repetitive Strain Injuries, fourth

section with treatments for Carpal Tunnel Syndrome & fifth section with Internet & social media addiction.

The subsequent sections provide results & conclusion drawn from the study.

II. TREATMENTS FOR COMPUTER VISION SYNDROME

Computer vision syndrome (CVS) is nothing but a cluster of several eye problems. Itchiness, dryness, redness, blurred vision, headache, etc. are some of the problems which adversely affect the health of the eyes. Tiredness may be felt in the eyes, which ultimately decrease the concentration on any task/work. CVS is the impact on health of the eyes due to repetitive use of digital screens; hence it is also referred as Digital Eye Syndrome. In this era of technology, use of smart phones, computer, e-readers, etc. is common, but these technologies do affect the health of the eyes. The symptoms of this syndrome are very common amongst today's young generation and adults.



Fig 1: Uncorrected vision problems can increase the severity of CVS

According to Fairview, The treatment of CVS basically involves alteration in ergonomics while working on the computer.

Some of the suggested measures could be:

- Use of flat screen monitors.
- Reducing the glare of the screen.
- Keeping large text size on screen.
- Adjusting the brightness and contrast of the screen to suit your eyes might be helpful.
- Giving rest to eyes at proper intervals. Usually a rest of 15 minutes is recommended after every 2 hours of computer use.
- The screen must be positioned at a proper level. Screen must be 20 to 28 inches away from the eyes and centre of the screen must be 4 to 5 inches below your eye level.
- Frequent blinking of eyes might lower the stress on muscles of the eyes.
- Wearing computer glasses to prevent harmful rays from screens might prove beneficial.
- Proper lighting at workplace can reduce a number of eye problems.

Tears in eyes provide the necessary lubricants and moisture. When functioning of the “tear flow system” of the eyes fails, it results in dryness of eyes. Dryness of eyes could be treated by following measures:

- Wearing vision corrective lenses.
- Use of eye drops, which provide essential lubrication.
- Use of humidifiers.
- Drinking plenty of water.
- Consumption of appropriate medicine for increasing tear production.
- Taking necessary steps for the treatment of computer vision syndrome.

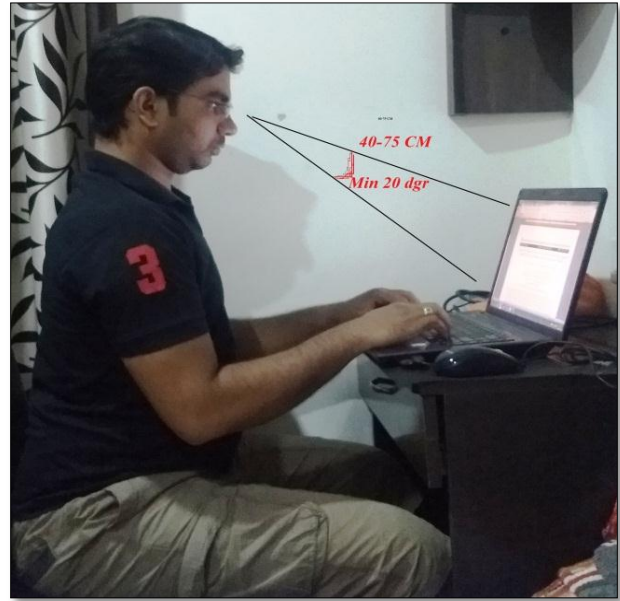


Fig 2: Proper body positioning & Eye contact for computer use

Proper angles of viewing a computer and proper distances between screen and eyes are an essential factor in the context of health of the eyes. The most usual and comfortable angle to view on a digital screen is at an angle of 15 to 20 degrees downwards below eye level, i.e. the computer screen must be 4 to 5 inches below your eye level. Proper distance must be maintained between the viewer's eyes and the computer screen to avoid stress in the eyes and other vision problems. Mostly the center of the screen is placed at a distance of 20 to 28 inches away from the eyes. Necessary and appropriate steps must be taken to avoid Computer vision syndrome and other vision problems. Examination of health of the eyes must be done on a regular basis. Early symptoms of CVS can be cured if appropriate steps are taken at an early stage [2].

III. TREATMENTS FOR REPETITIVE STRAIN INJURY (RSI)

Repetitive strain injury is pain in muscles, tendons and tissues of the body. There is wear and tear in the muscles and tissues due to repetitive movement which ultimately results in pain. Repetitive Strain Injury is also referred as Upper Limb disorder as it is mostly experienced in upper parts of the body, such as wrists, arms, neck and shoulder.

The mostly affects parts of the upper body are:

- Forearms and elbows
- Wrists and hands
- Neck and shoulders



Fig 3: RSI affects parts of wrists and hands

At initial stage a minor pain may be experienced only when carrying out a particular repetitive action. If the treatment of RSI is not done at an early stage, then the symptoms might get worse. Affected areas might get swollen leading to frequent pain. The symptoms may get worse to such an extent, leaving no option of treatment rather than surgery.

The treatment of RSI depends on the severity of pain and swelling in affected areas. It also depends upon which parts of the body are affected. The remedy for RSI depends on the level and extent of symptoms diagnosed. The symptoms developed due to repetitive task at work must be informed as soon as possible to heads of organization and the necessary precautions must be taken for treatment. The activity causing the development of symptoms of RSI must be notified and some changes must be introduced in order to avoid further symptoms. Necessary steps must be taken to reduce the amount of time spent on repetitive tasks. Changes in working style and environment might prove beneficial. General reminders might be set on smart phones or on computers to take short breaks from work. Taking breaks might help in relieving from pain. If the affected areas are more painful and swelling increases, consulting doctor might be the best option. Getting advice from health experts related to ergonomics at work could avoid further problems.



Fig 4: Using elastic support or wrist splint to get relief from pain

According to National Health Service's scheme some of the suggested treatments for RSI could be[3]:

- **Cold Packs:** Applying ice packs on affected areas helps in reducing pain and swelling.
- **Heat Packs:** Heat packs help in relaxing muscles and tendons. It is advisable not to prefer heat packs when there is internal bleeding.
- Appropriate acupuncture therapy also helps in relieving pain.
- **Medication:** Consumption of anti-inflammatory painkillers such as ibuprofen must be done only after consulting a general practitioner.
- Stretching exercises and a physiotherapy involving proper advice on posture would help relaxing muscles. Doing yoga and exercises on a daily basis would ease treatment of RSI.
- Elastic supports or splints provide support and relieve pain.
- Use of steroid injections to reduce inflammation.
- If the physical treatments don't prove beneficial, then treatment through surgery is the last option.

IV. TREATMENTS FOR CARPAL TUNNEL SYNDROME

Carpal tunnel syndrome is a common condition in which an individual experiences pain, numbness, and tingling in the hand and arm. The symptoms of Carpal Tunnel Syndrome are experienced due to squeezing or compression of the median nerve which travels through the wrist.

According to health line scheme some of the suggested treatments for CTS could be[4]:

- **Take breaks from repetitive tasks:** Stretch hands and move wrists to improve blood flow to these areas.
- **Wear splints on wrists:** If anyone has issues with repetitive tasks at work, so the treatment could be wear wrist splints during the day.
- **Lighten up:** Try using a soft-grip pen or tapping keys more lightly.
- **Mind flexion:** Avoid activities that make wrists flex to the extreme in either direction.
- **Stay warm:** wearing fingerless gloves or keeping hand warmers nearby or keeping hands warm can help with pain and stiffness.
- **Stretch it out:** make a fist and then slide fingers until they are straight again. Repeat this action five to 10 times.
- Elevate hands and wrists whenever possible.

Often the symptoms of carpal tunnel syndrome get worse over time, early diagnosis and treatment might reduce the chances of opting surgical treatments. At an early stage, the symptoms of minor pain and numbness could be relieved by pain killers or using wrist splints or elastic support.

Over time the pressure felt on nerve might increase and

even damage the nerve. In such cases, surgery to eliminate the causes of high pressure and compression is highly recommended.

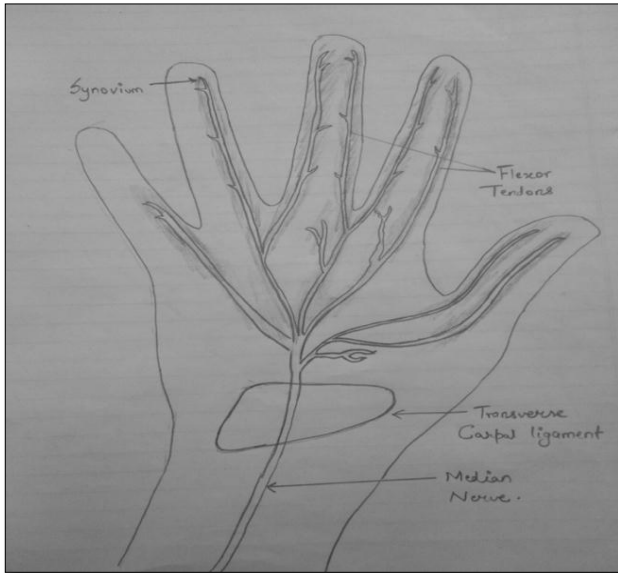


Fig 5: Carpal tunnel syndrome is caused by pressure on the median nerve as it travels through the carpal tunnel.'

Early treatment of carpal tunnel syndrome is highly recommended. Applying cold packs to reduce swelling, avoiding tasks that pressurize the nerve and cause more pain, taking breaks from activities and exercising on a daily basis are some preliminary treatment for the syndrome. If the condition worsens, consult a doctor as early as possible.

Carpal tunnel syndrome can also be treated by other methods such as use of splints, consumption of prescribed medicines and surgery. Wearing a wrist splint proves beneficial in preliminary stages of the syndrome.

According to Int J Clin Rheumatol, Author manuscript; available in PMC 2010, some non-surgical approaches for treatment of Carpal Tunnel Syndrome could be [5]:

- **Non-surgical therapy:** Early diagnosis and treatment of any disease is always beneficial. Preliminary non-surgical approaches of treatment might help reduce the symptoms of the Carpal Tunnel Syndrome.
- **Wrist splinting:** A splint that holds your wrist still while sleeping can help relieve nighttime pain and other symptoms of tingling and numbness. Although it is temporary approach, but this method could eliminate the cause of disturbed sleep.
- **Non-Steroidal anti-inflammatory drugs (NSAIDs):** NSAIDs, such as ibuprofen, Advil, Motrin IB, etc., may reduce the pain and provide short term relief.
- **Corticosteroids:** In the mediocre stages of syndrome, doctor may inject carpal tunnel with a corticosteroid such as cortisone to relieve pain. Ultrasound

technology is also used sometimes to guide these injections. Corticosteroids help in decreasing inflammation and swelling, which lowers down pressure on the median nerve. Corticosteroid injections prove to give better results as compared to Oral for treating carpal tunnel syndrome.

According to Mayo Clinic, which is a not-for-profit organization, some surgical approaches for treatment of Carpal Tunnel Syndrome could be [6]:

- **Surgical treatment:** If all the non-surgical treatments fail to give the desired results and the conditions get worse day by day, then surgery might only be the solution. In the surgical treatment, the ligaments pressurizing the median nerve and blocking the tunnel are cut. There are two different techniques of surgery namely Endoscopic Surgery and Open surgery.
- **Endoscopic surgery:** In this method of surgery, the surgeon uses a telescope-like device with a tiny camera attached to it (endoscope) to see inside the carpal tunnel. The surgeon then cuts the ligament through one or two small incisions in hand or wrist. Endoscopic surgery is less painful as compared to open surgery.
- **Open surgery:** Open surgery involves making an incision in the palm of the hand over the carpal tunnel and then cutting down the ligament to free the nerve.

V. TREATMENTS FOR SOCIAL MEDIA ADDICTION

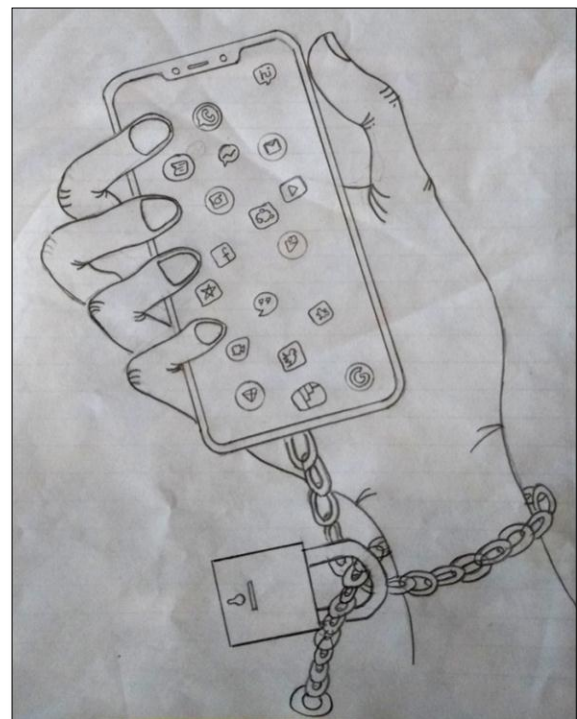


Fig 6: Internet and Social media addiction.

The above picture clearly depicts the current level of addiction of people to technology. People these days are getting more attracted towards to the use of social media and internet. No doubt, technology is developing slaves out of humans, making them addicts. Although the appropriate treatment of social media addiction lies in the mindset of an individual, but some methods have been developed to find the solution of this problem.

“Digital detox”, the term deals with a strategy which forces an individual to reduce the amount of time spent on social media. This strategy could be accomplished through a few basic steps such as turning off the notifications, limiting the amount of time spent on the phone, trying to develop habits of socializing offline etc. [7].

- Addiction is the root cause of depression and other mental issues. The addiction takes no time in turning into psychological disorder. If the level of addiction increases, then consulting psychologist or psychiatrist is the best option.
- Governments and organizations can help minimize the addiction by prohibiting the use of mobile devices, spreading awareness, etc. Some precautions such as a ban on the use of mobile phones while driving have been already implemented in some countries.
- The overuse of phones and addiction to social media lowers down the productivity and efficiency of an individual. Employers, schools and colleges need better policies to ensure that people focus on their important tasks and activities. Many schools and colleges ban the use of smart-phones in the classroom.
- Some out of way solution for this addiction is to provide people certain things in exchange of the amount of time spent being detached from phones. Some restaurants implement this idea by providing discounts to customers who refrain from using their smart-phones during a meal. More positive reinforcement strategies like these need to be introduced to increase time spent engaging in real life.
- The harmful impacts of social media addition and development of various “digital diseases” need to be addressed on a priority basis and awareness must be spread to curb this menace. Every coin has two faces, the development of addiction is not only due to users, and the service providers are also responsible for it. More controversially, social media operators like Facebook, Instagram etc. could make use of usage statistics and provide strategies to limit time spent on their products.
- The goal of treatment for this type of addiction, unlike for many other addictions, should be controlled use of social media sites. In this world full of the latest gadgets and technology, it seems impossible to prohibit someone from accessing all smart devices.
- As already mentioned the basis of treatment for addiction depends upon the individual’s mindset. The most successful type of treatment for online addictions appears to be a traditional cognitive behavioral therapy. More and more research is needed to be done in the area of treatment of social media addiction.
- There is no magic wand yet discovered which when waved could free an individual from these addictions. It is the sole responsibility of the user for the level of addiction developed. But policymakers, social media operators, employers, researchers, health care providers and educational establishments all play an equal role in developing and treating the addiction of social media and internet.

VI. RESULT AND DISCUSSION

The last survey paper, based on descriptive research, sampled 322 Computer and electronic gadget users in Pune city, Maharashtra working in private sector using stratified random sampling to examine and differentiate the impact of occupational hazards on health of computer and electronic gadget users. The result of the study proved that many hazards like pain in the neck, shoulder, upper and lower back, waist and leg and joints, eye problem, loss of appetite or changes in appetite, digestive problem, stress and irritation, minute injuries, ear pain due to prolonged exposure to air condition, breathing difficulties due to excessive cold, sleep disorder and menstrual can be controlled by using some small prevention and treatments for such occupational hazards.

VII. CONCLUSION

The study of various occupational hazards faced by computer professionals shows that the impact of these hazards could be avoided if treated at an early stage. Some temporary treatments such as wrist splinting, painkillers, etc. provide temporary relief. Surgical approach is the last option for severe cases. Preliminary measures to avoid hazards can be opted by an individual to avoid further impacts.

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