The Role of Specific Eye Care Exercise Combined with 0-20-20 Vision Rule in Managing Computer Vision Syndrome among Computer Users


1Undergraduate, 2Professor and Vice Principal, 3Professor, 4Assistant Professor, 5Tutor, 6Tutor, 7Tutor
Saveetha College of Physiotherapy, Saveetha Institution of Medical and Technical Sciences, Thandalam, Chennai, Tamil Nadu, India. Saveetha College of Physiotherapy, SIMATS, Chennai, Tamil Nadu, India.

How to cite this article: Afreen fathima.J, Prathap Suganthirababu, Kumaresan. A et. al. The Role of Specific Eye Care Exercise Combined with 0-20-20 Vision Rule in Managing Computer Vision Syndrome among Computer Users. Indian Journal of Physiotherapy and Occupational Therapy / Volume 18, Year 2024.

Abstract

Background: Digital Eye Strain (DES) has enhanced one of the crucial well-being matters with the expanded utilization of digitalized gadgets with optical revealing. Common digital eye strain manifestations include eye strain, headaches, blurred vision, and neck or shoulder pain, which typically get worse the more video display terminals (VDT) users use them. Very little investigation has been done to show how digital use affects Indian users’ physical health, particularly among college undergraduate.

Purpose: To find the effect of specific eye care exercise combined with 20-20-20 vision rule in managing computer vision syndrome among computer users.

Methods: Seventy-four participants were selected for inclusion and exclusion criteria. They were divided into two groups: 20-20-20 Vision Rule Group (37) and conventional group (37). The pre and post-test values will be measured by computer vision syndrome - questionnaire. Group-A received 20-20-20-vision rule along with eye exercise and group-B received specific eye exercise. Both programs were given for 2 weeks, weekly 6 days.

Results: Using Computer vision syndrome-questionnaire, 20-20-20 vision rule group’s post-test mean was 25.51 and whereas conventional group’s was 29.35. This demonstrates that the conventional group received a higher score of digital eye strain symptom positive than the 20-20-20 vision rule group.

Conclusion: Specific eye care exercise combined with 20-20-20 vision rule in managing Digital Eye Strain among digital users was found to be more successful than specific eye exercise in reducing manifestation of Digital Eye Strain.

Keywords: Digital Eye Strain, computer vision syndrome, 20-20-20- Vision rule

Introduction

Digital Eye Strain (DES) has enhanced one of the crucial well being matters with expanded utilization of digitalized gadgets with optical revealing. The subjective asthenopic manifestation experienced by video display terminals (VDT) users have been identified, acknowledged, and validated by numerous investigations. When compared to non-users, VDT

Corresponding Author: Prathap Suganthirababu, Saveetha College of Physiotherapy, Saveetha Institute of Medical And Technical Sciences, Thandalam, Chennai, Tamil Nadu, India.

E-Mail: Prathap.scpt@saveetha.com
users report it 1.4–1.5 times more frequently than they do. In his research, Red and green lights are reported to cause more visual tiredness than white and blue lights, according to research on the color of ambient light. More than 60 million folks were evaluated to be identified with Digital eye strain. It is also mentions as Visual Fatigue (VF) and Digital Eye Strain (DES). Hazards are male gender, adult age more than 40 years, person who uses power glasses, failure of execute offer genomic habit. The load of digital eye strains elevated in developing countries due to work task, poor knowledge of ergonomics during digital operating, blockade and utilization of private protecting equipment. Digital eye strain was characterised as the concomitant eye and vision issues brought on by digital use. Common digital eye strain manifestation include eye strain, headaches, blurred vision, and neck or shoulder pain, which typically get worse the more video display terminals (VDT) users use them. The prevalence of digital eye strain among digital users ranges from 64% to 90%. Numerous studies have linked extended digital use, awkward workstation postures, and a variety of musculoskeletal pains, but the majority of them were concentrated on western adult patients. Compared to men, women had much increased chance of having headaches as well as neck and shoulder pain. Interstudy, Tooma et al. found that there were more girls than males who had digital eye strain. Other investigators reported obtaining similar result Digital eye strain is the reason for poor production in work related task. It includes manifestations such as headache, dry eyes, eye redness, cervical and shoulder pain. Digital Eye Strain is due to laptops, cellular phones, e-readers and people who even watch for more than 3 hours. Other causes are screen illumination, less distance from the screen. Digitals can increase their rate and precision on many work processes, which improves overall worker organization. Documents can be written and edited much more rapidly with the aid of a word clarifying plan of action and course of action such as invoice and accounting, can also occur more rapidly and with fewer errors. Digital Eye Strain decreases the speed and productivity of the process. The various manifestation groups are the focus of treatment for digital eye strain, and it is advised to administer a single therapy for all manifestation tic groups. The main tendency of vision is through replacement, accommodation difficulties, base-in urban-up prisms, and residual astigmatism. Treatment options for dry eye manifestation include changing the lighting, positioning the screen correctly, adjusting the angle of gaze in regard to manifestations related to artificial tears and screens, increasing wink rates, and moistening the air in the space. It is advised to reduce blue light as much as a precaution, it is advised to minimise the amount of blue light exposure that accesses the eye or is released from a computer monitor. Blue light has some impact on digital eye strain as well. In fact, the typing speed of digital workers at baseline, when they were permitted three 30 second pause plus a three minute pause every hour, and a rest interval plus interruption. where during the interval, stretching movement were taught. For the circumstances with interval and movement, productivity increased by 5% and 15%, respectively. Common digital eye strain manifestation include eye strain, headaches, blurred vision, and neck or shoulder pain, which typically get worse the more video display terminals (VDT) users. The prevalence of digital eye strain among digital users ranges from 64% to 90%. Numerous studies have linked extended digital use, awkward workstation postures, and a variety of musculoskeletal pains. So, the research was to find the effectiveness of the 20-20-20 vision role in managing computer vision syndrome along with specific eye exercise.

**Aim**

To find “the effect of specific eye care exercise combined with 20-20-20 vision rule in managing Digital Eye Strain among digital users”.

**Methods**

This was an experimental study done with 74 subjects with computer vision syndrome aged between 25-50 years of both genders from a private company from Chennai. Samples were conveniently selected and allocated into two groups.

**Study period:** December 2022 to June 2023

**Inclusion Criteria:**

- Age: 25-50 years
- Both gender
• Using Digital or Laptop More Than 4 Hours/day
• Presence of eye strain by using computer or laptop
• >6 score in computer vision syndrome-questionnaire
• History Of Using Glasses and contact lens

Exclusion criteria:
• History Of Eye disease
• Blind person
• Recent Eye Related Surgery
• Using Digital or Laptop lessthan1 hour/day

Outcome Measure

Assessment was done at initial and at the end of the study using Computer vision syndrome-questionnaire: The quantity of manifestations was assessed using the 16 questionnaire items as follows: never, meaning there was no manifestation at all, go through an evaluation of some times meaning only occasion in all seven-day period, go through a sum total of 1; and frequently, meaning at least twice a seven-day period, received a score of 2. Two categories of intensity were used to evaluate it: moderate received a score of 1, and strong received a score of 2. The frequency score and intensity score were then multiplied for each manifestation, and the result was recorded in the following order: 0 = 0; 1 or 2 = 1; 4 = 2. A total was calculated by adding the recorded results for every of the 16 manifestations. A computer-positive expression has been defined as having a total score of less than 6.

Procedure

74 participants were selected from MC engineers company according to inclusion, exclusion criteria incidence rate of the condition. Informed consent was obtained from each participant. Participants were explained regarding the wellbeing and simplicity of the procedure, all the participants were to be chosen according to convenient sampling technique. Pre assessment was taken using computer vision syndrome-questionnaire and data was recorded. Intervention groups were given specific eye exercises combined with the 20-20-20 vision rule. Conventional groups were given routine specific eye exercises as an intervention. Post assessment was taken using the same scale and data was recorded.

20-20-20 Vision Rule Group: 37 participants were selected according to selection principles, the participants were asked to see 20 feet far away for 20 seconds from their digital display every 20 minutes of their working time and asked to perform eye movement such as see medially, laterally, upward and downward direction every two hours of their working time for two weeks and every 20 minutes of work, exercises performed. It was practiced 6 days a week for two weeks.

Conventional group: 37 participants were selected according to selection principles, participants were asked to perform eye movements such as see medially, laterally, upward and downward direction every two hours of their working time for 6 days for two weeks.

Data Analysis

Statistical analysis was done to evaluate the effects of specific eye care exercise combined with the 20-20-20 vision rule in managing Digital Eye Strain. Among digital users. Pre and post result values for Computer vision syndrome-questionnaire were not paired, unpaired t test was conducted.

The pre-test mean value of Computer vision syndrome-questionnaire in 20-20-20 Vision Rule Group and conventional group were 29.97 and 30.43 and with two-tailed p value of <0.0001.

The post-test mean value of Computer vision syndrome-questionnaire in 20-20-20 Vision Rule Group and conventional are 25.51 and 29.35 and with two-tailed p value of <0.0001. Pre-test and post-test values of

![Fig-1: Pre and post-test analysis of 20-20-20 vision rule group](image-url)
The statistical analysis of quantitative data between the experimental and control groups, as well as within the groups, statistically significant variation. The statistical analysis of computer vision syndrome in the 20-20-20 vision rule group by using computer vision syndrome-questionnaire, pre-and post-test values of mean 29.97 and 25.51, SD value of 4.68 and 4.17 and P<0.0001 were statistically significant.

The statistical difference between the two groups’ subjects was evaluated by post values of 20-20-20 vision rule and conventional group test of mean 25.51 and 29.35 and SD value of 4.17 and 3.90 and P value is <0.0001. These values were considered to be extremely statistically significant. These differences indicated that the subjects receiving 20-20-20 vision rule combined with specific eye exercise, was highly effective in reducing computer vision syndrome than the conventional group.

**Discussion**

Corneal irritation (dry pupils, itchy eyes, and red eyes) is one of the eye issues brought on by prolonged digital use, and is known as Digital eye strain. Vision that is hazy, headaches, backaches. The pain and soreness brought on by Digital Eye Strain Can affect daily living or performance at work, even though eye professionals have not yet connected it to any ongoing eye damage. However, by taking a few preventative measures, the symptoms and indicators of eye strain caused by digital devices can be swiftly eradicated.

Digital Eye Strain causes an inappropriate atmosphere and poor eyeglass or contact lens wear are two of the primary causes of digital eye strain. Changes must be done to enhance these circumstances in order to prevent digital eye strain.

The term “Digital eye strain” refers to eye issues brought on by extended digital use, such as: Red, itchy, and dry eyes are manifestations of ocular irritation, distorted vision, headaches, low back pain, neck pains, muscle tiredness.

In my research, the role of specific eye care exercise combined with the 20-20-20 rule has an effect on managing computer vision syndrome among computer users. I concluded that those who received 20-20-20 vision rule combined with specific eye exercise, were more effective in reducing computer vision syndrome than conventional groups.

A statistically significant difference between groups-A and B as well as within each group was found by statistical analysis of quantitative data. Using computer vision syndrome-questionnaire, 20-20-20 Vision Rule Group post-test mean was 25.51 and whereas conventional group was 29.35. This demonstrates that conventional groups received a higher score of manifestation positive than 20-20-20 Vision Rule Group and this suggests that 20-20-20 Vision Rule Group performed considerably better than Conventional Group. This strongly suggests that specific eye care exercise combined with 20-20-20 vision rule in managing Digital Eye Strain among digital user’s effective than specific eye exercise.
The effects of regular exercise on visual physiology and illness discussed. Dynamic exercise temporarily lowers intraocular pressure. Exercise is good for the eyes for the vast majority of people because it lowers the risk of central veins in a blockage neovascular macular degeneration due to age and improves control of peripheral hypertension and diabetes. Ophthalmologists ought to promote regular physical activity while using the proper eye protection.

Digital Eye Strain diagnosis Penn suggests the following suggestions possible remedies for vision problems. The environmental causes for Digital vision Strain are easily reversible with a few straightforward modifications. Following Are Some Remedies for these environmental issues:

- Lowering glare and harsh reflections on the digital screen by altering the lighting in the space, drawing the shades, adjusting the screen contrast brightness, or mounting a filter or monitor hood. Not only would this improve eye concentration, but it might also make it unnecessary to squint while seeing the screen. If the room’s present lighting is an issue, the visor test can assist identify it. When doing the test, participants cup their hands over their eyes to obscure the lights while seeing the monitor. Lighting should be used if instant benefit is perceived.

Parihar JK, et al., (2016) in his study concluded that the asthenopic component may be reduced with the use of suitable refractive aids, LED displays with a greater refresh rate and resolution, screen filters, improved ambient illumination, and altered ergonomic monitor placement. Modifications to digital peripherals, such as a low keyboard with forearm support and vertical mouse design, may also aid with repetitive musculoskeletal ailments. It is advantageous to utilise lubricating eye drops.

- Polyunsaturated Supplements, steer clear CLs, and treatment prior ocular surface diseases in order to preserve an optimal ocular surface and prevent related manifestation. Periodic work breaks from prolonged VDT exposure are necessary to prevent cumulative labor-induced fatigue vision, corneal damage, and musculoskeletal injury/strain. It requires a complex, critical analysis because it is the outcome of several, overlapping, concurrent causes.¹

Ranasinghe, et al., (2016) concluded that Digital Eye Strain was among digital workers in Sri Lanka. Female gender, longer employment history, greater daily digital use, previous eye disease, non-application a DD_filter, contact lens house, and greater understanding of ergonomics procedure were substantially linked with the frequency of eye problems. The length of employment including the presence of a pre-existing ocular condition were factors that were related to the severity of eye problem.²

**Conclusion**

This finding led to the conclusion that specific eye care exercises combined with 20-20-20 vision rule in managing Digital Eye Strain among digital users was found to be more successful than specific eye exercise in reducing manifestation of Digital Eye Strain and therefore reducing sickness absenteeism and improving quality of life in participants.

**Ethical clearance:** Taken from institutional ethical committee. ISRB number 03/006/2022/ISRB/SR/SCPT

**Funding:** Self

**Conflict of interest:** No conflict of interest during this research.

**Reference**


