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Trataka Kriya in Individuals with Digital Eye Strain: A Pre–Post Experimental Design

Dhanesh Kumar K.U.[1] Sparsha Shetty[2] Hrishikesh Amin[3] Rashmitha A. P.[1] Shilna Rani P.[1]

[1]Nitte Institute of Physiotherapy, Mangaluru, Karnataka, India
[2]Kokilaben Dhirubhai Ambani Hospital, Mumbai, Maharashtra, India
[3]Department of Ophthalmology, K.S. Hegde Medical College, Mangaluru, Karnataka, India

Address for correspondence Rashmitha A.P., Nitte Institute of Physiotherapy, Deralakatte, Mangaluru, Karnataka 575018, India (e-mail: rashmitha1409@gmail.com).

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Abstract

Introduction Digital eye strain is the physical discomfort felt after 2 or more hours in front of a digital screen, including cell phones. Digital eye strain is otherwise known as computer vision syndrome. *Trataka* is to look at or to gaze—it is a preliminary step for meditation that involves staring at a single point such as a small object, black dot, or candle flame.

Objective This study aimed to analyze the effect of *trataka kriya* in the management of digital eye strain.

Materials and Methods Thirty participants of the age group 18 to 40 years were recruited in the study. The study design was a pre–post experiment. A convenient sampling technique was used to recruit the participants. The study included participants who use laptops or smartphones for a minimum of 2 hours daily and also participants having eye strain, dry eyes, burning sensation in the eyes, headache, and eye fatigue. They performed *trataka kriya* exercises once a day on alternative days for 1 month. Outcome measures was a computer vision syndrome questionnaire to assess the visual fatigue experienced by the study participants and the Schrimer test to find out whether the eye produces enough tears to keep it moist.

Statistical Analysis and Results Statistical analysis was done using SPSS version 16.0. To compare the computer vision syndrome questionnaire and Schrimer test before and after interventions paired *t*-test was used. A *p*-value of less than 0.05 is considered significant for the study.

Conclusion The study concludes that there was an improvement in the subjects with digital eye strain after performing *trataka kriya*. The clinical implication of the study is that this method can be used as one of the nonpharmacological interventions for digital eye strain.

Keywords
- computer vision syndrome
- *trataka*
- eye exercises
- eye strain
- yogic interventions

Introduction

Digital eye strain is known as computer vision syndrome (CVS). On average, it is seen that an individual going through his or her daily routine is required to blink 18 times in a minute. Though passing a long duration gazing at a digital eye screen may cause decreased blink rates which results in dry, burning, and itchy eyes.[1] Factors such as exposure to bright light, prolonged hours of working, a very short-distance light, more concentration on the near work without changing gaze,

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poorly illuminated room, no or less blinking rate, reading very short fonts against very bright screens, and constant screen staring could develop digital eye strain.[2] The primary features noted by such users include eye fatigue, eye tiredness, itchy eyes, redness, blurred vision, burning sensation, and double vision. The prevalence of symptoms associated with digital eye strain was 89.9%, the most prevailing and distressing symptom being headache (19.7%) and the second being eye strain (16.4%); students who were using digital devices for 2 or more hours per day had significantly more symptoms of digital eye strain.[3] Digital eye strain affects all age groups—87.7% of ages 18 to 39 years, 82.6% of ages 40 to 59 years, 76.3% of ages 60 years and above. *Trataka* aids in the elimination of all disorders of the eye, including eye strain, and is known to close the doorway of creating these symptoms. *Trataka* also helps in a wide range of physiological and mental functions.[4] *Trataka* means to look or gaze steadily. It is a preliminary step for meditation. It is a *kriya* (technique) that includes prolonged staring at a single point such as a small object or black dot or candle flame. *Trataka* helps in the degree of relaxation, emotional stability, and pleasant feeling.[5] The purpose of this study was to analyze the effect of *trataka kriya* in the management of digital eye strain.

Materials and Methods

The study design was a pre–post experimental study for the duration of 1 year.

Sampling method was convenient sampling and sample size was 30.

To calculate sample size, technique of estimation of single proportion (digital eye strain) is used:

$$n = \frac{Z^2_{1\frac{\alpha}{2}}\, p\,(1-p)}{d^2}$$

Where α = confidence level

a. d = precision (15%)
b. p = anticipated digital eye strain (25%)

The calculated sample size is 30.

Data Collection and Procedure

A total of 30 participants were recruited in the study by using a convenient sampling method. Inclusion criterion was 18 to 40 years of age. All participants used a laptop or smartphone daily for 2 hours and were experiencing eye strain, dry eyes, burning sensation in the eyes, headache, and eye fatigue.

Exclusion criteria were who were suffering from infective conditions of the eyes like conjunctivitis, scleritis, uveitis, and refractive errors.

Ethical Clearance

The study was approved by the institutional ethical committee of Nitte Institute of Physiotherapy, Mangaluru, Karnataka, India. The details of the study were explained to the participants and informed consent was taken before commencing the study.

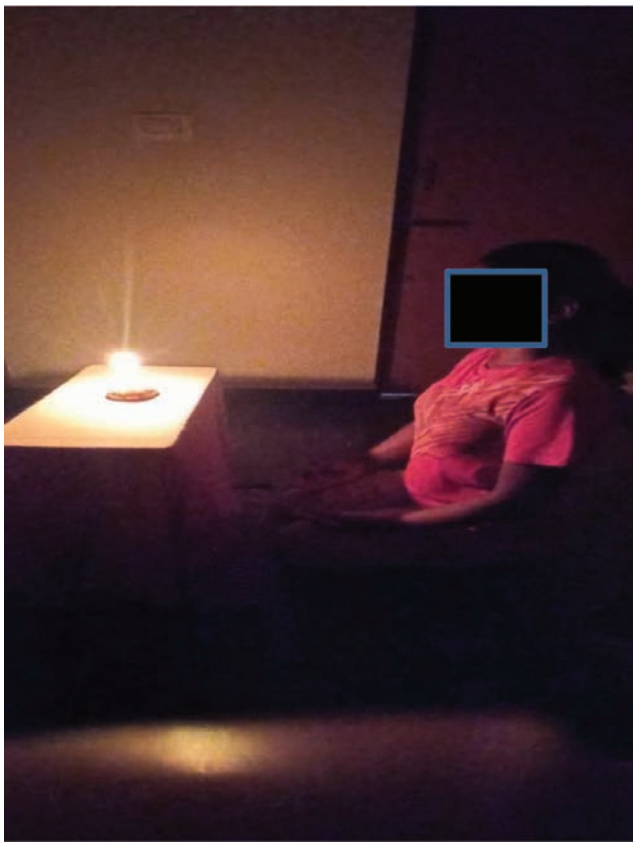

Fig. 1 *Trataka kriya*, individual practice.

Intervention

Participants were assessed at baseline and the end of 1 month by the assessor, who was blinded to the intervention. During 1 month participants practiced *trataka* 3 times a week under supervision. Initially the intervention was demonstrated in a small group—10 participants were seated around a stool maintaining distance of 2 m. Later, participants were asked to practice individually under supervision and there were no dropouts (►**Figs. 1** and **2**).

The practices had three stages:

1. Gazing the whole flame without any effort (duration 30 seconds).
2. Intense gazing at the tip of the wick of the candle (duration 1 minute).
3. Expanding awareness (duration 1 minute)—frequency once a day for alternative days for 1 month.

Assessment

Computer Vision Syndrome Questionnaire

It is a tool to assess visual fatigue. This scale has got a good validity and reliability and can be used to assess the visual health of computer workers and for research purposes.[6] The questionnaire was given before the commencement and at the end of the study.

Table 1 Age distribution of participants

	n = 30(%)	Mean	SD	*t*	*p*-Value
Female	91%	26.00	6.245	0.762	0.452
Male	9%	23.51	5.30		

Table 2 Pre- and posttest comparison of computer vision syndrome questionnaire (CSV-Q) and Schirmer test score

		Mean	SD	*t*	*p*-Value
CVS-Q	Pretest	14.37	2.593	4.507	[a]<0.004
	Posttest	9.33	1.882		
Schirmer test	Pretest	7.70	1.393	−2.989	[a]<0.001
	Posttest	6.53	1.456		

Abbreviation: SD, standard deviation.
[a]Indicates significance.
Analyzed through paired *t*-test.

Fig. 2 *Trataka kriya* group demonstration.

Schirmer Test

The Schirmer test is a useful assessment of aqueous tear production. This involves assessing the sum of wetting of a special filter paper (No. 41 Whatman; 5 mm width and 35 mm length), and it was performed without topical anesthesia. The test was performed as follows[7]

Measures taken to avoid adverse events during intervention: Participants were advised to rub their palms and place them over their eyes to feel the warmth around the eyes and also splash cold water on their eyes if they experienced visual problems like pain in the eyes and lacrimation, and were unable to concentrate.

Results

►**Table 1** shows age distribution of participants. Out of 30 participants, 91% included female and 9% included male participants. Mean age of the female participants was 26.00 years, with a standard deviation (SD) of 6.245 years, and mean age of the male participants was 23.51 years, with a SD of 5.30 years. The *p*-value is more than 0.05, suggesting age is homogeneously distributed among male and female participants.

►**Table 2** shows the pre- and posttest comparison of the computer vision syndrome questionnaire scores and Schirmer test scores among the participants. The obtained *p*-value was 0.001. Hence there was a difference in the mean before and after the intervention. This indicates that there was a significant change in the postintervention parameter.

Discussion

The present study investigated the effectiveness of *trataka kriya* in computer vision syndrome. It was found that *trataka kriya* is effective in reducing eye strain in individuals with digital eye strain or computer vision syndrome and it was also shown that a significant improvement was achieved in producing tears which help to keep the eye moisturized. Probably the reason for this could be that during *trataka kriya*, when the identical object (candle), is continuously being observed, the brain becomes habituated and soon stops registration of that particular object. This habituation tends to occur at the same time with an incline in α waves which indicates reduced visual attention to the exterior world; the time they are formed, several brain areas stop functioning. *Trataka* helps to reduce and cure all eye disorders such as eye fatigue, myopia, and headache.[3] *Trataka kriya* helps to relax the eyes and the mind, and also improves the vision. There was average improvement in clarity of vision, contrast sensitivity, and fineness of objects, a best relief was appreciated by patients of *trataka kriya*.[8] *Trataka* helps in the vitalization of vision by circulating blood around the areas of the eye. *Trataka kriya* improves the metabolism of rods and cones through the mechanism of dark and light adaptation. It has also been seen that the use of gazing helps in decreasing mental fatigue and bringing about relaxation.[9] The findings of this study have been supported by Gopinathan et al (2017) who conducted a study to assess the effect of eye exercises and *trataka kriya* in the treatment patients with ametropia and presbyopia who were registered under two main groups (group A and group B); 32 patients performed eye exercises, 34 patients performed *trataka kriya*. The patients in both groups were

subjected to perform the exercises once daily for 3 weeks. The patients were followed-up for 30 days to observe any ill effects of the therapy. There was a better result in clarity of vision and contrast sensitivity. The grade of development was almost similar in both the groups; a better relief was valued by patients in the *trataka kriya* group.[8] During *trataka*, several centers of the brain are connected to the optic nerves and they receive input via the optic nerves and send signals to rise the perception function. Through the perception, the brain centers that remain dormant for an ordinary individual are awakened. *Trataka* also aids in relieving eye disorders. Gazing helps decrease the central nervous system and autonomic nervous system activity by decreasing the proprioceptive feedback to the reticular activating system.[10]

Conclusion

The study concluded that there is an improvement in self-rated discomfort in the participants with digital eye strain. The clinical implication of the study is that *trataka* method can be used as an adjunct to pharmacological management.

Limitations

The sample size was very small and only the student population was recruited. Hence the study should be done in a larger population and participants other than students can also be recruited.

Conflict of Interest
None declared.

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