

Therapeutic Effects of Head Massage (Shiro Abhyanga) on Visual Fatigue Associated with Prolonged Digital Screen Exposure Among Students

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Abstract

Background: Computer Vision Syndrome (CVS), or Digital Eye Strain, is a common condition resulting from prolonged use of digital devices. Head Massage (Shiro Abhyanga) with sesame oil is a traditional naturopathic intervention believed to promote relaxation, improve circulation, and relieve muscular tension, yet evidence for its effect on visual fatigue remains limited.

Objectives: To evaluate the effectiveness of Head Massage (Shiro Abhyanga) with sesame oil on visual fatigue associated with prolonged digital screen exposure among students.

Materials and Methods: A single-group pre–post interventional study was conducted on 10 students aged 18–25 years. Participants received Head Massage with lukewarm sesame oil for 10 minutes once daily for 10 consecutive days. Outcomes were assessed using the Computer Vision Syndrome Questionnaire (CVS-Q), Near Point of Convergence (NPC), and Snellen Visual Acuity before and after the intervention. Data were analysed using paired samples t-tests.

Results: CVS-Q scores decreased significantly from 25.00 ± 7.53 to 14.00 ± 6.36 ($t(9) = 7.611$, $p < 0.001$, Cohen's $d = 2.41$). NPC improved from 6.20 ± 0.65 cm to 5.00 ± 0.94 cm ($t(9) = 3.682$, $p = 0.005$, Cohen's $d = 1.16$). Snellen Visual Acuity remained unchanged.

Conclusion: Head Massage (Shiro Abhyanga) with sesame oil is an effective, safe, simple, economical, and non-invasive complementary therapy for reducing visual fatigue associated with prolonged digital screen exposure among students. Larger controlled trials are recommended.

Keywords: Computer Vision Syndrome; Digital Eye Strain; Visual Fatigue; Shiro Abhyanga; Head Massage; Sesame Oil; Near Point of Convergence; Naturopathy

1. Introduction

The widespread use of digital devices has made Computer Vision Syndrome (CVS), also known as Digital Eye Strain, one of the most prevalent occupational and academic health problems of the digital age [1–4]. CVS encompasses ocular and visual symptoms—eye strain, headache, blurred vision, dry eyes, burning, redness, and difficulty maintaining focus—that arise from continuous accommodative effort, sustained convergence, reduced blink rate, glare, and poor ergonomics [2,3]. Epidemiological estimates indicate that 50–90% of regular digital device users experience one or more CVS symptoms, with students particularly affected because of prolonged academic screen use [3].

Visual fatigue is a principal manifestation of CVS and is characterised by ocular tiredness, heaviness, discomfort, and temporary visual disturbances after prolonged near work [5]. Reduced blink frequency during screen use increases tear evaporation and ocular-surface dryness, further aggravating symptoms [6]. Conventional management includes ergonomic adjustments, scheduled visual breaks, refractive correction, and artificial tears; however, adherence is often limited, creating a need for simple, low-cost complementary approaches [10].

Head Massage (Shiro Abhyanga) is a traditional Ayurvedic and naturopathic procedure involving gentle, rhythmic massage of the scalp with oil. Sesame oil is traditionally preferred for its nourishing, antioxidant, and Vata-pacifying properties [11,12]. Physiologically, head massage stimulates cutaneous mechanoreceptors, enhances local circulation, activates parasympathetic tone, reduces sympathetic overactivity, and relieves muscular tension in the scalp, forehead, neck, and shoulder region [13–15]. These effects may alleviate both the muscular and stress-related components of visual fatigue.

Although massage therapy has demonstrated benefits for stress reduction, muscle relaxation, and autonomic balance [14,15], evidence specifically evaluating Shiro Abhyanga with sesame oil for digital-screen-related visual fatigue is scarce. The present study was therefore undertaken to assess its effectiveness using both subjective (CVS-Q) and objective (NPC, Snellen acuity) outcome measures in students with prolonged digital screen exposure.

2. Aims and Objectives

Aim: To evaluate the effectiveness of Head Massage (Shiro Abhyanga) with sesame oil on visual fatigue associated with prolonged digital screen exposure among students.

Objectives:

1. To evaluate change in Computer Vision Syndrome Questionnaire (CVS-Q) scores before and after the intervention.
2. To assess change in Near Point of Convergence (NPC) before and after the intervention.
3. To assess Snellen Visual Acuity before and after the intervention.

3. Review of Literature

Computer Vision Syndrome is multifactorial, involving accommodative and vergence stress, reduced blink rate, tear-film instability, and musculoskeletal tension [3,4]. The CVS-Q developed by Seguí et al.

is a validated instrument for quantifying symptom frequency and intensity [7]. Near Point of Convergence is a standard clinical measure of binocular function; prolonged near work can temporarily recede the NPC, reflecting convergence fatigue [8]. Snellen acuity is generally unaffected by functional visual fatigue and serves primarily to confirm baseline visual stability [9].

Massage therapy improves circulation, reduces muscle stiffness, lowers stress-hormone levels, and promotes parasympathetic dominance [14,15]. Specific studies of head massage have reported favourable changes in autonomic activity and psychological state [20]. Traditional Ayurvedic literature attributes to Shiro Abhyanga and sesame oil the capacity to nourish tissues, pacify Vata, and support sensory-organ function [11,12]. These mechanistic and traditional rationales support evaluation of the modality for screen-related visual fatigue.

4. Materials and Methods

4.1 Study Design and Setting

A single-group, pre-test/post-test interventional study was conducted at Tapovana Medical College of Naturopathy and Yogic Sciences, Doddabathi, Davangere, Karnataka.

4.2 Participants

Ten students aged 18–25 years who reported prolonged digital screen exposure and symptoms consistent with visual fatigue were enrolled by convenience sampling. All completed the protocol with no dropouts.

Inclusion criteria:

- Age 18–25 years, either gender
- Prolonged daily digital screen use with symptoms of visual fatigue
- Willingness to provide written informed consent and attend daily sessions
- Normal or corrected-to-normal Snellen visual acuity (6/6)

Exclusion criteria:

- Ocular pathology, recent eye surgery, or uncorrected significant refractive error
- Skin conditions or hypersensitivity precluding scalp massage with oil
- Acute systemic illness or concurrent experimental ocular therapy

4.3 Ethical Considerations

The study protocol received institutional ethics committee approval. Written informed consent was obtained from all participants. Participation was voluntary and data confidentiality was maintained.

4.4 Intervention

Head Massage (Shiro Abhyanga) was administered once daily for 10 consecutive days. Lukewarm pure sesame oil was applied to the scalp, temples, and forehead, and gentle rhythmic massage was performed for 10 minutes by a trained investigator under standardized conditions. Participants remained seated comfortably throughout the session.

4.5 Outcome Measures

Computer Vision Syndrome Questionnaire (CVS-Q): A validated 16-item instrument assessing frequency and intensity of ocular and visual symptoms; total score ≥ 6 indicates presence of CVS [7].

Near Point of Convergence (NPC): Measured in centimetres as the closest point at which single binocular vision is maintained; a lower value indicates better convergence ability [8].

Snellen Visual Acuity: Standard distance acuity screening to confirm baseline visual stability [9].

4.6 Statistical Analysis

Data were analysed using Jamovi Cloud (version 2.7.30). Descriptive statistics (mean $\pm$ SD) were computed. Pre- and post-intervention scores were compared with the paired samples t-test. Effect size was expressed as Cohen's d. A p-value < 0.05 was considered statistically significant.

5. Results

All 10 participants completed the 10-day intervention with no adverse events.

5.1 Demographic Profile

Participants were students aged 18–25 years. Detailed age- and gender-wise distributions are presented in the original data set; the sample was balanced with respect to the inclusion criteria.

5.2 Primary and Secondary Outcomes

Table 1 summarises the pre- and post-intervention comparisons.

Outcome	Pre (Mean $\pm$ SD)	Post (Mean $\pm$ SD)	t(9)	p-value	Cohen's d
CVS-Q score	25.00 $\pm$ 7.53	14.00 $\pm$ 6.36	7.611	<0.001	2.41
NPC (cm)	6.20 $\pm$ 0.65	5.00 $\pm$ 0.94	3.682	0.005	1.16
Snellen Visual Acuity	6/6 (stable)	6/6 (stable)	—	No change	—

Table 1. Comparison of pre- and post-intervention outcome measures (n = 10)

The reduction in CVS-Q score was highly significant with a very large effect size (Cohen's d = 2.41). NPC also improved significantly with a large effect size (d = 1.16). Snellen Visual Acuity remained unchanged, confirming that the observed benefits reflected functional improvement rather than alteration of refractive status.

6. Discussion

The present study demonstrated that a 10-day course of Head Massage (Shiro Abhyanga) with sesame oil significantly reduced subjective symptoms of Computer Vision Syndrome and improved objective

Near Point of Convergence in students with prolonged digital screen exposure. Visual acuity remained stable, as expected for a functional rather than refractive intervention.

These findings are consistent with the known physiological effects of massage: enhanced local circulation, reduced muscular tension, parasympathetic activation, and lowered stress-hormone levels [14,15]. Relief of periocular, scalp, and cervical muscle tension may reduce the contribution of musculoskeletal factors to visual discomfort, while autonomic relaxation may lessen the stress-related component of digital eye strain. The improvement in NPC suggests a beneficial effect on convergence endurance, a function commonly fatigued by sustained near work [8].

From the traditional perspective, Shiro Abhyanga with sesame oil is regarded as nourishing and Vata-pacifying, supporting sensory-organ function and mental calm [11,12]. The convergence of modern physiological and traditional rationales strengthens the plausibility of the observed benefits.

Limitations include the small sample size ($n = 10$), absence of a control group, short intervention period, lack of long-term follow-up, and restriction to a young adult student population. Outcomes relied partly on self-report. Future studies should employ larger samples, randomized controlled designs, longer follow-up, and additional objective ocular measures (e.g., accommodative facility, tear-film parameters).

Despite these limitations, the magnitude of change, large effect sizes, absence of adverse events, and simplicity of the protocol support the potential value of Head Massage with sesame oil as a complementary approach to digital eye strain.

7. Conclusion

Within the limitations of this single-group pre–post study, Head Massage (Shiro Abhyanga) with sesame oil administered daily for 10 days significantly reduced Computer Vision Syndrome symptoms and improved Near Point of Convergence among students with prolonged digital screen exposure. Snellen Visual Acuity remained unchanged. The intervention was safe, inexpensive, non-invasive, and well tolerated. These findings support its use as a complementary naturopathic therapy for visual fatigue associated with digital device use. Larger controlled trials are recommended to confirm and extend these results.

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Conflict of Interest

The author declares that there is no conflict of interest.

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