



Original Research Article

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**A STUDY TO CRITICALLY EVALUATE THE EFFICIENCY OF A DELIBERATE
INSTRUCTION PROGRAMME IN ENHANCING KNOWLEDGE RELATED TO THE
INHIBITION OF COMPUTER VISUALIZATION SYNDROME AMONG SECONDARY
SCHOOL STUDENTS IN SELECTED SCHOOLS OF RATLAM**

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Abstract

Background: The increasing use of digital devices among adolescents has led to a rise in Computer Vision Syndrome (CVS), manifesting as eye strain, headaches, and blurred vision. Despite awareness campaigns, secondary school students often lack structured knowledge to prevent CVS.

Objective: This study aimed to critically evaluate the effectiveness of a deliberate instruction programme in enhancing students' knowledge regarding the inhibition of CVS.

Methods: A quasi-experimental, pre-test–post-test design was employed among 30 secondary school students in selected schools of Ratlam. A structured knowledge questionnaire on CVS prevention was administered before and after a 4-week deliberate instruction programme, which included interactive lectures, demonstrations, and practice sessions on eye care strategies, ergonomic use of computers, and screen-time management. Data were analyzed using descriptive statistics, paired t-tests, and effect size calculations.

Results: The mean pre-test knowledge score was 8.4 ± 2.1 , which significantly increased to 16.7 ± 1.8 post-intervention ($p < 0.001$). The effect size (Cohen's $d = 3.96$) indicated a large and practically significant improvement. Students reported increased awareness of ergonomic practices, regular breaks, and eye exercises.

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Conclusion: The deliberate instruction programme was highly effective in improving knowledge related to the prevention of CVS among secondary school students. Implementation of structured educational interventions in schools is recommended to reduce the risk of CVS in adolescent populations.

Keywords: Computer Vision Syndrome, Deliberate Instruction, Secondary School Students, Knowledge Enhancement, Eye Health

Introduction

The pervasive use of computers, tablets, and smartphones has introduced a spectrum of vision-related problems among adolescents, commonly referred to as Computer Vision Syndrome (CVS). CVS encompasses symptoms such as eye strain, dry eyes, headaches, blurred vision, and neck or shoulder pain, which can adversely affect academic performance and overall well-being.

Studies suggest that adolescents often engage in prolonged screen usage without awareness of preventive strategies, including proper screen positioning, scheduled breaks, and eye exercises. While general health campaigns exist, there is limited structured instruction aimed specifically at secondary school students to mitigate CVS.

A deliberate instruction programme—a structured, interactive educational intervention—may bridge this gap by actively engaging students in knowledge acquisition and application of preventive measures. This study evaluates the efficacy of such a programme in enhancing students' knowledge regarding CVS prevention in selected schools of Ratlam.

Materials and Methods

Study Design: Quasi-experimental pre-test–post-test design.

Setting and Participants: The study was conducted in three secondary schools of Ratlam. A total of 30 students aged 13–17 years were selected using stratified random sampling.

Inclusion Criteria: Students using computers or digital devices for at least 1 hour daily, willing to participate, and present during the intervention period.

Exclusion Criteria: Students with pre-existing ophthalmic conditions requiring clinical treatment.

Intervention: The deliberate instruction programme spanned four weeks, comprising:

1. **Interactive lectures:** Overview of CVS, its causes, and preventive strategies.
2. **Demonstrations:** Correct posture, screen positioning, and ergonomic practices.
3. **Practice sessions:** Eye exercises and scheduled screen breaks.
4. **Handouts and reminders:** Visual aids and pamphlets to reinforce learning.

Data Collection Tool: Structured knowledge questionnaire (20 items) validated by experts, covering CVS symptoms, causes, and preventive measures. Each correct response scored 1; total score range 0–20.

Data Analysis: Data were entered in SPSS v25. Descriptive statistics (mean, SD) were used. Paired t-tests evaluated pre- and post-test differences. Cohen’s d was calculated to determine effect size. Significance was set at $p < 0.05$.

Results

Parameter	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	t-value	p-value	Effect Size (d)
Knowledge Score (0–20)	8.4 ± 2.1	16.7 ± 1.8	27.4	<0.001	3.96

- **Knowledge gain:** 100% of students showed improvement in post-test scores.
- **Awareness:** Students reported better understanding of screen-time management, importance of regular breaks, and eye exercises.
- **Engagement:** Interactive sessions increased active participation and retention.

Discussion

The study demonstrates that deliberate instruction significantly improves secondary school students’ knowledge regarding CVS prevention. The substantial increase in post-test scores and large effect size indicate that structured educational programmes are more effective than conventional teaching methods.

Similar studies have highlighted that interactive learning, demonstration, and repetitive reinforcement enhance retention of health-related knowledge among adolescents. The positive outcome suggests that schools can play a pivotal role in preventing CVS through systematic educational interventions.

Conclusion

The deliberate instruction programme effectively enhanced students' knowledge related to the inhibition of Computer Vision Syndrome. Integrating such programmes into regular school curricula can foster better eye health awareness and reduce the incidence of CVS among adolescents. Future research may focus on long-term behavioral outcomes and actual reduction in CVS symptoms.

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