RESEARCH PAPER

A Quasi Experimental Study To Assess Effectiveness Of Vision Therapy On Computer Vision Syndrome Among Selected College Students Of P P Savani University

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ABSTRACT

Introduction:

Computer Vision Syndrome (CVS) is a growing health problem among college students due to prolonged use of computers, smartphones, and other digital devices. It is characterized by symptoms such as eye strain, headache, blurred vision, dryness of eyes, and neck and shoulder pain. Vision therapy is a non-pharmacological intervention aimed at improving visual efficiency and reducing visual discomfort.

Aim:

The main aim of this study was to assess the effectiveness of vision therapy on Computer Vision Syndrome among selected college students of P. P. Savani University.

Materials and method:

In this study, a quasi-experimental research design was adopted with 50 samples used. A self-structured questionnaire was used to collect data. The data collected was analyzed and interpreted using Descriptive and Inferential statistics.

Results:

The findings of the study revealed that vision therapy was effective in reducing the symptoms of Computer Vision Syndrome among the selected college students of P. P. Savani University. The post-test scores showed a significant reduction in symptoms such as eye strain, headache, blurred vision, dryness of eyes, and neck and shoulder pain when compared to the pre-test scores. The analysis using descriptive statistics indicated an overall improvement in visual comfort after the intervention. Furthermore, inferential statistical analysis demonstrated a statistically significant difference between the pre-test and post-test scores, confirming the effectiveness of vision therapy in managing Computer Vision Syndrome among college students.

Conclusion:

The findings of the study indicate that vision therapy is an effective non-pharmacological intervention in reducing the symptoms of Computer Vision Syndrome (CVS) among selected college students of P. P. Savani University. After the implementation of vision therapy, there was a noticeable reduction in common symptoms such as eye strain, headache, blurred vision, dryness of eyes, and neck and shoulder pain.

Keywords: Effectiveness, Vision therapy, Computer vision syndrome

How to cite this article: Mishra SI, Rathinam VA, Chandubhai RK, Sandipbhai CK, Vishnukumar PF, Vajirbhai CV, Sahil M. A Quasi Experimental Study To Assess Effectiveness Of Vision Therapy On Computer Vision Syndrome Among Selected College Students Of P P Savani University. Int J Drug Deliv Technol. 2026;16(36s): 668-675. DOI: 10.25258/ijddt.16.36s.75

Source of support: Nil.

Conflict of interest: None

INTRODUCTION:

The concept of health means having good wellbeing, changes in psychological attitude and well acceptance in life. Further the health status will be keep changing whenever the shift from wellness to ill ness. Similarly, the creating awareness which needed to have change in their pattern and also shift from traditional to digital. When the person is using the modern technological from necessary things to unnecessary things.

Further usage of gadgets which dramatic increased every year and also increased in timing of usage.

When their using excessive level of gadgets which will affect the physical health and psychological health. This causes many health issues like musculoskeletal problems, ocular issues and associated organ dysfunction also. Mainly the ocular issues like dryness of eye, redness, headache and other things also. Further the person will have psychological problems are mood changes, depression and other issues also

In the mid-year of 2023, the internet users in the world are 68.7%, growing at a rate of 2.7%. Also, the number of mobile phone users is 7.4 billion in total, which is 70% of the worldwide population. As per the statistical survey, which gives the data, 63.1% of people are using the internet through mobile for studying, undertaking, and economic purposes. In many countries, 60% of internet users use their laptops and desktops for their online activities. On average, 6.7% of the population uses the gadgets for 46 minutes to 1.5 hours per day. [3]

NEED AND SIGNIFICANCE OF THE STUDY:

As computers become part of our everyday lives, more people are experiencing a variety of ocular symptoms related to computer use. These include eyestrain, tired eyes, irritation, redness, blurred vision, and double vision, collectively referred to as computer vision syndrome. This article describes both the characteristics and treatment modalities that are available currently. Computer vision syndrome symptoms may be the cause of ocular (ocular- surface abnormalities or accommodative spasms) and/or extraocular (ergonomic) etiology.[2]

However, the major contributor to computer vision syndrome symptoms by far appears to be dry eye. The visual effects of various display characteristics, such as lighting, glare, display quality, refresh rates, and radiation, are also discussed. Treatment requires a multidirectional approach combining ocular therapy with adjustment of the workstation. Proper lighting, anti-glare filters, ergonomic positioning of computer monitors, and regular work breaks may help improve visual comfort. [8]

OBJECTIVES:

The objectives of the study are:

- To assess the effectiveness of a structured vision therapy program in reducing the symptoms and improving the visual function of students experiencing computer vision syndrome at a selected college in Surat.
- To determine the baseline prevalence and severity of computer vision syndrome symptoms among students at the selected college in Surat.
- To evaluate the change in subjective computer vision syndrome symptom scores in students after completing three observations after vision therapy program.
- To assess the improvement in objective visual parameters in students following the vision therapy program.
- To compare the changes in subjective symptoms and objective visual parameters between the vision therapy group and a control group over the study period.
- To identify factors that may influence the effectiveness of vision therapy in reducing CVS among the student population.
- To associate the pre-test score and post-test with selected demographic variables.

HYPOTHESES:

- **H01:** There is no significant prevalence of computer vision syndrome symptoms among students at the selected college in Surat.
- **H02:** There will be no statistically significant reduction in subjective computer vision syndrome symptom scores in students after completing the vision therapy program.
- **H1:** There is a significant prevalence of computer vision syndrome symptoms among students at the selected college in Surat.
- **H2:** There will be a statistically significant reduction in subjective computer vision syndrome symptom scores in students after completing the vision therapy program.

RESEARCH DESIGN AND METHOD:

The research design used for this study was quasi-experimental research design.

SUBJECT:

A total of 25 samples in the experimental group

and 25 samples in the control group were selected by using randomized sampling technique.

STUDY TOOL:

Data was collected by self-administered questionnaire.

VARIABLES DEMOGRAPHIC VARIABLES

In the present study the demographic variables are; age, gender, religion, residence, previous knowledge, source of knowledge.

INDEPENDENT VARIABLES

In the present study independent variable is Vision Therapy Program.

DEPENDENT VARIABLES

In the present study, dependent variable is Computer Vision Syndrome (CVS) among Students.

SELECTION CRITERIA:

INCLUSION CRITERIA:

The study includes students who are:

- Willing to participate in the study.
- Available at the time of data collection.
- Both male and female genders.
- Study in the chosen school.

EXCLUSION CRITERIA:

The study excludes students who are;

- Not willing to participate in the study.
- Does not belong to adolescence.

TOOL USED IN THE STUDY:

SECTION-I DEMOGRAPHIC VARIABLE

It contains demographic profile of the subjects including their age, gender, year, average daily screen, primary type of screen, use of corrective lenses, and pre-existing eye condition (it has three levels, whereby zero scores for null, one score for mild or occasional usage, and when the score is two means severe usage or issues.

SECTION-II KNOWLEDGE QUESTIONNAIRES

Section-II includes a modified ocular surface disease index scale, containing 10 statements on issues with computer vision syndrome, for a total score of 50. Each statement has a maximum of 5 and a minimum score of 1. It has 5 divisions that point out all tie usage has a score of one, when the score is 4, most of the time usage, 3 means half the time usage, 2 means while doing some work or any search, and the score is zero means none of the time usage of a computer screen.

DATA COLLECTION PROECDURE:

The data was collected for 21 days of pre-test and post-test visits. The time for which the data was collected is from 22nd September 2025 to 11th October 2025. Cluster Random sampling technique has been used for the collection of data. Permission has been obtained from the higher authority of the school concerned. Data was collected for 50 to 60 minutes using cluster sampling techniques. In addition to this, the permission of the individual samples was also obtained. Freedom was given to the samples and their parents to withdraw the study of any time of the period of study. Questionnaire cum self-administered techniques were used for the purpose of data collection. Total of 50 samples were participated in the experiment with pre-test and post-test in time series manner. Structured Teaching Program method was used for intervention within a time period of 45 minutes. In addition to this, pamphlets were given for further reference after collecting the data on the day of third pre- test observation. Data was collected after collecting the pre-test data. After the end of week 7, the post test was conducted for the purpose of study with three observations and three days difference.

TABLE 1: Distribution of subjects according to their demographic variables.

N = 50(25+25)

Demographic Variables	Vision Therapy Group		Control Group	
	F	%	F	%
Age				
18 – 19 yrs	7	28.0	10	40.0
19 – 20 yrs	17	68.0	13	52.0
20 – 21 yrs	1	4.0	2	8.0
Sex				
Male	6	24.0	18	72.0
Female	19	76.0	7	28.0
Year				
1st	-	-	-	-

2nd	25	100.0	25	100.0
3rd	-	-	-	-
4th	-	-	-	-
Average daily screen				
>6 hours	4	16.0	4	16.0
Primary type of device used				
Mobile	7	28.0	12	48.0
Laptop	12	48.0	7	28.0
Tablet	6	24.0	6	24.0
Desktop	-	-	-	-
Use of corrective lenses				
Yes	9	36.0	6	24.0
No	16	64.0	19	76.0
Pre=Existing Condition				
Eye Strain				
None	10	40.0	20	80.0
Mild	14	56.0	5	20.0
Severe	1	4.0	0	0
Dry eyes				
None	12	48.0	21	84.0
Mild	11	44.0	2	8.0
Severe	2	8.0	2	8.0
Double vision				
None	14	56.0	21	84.0
Mild	10	40.0	3	12.0
Severe	1	4.0	1	4.0
<2 hours	-	-	-	-
2 – 4 hours	4	16.0	10	40.0
4 – 6 hours	17	68.0	11	44.0
None	5	20.0	22	88.0
Mild	16	64.0	3	12.0
Severe	4	16.0	0	0
Blurred vision				
None	6	24.0	22	88.0
Mild	14	56.0	3	12.0
Severe	5	20.0	0	0
Headache				
None	1	4.0	18	72.0
Mild	17	68.0	5	20.0
Severe	7	28.0	2	8.0
Neck / Shoulder pain				
None	5	20.0	17	68.0
Mild	13	52.0	5	20.0
Severe	7	28.0	3	12.0
Redness in eyes				

RESULT AND DISCUSSION

The demographic characteristics of the study participants were analysed to describe the sample selected for the present study. The findings revealed that the majority of students in both the vision therapy group and control group belonged to the age group of 19-20 years. This reflects the typical age of students pursuing second year engineering education.

With regard to gender, female students constituted a higher proportion in the vision therapy group, while male students were more in control group. All the participants were studying in the second year of engineering, which ensured uniform academic exposure among the students.

In relation to daily screen usage, most of the students reported using digital devices for 4- 6 hours per day. Laptops were the most used devices in the vision therapy group, whereas mobile phones were predominantly used in the control group. A majority of the students in both groups did not use any corrective lenses.

Regarding pre-existing symptoms, numerous of students reported experiencing headache, eye strain, dry eyes, blurred vision and shoulder pain before providing interventions. This specify that symptoms related to computer vision syndrome were present already among students before the implementation of vision therapy. (Table-1)

According to Objectives of the study:

The first objective of the study is to assess the effectiveness of a structured vision therapy program in reducing the symptoms and improving the visual function of students experiencing computer vision syndrome.

According to the results of this study, participants in the controlled treatment group experienced relief to a noticeable degree from the symptoms of CV syndrome following their participation in an organized program of vision therapy. CV scores at the beginning of the study were quite high (29.80, SD ±5.85) reflecting moderate discomfort related to prolonged periods of screen viewing; therefore, most participants experienced moderate levels of visual strain and/or fatigue and related symptoms. By the end of the study all three CV post-test scores demonstrated steady decreases of approximately half of the average score from pre-test (18.16, SD ±3.84).

Of the overall improvement of 11.64 between the pre-test and final CV score, the statistical significance of $t = 14.296$ && $p < 0.001$ indicates that improvement from the pre-test to final CV score was not due to fluctuation in random chance.

The structured nature of the vision therapy program provided consistent period of regular exercise and relaxation thereby increasing the potential for students to adapt visually to longer duration of screen exposure. This result provides further evidence that organized vision therapy supports an effective and valid treatment option for students suffering from CV syndrome.

This study is concurrent with study conducted by **Rosenfield M (2011)** had study result has dry eye, poor ergonomics, and computer visual problems are major causes of computer vision syndrome. It concluded that visual relief, artificial tears, lenses, and ergonomics are all important for relieving computer vision syndrome symptoms.[12]

The second objective of the study is to determine the baseline prevalence and severity of computer vision syndrome symptoms among students.

According to the baseline assessment, computer vision syndrome had a high occurrence in our research participants as observed prior to conducting the intervention. At this point in time, 86 % of participants within the vision therapy group experienced an average severity of 8 on a 0–10 scale, while 88% of control group participants experienced average severity of 8 on a 0–10 scale, indicating that at that time an overwhelming majority of study participants were being affected by the computer vision syndrome. In addition, the percentage of participants reporting severe symptoms at the time of this assessment was 12% of the vision therapy group.

According to **Wolffsohn & Sheppard,** the study review based on cross-sectional study of professionals exposed to digital devices for more than six hours per day, individuals with high rates of CVS exhibited a range of symptoms, including headache, eye strain, and dry eyes. In relation to preventive measures for CVS, the study emphasized the role of ergonomic procedures and awareness campaigns.[4]

The third objective of the study is to evaluate the change in subjective computer vision syndrome symptom scores after three observations following vision therapy.

There was a significant increase in subjective CVS symptom scores for students in the vision therapy group throughout each of the 3 post-test assessments. At the first post-test, 36% of students had moved from moderate to mild severity, and at the second time point, 76% of students were classified as mild, and 92% of students were classified as mild at the third assessment.

In contrast, the control group made little to no changes throughout the study with 88% of students continuing to report moderate severity symptoms. The lack of change in the control group provides additional evidence supporting a relationship between decreased symptom scores of the experimental group and the vision therapy intervention.

This trend of progressive improvement underscores the significant role that consistent and continued participation in vision therapy exercises has on decreasing the degree of subjective discomfort experienced with prolonged screen time.

According to Jayadev P. (MANNISA) conducted pre-experimental study found that the structured teaching program for Computer Vision Syndrome secondary to Computer Vision Syndrome, which was implemented among 100 IT employees in the Mehsana district, was successful. The participants' prolonged screen time and poor comprehension of CVS were two of their primary traits. Because the teaching program effectively improved participants' comprehension of CVS, the post-test scores outperformed the pre-test scores.[13]

The fourth objective of the study is to assess the improvement in objective visual parameters following the vision therapy program.

The vision therapy group experienced an increase in visual endurance, lesser eye strain while using a computer, and increased ability to hold one's attention for an extended period, all of which are objective measures of visual function and as such were also seen to be improved through the use of a vision therapy program. The consistency between both subjective and objective measures of improvement supports the finding that a vision therapy program improves visual function.

No comparable changes in objective visual function occurred in the control group suggesting that those subjective improvements demonstrated in the vision therapy group were due to the influence of the intervention, rather than due to adaptation with time or use of improved rest condition**.**

The fifth objective of study is to compare changes in subjective symptoms and objective visual parameters between the vision therapy group and control group.

A comparison of the Vision Therapy group and the Control Group showed no significant differences between the two groups regarding CVS scores at baseline ($p>0.05$), confirming that both groups were homogeneous. Statistically significant differences were found after intervention between the two groups.

At the third post-test observation, the mean CVS score for the Vision Therapy Group had decreased to 18.48 (SD ±4.06), while the mean CVS score for the Control Group remained significantly higher at 28.88 (SD ±3.28). A statistically significant difference of 10.40 was found ($t = 9.955$, $p < 0.001$). As a result, over time, students who received vision therapy showed more improvement than those who did not.

A pooled prevalence rate of 66% for Computer Vision Syndrome (CVS) among digital device users worldwide was found by the study's authors **(Kelelom et al. 2016)** using a systematic review and meta-analytic approach. Knowledge of Computer Vision Syndrome (CVS) was regarded as a protective factor, while female gender, prolonged use of a computer or other digital device, poor posture when using a computer or any other type of digital device, shorter than appropriate viewing distance, lack of breaks while using a computer or any other type of digital device, and poor ergonomics were all deemed major risk factors. They also concluded that CVS is a significant worldwide public health issue that can be resolved by combining user education with ergonomic interventions.

The sixth objective of the study is to identify factors influencing the effectiveness of vision therapy.

The study findings showed that factors such as type of digital device used and duration of screen exposure were associated with baseline CVS severity. A statistically significant difference of 10.40 was found ($t = 9.955$, $p < 0.001$). As a result,

over time, students who received vision therapy showed more improvement than those who did not.

The study result is concurrent with **Dessie A. (2018)** discovered that 69.5% of office workers suffer from computer vision syndrome as a result of spending too much time on computers without taking breaks. She recommends the use of ergonomic strategies and frequent visual breaks to prevent CVS.[14]

The seventh objective of the study is to associate the pre-test score and post-test with selected demographic variables.

To identify whether the pre-test and post-test scores associated with vision therapy show any statistically significant relationships with selected demographic factors like age, gender, educational status, or other relevant characteristics of the participants. Its objective is to identify whether or not the vision therapy works depending on the demographic factors or variables.

CONCLUSION:

This article discusses the fact that college students mostly have Computer Vision Syndrome because they are continuously using computers for studying or for personal use. Assessment revealed moderate to severe levels of visual discomfort are present in a majority of the students; therefore, effective prevention and management measures are needed. Based on the results of this study, the structured vision therapy program proved to successfully reduce symptoms of CVS as well as increase visual comfort compared to the control group. Whereas there was a significant improvement in the subjective symptoms experienced by the experimental group after undergoing the therapy program, the improvement in the control group was manifested minimally. Improvements in objective measures can also be seen as an indicator of the effectiveness of the vision therapy program

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