

**THE PREVALENCE AND PERCEPTION OF COMPUTER VISION SYNDROME  
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**ABSTRACT**

In present era, computer became a part of life and prolonged exposure to computer screen can put a real strain on our eyes and disturbance in musculoskeletal system. This is called "computer vision syndrome." A quantitative study was aimed to assess the prevalence and level of perception of computer vision syndrome among engineering students, to find the association between prevalence of computer vision syndrome among engineering students and selected demographic variables and find the association between perception regarding computer vision syndrome among engineering students and selected demographic variables. The study covered 100 computer science engineering student from AISAT Engineering College, Ernakulam. Data was collected using a checklist and Likert scale. Descriptive survey design was used to conduct the study. Results showed that prevalence of computer vision syndrome was 77%. Out of 100 sample, 89% of sample had poor perception and 11% had good perception regarding computer vision syndrome. There was an association between prevalence of computer vision syndrome among engineering students and selected demographic variables like year of study ( $\chi^2 = 10.56$ , p value = 0.04) and type of device used ( $\chi^2 = 8.75$ , p value = 0.03) and there was no significant association between perception regarding computer vision syndrome among engineering students and selected demographic variables. The study was concluded that computer vision syndrome was found to be very frequent among the computer science students, which emphasizes the need to adopt some preventive measures to avoid the conditions.

**KEYWORDS:** computer vision syndrome; perception; prevalence.**INTRODUCTION**

Nowadays, many of us have jobs that require us to stare at computer screen for hours at a stretch. Computer screen are in rampant use not only at workplaces, office and academic institutions but also there is a usage common even at recreational places and homes. This prolonged exposure to computer screen can put a real strain on our eyes. Eye problems caused by the usage of computer fall under the heading computer vision syndrome (CVS). It isn't one specific problem. Instead, it includes a whole range of eye strain and pain. Computer vision syndrome include extra ocular complaints like back pain, tension, headache and psychosocial stress.<sup>[1]</sup>

The American Optometric Association defines computer vision syndrome is a group of eye and vision related problems that result from prolonged computer use, e – readers and cell phone use. Most commonly reported visual complaints include redness, dry eyes, burning sensation and ergonomic problems or musculoskeletal related complaints include tingling of fingers, cervical stiffness, backache, and headache.<sup>[2]</sup> Symptoms of computer vision syndrome are broadly classified into

four categories: such as, Asthenopic: sore eyes, eye strain, tired eyes, Ocular surface related: dry eyes, watery eyes, irritated eyes, Visual: blurred vision, slowness of focus change, double vision, presbyopia and Extra ocular: neck pain, back pain, shoulder pain and headache.

The computer vision syndrome is otherwise known as repetitive strain injury (RSI) or Digital Eye Strain (DES).<sup>[3]</sup>

**OBJECTIVES**

1. To assess the prevalence of computer vision syndrome among engineering students.
2. To assess the level of perception of computer vision syndrome among engineering students.
3. To find the association between prevalence of computer vision syndrome among engineering students and selected demographic variables.
4. To find the association between perception regarding computer vision syndrome among engineering students and selected demographic variables.

## MATERIALS AND METHODS

A quantitative study was aimed to assess the prevalence and level of perception of computer vision syndrome among engineering students, to find the association between prevalence of computer vision syndrome among engineering students and selected demographic variables and find the association between perception regarding computer vision syndrome among engineering students and selected demographic variables. Descriptive survey design was employed in this study. In the study, sample were comprised of 100 Computer science students were selected from Albertian Institute of Science and Technology (AISAT) Engineering College, Kalamassery, Ernakulam. Sample size was calculated by Fischer's Formula

$$n = Z^2pq/d^2$$

$p = 0.44$  (According to study conducted Mani S, Menon M, Harishankar, Mathew A regarding the prevalence of computer vision syndrome among information technology students.<sup>12</sup>)

$$q = 1 - p = 0.55 \quad Z = 1.96 \text{ If } d = 10\%$$

$$n = [(1.96)^2 \times 0.44 \times 0.55] / (0.1)^2 = 92$$

Sample size was fixed as 100 and Non probability convenience sampling technique was used to select the sample in this study. Checklist and Likert scale were used to collect the data.

Tool 1 was used to assess the prevalence of computer vision syndrome which consisted of Section A: Demographic profile of the sample. Section B: Check list to assess the prevalence of computer vision syndrome. Scoring and interpretation of Tool 1 was subject who have at least one symptom out of ten is considered as a person with computer vision syndrome. Tool 2 was used to assess the perception of computer vision syndrome which consisted of a Likert scale to assess the perception of computer vision syndrome. All items were scored in a five – point scale. Scoring and interpretation of Tool 2 was done as 10 – 30 (poor perception) and 31 – 50 (good perception).

The data was collected and compiled in MS Excel sheet and analyzed by using SPSS version 20.0. Descriptive statistics was used. Chi square test was applied to know

the association between two variables. Socio-demographic variable was analysed using frequency and percentage. Prevalence of computer vision syndrome among engineering students was analysed by using descriptive statistics. Perception of computer vision syndrome among engineering students was analysed by using descriptive statistics. Chi-square test was used to find the association between prevalence of computer vision syndrome among engineering students and selected socio demographic variables and association between perception regarding computer vision syndrome among engineering students and selected demographic variables.

## INCLUSION CRITERIA

The study included engineering students,

- who are in Computer Science discipline.
- aged between 17 and 25 years

## EXCLUSION CRITERIA

The study exclude engineering students

- who are absent during the period of data collection.
- who are not willing to participate in this study.

## RESULTS

The data collected is subjected to descriptive and inferential statistics to assess the prevalence and perception of computer vision syndrome. The data is compiled analysed and interpreted using descriptive and inferential statistics by SPSS version 20 based on the objectives and hypotheses formulated for the study.

### a) Table 1: Socio demographic profile of study subjects (n = 100)

This section deals with sample characteristics like age, gender, year of study, type of device, duration and years of computer usage and use of anti – glare coated spectacles. Data pertaining to the sample characteristic are presented and analyzed in terms of frequency and percentage.

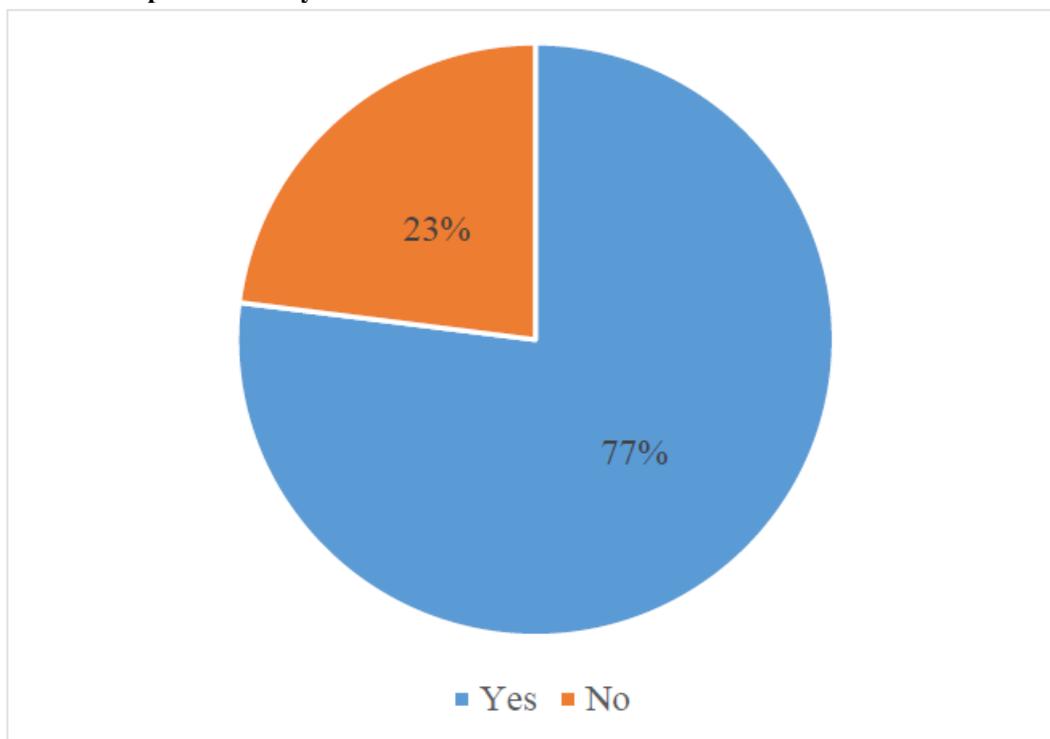
Socio demographic profile		Frequency	Percentage (%)
Age in years	17 – 19	40.0	40
	20 – 22	59.0	59
	23 – 25	1.0	1
Gender	Male	61.0	61
	Female	39.0	39
Year of study	Second year	49.0	49
	Third year	31.0	31
	Fourth year	20.0	20
Type of device used	Computer	2.0	2
	Laptop	4.0	4
	Smartphones	54.0	54
Year of usage of electronic device	All the above	40.0	40
	1 – 2 years	6.0	6

	2 – 4 years	22.0	22
	4 – 6 years	16.0	16
	More than 6 years	56.0	56
Duration of electronic device usage per day	1 – 2 hrs.	13.0	13
	3 – 4 hrs.	34.0	34
	5 – 6 hrs.	26.0	26
	More than 6 hrs.	27.0	27
Use of anti – glare coated spectacles	Yes	11.0	11
	No	89.0	89

Table 1 shows the Socio demographic profile of study subjects (n = 100). Out of 100 sample, 59% of the sample were aged between 20 and 22 years. Regarding gender, 61% were male and 39% were female. Regarding year of study, 49% were second year, 31% were third year and 20% were fourth year students. Regarding the type of device used, 54% had smart phone usage, 4% had laptop usage, 2% had computer usage,

and 40% students had all electronic devices. Regarding years of duration of electronic device, 56% used for more than 6yrs, 22% used for 2 to 4yrs, 15% used for 4 to 6yrs and 7% used electronic device for 1 to 2 years. Regarding duration of usage of computer per day, 34% used computer for 3 to 4hrs. Regarding usage of anti – glare coated spectacles while using computers, 89% of sample did not use any anti – glare coated spectacles.

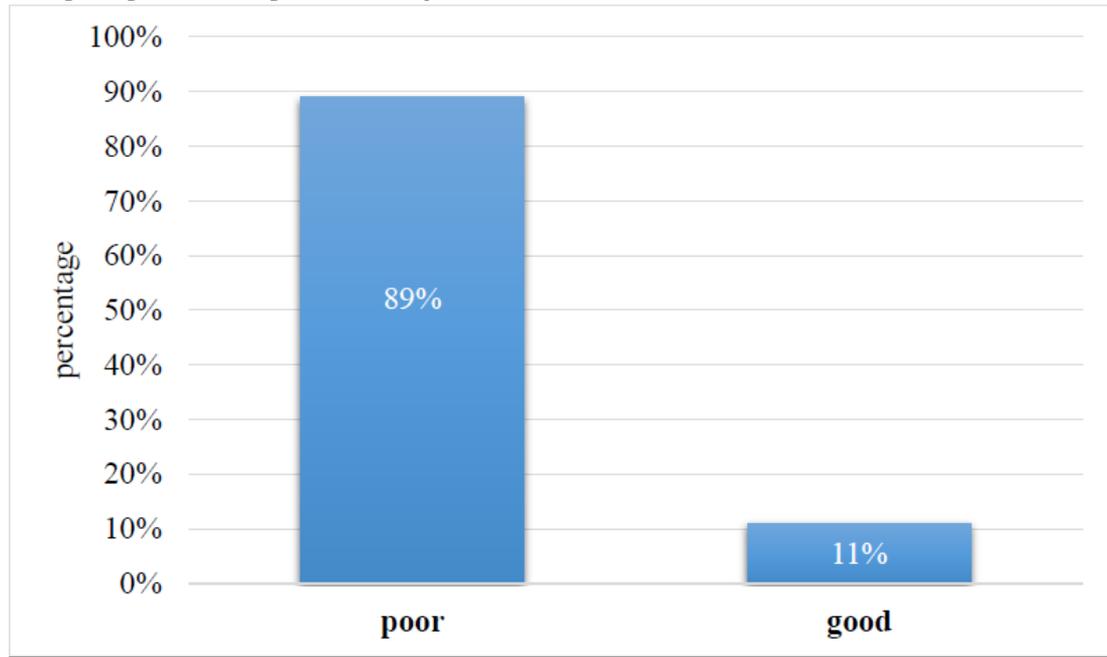
**b) Prevalence of computer vision syndrome**



**Figure 1: Pie diagram shows the prevalence on computer vision syndrome.**

Figure 1 reveals that Out of 100 sample 77% of the sample have computer vision syndrome.

## c) Level of perception of computer vision syndrome



**Figure 2: Bar diagram showing the level of perception of computer vision syndrome.**

Figure 2 depicts that out of 100 sample, 89% of sample have poor perception and 11% have good perception regarding computer vision syndrome.

## d) Table 2: Association between prevalence and selected demographic variables.

Sample characteristic	Chi – square ( $\chi^2$ )	p value
Age	4.67	0.97 <sup>ns</sup>
Gender	0.97	0.32 <sup>ns</sup>
Year of study	10.56	0.04 <sup>*</sup>
Type of device used	8.75	0.03 <sup>*</sup>
Year of usage of electronic device	1.49	0.68 <sup>ns</sup>
Duration of electronic device usage per day	0.58	0.90 <sup>ns</sup>
Use of anti – glare coated spectacles	1.24	0.26 <sup>ns</sup>

\* = Significance at 0.05 level

ns = non-significant at 0.05 level

Table 2 shows the association between prevalence of computer vision syndrome among engineering students and selected demographic variables. There is a significant association

between prevalence of computer vision syndrome and year of study ( $\chi^2 = 10.56$ , p value = 0.04) and type of device used ( $\chi^2 = 8.75$ , p value = 0.03).

## e) Table 3: Association between perception and selected demographic variables.

Sample characteristic	Chi – square ( $\chi^2$ )	p value
Age	0.20	0.90 <sup>ns</sup>
Gender	0.03	0.84 <sup>ns</sup>
Year of study	1.60	0.44 <sup>ns</sup>
Type of device used	1.56	0.66 <sup>ns</sup>
Year of usage of electronic device	0.56	0.90 <sup>ns</sup>
Duration of electronic device usage per day	0.76	0.85 <sup>ns</sup>
Use of anti – glare coated spectacles	3.34	0.67 <sup>ns</sup>

Table 3 shows the association between perception regarding computer vision syndrome among engineering students and selected demographic variables. There was no significant association between perception regarding computer vision syndrome among engineering students and selected demographic variables.

**LIMITATIONS**

- Findings of this study cannot be generalized to whole community as Computer Science students of only one engineering college were selected to carry out this study.
- The prevalence of the computer vision syndrome was assessed only through the questionnaire.

## RECOMMENDATIONS

- A similar study can be undertaken with a large sample size for wider generalization.
- A comparative study can be conducted to assess the prevalence of computer vision syndrome in different professional and non-professional students.
- A follow up study may be undertaken to evaluate the effectiveness of informative leaflet on computer vision syndrome.
- Adequate screening and testing should be done for computer professionals regarding computer vision syndrome.
- Regular in-service educational programmes should be conducted for computer professionals regarding preventive aspects of computer vision syndrome.

## CONCLUSION

The present study was done to assess the prevalence and perception of computer vision syndrome among engineering students. The study revealed that majority of the sample had computer vision syndrome. In case of perception regarding computer vision syndrome, majority of sample had poor perception regarding computer vision syndrome. There was an association between prevalence of computer vision syndrome among engineering students and selected demographic variables like year of study. Hence the null hypothesis rejected and research hypothesis accepted. There was no association between perception regarding computer vision syndrome among engineering students and selected demographic variables. Hence the null hypothesis accepted and research hypothesis rejected. The conceptual frame work utilized for the study was Health belief Model Rosen stock and Becker and Maiman (1988). The expert's opinions and direction from the guide and help from engineering college authorities made the study worthwhile.

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