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A Study to Assess the Effect of Health Teaching Program on Knowledge Regarding the Prevention of Computer Vision Syndrome among Engineering Students in Selected Pcmc Area".

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Abstract:- **Background:** Computer Vision Syndrome (CVS) has emerged as a common health concern among engineering students due to prolonged use of digital devices for academic and recreational purposes. Symptoms such as eye strain, dryness, blurred vision, and headaches can negatively impact students' productivity and well-being. Despite its growing prevalence, awareness regarding preventive measures remains limited. Therefore, a structured health teaching program is essential to improve knowledge and promote healthy practices, helping to reduce the risk and impact of CVS among engineering students in the selected area. **Objective:** To evaluate the effectiveness of a health teaching program on improving the knowledge and awareness regarding the prevention of computer vision syndrome. **Methods:** A quantitative research approach was adopted for the study as it helped to measure the knowledge level of students and to evaluate the effectiveness of the health teaching program. A pre-experimental one-group pre-test and post-test research design was used to assess the effectiveness of the health teaching program on knowledge regarding the prevention of Computer Vision Syndrome among engineering students. The study was conducted in a selected engineering college located in the PCMC area. The sample size consisted of 100 engineering students. A convenient sampling technique was used to select the participants for the study. The tool consisted of two sections. Section I included demographic variables such as age, gender, year of study, branch of engineering, type of residence, daily screen time, use of spectacles, and previous knowledge regarding Computer Vision Syndrome. Section II consisted of structured knowledge questions related to Computer Vision Syndrome and its prevention, including causes, symptoms, risk factors, complications, and preventive measures. Prior to data collection, permission was obtained from the concerned authorities. A pre-test was conducted to assess the baseline knowledge of students regarding Computer Vision Syndrome. After the pre-test, a health teaching program regarding the prevention of Computer Vision Syndrome was conducted using appropriate teaching methods such as lecture and audiovisual aids. A post-test was conducted using the same questionnaire to evaluate the effectiveness of the health teaching program. **Result:** The study suggested that the comparison of pre-test and post-test knowledge scores showed that the mean post-test knowledge score (17.8) was higher than the mean pre-test knowledge score (7.9), with a mean difference of 9.9. The calculated t-value (18.6) was found to be statistically significant at $p < 0.05$ level. **Conclusion:** The study concluded that the health teaching program was effective in improving the knowledge of engineering students regarding the prevention of Computer Vision Syndrome and research hypothesis was accepted.

Keywords*: Assess, Effect, Prevention, Computer Vision Syndrome, Engineering Student.*

1. Introduction

Nowadays, everyone uses computers. Our personal, professional, and educational life is all significantly impacted by computer technology. Given that young adults are using computers more frequently both at home and in educational settings, it is necessary to look at whether or not students are implementing ergonomic practices. Computer Vision Syndrome, wrist and shoulder discomfort, overuse syndrome, and musculoskeletal injuries are the most common health issues among computer users, according to recent studies. Computer vision syndrome, according to the American Optometric Association, is a collection of eye and vision issues associated with close vision-stressing activities that occur during or in connection with computer use. Among computer workers, eye strain, irritation, burning sensation, redness, blurred vision, and double vision are the most common ocular complaints. Currently, very little study has been done on the safety and health risks related to college students' computer use. This study was conducted to close this gap by examining the application of ergonomic principles when using computers and the relationship between existing practices and ocular discomfort linked to vision in undergraduate students.[1]

For more than 20 years, computer vision syndrome has been recognized as a health issue. It is characterized by a variety of eye and vision-related symptoms. The disease is also referred to as digital eye strain (DES) and visual fatigue (VF), reflecting the range of digital gadgets associated with possible issues. When speaking with patients and the general public, who might not think of gadgets like tablets and smart phones as computers, these phrases might be more suitable.3 millions of people of all ages are at risk for digital eye strain due to the recent sharp increase in the use of digital devices.Although the condition's symptoms are typically temporary, it can create severe, recurrent discomfort for those who suffer from it, and when it affects professional computer users, it may have serious financial repercussions due to greater errors and more frequent breaks. The review that follows takes into account recent discoveries in this dynamic sector. Current statistics and information are provided regarding the use of digital devices, methods of assessment, and condition management. Additionally, scientifically determined digital eye strain markers are taken into consideration in addition to the more widely reported subjective methods (such as questionnaires) employed in this field of study.[2]

The health problems associated with computer vision syndrome are fast growing as more people use computers and other electronic gadgets. Longer computer use, ergonomic practices like room lighting, improper eye-to-computer distance, refresh rate, and wearing glasses have all been linked in studies to computer vision syndrome symptoms like headaches, back discomfort, and tension. The purpose of this study was to determine the prevalence of Computer Vision Syndromeamong computer engineering students at institutions in the Kathmandu Valley that are affiliated with Pokhara University, as well as to identify the risk factors and preventive measures that the students are taking. It was discovered that 76.50% of computer engineering students have computer vision syndrome. Only 39.3% of people were discovered to be using computers with a straight back and an upright posture, and 73.5% were using them at a distance of less than or equal to 50 cm. The 20/20/20 rule was not being followed by 81.2% of participants. The usage of protective eyewear, artificial eye drops, and vision assist lenses has been linked to Computer Vision Syndromeas people age.[3]

The symptoms of Computer Vision Syndrome, a repeated stress disorder, include eye strain, fatigue, eye-watering, irritation, burning sensations, dry eyes, blurred vision, difficulty focusing, word disappearance, and double vision in computer users. The most significant determinants of visual issues were age, education, gender, income, and workplace. Therefore, reducing temporal exposure and educating computer users about proper posture are crucial to solving the issues. A visual issue is a degree of reduced vision. Because they spend so much time in front of a computer screen, the most common discomfort among computer users is visual discomfort. Vision discomfort and eye tiredness were caused by a number of reasons, including poor lighting, an incorrect computer screen height, and reflection from glare.[4]

Holding the gadget somewhat below eye level reduced the likelihood of neck pain and ocular problems. University students have a significant prevalence of Computer Vision Syndromesymptoms, which could be decreased with better ergonomic measures, especially neck pain and eye strain and burning.[5]

Nowadays, practically every family, college, and university uses computers on a regular basis. The consequences of computer use on eye and vision-related issues have not been extensively studied in India, particularly among college students.[6]

2. Objectives

1. To identify the level of knowledge regarding the prevention of computer vision syndrome among engineering students before and after the health teaching program.
2. To evaluate the outcome of a health teaching program on improving the knowledge and awareness regarding the prevention of computer vision syndrome among engineering students.
3. To find out the association between the knowledge with selected demographic variables.

3. Methods

3.1 Study Design:

A quasi-experimental, one-group pretest-posttest design was adopted for this study

3.2 Study Setting and Population:

The study was conducted at selected engineering colleges in PCMC area.

3.3 Sample Size and Sampling Technique:

A total of 100 students studying engineering were selected using non - probability purposive sampling based on inclusion criteria.

3.4 Inclusion Criteria:

- Students who are present at the time of data collection.
- Students who are willing to participate in the study.
- Students who use digital devices (mobile/laptop/computer) regularly.

3.5 Exclusion Criteria:

- Students who are diagnosed with pre-existing eye disorders (e.g. glaucoma, cataract).
- Students who are under treatment for chronic eye diseases.
- Students who have undergone recent eye surgery.

3.6 Hypothesis

H_0: There is no significant difference between pre-test and post-test knowledge score.

H_1: There is significant difference between pre-test and post-test knowledge score.

3.7 Ethical Aspects

Permission taken from the college or authorities before starting te research. All students explained the purpose of the study and their consent obtained. Their privacy and confidentiality maintained.

3.8 Data Collection Tools:

Demographic Variables : It includes variables such as Age, Gender, Year of study, educational qualification, and Screen time duration.

Knowledge Questionnaire : It consists of 20 structured multiple-choice questions related to knowledge regarding Computer Vision Syndrome, its causes, symptoms, risk factors, and preventive measures.

Score Interpretation

Grade	Percentage	Score

Poor	0-35%	0-7
Average	36-70%	8-14%
Good	71-100%	15-100%

4. Results

Section I: Distribution of Respondents According to Demographic Variables.

Table 1. Frequency and percentage distribution of engineering students according to demographic variables (N = 100)

Sr. No	Demographic Variables	Category	Frequency (f)	Percentage (%)
1	**Age**	18–20 years	71	71%
		21–23 years	22	22%
		24–26 years	7	7%
		Above 26 years	0	0%
2	**Gender**	Male	67	67%
		Female	32	32%
		Transgender	1	1%
3	**Year of Study**	1st Year	6	6%
		2nd Year	68	68%
		3rd Year	20	20%
		4th Year	6	6%
4	**Branch of Engineering**	Civil Engineering	7	7%
		Mechanical Engineering	33	33%
		Computer Engineering	19	19%
		Electronics Engineering	10	10%
		Others	31	31%
5	**Residence**	Hostel	11	11%
		Paying Guest (PG)	26	26%
		Home with Family	52	52%
		Rented Accommodation	11	11%
6	**Average Screen Time**	<2 hours	19	19%
		2–4 hours	39	39%
		4–5 hours	31	31%
		≥6 hours	11	11%

7	**Use of Spectacles**	Yes	2	2%
		No	98	98%

Table 1 indicates that, the the majority of students 71% were in the age group of 18–20 years, 67% were male, and 68% were studying in the 2nd year. Regarding the branch of engineering, 33% belonged to Mechanical engineering, while 31% belonged to other branches. Most of the students (52%) were living with their families. Regarding screen time, 39% used digital devices for 2–4 hours daily, and 98% of students were not using spectacles.

Section II :Assessment of Level of Knowledge Regarding Prevention of Computer Vision Syndrome (Pre-Test).

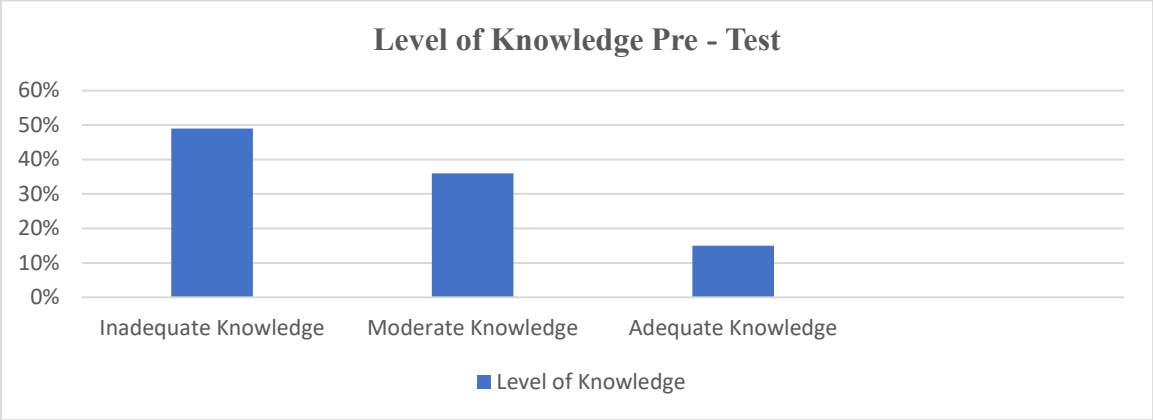

Fig. 1: Distribution of engineering students according to level of knowledge regarding prevention of computer vision syndrome in the pre-test

Fig 1 depicts that the 49% of engineering students had inadequate knowledge, 36% had moderate knowledge, and 15% had adequate knowledge about the prevention of Computer Vision Syndrome on the pre-test.

Section III: Effectiveness of Health Teaching Program on Knowledge Regarding Prevention of Computer Vision Syndrome.

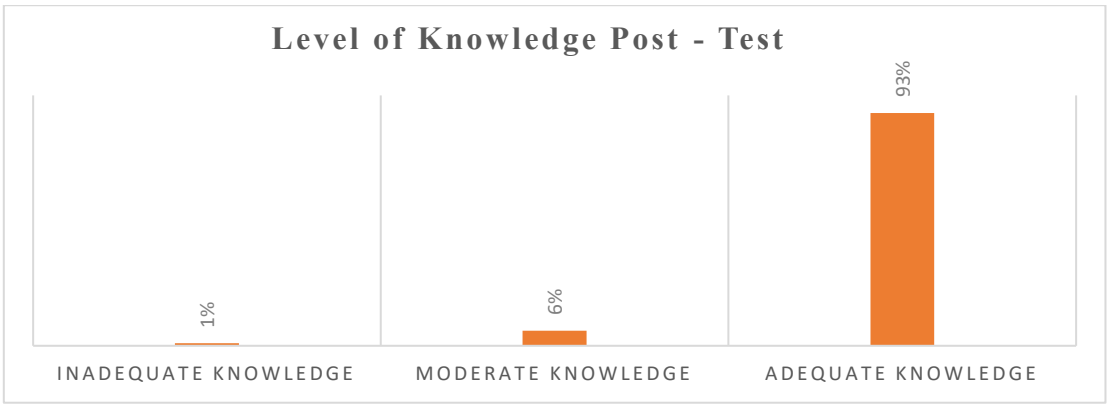

Fig. 2: Distribution of engineering students according tolevel of knowledge regarding prevention of computer vision syndrome in the post-test

Fig. 2 showed that the 93% of engineering students had adequate knowledge, 6% had moderate knowledge, and 1% had inadequate knowledge about the prevention of Computer Vision Syndrome on the post-test.

Section IV: Comparison of Pre-Test and Post-Test Knowledge Scores Regarding Prevention of Computer Vision Syndrome.

Table 2. Comparison of pre-test and post-test knowledge scores among engineering students (N = 100)

Test	Mean Score	Standard Deviation	Mean Difference	t-value
Pre-Test	7.9	4.2	9.9	18.6
Post-Test	17.8	2.3		

Table 2 shows that the mean post-test knowledge score (17.8) is higher than the mean pre-test knowledge score (7.9). The mean difference between pre-test and post-test scores is 9.9. The calculated t-value (18.6) is statistically significant at $p < 0.05$ level, indicating that the health teaching program was effective in improving the knowledge of engineering students regarding prevention of Computer Vision Syndrome. Thus, the research hypothesis (H_1) is accepted, which states that there is a significant difference between pre-test and post-test knowledge scores after the health teaching program.

Section V: Association Between Post-Test Knowledge Scores and Selected Demographic Variables

Table 3. Association between post-test knowledge scores and selected demographic variables (N = 100)

Demographic Variable	Adequate	Moderate	Inadequate	X^2 Value	p Value	Remark
Age	70	4	1	1.25	>0.05	Not Significant
Gender	52	3	0	0.84	>0.05	Not Significant
Year of Study	60	3	0	1.12	>0.05	Not Significant
Daily Computer Usage	68	5	1	2.01	>0.05	Not Significant
Previous Knowledge	55	2	0	3.45	<0.05	Significant

Table 3 indicates that the demographic variables such as age, gender, year of study, and daily computer usage, did not show a statistically significant association with knowledge scores ($p > 0.05$). However, previous knowledge regarding Computer Vision Syndrome showed a statistically significant association with post-test knowledge scores ($p < 0.05$). This indicated that students who had prior knowledge about Computer Vision Syndrome demonstrated better post-test knowledge after the health teaching program.

5. Discussion

Amala George et al. conducted a study on A Study to Assess the Level of Knowledge regarding Computer Vision Syndrome among Engineering Students in A Selected College at Kottayam with aims to assess the level of knowledge regarding computer vision syndrome among engineering students. The present study was done to assess the level of knowledge regarding computer vision syndrome among engineering students and to identify the association with selected socio-demographic variables. The sample consisted of 30 engineering students selected by convenience sampling technique. The design use was descriptive design with quantitative approach. Structured questionnaire on socio-demographic data and computer vision syndrome were used to assess the sample characteristics and level of knowledge regarding computer vision syndrome. The findings of the study were that majority (70%) of students were having average knowledge regarding computer vision syndrome. The study revealed that there was no significant correlation between the knowledge of engineering students

regarding computer vision syndrome and the demographic variables. Thus the present study showed that, the knowledge regarding computer vision syndrome is independent of selected demographic variable.[8]

6. Conclusion

The study concluded that the engineering students had inadequate knowledge regarding Computer Vision Syndrome and its prevention before the health teaching program.After the implementation of the health teaching program, the knowledge level of students improved significantly.The study highlights the importance of health education programs in creating awareness about the prevention of Computer Vision Syndrome among students who frequently use computers and digital devices.Health teaching programs are effective in improving knowledge and promoting healthy practices related to eye care and safe computer usage.

7. Recommendations

- Based on the findings of the present study, the following recommendations are suggested:
- Similar studies can be conducted with a larger sample size to increase the generalizability of the findings.
- The study can be replicated among students of different educational streams such as medical, management, and computer science students.
- Further research can be conducted in different geographical areas including rural and urban settings.
- Experimental studies can be conducted to evaluate the effectiveness of various educational interventions such as digital awareness programs, workshops, and seminars.
- Longitudinal studies can be conducted to assess the long-term impact of health education programs on preventive practices related to Computer Vision Syndrome.
- Regular health education programs should be organized in schools and colleges to increase awareness about the prevention of Computer Vision Syndrome among students who frequently use computers and digital devices.

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9. Conflict of Interest

The authors declare no conflict of interest.

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Refrences

[1] Muthunarayanlogaraj, V madhupriya, N seetharaman, shailendrakumar Hedge practice of ergonomic principles and computer vision syndrome (cvs) among undergraduate's students in chennai 2013; volume 3-page no. 1.

[2] Sheppard al, wolffsohnjs. Digital eye strain: prevalence, measurement and amelioration. bmjopenophthalmology.2018;3: e000146. Https://doi.org/10.1136/bmjophth-2018-000146.

[3] Sitaula k, kafle n, acharya a, mishra VP. Prevalence and associated factors of computer vision syndrome among the computer engineering students of Pokhara University affiliated colleges of Kathmandu valley. Int j community med public health [internet]. 2020 may 27 [cited 2026 jan. 14]; 7(6):2027-31. Available from: https://www.ijcmph.com/index.php/ijcmph/article/view/6355.

[4] Sasmita dandasena, dr. Shishir kala, dr. Manorama gupta and charulata naik assessment of vision problems among computer users at drpcau, pusa; 2023 sp-12(11): 334-339 https://www.thepharmajournal.com

[5] Mowatt L, Gordon C, Santosh ABR, Jones T. Computer vision syndrome and ergonomic practices among undergraduate university students. Int J Clin Pract. 2018 Jan;72(1). doi: 10.1111/ijcp.13035. Epub 2017 Oct 5. PMID: 28980750.

[6] Logaraj M, Madhupriya V, Hegde S. Computer vision syndrome and associated factors among medical and engineering students in chennai. Ann Med Health Sci Res. 2014 Mar;4(2):179-85. doi: 10.4103/2141-9248.129028. PMID: 24761234; PMCID: PMC3991936.

[7] Lema AK, Anbesu EW. Computer vision syndrome and its determinants: A systematic review and meta-analysis. SAGE Open Med. 2022 Dec 9; 10:20503121221142402. doi: 10.1177/20503121221142402. PMID: 36518554; PMCID: PMC9743027.

[8] Amala George, Amala Thomas, Archana S Nair, Blessy Varghese, Josna Joseph, Maria Subash, Rosemary Joseph, Starly SVM, Melvi Thomas. A Study to Assess the Level of Knowledge regarding Computer Vision Syndrome among Engineering Students in A Selected College at Kottayam. Int. J. Nur. Edu. and Research. 2021; 9(2):226-229. doi: 10.5958/2454-2660.2021.00054.5