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Research Article

Assessing knowledge about computer vision syndrome among students of Karakoram international university of Gilgit Baltistan, Pakistan

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Abstract

Computer vision syndrome (CVS) is one of the major concerns of public health related to symptoms, including visual and nervous system disorders. Major complaints are blurred vision, difficulty in focusing, neck muscle spasm, and frozen shoulders due to the use of digital devices for a long time in same posture for academic and with extra-curricular activities as well specially among students. The current research was conducted in the IT department of Karakoram University in Gilgit Baltistan, KPK, Pakistan, through cross sectional study design using a structured questionnaire. These include demographics and social information of IT students, including their knowledge and perception about CVS. All the IT students were selected for the current study through convenience sampling. The observed data was analyzed through description stats and revealed that 20% of students were agreed and 20.4 were strongly agreed that digital devices use increased the risk of CVS, 18.4% and 24% were agreed and strongly agreed, respectively that wrong posture was the major contributing factor of CVS but approximately 20% said that poor screen contrast increased the risk of CVS but many others were remain uncertain. The research highlighted the gaps and provided useful insight into the prevalence of disease. None of the participants showed satisfactory knowledge regarding the effects of device use on health. Only 9% showed a moderate level of understanding. So, in conclusion, these findings helped to identify the causative factors and spread the awareness regarding the use of digital devices and the severity of CVS on public health. The findings will help to reform the effective strategies to reduce the prevalence of CVS specially among students.

Keywords: Computer Vision Syndrome, Digital Eye Strain, IT Students, Knowledge Awareness, Preventive Strategies, Public Health, Digital Device Use, Gilgit Baltistan.

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Introduction

Computer vision syndrome (CVS) is one of the major concerns of public health related to symptoms, including visual and nervous system disorders. Major complaints are

blurred vision, difficulty in focusing, neck muscle spasm, and frozen shoulders due to the use of digital devices for a long time in the same posture for academic and extracurricular activities, especially among students [1]. It is directly related to several poor ergonomic habits, including poorly aligned displays, inadequate lighting, and excessive display time. With the age of digital technology, CVS has also become a major public health issue because of exposure to digital devices. In Pakistan, as in other nations, it has been estimated that 55% of the population extensively uses digital screens. With increased use of digital screens, an absence of information regarding ergonomic principles and preventive methods has been related to their causation [2]. Most individuals in Gilgit-Baltistan, particularly students and workers, are spending more hours on their electronic screens, phones, and computers [3, 4]. For example, dry eyes, which result from decreased blinking frequency during extended screen time, are among the most prevalent symptoms of CVS. Inappropriate sunlight, a badly positioned screen, and erratic breaks further worsen the difficulty [5]. Users of digital devices, especially students, still lack sufficient awareness of preventive measures, including using blue light filters and adhering to the 20-20-20 rule. The World Health Organization estimates that approximately 60 million people worldwide suffer from CVS [6]. The condition has worsened during the COVID-19 pandemic since individuals were forced to work from home or take classes online. For example, a study states that there is an observed 69.1% and 77.1% of medical and undergraduate students, respectively, suffering from symptoms of CVS during the COVID-19 outbreak, with the most common headaches together with burning and dry eyes [7]. Research suggests that a considerable percentage of digital device owners do not know the best manual tools, and do not know that they need to have regular pauses. For example, a Malaysian study observed that only 26.9% of users comprehensively understood extension postures, even though the majority were aware of the disease. Similarly, a report from Ethiopia noted that despite 90.2% of bank workers knowing of CVS, they had little understanding of how to prevent it [8].

There are several factors that are instrumental in the increasing frequency of CVS's appearance. Among them, prolonged screen exposure, which sometimes goes on for over 3 hours per day, can safely be labelled a primary risk factor [9]. Dry eye, one of the most common complaints associated with CVS, is the result of dry blinking, which occurs due to a user staring at a screen. Poor ergonomics, comprising wrong settings of the correct screen distance, poor light conditions, and the use of multiple gadgets, also aggravate the situation. For example, under-illuminated working conditions will make users resort to high brightness displays that may stimulate several reactions, including pain and sight disturbance [10]. Moreover, lack of intervention and preventive practices is also an important factor in CVS. Many people ignore basic principles, such as screen brightness, proximity, angle, or regular motion of the body that might help in alleviating the chances of diagnosing CVS [1]. CVS knowledge and comprehension are still not well-captured in Pakistan, considering the country's increasing academic integration of technology.

Some of the challenges, like having limited access to ergonomic equipment and health care, are specific to Gilgit and other semi-urban areas. Since they regularly use digital devices and not enough guidance is given on preventive steps, IT students are prone to presenting CVS symptoms [2]. Studies in other developing nations indicate that the lack of awareness regarding CVS is associated with delays in treatment and the absence of early prevention strategies. As most people still work and study from home, the risk of CVS is still significant,

which has been recognized by the COVID-19 pandemic [11]. Increasing awareness of ergonomic practices, promoting the usage of preventative strategies, and implementing workplace interventions to ensure proper illumination and screen positioning are all effective measures to battle the condition. Most students are unaware of simple means to minimize symptoms, like the use of the 20-20-20 rule or blue light filters. In addition, in settings with low resources, healthcare services, ergonomic chairs, and anti-glare screens might not always be readily available [12]. This research aims to explore the understanding of IT student regarding CVS, awareness about the symptoms, risk factors, and management strategies in Karakoram University especially resident in Gilgit.

Methodology

The research is a cross-sectional descriptive study to assess the knowledge about CVS among IT students at Karakoram International University, Gilgit Baltistan, Pakistan. All students in the study were given clear details about its purpose and provided informed consent before participating. They could leave the study anytime without consequences. Their responses remained confidential [13, 14].

The level of knowledge about CVS was assessed in university students by a 10-item standardized questionnaire. All items were rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) [15]. The scores across all the items were summed up to yield an individual participant's total knowledge score, ranging from 10 to 50. The higher total scores indicated increased understanding of CVS. Participants were subsequently grouped into three categories of knowledge according to their overall score: (1) Good Knowledge (score: 40–50), indicating a high level of awareness and comprehension of CVS; (2) Moderate Knowledge (score: 30–39), indicating a basic or incomplete understanding of CVS; and (3) Poor Knowledge (score: 10–29), indicating restricted or inadequate aware-ness of CVS. These classifications were then applied to additional analysis [16].

Sampling technique

The study used convenience sampling to select participants. IT students from Karakoram
International University, Gilgit-Baltistan, was chosen based on how easy it was to reach and its willingness to take part [17]. Researchers approached students during their classes, labs, and other university activities. This method was used because it was quick and practical, allowing the researcher to gather information within the available time and resources. While convenience sampling made it easier to collect data, it also had some limitations [18]. The findings might not fully represent all IT students, as the sample was not completely random. Even so, this approach worked well for the study, especially in Gilgit, where getting access to more advanced sampling methods was difficult. The sample size was calculated using ROASOFT software. The recommended sample size was 197 from a population size of 400 with a 95% confidence level. The margin of error was 5%. The questionnaire was extracted from the following study [1]. It was a globally recognized and validated questionnaire. The questionnaire included 19 questions, divided into two main sections:

Section A

This part included 9 multiple-choice questions to gather background information regarding the participants. It included necessary demographic and vision-related health variables like age group, gender, year of study, and history of eye check-ups [2]. Further, it included inquiries regarding whether participants had at any time in the

past received a diagnosis for dry eye disease, if they utilized eye drops, had experienced refractive deficiencies such as nearsightedness or farsightedness, and whether they used current corrective lenses in the form of spectacles or contact lenses. It also probed the nature of eye check-ups, shedding light on general eye care activities among participants. This helped determine potential relations between these background variables and awareness or knowledge levels of CVS among the students [11].

Section B

This section was to test participants' knowledge of CVS, its risk factors, symptoms, and preventive measures. This section consisted of 10 questions. Questions 10 to 13 were to measure knowledge regarding risk factors for CVS, like inappropriate screen distance, using a computer for an extended period, using an inappropriate seat, and low screen contrast [12]. These questions were using a 5-point Likert scale with Strongly Disagree to Strongly Agree options. Questions 16 to 19 tested for awareness of preventive strategies, including taking frequent breaks, controlling screen contrast, employing antiglare glasses, and refractive error correction. These were also measured using a 5-point Likert scale, ranging from *Not at all aware* to *extremely aware*. Question 14 asked whether the respondent had heard of the term "CVS" (Yes/No), and question 15 allowed respondents to choose multiple symptoms they associated with CVS (e.g., headaches, eyestrain, dry eyes) [4, 5]. The Likert scale items were numerically coded, and total scores were used to classify the respondents' knowledge level as low, moderate, or high. This section demonstrated strong internal consistency, with a Cronbach's alpha value of 0.81, indicating high reliability of the scale. The tool was adapted from a previously validated and internationally recognized instrument, ensuring the content was both reliable and culturally appropriate for IT students in Gilgit [9, 10].

Data was analyzed using SPSS to summarize and describe the responses to the questionnaire, including frequencies, percentages, and measures of central tendency (e.g., mean and standard deviation) for each variable. To find the association between demographics and knowledge levels chi-square test was applied.

Results

According to the study results, the most common symptom of CVS, dry eyes, affected 56.1% of students. Headaches (46.5%), eyestrain (40.2%), exhaustion (33.3%), and irritability (29.7%) were the remaining complaints (Table 1). According to these results, most students had at least one CVS symptom, with dry eyes being the most common. The outcomes confirm the evidence of screen-associated discomfort among students of IT because prolonged screen time is the cause of the major symptoms. Also, the results indicate that most students suffer from numerous symptoms simultaneously, so it can be said that CVS is a multiple-facet problem touching a lot of dimensions of well-being. Students with dry eyes, for instance, often complain of headaches or fatigue. The interrelatedness of symptoms and the need to treat the problem holistically instead of symptom-by-symptom are emphasized by this result. The findings overall confirm that CVS is a major problem among Karakoram International University students, especially in the IT department, where screen use is a regular part of study practice. According to this research, there is a need for improved management of screen time and behaviors to minimize the unpleasantness of protracted use of digital devices.

The study participants were young adults, with most being between 20 and 24 years of

Table 1: Demographic characteristics of participants.

Variable	Frequency (n)	Percentage (%)
Age Group		
15–19 years	41	20.9
20–25 years	146	74.1
26–30 years	9	4.5
Gender		
Male	96	49
Female	100	51
Year of Study		
1st Year	45	23
2nd Year	61	31
3rd Year	43	21
4th Year	47	24
Eye Check-up Frequency		
Annually	36	18.4
Every 6 months	32	16.3
Never	42	21.4
Others	43	21.9
Randomly	43	21.9
Dry Eye Disease		
No	110	56.1
Yes	86	43.9
Use of Eye Drops		
No	96	49
Yes	100	51
Refractive Error		
No	86	43.9
Yes	110	56.1
Vision Correction Method		
Spectacles	68	34.7
None	61	31.1
Contact Lenses	67	34.2

age, which is the typical age for university students. The information indicated that the most frequent age was 21, with 17.3% of the students indicating this age, 14.8% were 20 years old, and 14.3% were 23. This age group is especially susceptible to digital eye strain, which can contribute to the onset of CVS (Table 2). The research had a near equal number of male and female respondents, and females constituted 51% while males accounted for 49% of the sample population. This equal gender distribution in the study provides a strong backing to the results, enabling proper generalization to both genders concerning CVS. It identifies that the male and female students exhibited parallel awareness patterns. Nonetheless, given that awareness of CVS is relatively low. The participants included students from all academic years, making sure the research covered a wide range of experiences from different stages of university life. The second-year students formed the largest group at 31.1%, while third-year students made up the smallest group, accounting for 21.9% of the sample. The different levels of academic pressure and screen usage habits at each stage provide useful insights into how CVS might develop or get worse as students' progress in their studies. Including students from all years helps show how academic stress and screen time affect eye health across the entire university experience.

The frequency of eye check-ups among students varied. About 21.9% of students had eye check-ups occasionally, 21.4% had never seen an eye doctor, and only 18.4% had an eye exam every year. This shows that many students are not taking eye care seriously, which could lead to problems like cataracts or dry eye disease being discovered too late. Regular eye exams are important for early detection and prevention, but many students are not making them a priority.

Almost 43.9% of the respondents reported that they were diagnosed with dry eye disease, whereas 56.1% were not. Dry eye disease is widespread among students due to extended screen usage without appropriate eye care. The prevalence of this disorder among students indicates how crucial it is to treat eye health at an early stage and increase awareness about the danger of excessive screen use. Most

students, 51%, used eye drops to alleviate eye discomfort, but 49% did not. The fact that many students used eye drops means that they are experiencing frequent eye strain or dryness, both of which are typical symptoms of CVS. Even though eye drops can temporarily ease the symptoms, they do not address the causes, like extensive screen use for hours or poor posture while watching screens.

Over half of the students, 56.1%, indicated that they had refractive errors, such as near-sightedness or farsightedness. This indicates a definite need for frequent vision check-ups to detect and correct vision issues early. The prevalence of refractive errors also indicates that students might be spending too much time in front of screens, which can exacerbate vision issues over time. A considerable number of students, 34.7%, used contact lenses, 34.2% used spectacles, and 31.1% made no use of corrective lenses (Table 3A and B). The prevalence of the use of corrective lenses showcases the high prevalence of refractive errors among students. It also puts into perspective the need to use the correct visual aids so as to keep their eyes healthy, particularly for students who spend extended hours in front of the computer. The rate of eye check-ups among students was not consistent. Around 21.9% of students reported that they got eye exams sporadically, 21.4% never went to an eye doctor, and just 18.4% had check-ups every year. This indicates that most students are not taking regular eye care seriously, which may result in delayed diagnosis of eye issues such as CVS or dry eye disease. Proper eye check-ups are essential in detecting such conditions at early stages and in prevention, but most students forget about this all-important element of eye health.

Table 2: Knowledge of computer vision syndrome (CVS).

Statement	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
Viewing a screen less than arm's length is a CVS risk	39 (19.9%)	41 (20.9%)	47 (24.0%)	40 (20.0%)	29 (14.8%)
Prolonged computers use increases CVS risk	39 (19.9%)	33 (16.8%)	33 (16.8%)	51 (26.0%)	40 (20.4%)
Inappropriate seating contributes to CVS	43 (21.9%)	36 (18.4%)	34 (17.3%)	36 (18.4%)	47 (24.0%)
Poor contrast increases CVS risk	37 (18.9%)	52 (26.5%)	39 (19.9%)	36 (18.4%)	32 (16.3%)

Table 3A: Knowledge of preventive measures of CVS.

Preventive Measure	Not at all aware	Slightly aware	Somewhat aware	Moderately aware	Extremely aware
Balanced contrast reduces CVS	27 (13.8%)	42 (21.4%)	44 (22.4%)	46 (23.5%)	37 (18.9%)
Antiglare spectacles reduce CVS	43 (21.9%)	38 (19.4%)	33 (16.8%)	45 (23.0%)	37 (18.9%)
Correcting refractive errors helps	42 (21.4%)	39 (19.9%)	39 (19.9%)	30 (15.3%)	46 (23.5%)
Taking breaks reduces CVS	41 (20.9%)	44 (22.4%)	43 (21.9%)	39 (19.9%)	29 (14.8%)

Table 3B: Awareness of CVS

Awareness of CVS	Frequency (n)	Percentage (%)
No	100	51
Yes	96	49

The questionnaire reflected different degrees of knowledge concerning the dangers of sitting close to screens. While 35.2% of the students agreed or strongly agreed that sitting close to screens is bad for you, 24% were not sure. Approximately 46.4% of students knew that prolonged computer use heightens the risk of CVS. Though this is a significant figure, it also indicates that there are still many students who are unaware of the risks of excessive screen time. This awareness gap is an indication of the necessity for more specific education on the hazards of excessive screen exposure. Knowledge regarding how poor seating and posture impact CVS was moderate, with 42.4% of the students agreeing or strongly agreeing that poor seating is a cause of eye strain. Yet, many students still do not comprehend the relationship between posture and eyesight fully, underlining the requirement for further education on proper ergonomic procedures.

The level of awareness of the role of screen contrast settings was quite low, as only 37.3% of the students agreed or strongly agreed that poor contrast was a CVS risk factor. Most students might not be fully aware that screen settings such as contrast and brightness contribute to eye strain. Educating people and raising awareness about proper screen settings would be imperative in mitigating CVS risk. The research revealed that students frequently suffered from CVS symptoms like dry eyes, headaches, fatigue, irritation, and eyestrain. The frequent prevalence of these symptoms suggests the severe effects of CVS on students' well-being and health. It's essential to resolve these symptoms in time and provide students with practical methods to reduce and cope with CVS effects (Figure 1).

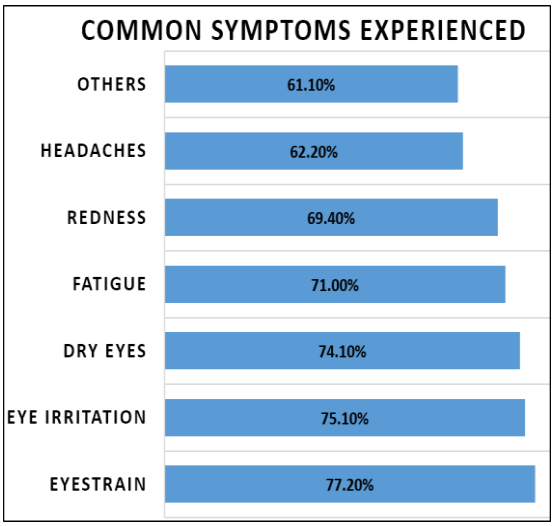

Figure 1: Common symptoms experienced by CVS.

A mere 14.8% of the students understood that taking breaks from screen time can minimize CVS symptoms. This low percentage highlights the importance of further education on the advantages of taking regular breaks and easy measures that students can adopt to alleviate eye strain and minimize the risk of CVS.

Only about 18.9% of students had a high degree of knowledge about how balanced screen contrast can prevent CVS. As much as the knowledge is slightly higher compared to other areas, it remains not prevalent enough to cause marked changes in behavior. Informing students on why screen settings will reduce eye strain is important for ensuring improved eye health. Just 18.9% of the students were extremely aware that computer glasses can alleviate CVS symptoms. This is a moderate awareness rating, which means that while there are some students who recognize corrective glasses that can be used with screens, not all of them are completely informed about the advantages. Increased awareness about the benefits of computer-specialized glasses can encourage students to better care for their eye health (Table 4).

Table 4: Knowledge levels of CVS

Knowledge Level	Frequency (n)	Percentage (%)
Good	0	0
Moderate	17	8.7
Poor	179	91.3

Note: Knowledge levels were categorized based on responses to CVS-related statements.

23.5% of students were very aware that correcting refractive errors can prevent CVS. Although this awareness is higher than for other factors, it still reflects the necessity of further education regarding the significance of regular eye exams and correcting refractive errors to prevent or alleviate CVS symptoms. Based on the SPSS data, symptoms related to CVS among students. Show that eyestrain (77.2%), eye irritation (75.1%), and dry eyes (74.1%) were the most frequently encountered symptoms. These findings suggest a wide effect of prolonged screen exposure on visual discomfort. Fatigue (71%) and redness (69.4%) were also commonly encountered, further illustrating the pressure that prolonged screen use places on eye health. 62.2% of the participants were experienced by 62.2% of the participants, which indicates an association between use of digital screens and wider physiological impacts such as tension and mental exhaustion. Perhaps most surprisingly, 61.1% of the participants indicated that they experienced 'other' symptoms, including possibly less familiar impacts such as being unable to focus, sensitivity to light, or neck and shoulder pain (Table 5).

Table 5: Associations between demographic characteristics and knowledge level of CVS.

Variable	Moderate Knowledge (n)	Poor Knowledge (n)	p-value
Gender			
Female	17	83	< .001
Male	0	96	
Year of Study			0.628
Year 1	4	41	
Year 2	6	55	
Year 3	5	38	
Year 4	2	45	
Last Eye check-up			0.389
1–6 months ago	1	32	
6 months to 1 year ago	5	33	
1 year to 5 years ago	3	43	
More than 5 years ago	6	39	
Never	2	32	
Eye Checkup Frequency			0.12
Annually	5	31	
Every 6 months	1	31	
Never	2	40	
Others	2	41	
Randomly	7	36	
Dry Eye Disease Diagnosis			0.782
Yes	8	78	
No	9	101	
Use of Corrective Lenses			0.222
Contact Lenses	6	62	
Spectacles	3	64	
None	8	53	

Note: Chi-square test was used to assess associations. A p-value < .05 is considered statistically significant.

Dry eyes were the most cited symptoms, followed by headaches and eyestrain. This indicates that a substantial percentage of the student population is suffering from the irritation of prolonged screen exposure. These symptoms most probably result from extended periods on digital devices for study, gaming, and social media, which are common daily activities among most university students. The results showed that most students experienced multiple symptoms simultaneously, meaning that CVS is not limited to a single issue. For instance, students who developed dry eyes likewise commonly reported eyestrain or headaches, and this implies that the discomfort aggravates and invades well-being. The predominant occurrence of such symptoms indicates an alarming public health issue among learners, particularly within an educational landscape with technology, where digital screen exposure is imminent. Such discoveries emphasize the value of attending to eye health in the university educational context, whereby exposure to digital screens is always present. The data shows that the problem of CVS is ubiquitous and that students in Karakoram International University, Gilgit, especially those in the IT department, could be at greater risk because of the subject matter of their study and extensive screen usage. This requires more awareness and possible interventions to reduce these symptoms.

Table 5 shows participant characteristics and levels of knowledge of CVS. A significant correlation was present between gender and level of knowledge ($p<.001$), where all participants with a moderate level of knowledge were female, and none of the male participants had a moderate level of knowledge. No significant correlations were present between level of knowledge and year of study ($p = .628$), last eye check-up ($p = .389$), or rate of eye checkups ($p =.120$). Similarly, diagnosis of dry eye disease ($p =.782$) and correction with glasses or contacts ($p =.222$) were also not found to be significantly correlated with levels of knowledge. The results, therefore, suggest that gender is a very important variable influencing CVS knowledge for the participants, but that other demographic and eye health-related factors are not so.

Discussion

According to the data collected at Karakoram International University, Gilgit, CVS is a common ailment among students in the IT department. The most common symptoms are dry eyes, headache, eyestrain, exhaustion, and irritation, all of which align with the known negative effects of prolonged screen use [15]. IT students are particularly likely to have these symptoms, as they often sit in front of computers for lengthy periods for personal and academic activities. It's alarming that statistics indicate that a significant number of children are already suffering from the discomfort of screen use. Such symptoms could worsen if nothing is done, which may lead to long-term vision problems [9]. This suggests that awareness is different across different age groups, perhaps because of varying exposure to digital health information and frequent device use. Younger groups, specifically students and working professionals, will have higher chances of being on digital screens for prolonged periods and hence are likely to be more accustomed to CVS [3].

Gender was also an important factor in influencing knowledge and beliefs regarding CVS. The survey showed strong correlations between gender and several CVS-related beliefs, such as the belief that looking at screens at close range is a risk factor ($p = 0.029$), knowledge of CVS ($p = 0.046$), belief in taking breaks to alleviate symptoms ($p = 0.006$), and belief in the efficacy of computer spectacles ($p = 0.046$). A Malaysian investigation also indicated that those visiting eye care specialists more often knew more about CVS and its avoidance, especially about posture and

adjustment of lighting conditions [20]. Previous researchers highlighted the importance of regular eye screening in enhancing knowledge and minimizing risk in office workers from developing countries as well [14]. Use of eye drops was also strongly related to previous knowledge of CVS ($p = 0.010$). This can suggest that those who know about CVS are likely to control its symptoms, including dryness of the eyes, by using lubricating drops. A preprint work conducted and found that CVS symptoms, particularly dryness and discomfort, were common in heavy screen users and that awareness was associated with the use of simple interventions such as artificial tears [12, 15]. Further, study participants who had a past history of refractive errors were more inclined to believe that computer glasses do relieve CVS symptoms ($p = 0.032$). This implies that individuals with existing visual impairments will be more accepting of preventive solutions such as blue light-blocking glasses. This was determined by a study conducted where they indicated that refractive correctors were more likely to utilize visual aids and employ ergonomic interventions in mitigating eye strain caused by screens [13]. Further indicated the importance of visual correction and personalized lenses in minimizing symptoms of digital eye strain [17]. The analysis of knowledge also picked up on a significant lacuna in public knowledge. It was observed that a significant percentage of participants (91.3%) had weak knowledge regarding CVS, and merely 8.7% had moderate knowledge.

Conclusion

The data collected from the IT department at Karakoram International University, Gilgit, indicates that although some students are aware of the hazards of excessive screen time, many are oblivious to the easy steps they can take to shield their eyes. For instance, most students are unaware of how crucial it is to maintain an appropriate distance from the screen, take breaks frequently, or alter screen settings such as contrast to help minimize eye strain. This indicates that students may not be taking sufficient measures to avoid issues such as Computer Vision Syndrome (CVS). The results also indicate that although certain students know the effects of poor posture and seating on their eye health, most do not realize how much these can potentially lead to eye strain. Another significant discovery is that many students are not making regular eye check-ups a priority. Eye tests are crucial for detecting issues early, but the statistics indicate that most students don't have regular eye tests or have them only when they are absolutely needed. Getting students to have regular eye exams and ensuring easy access to eye care services might help them take better care of their eyes. Generally, the findings imply that the universities need to engage their students in learning how to carry out proper eye care and give them resources to enable them to do better with their eye health.

Study limitations

This study focuses only on IT students at Karakoram International University, so the results may not reflect the experiences of students from other fields. Since we use consecutive sampling**,** all eligible students are included, but this method does not ensure full diversity in digital habits. Additionally, the study relies on self-reported data**,** meaning students might not always provide accurate answers they could overestimate or underestimate their awareness of CVS.

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Appendix

Research questionnaire

Introduction

This questionnaire is part of a research study on awareness of Computer Vision Syndrome (CVS) among IT students at Karakoram International University, Gilgit-Baltistan. As digital screen use increases, understanding CVS and preventive measures is crucial for eye health. This questionnaire aims to assess your knowledge, awareness, and habits related to CVS. Your responses will help identify gaps and support efforts to improve awareness. Participation is voluntary, and your answers will remain confidential, used only for academic purposes. You may withdraw at any time if you feel uncomfortable. If you are willing to participate, please sign below:

Section A: Sociodemographic data.

Item No.	Question	Response Options
1	What is your age group?	☐ 15–19 ☐ 20–25 ☐ 26–30
2	What is your gender?	☐ Male ☐ Female
3	What is your current year of study?	☐ 1 ☐ 2 ☐ 3 ☐ 4
4	When was your last eye check-up?	☐ 1m–6m ☐ 6m–1y ☐ 1y–5y ☐ >5y ☐ Never
5	Have you ever been diagnosed with dry eye disease?	☐ Yes ☐ No
6	Do you use any eye drops?	☐ Yes ☐ No
7	Do you experience any refractive error (e.g., nearsightedness)?	☐ Yes ☐ No
8	Do you currently use corrective lenses?	☐ Spectacles ☐ Contact lenses ☐ None
9	How frequently do you undergo eye check-ups?	☐ Every 6m ☐ Annually ☐ Randomly ☐ Never ☐ Other:

Section B: Knowledge of CVS

Item No.	Statement	Strongly Disagree	Disagree	Do Not Know	Agree	Strongly Agree
10	Viewing a computer screen at a distance less than an arm's length is a risk factor for CVS.	☐	☐	☐	☐	☐
11	Prolonged computer use increases the risk of developing CVS.	☐	☐	☐	☐	☐
12	Inappropriate seating position contributes to CVS.	☐	☐	☐	☐	☐
13	Poor contrast between the computer screen and surrounding brightness is a risk factor for CVS.	☐	☐	☐	☐	☐

Knowledge about symptoms of CVS

Item No.	Question	Response Options
14	Have you heard of the term CVS before?	☐ Yes ☐ No
15	What are the common consequences of CVS you are aware of?	☐ Headaches ☐ Eyestrain ☐ Eye irritation ☐ Fatigue ☐ Redness ☐ Dry eyes ☐ Others:

Knowledge of preventive measures for CVS.

Item No.	Statement	Not at All Aware	Slightly Aware	Somewhat Aware	Moderately Aware	Extremely Aware
16	Taking regular breaks during computer use can reduce CVS symptoms.	☐	☐	☐	☐	☐
17	Maintaining a balanced contrast between the computer screen and room illumination can reduce CVS.	☐	☐	☐	☐	☐
18	Using computer spectacles with antiglare features can help reduce CVS symptoms.	☐	☐	☐	☐	☐
19	Correcting refractive errors (e.g., nearsightedness, farsightedness) can help reduce CVS symptoms.	☐	☐	☐	☐	☐