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Unavoidable online education due to COVID-19 and its association to computer vision syndrome: a cross-sectional survey

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ABSTRACT

Background During the COVID-19 pandemic, online education and entertainment have increased significantly due to strict isolation and frequent lockdowns. This study intended to explore the prevalence and potential factors associated with computer vision syndrome (CVS) among the postsecondary students of Bangladesh pursuing online education.

Methods In total, there were 917 postsecondary students participated in this study. Information on sociodemographic variables, and CVS symptom-related variables were collected using a prevalidated self-administered questionnaire. The CVS questionnaire was used to assess an individual's CVS status. The bivariate association between CVS and other categorical variables was obtained using a χ^2 test. A multivariable logistic regression model was used to explore variables associated with the CVS.

Results The overall prevalence of CVS was 68.16%. Most common symptoms were headache (42.4%), feeling of worsening eyesight (23.2%), and eye pain (23.2%). CVS was associated with educational status (p=0.03), family history of eye-related problems (p<0.001), personal history of eye-related problems (p<0.001), usage of eye accessories (p<0.001), type of device used for online education (p<0.01), average daily use (p<0.01), and usage pattern (p=0.02). After adjusting for confounders, CVS was significantly related to the use of mobile or tablet (adjusted OR, AOR 8.954, 95% CI 1.57 to 51.063), continuing online education for more than 12 hours/day without any break or insufficient break (AOR 7.654, 95% CI 1.625 to 36.053), and previous family (AOR 3.189, 95% CI 1.751 to 5.811) or personal history of eye problems or headaches, or insomnia (AOR 6.214, 95% CI 2.783 to 13.878).

Conclusion A high prevalence of CVS was observed among the post-secondary students in Bangladesh. Since an extensive use of digital screens is somewhat unavoidable during unprecedented times, such as COVID-19, educators should include CVS awareness and prevention in their curricula.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Prevalence of computer vision syndrome (CVS) has been reported to vary between 25% and 93%, depending on the cohort of the population examined, and the criteria and technique used to assess the CVS.

⇒ As the usage of devices for online courses and entertainment increased significantly during the COVID-19, the risk of developing CVS is more likely to follow. Therefore, we explored the prevalence of CVS and factors related to CVS among the postsecondary students of Bangladesh who were continuing online education.

WHAT THIS STUDY ADDS

⇒ Significant risk factors for CVS were: the use of mobile or tablet, continuing online education for more than 12 hours/day without any break or insufficient break, and previous family or personal history of eye problems or headaches or insomnia.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Due to the widespread usage of digital screens resulting from COVID-19, educational institutions should include the prevention of CVS and related discomfort into their curriculum.

INTRODUCTION

Computer vision syndrome (CVS), also referred to as digital eye strain, describes a group of eye and vision-related problems that result from prolonged computer, tablet, e-reader and cell phone use.[1] The prevalence of CVS has been reported to vary between 25% and 93%, depending on the cohort of the population examined, and the criteria and technique used to assess CVS.[2–8] CVS is linked to prolonged computer use, inadequate lighting, glare, screen brightness, visual issues, and inappropriate workstation arrangement.[9] To prevent CVS, it is recommended to rest the eyes for at least 15 min after 2 hours of continuous computer use.[10] In addition, proper distancing, viewing angle, antiglare screen, enough lighting, and blinking may also be helpful.[11]

The COVID-19 pandemic has significantly impacted the global educational sector, closing down many institutions, and temporarily displacing bulk of students. Majority of the nations have shuttered their educational institutions temporarily to contain the COVID-19 epidemic.[12] Online classes are in high demand because there are few opportunities to explore substitutes in these unprecedented circumstances.[13] Within this worldwide regime of educational institution closure, technologically sophisticated nations have all the instruments necessary for online education, whereas developing nations are yet to fully adopt online education.[14] Moreover, many developed countries ensured that their schools remained open, maintaining social distancing and/or ensuring adequate vaccination, whereas developing countries still struggle to do so.[15]

Over 1.5 billion children are now out of school, which may mean that many of them are spending significant time on devices as a by-product of completing online tasks when they are homeschooled or engaging in other online activities, such as, interacting with their friends or playing video games. For educational purposes, students use various social media applications to get academic knowledge; YouTube for self-learning, Zoom, Skype, and Google Meet for video conferencing to foster distance learning. As an alternative to text messaging, video conferencing technologies have been extensively used for interactions between educators and students.[16] All these factors contribute to an increased use of screen time.

Excessive screen time is associated with health risks. It replaces healthy behaviours and habits such as physical activity and sleep. This can lead to malnutrition, headaches, neck pain, etc.[17] During COVID-19, the rapid use of digital gadgets has resulted in a steady decline in ocular health across all age groups.[18] Screen time engagement every day through online entertainment services showed over 90% increase.[18] Several eye complications may occur if a person spends an extended amount of time on digital devices. Individuals with CVS may experience tears, eye fatigue, eye irritation, head pain, blurred vision, redness, squinting, and other visual symptoms.[19]

Educators in Bangladesh have begun combining real-time interactive courses and classes with prerecorded materials and homework-based digital sessions.[20] In Bangladesh, most online courses last for 4–5 hours, with individual tutoring adding up to 8 hours.[21] As the usage of devices for online courses and entertainment increased significantly, the risk of developing CVS is more likely to follow. In this article, the aim was to explore the prevalence of CVS and factors related to CVS among the postsecondary students of Bangladesh who are continuing online education.

METHODS

Study design and sampling technique

A cross-sectional study was carried out among students from two major cities in Bangladesh (Dhaka and Chattogram) pursuing online education in post-secondary (11th, 12th grade) level or above. From the selected educational institutions (tuition homes/academies), a total of 917 students who provided consent to participate in the study were included. Any foreign nationals studying in Bangladesh and students who were engaged in online education before COVID-19 were excluded from the study.

Students were recruited using a convenient sampling technique. Convenient sampling is a non-probability sampling technique where samples are being selected according to the researcher's convenience. Although non-probability sampling may introduce biases because of not giving equal change to all eligible students to participate, researcher's often use a non-probability type sampling technique for data collection when taking a probability sample is either not possible or not feasible. There are three reasons why we choose to use a convenient sample: (1) non-availability of sampling frame, (2) resources were limited and (3) COVID-19-related restrictions and lockdowns. However, we tried to overcome this limitation by taking a large sample (n=912), and selecting students from tuition homes rather than traditional schools or colleges. The tuition homes/academies in Bangladesh include students from diverse backgrounds in terms of the location of the school, location of their residence, etc.

Study instrument

Data were collected from the study participants using a structured online questionnaire. Information on socio-demographic variables (gender, age, level of education, family income), disease history (personal and family), current optical equipment use (use of glasses or contact lenses) and screen exposure (daily hours spent on electronic devices for study and entertainment, type of device used, breaks taken during use, duration of online education) were gathered. The accuracy of smartphone use statistics was verified by using an in-built mobile app.

A portion of the questionnaire consists of a previously validated CVS Questionnaire (CVS-Q) developed by Seguí *et al*.[22] The CVS-Q scale was used to assess the CVS status of the participants of this study. CVS-Q assesses the frequency (never, sometimes, often, or always), and intensity (moderate or severe) of sixteen ocular and visual complaints associated with digital screen usage. These complaints include burning, itching, feeling of a foreign body, tearing, excessive blinking, eye redness, eye pain, heavy eyelids, dryness, blurred vision, double vision, difficulty focusing for near vision, increased sensitivity to light, coloured halos around objects, and a feeling that eyesight is worsening and headache. The frequency and intensity data were recorded to determine the severity of each symptom, yielding a cumulative score. The following criteria were used for scoring: Never (score=0), sometimes (score=1) (one per week, intermittent episodes) and always (score=2) (more than 2–3 times per week). The intensity was generally considered moderate (score=1) and intense (score=2).[22]

$$\text{CVSQ score} = \sum_{i=1}^{16} (\text{frequency} \times \text{intensity})$$

The result of (frequency × intensity) was recoded as follows: 0=0; 1 or 2=1; 4=2. A person with a total score of more than or equal to six was identified as having CVS.[22] All of these symptoms were assessed using the phrase "'fter beginning online education, have you developed any of the following symptoms?' to ascertain the incidence of CVS after the transition to online education.

Statistical analysis

The statistical software STATA (V.16.0) was used to analyse the data. The categorical variables were displayed as frequencies and their respective percentages. Association between a categorical independent variable and CVS was evaluated using the Pearson's χ^2 test. A binary logistic regression model was fitted to investigate the factors associated with the CVS after adjusting for potential confounders. A $p<0.05$ was considered statistically significant.

Public involvement

Members of the public were involved in several stages of the study including design and conduct. We received input from postsecondary continuing online education and implemented them in our study design. We intend to disseminate the main results to study participants and will seek public involvement in the development of an appropriate method of dissemination.

RESULT

This study included a total of 917 postsecondary students. The sociodemographic characteristics of the study participants were presented in table 1. The age of the participants were ranged from 14 to 46 years, with the average age±SD being 18.62±3.01 years. Female students were predominant in our study participants, nearly three-fourths (76.01%) of the participants were female. Most of the participants belonged to 11th and 12th grade (63.03%), and a majority of them belonged to a middle-class household (38.39 %). One-fifth of the participants reported no family history of eye-related problems; three-fifth of the participants had a family history of at least eye problems or headache and eye problems or headache, eye problems and insomnia. 23.77% of the participants reported no illness, while eye problems, and headaches and eye problems were reported as 24.43% and 21.16 %, respectively.

Mobile/tablet was the most often used device for educational (65.54%) and entertainment (53.76 %) purposes. 66.34% of the participants use digital gadgets for 2–6 hours per day, and 46.67% used to take a 10 min break after 2 hours of continuous use. In contrary, about 47.55% of the participants used digital gadgets for less than 2 hours per day for entertainment, with 46.02% enjoyed adequate breaks.

The reliability of the CVS questionnaire was assessed using Cronbach's alpha (0.87). Bivariate analysis was performed using a χ^2 test and the unadjusted results were presented in table 2. The majority of the variables were associated with CVS. χ^2 test indicates that educational status (p=0.03), family history of the disease (p≤0.001), personal history of the disease (p≤0.001), use of eye accessories (p≤0.001), the device used for online education (p=0.01), average daily use (p=0.01) and usage pattern (p=0.02) were associated with CVS.

The multivariable binary logistic regression analysis discovered that after adjusting for potential confounders, participants pursuing graduate-level studies had a 48% lower chance of developing CVS than those who were studying at the higher secondary level. CVS was more likely to develop in individuals with a family history of headaches, eye problems and insomnia (adjusted OR, AOR=3.19) compared with those with no family history of eye-related illness. Participants with a personal history of headaches, and personal history of eye problems had more than twofold (AOR=2.11 and AOR=2.57, respectively) odds of developing CVS than individuals with no personal history of illness. Moreover, individuals with both headaches and eye problems were five times (AOR=5.52) more likely to suffer from CVS. Individuals with a history of both headache and insomnia, and individuals with a history of both eye problems and insomnia had a higher odds of developing CVS (AOR=4.35, and OR=11.65, respectively) than individuals with no history of personal illness. Likewise, those with a history of headaches, eye problems or insomnia had 6.21 times higher odds of getting CVS when compared with individuals without a history of illness. Individuals who used either mobile or computer or television for online education had more than seven times higher odds (AOR=8.95, AOR=7.25, AOR=7.70) of getting CVS than individuals who used all three (mobile, computer and television) for online education. Participants with digital screen use of more than 12 hours daily had 7.6 times higher odds of CVS than those with 6–12 hours of use. Those who used digital screens continuously and with small breaks had high odds (AOR=1.49, AOR=1.58) of developing CVS than those used with enough breaks.

DISCUSSION

This research showed an increased prevalence of CVS among postsecondary students enrolled in online education during the pandemic in Bangladesh. During this pandemic, digital learning has become a daily requirement, resulting in a significant increase in the usage of digital devices among students. The world is presently witnessing a surge in online education, which has resulted in an increased usage of digital screens. The current research, the first of its kind in the region, examines the consequences of extended digital screen usage on post-secondary students' eye problems, namely, CVS.

Previous research on CVS has shown considerable variability in its findings, which may be due to the use of diverse study methods. In this study, 68.16% (625 of 917) individuals had CVS, similar to a study on general

Table 1 Relationship between the CVS and the demographic characteristics

	N (%)	No CVS N (%)	CVS N (%)	P value ($\chi 2$)
	917 (100.00)	292 (31.84)	625 (68.16)	
Gender				
Male	339 (36.97)	120 (35.40)	219 (64.60)	0.08
Female	578 (63.03)	172 (29.76)	406 (70.24)	
Age				
< 18 years	425 (46.35)	129 (30.35)	296 (69.65)	0.37
≥ 18 years	492 (53.65)	163 (33.13)	329 (66.87)	
Educational status				
Higher secondary (11th or 12th grade)	697 (76.01)	205 (29.41)	492 (70.59)	0.01
Graduate	166 (18.10)	68 (40.96)	98 (59.04)	
Postgraduate	54 (5.89)	19 (35.19)	35 (64.81)	
Socioeconomic status (family income)				
Lower (income <BDT10 000/month)	70 (7.63)	20 (28.57)	50 (71.43)	0.67
Lower middle (income BDT10 000–BDT30 000/month)	288 (31.41)	88 (30.56)	200 (69.44)	
Middle (income BDT30 001–BDT60 000/month)	352 (38.39)	111 (31.53)	241 (68.47)	
Upper middle (income BDT60 001–BDT100 000/month)	157 (17.12)	53 (33.76)	104 (66.24)	
Upper (income >BDT100 000/month)	50 (5.45)	20 (40.00)	30 (60.00)	
Family history				
No history of disease	197 (21.48)	94 (47.72)	103 (52.28)	<0.001
Only headache	69 (7.52)	23 (33.33)	46 (66.67)	
Only eye problem	188 (20.50)	75 (39.89)	113 (60.11)	
Only insomnia	24 (2.62)	9 (37.50)	15 (62.50)	
Both headache and eye problem	190 (20.72)	50 (26.32)	140 (73.68)	
Both headache and insomnia	30 (3.27)	6 (20.00)	24 (80.00)	
Both eye problem and insomnia	45 (4.91)	12 (26.67)	33 (73.33)	
Headache, eye problem and insomnia	174 (18.97)	23 (13.22)	151 (86.78)	
Personal history				
No history of disease	218 (23.77)	122 (55.96)	96 (44.04)	<0.001
Only headache	135 (14.72)	45 (33.33)	90 (66.67)	
Only eye problem	224 (24.43)	75 (33.48)	149 (66.52)	
Only insomnia	24 (2.62)	7 (29.17)	17 (70.83)	
Both headache and eye problem	194 (21.16)	29 (14.95)	16 5 (85.05)	
Both headache and insomnia	21 (2.29)	3 (14.29)	18 (85.71)	
Both eye problem and insomnia	20 (2.18)	2 (10.00)	18 (90.00)	
Headache, eye problem and insomnia	81 (8.83)	9 (11.11)	72 (88.89)	
Eye accessories				
No	478 (52.13)	185 (38.70)	293 (61.30)	<0.001
Yes	439 (47.87)	107 (24.37)	332 (75.63)	

CVS, computer vision syndrome.

students (50.6%) during COVID-19 in India.[23] Previous studies before COVID-19 discovered a prevalence of 67.4% among computer office workers in Sri Lanka,[8] 72% among computer-using university students in the United Arab Emirates[24] and 80.3% among medical and engineering university students.[7]

This study did not find any significant relationship between the CVS and gender, which is aligned with the

Table 2 Online education and entertainment-related factors and their association with CVS

Variables	N (%)	No CVS N (%)	CVS N (%)	P value (χ2)
	917 (100.00)	292 (31.84)	625 (68.16)	
Duration of online education				
1–3 months	60 (6.54)	27 (45.00)	33 (55.00)	0.13
3–6 months	127 (13.85)	38 (29.92)	89 (70.08)	
6–12 months	353 (38.50)	114 (32.29)	239 (67.71)	
>12 months	377 (41.11)	113 (29.97)	264 (70.03)	
Device used for online education				
Mobile/Tab	601 (65.54)	183 (30.45)	418 (69.55)	0.01
Computer	56 (6.11)	21 (37.50)	35 (62.50)	
Mobile and television	6 (0.65)	0 (0)	6 (100.00)	
Mobile and computer	243 (26.50)	80 (32.92)	163 (67.08)	
Mobile, computer and television	11 (1.20)	8 (72.73)	3 (163)	
Online education per day				
<2 hours	115 (12.54)	34 (29.57)	81 (70.43)	0.01
2–6 hours	607 (66.19)	211 (34.76)	396 (65.24)	
6–12 hours	167 (18.21)	45 (26.95)	122 (73.05)	
>12 hours	28 (3.05)	2 (7.14)	26 (92.86)	
User type (online education)				
Use with enough break (15 min break after every 2 hours of use)	253 (27.59)	98 (38.74)	155 (61.26)	0.02
Use with a small break (10 min break after every 2 hours of use)	428 (46.67)	129 (30.14)	299 (69.86)	
Continuous use (4 hours without break)	236 (25.74)	65 (27.54)	171 (72.46)	
The device used for entertainment				
Mobile/tab	493 (53.76)	141 (28.60)	352 (71.40)	0.02
Computer	44 (4.80)	17 (38.64)	27 (61.36)	
Television	29 (3.16)	16 (55.17)	13 (44.83)	
Mobile and elevision	153 (16.83)	45 (29.41)	108 (70.59)	
Mobile and computer	124 (13.52)	44 (35.48)	80 (64.52)	
Television and computer	5 (0.55)	1 (20.00)	4 (80.00)	
Mobile, computer and television	69 (7.52)	28 (40.58)	41 (59.42)	
Entertainment per day				
<2 hours	436 (47.55)	140 (32.11)	296 (67.89)	0.47
2–6 hours	366 (39.91)	110 (30.05)	256 (69.95)	
6–12 hours	85 (9.27)	33 (38.82)	52 (61.18)	
>12 hours	30 (3.27)	9 (30.00)	21 (70.00)	
User type (entertainment)				
Use with enough break (15 min break after every 2 hours of use)	422 (46.02)	140 (33.8)	282 (66.82)	0.38
Use with a small break (10 min break after every 2 hours of use)	334 (36.42)	97 (29.04)	237 (70.96)	
Continuous use (4 hours without break)	161 (17.56)	55 (34.16)	106 (65.84)	

CVS, computer vision syndrome.

findings of Kolawole *et al*[25] and Alqarni *et al*.[26] However, a significant association between the CVS and gender was observed in Toomingas *et al*[27] and Uchino *et al*[28] This contrasted result may requires further exploration via a multicentre study with a large enough sample size.

Among the participants, the most common and severe symptoms were headaches (figures 1 and 2), which is quite similar to other studies.[29 30] These headaches are most likely the result of a combination of factors, including visual fatigue, long-term shifting and accommodating, and

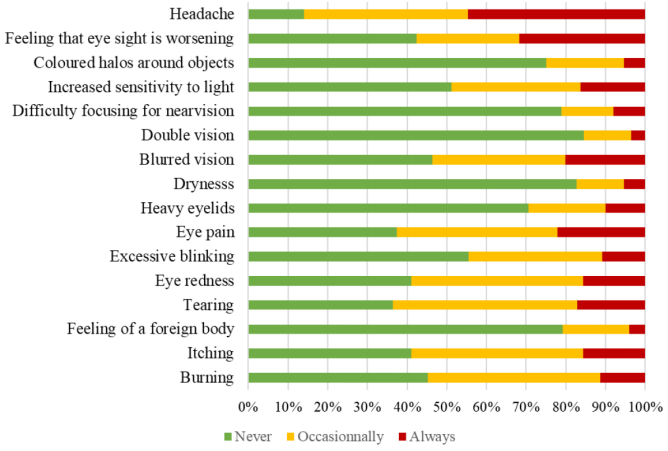

Figure 1 Bar diagram showing the frequency of ocular symptoms among the participants.

long-term muscle stress.[31] The intensity and frequency of headache and other CVS symptoms may vary by gender, but in this study prevalence of these symptoms was not differentiated by gender.

The educational and socioeconomic status of the participants were significantly associated with CVS. Undergraduate-level students, in this study, had 48% less odds of developing CVS compared with those who studying at the higher secondary level. This finding is consistent with that of Belay *et al*.[32] Undergraduate-level students may be more mature to know the proper use of the digital devices and thus resulted in a lower risk of developing CVS. Participants from upper-class families were 63% less likely to have CVS than those from lower-class families. This disparity may be due to the use of better quality device, eye protection features and ambient lighting.

Adjusting for potential confounders, the current study demonstrated a significant association between CVS and the number of hours spent on online education each day, in particular, those who spent 2–6 hours per day on online education. This finding is similar to Kamal and

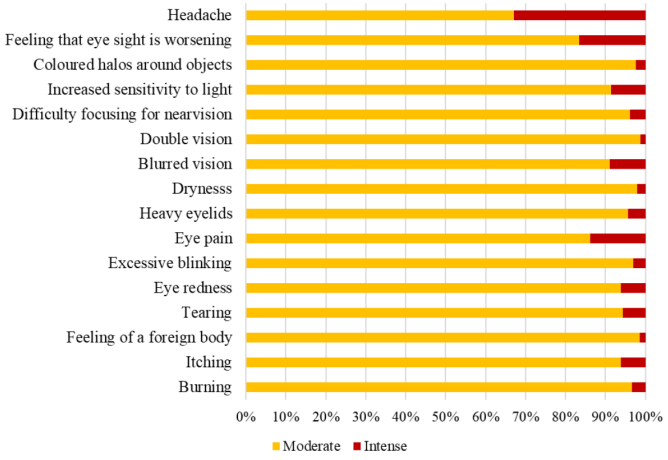

Figure 2 Bar diagram showing the intensity of ocular symptoms among the participants.

El-Mageed (2018), who found a statistically significant association between ocular symptoms and computer usage duration.[29 33] Daily screen time usage for entertainment was not observed to be statistically related to CVS (tables 2 and 3).

Assefa *et al*[34], Reddy *et al*[2] and Zayed *et al*[29] suggested that computer workers who wore eyeglasses were substantially more likely to experience CVS than those who did not. A statistically significant relationship between CVS and the use of visual aids (eyeglasses or contact lenses) was observed in this study.

Students who continued online education with no or a small break (10 min break after every 2 hours of use) had a higher odds of developing CVS than those who had a sufficient break (15 min break after every 2 hours of use). This finding is comparable to the research done in Chennai suburbs and Uttar Pradesh, India, which demonstrated a strong connection between working on a computer for more than 20 min without a break and being more susceptible to CVS symptoms.[7 35] In addition, numerous research suggests that regular pauses are beneficial to prevent CVS.[10 36 37]

CVS is more likely to occur in individuals with a family history of headaches, eye difficulties or sleeplessness as compared with those who did not have these symptoms. On the other hand, students with a personal history of headaches or visual problems have approximately two times more odds of developing CVS than those without such history. These results also support the findings of another study.[32]

Individuals who used either mobile or computer or television for online education had more than seven times higher odds of getting CVS than individuals who used all three (mobile, computer and television) for online education. A possible explanation for such a finding is that those who use all three-screen types may rely more on television and not on other smaller devices, such as cellphones or tablets. On the other hand, most of the participants who use a single device in this study are mobile/tablet users which mean most of them used a smaller screen. A similar research observed that the use of a smaller screen type is responsible for increased eye strain as compared with the larger screens.[38]

The study findings recommend that educational institutions may limit online class durations to 2 hours and take at least a 15 min break between classes. Students should restrict other screen-related activities such as viewing television, social media and the internet to compensate for screen time spent on online education. Proper lighting, antiglare filters and digital screen distance may all improve visual comfort. Eye-drops and protective glasses may help relieve ocular surface discomfort. More research is required to explore other factors associated with the CVS and to develop an appropriate treatment plan for CVS alleviation.

One of the drawbacks of this study was the use of a convenient type of non-probability sampling technique due to unavailability of the sampling frame, lack of

Table 3 Results from multivariate logistic regression

Variable	AOR	95% CI
Sex		
Male	Ref	
Female	0.915	0.657 to 1.274
Educational status		
Higher secondary (11th or 12th grade)	Ref	
Graduate	0.52*	0.345 to 0.784
Postgraduate	0.713	0.357 to 1.424
Socioeconomic status (family income)		
Lower (income<10 000 BDT/month)	Ref	
Lower middle (income BDT10 000–BDT30 000/month)	0.829	0.441 to 1.558
Middle (income BDT30 001–BDT60 000/month)	0.807	0.433 to 1.504
Upper middle (income BDT60 001–BDT100 000/month)	0.694	0.349 to 1.38
Upper (income >BDT100 000/month)	0.370*	0.152 to 0.898
Family history		
No history of disease	Ref	
Only headache	1.41	0.741 to 2.683
Only eye problem	1.072	0.681 to 1.686
Only insomnia	0.923	0.352 to 2.415
Both headache and eye problem	1.515	0.908 to 2.528
Both headache and insomnia	2.320	0.853 to 6.314
Both eye problem and insomnia	1.682	0.768 to 3.686
Headache, eye problem and insomnia	3.189**	1.751 to 5.811
Personal history		
No history of disease	Ref	
Only headache	2.112*	1.284 to 3.473
Only eye problem	2.566	1.681 to 3.916
Only insomnia	2.661*	1.014 to 6.982
Both headache and eye problem	5.518**	3.202 to 9.511
Both headache and insomnia	4.352*	1.172 to 16.152
Both eye problem and insomnia	11.648*	2.497 to 54.349
Headache, eye problem and insomnia	6.214**	2.783 to 13.878
Online education medium		
Mobile/tablet, computer and television	Ref	
Mobile/tab	8.954*	1.57 to 51.063
Computer	7.251*	1.167 to 45.069
Mobile and computer	7.697*	1.331 to 44.513
Online education per day		
6–12 hours	Ref	
<2 hours	1.483	0.795 to 2.768
2–6 hours	0.774	0.505 to 1.187
>12 hours	7.654*	1.625 to 36.053
Online education use pattern		
Use with enough break (15 min break after every 2 hours of use)	Ref	
Use with a small break (10 min break after every 2 hours of use)	1.492*	1.028 to 2.167
Continuous use (4 hours without break)	1.576*	1.007 to 2.467

*p<0.05, **p<0.01.
AOR, adjusted OR .

resources (budget constraint) and COVID-19-related restrictions. However, a large sample size was considered to compensate for our inability to conduct a probability sample. Moreover, the samples were taken from tuition homes rather than traditional schools or colleges to ensure better diversity in the sampled population. The second drawback of this study was the use of a self-reported questionnaire. COVID-19-related restrictions and lockdowns did not allow the researcher to physically examine the participants. Nevertheless, self-reported measure of the CVS is widely practiced in the existing literature.[8 39–41] Due to the self-reported nature of this survey, variables such as the screen distance, anti-glare protector usage, and screen brightness were omitted as those measurements were harder to justify. In addition, the participants with history of eye problem or headache were not asked whether they are taking any measures to alleviate those symptoms. Finally, since the study sample may not represent the entire country, generalising the study findings to the entire community is not reliable. However, research findings related to CVS from this study were in line with other published literature. A study including a larger sample size with data collected via face-to-face interviews where physical examinations of the symptoms can be confirmed, may better justify this research findings. Despite these limitations, present research offers important information related to the status of CVS among postsecondary students in Bangladesh during COVID-19.

CONCLUSION

The current study revealed that almost three-quarters of the postsecondary students, who pursuing online education during COVID-19, were suffering from the CVS. Due to the widespread usage of digital screens resulting from COVID-19, educational institutions should include prevention strategies to control the spread of CVS and related discomfort in their curriculum.

Correction notice This article has been corrected since it first published. Orcid ID for 'Azaz Bin Sharif' has been corrected.

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