# Prevalence and Associated Factors of Computer Vision Syndrome Among University Lecturers in Ondo West Local Government Area, Nigeria

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**DOI: https://doi.org/10.51584/IJRIAS.2026.11110015**

**Received: 30 October 2026; Accepted: 04 November 2026; Published: 21 November 2026**

## ABSTRACT

**Background:** Computer vision syndrome (CVS) is an increasingly important occupational health concern associated with prolonged use of digital devices. University lecturers are particularly exposed because of the growing reliance on computers for teaching, research, communication and administrative activities. This study assessed the prevalence of CVS and factors associated with its occurrence among university lecturers in Ondo West Local Government Area, Southwestern Nigeria.

**Methods:** A cross-sectional study was conducted among 125 university lecturers. Data were collected using a structured self-administered questionnaire incorporating the validated Computer Vision Syndrome Questionnaire (CVS-Q). Participants with a CVS-Q score of ≥6 were classified as having CVS. Sociodemographic characteristics, computer-use patterns, workstation characteristics and protective practices were assessed. Data were analysed using descriptive and inferential statistics, with statistical significance set at $p<0.05$.

**Results:** The prevalence of CVS was 30.4%. Awareness of CVS was reported by 64.8% of participants. Headache was the most frequently reported symptom (86.4%), followed by eye redness (45.6%), photophobia (42.4%) and ocular pain (40.8%). Computer exposure was substantial, with 78.4% of lecturers reporting 7-12 hours of daily computer use and 68.8% using computers five days per week. Most participants (80.0%) used their devices at a viewing distance of ≤50 cm, while 42.4% reported taking breaks every 20 minutes. No statistically significant associations were found between CVS and the socio-demographic, ergonomic, computer-use or protective-practice factors examined.

**Conclusion:** CVS affected approximately one-third of university lecturers despite substantial occupational exposure to digital devices. Although no significant associated factors were identified, the frequency of ocular and visual symptoms and prolonged daily computer use highlight the importance of digital eye health in this occupational group. Workplace eye-health education, appropriate ergonomic practices, regular breaks during prolonged screen use and timely eye assessment should be promoted among university lecturers.

**Keywords:** health education, computer vision syndrome, occupational health, Sociodemographic

## INTRODUCTION

Digital technology has become integral to modern work, education, communication, and access to information, resulting in increasing exposure to computers, smartphones, tablets, and other digital display devices. Although these technologies have improved efficiency and access to information, prolonged screen use has raised concerns about its effects on ocular and visual health. Computer vision syndrome (CVS), also referred to as digital eye

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue XI November 2026

strain (DES), encompasses a range of ocular, visual, and related symptoms associated with digital-device use(Pucker et al., 2024; Rosenfield, 2016; Sheppard & Wolffsohn, 2018). Common symptoms include eyestrain, headache, blurred vision, ocular dryness, burning, irritation, redness, and ocular discomfort (Bali et al., 2014; Portello et al., 2012). The condition is highly prevalent, although estimates vary considerably because of differences in study populations, definitions, symptom assessment periods, and assessment methods (Ccami-Bernal et al., 2024; Seguí et al., 2015). Systematic reviews have demonstrated a substantial burden of CVS across occupational and student populations, highlighting its increasing importance as an ocular and occupational health concern (Lema & Anbesu, 2022; Pucker et al., 2024).

University lecturers represent an occupational group in whom digital-device use is increasingly embedded in routine professional activities. Academic work now relies heavily on digital technology for lecture preparation and delivery, literature searches, manuscript preparation, data analysis, electronic communication, virtual meetings, student assessment, and administrative responsibilities. Consequently, lecturers may experience prolonged periods of screen viewing and sustained near work throughout the working day. A substantial burden of CVS and related symptoms has been documented in university populations in different settings (Al Tawil et al., 2020; Gammoh, 2021; Logaraj et al., 2014; Mowatt et al., 2018; Reddy et al., 2013). Within African university environments, Boadi-Kusi et al.(2020) reported a CVS prevalence of 51.5% among university administrative staff in Ghana. Higher prevalences have been reported among academic staff in Ethiopia, with Zenbaba et al. (2021) reporting 70.4% among university instructors and Tesfaye et al. (2022) reporting 78.8% among academic staff at the University of Gondar. These findings suggest that CVS may constitute an important occupational health problem within university environments, where professional responsibilities increasingly involve sustained use of digital devices.

The occurrence of CVS is multifactorial and reflects the interaction of digital-device exposure with individual, visual, behavioural, ergonomic, and environmental factors. Prolonged screen time, inadequate rest breaks, inappropriate viewing distance, poor sitting posture, inappropriate screen positioning, and suboptimal workplace illumination have been associated with CVS (Boadi-Kusi et al., 2020; Dessie et al., 2018; Lema & Anbesu, 2022; Lemma et al., 2020) Individual and ocular characteristics, including age, sex, refractive status, spectacle or contact-lens use, and ocular surface abnormalities, may also influence the occurrence of symptoms, although associations are not consistent across studies (Mowatt et al., 2018; Portello et al., 2012; Ranasinghe et al., 2016; Sánchez-Brau et al., 2021). Among academic staff, duration of computer use, use of visual display terminals, inadequate rest breaks, use of eye drops, and inappropriate workplace illumination have been identified as associated factors (Tesfaye et al., 2022; Zenbaba et al., 2021). The burden of CVS among lecturers may therefore depend not only on the duration of screen exposure but also on patterns of device use, ergonomic practices, individual characteristics, and the working environment.

In Nigeria, CVS has been documented among different groups of digital-device users. Akinbinu and Mashalla (2013) demonstrated a substantial burden of computer-related visual symptoms and limited awareness of CVS among computer users in Abuja, while Agbonlahor (2019) reported a CVS prevalence of approximately 65% among working-class adults in the Federal Capital Territory. Uba-Obiano et al. (2022) subsequently reported a prevalence of 29.3% among bank workers in Onitsha, with headache, itching, photophobia, blurred vision, and eye pain among the commonly reported symptoms. Among undergraduates in northwestern Nigeria, Nwankwo et al. (2021) also documented a substantial burden of CVS, while Adepoju S. et al. (2025) more recently reported digital eye strain among students in a Nigerian tertiary institution. Collectively, these studies demonstrate the occurrence of CVS and related symptoms across occupational and student populations in Nigeria. However, evidence specifically addressing university lecturers remains limited. Findings from students and other occupational groups may not adequately reflect the combination of prolonged screen exposure, sustained near work, academic responsibilities, and workplace conditions experienced by lecturers. Population-specific evidence is therefore needed to determine the burden of CVS and its associated factors among university lecturers and to inform appropriate eye-health education, ergonomic interventions, and workplace preventive strategies. This study therefore aimed to determine the prevalence of computer vision syndrome and identify factors associated with its occurrence among university lecturers in Ondo West Local Government Area, Southwestern Nigeria.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue XI November 2026

# METHODS

## Study design and setting

A cross-sectional study was conducted among university lecturers in Ondo West Local Government Area, Ondo State, South-western Nigeria. The study involved academic staff from the three higher educational institutions in the LGA: Adeyemi Federal University of Education, Wesley University, and the University of Medical Sciences.

## Study population and sampling

Eligible participants were academic staff who had worked in their institution for at least one year and used a computer or other digital display device for at least two hours per working day. Lecturers with ocular or systemic conditions that could independently produce symptoms similar to those assessed by the Computer Vision Syndrome Questionnaire (CVS-Q), including chronic migraine, were excluded. Chronic migraine was considered an exclusion criterion because headache is one of the 16 symptoms assessed by the questionnaire, and migraine-related headaches could influence the CVS-Q score independently of computer use. Spectacle or contact-lens use was recorded as potential associated factors rather than exclusion criteria.

The minimum sample size was calculated using the single-population proportion formula, based on a CVS prevalence of 78.8% reported among academic staff at the University of Gondar (Tesfaye et al., 2022), 95% confidence level and 8% precision. After allowing for 10% non-response, the minimum required sample was 112 participants. A total of 125 lecturers participated in the study, exceeding the calculated minimum. The calculated sample size was primarily intended to estimate the prevalence of CVS. The resulting sample was also used to explore associations between CVS and selected socio-demographic, computer-use, ergonomic and protective-practice variables.

A multistage sampling technique was used. All three institutions were included, faculties or equivalent academic units were selected by simple random sampling, and eligible lecturers were randomly selected from staff lists. Participants were allocated proportionately according to the number of eligible academic staff in each institution, with 42 participants each from Adeyemi Federal University of Education and Wesley University, and 43 from the University of Medical Sciences. Where selected lecturers declined participation, additional participants were randomly selected from the remaining eligible staff until the allocated sample for each institution was achieved.

## Data collection and measurement of CVS

Data were collected using a structured, self-administered questionnaire incorporating the validated Computer Vision Syndrome Questionnaire (CVS-Q) developed by Seguí et al. (2015). Information was obtained on socio-demographic characteristics, digital-device use, workstation and ergonomic characteristics, ocular factors, and practices during digital-device use.

Computer-use patterns and workstation characteristics were assessed using a structured, self-reported questionnaire. Computer-use duration was assessed in terms of the number of years of use (1-3, 4-6 and >6 years), days of use per week (3, 5, 6 or 7 days), and average daily hours of use (0-6, 7-12 and >12 hours). Participants also reported how frequently they took breaks during computer use, categorised as every 20 minutes, every 60 minutes, every 2 hours or after more than 2 hours. Viewing distance was estimated and categorised as ≤50 cm or >50 cm, while screen position was self-assessed in relation to eye level (above, at or below eye level). Participants also indicated whether their face was at screen level with the working-area lighting assessed subjectively and classified as very bright, bright, medium/dull or I don't know. Protective practices, including eyeglass use, screen contrast adjustment, anti-glare/VDT filter use and lubricant eye-drop use were also assessed through participants' self-reports.

The CVS-Q assesses 16 ocular and visual symptoms: burning, itching, foreign-body sensation, tearing, excessive blinking, eye redness, ocular pain, heaviness of the eyelids, dryness, blurred vision, double vision, difficulty with near vision, increased sensitivity to light, coloured halos around objects, worsening of vision, and headache. Participants were asked to indicate the frequency and intensity of each symptom while using a computer.

Each symptom is assessed according to its frequency and intensity. Frequency is scored as 0 for never, 1 for occasionally, and 2 for often or always. Intensity is scored as 1 for moderate and 2 for intense. For each symptom, the frequency score is multiplied by the intensity score, and the resulting product is recoded as 0 when the product is 0, 1 when the product is 1 or 2, and 2 when the product is 4. The recoded scores for all 16 symptoms are summed to obtain the total CVS-Q score. In accordance with the validated scoring system, a total score of ≥6 was used to define CVS (Seguí et al., 2015).

Additional questionnaire items were reviewed for face and content validity by two public health experts and pretested among 20 workers outside the study area. Internal consistency was assessed during the pretest using Cronbach's alpha following a single administration. A reliability coefficient of 0.85 was obtained, indicating good internal consistency. Data were collected by the principal investigator and two trained research assistants after obtaining written informed consent from all participants.

**Statistical analysis**

Data were analysed using IBM SPSS Statistics version 24.0. Categorical variables were summarised using frequencies and percentages, while continuous variables were summarised using appropriate measures of central tendency and dispersion. CVS prevalence was calculated as the proportion of participants with a CVS-Q score ≥6, with a corresponding 95% confidence interval.

Associations between CVS and categorical variables were assessed using Pearson's chi-square test when expected cell frequencies were adequate. Fisher's exact test (for 2 × 2 tables) and the Fisher-Freeman-Halton exact test (for larger tables) were used when chi-square assumptions were not met. Univariable binary logistic regression was performed to determine the crude associations between the explanatory variables and CVS. Crude odds ratios (CORs) and 95% confidence intervals were calculated, with statistical significance set at $p < 0.05$.

**Ethical considerations**

Ethical approval was obtained from the Research Ethics Committee of the University of Medical Sciences, Ondo City, Nigeria and permission was obtained from the participating institutions. Written informed consent was obtained from all participants, and confidentiality and anonymity were maintained.

## RESULTS

Table 1: Socio-demographic characteristics of the respondent

| Variable | Frequency (n=125) | Percentage (%) |
|---|---|---|
| **Age (years)** | | |
| 20-29 | 36 | 28.8 |
| 30-39 | 60 | 48.0 |
| 40-49 | 25 | 20.0 |
| 50-59 | 4 | 3.2 |
| **Sex** | | |
| Male | 52 | 41.6 |
| Female | 73 | 58.4 |
| **Educational level** | | |
| Diploma | 0 | 0.0 |
| Bachelor’s degree | 63 | 50.4 |
| Postgraduate | 62 | 49.6 |

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue XI November 2026

| **Work experience (years)** | | |
|---|---|---|
| 1-5 | 57 | 45.6 |
| 6-10 | 34 | 27.2 |
| 11-15 | 25 | 20.0 |
| 16-20 | 7 | 5.6 |
| >20 | 2 | 1.6 |

Table 1 shows that among the 125 lecturers, 36 (28.8%) were aged 20-29 years, 60 (48.0%) were 30-39 years, 25 (20.0%) were 40–49 years, and 4 (3.2%) were 50-59 years. There were 52 (41.6%) males and 73 (58.4%) females. Regarding work experience, 57 (45.6%) had worked for 1-5 years, 34 (27.2%) for 6-10 years, 25 (20.0%) for 11-15 years, 7 (5.6%) for 16-20 years, and 2 (1.6%) for more than 20 years.

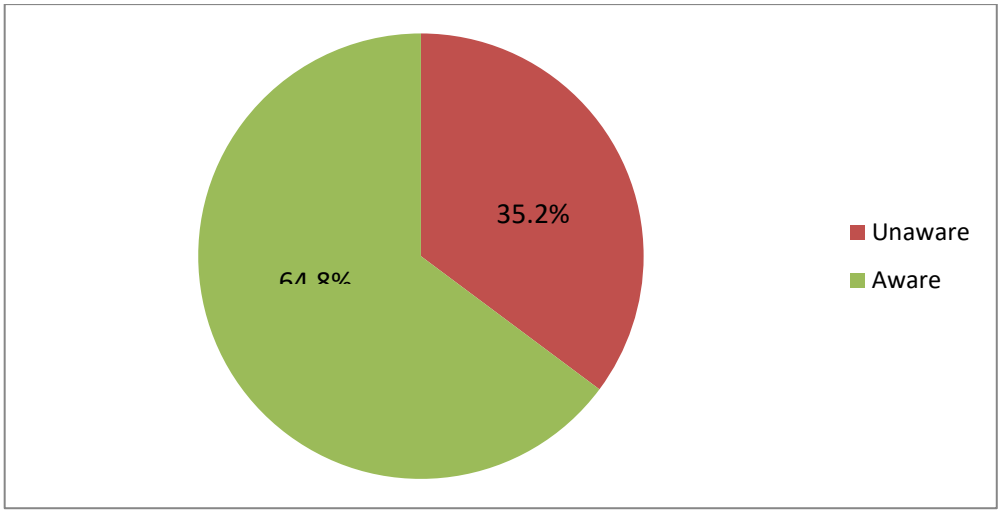


Figure 1: The awareness of CVS among lecturers

Awareness of CVS was reported by 81 lecturers (64.8%), while 44 (35.2%) were unaware of the condition (Figure 1).

**Table 2: Frequency of computer vision syndrome symptoms among university lecturers (n= 125)**

| **Symptom** | **Never n (%)** | **Occasionally n (%)** | **Often/Always n (%)** |
|---|---|---|---|
| Burning sensation | 116 (92.8) | 9 (7.2) | 0 (0.0) |
| Itching | 82 (65.6) | 38 (30.4) | 5 (4.0) |
| Foreign-body sensation | 91 (72.8) | 29 (23.2) | 5 (4.0) |
| Tearing | 98 (78.4) | 26 (20.8) | 1 (0.8) |
| Excessive blinking | 111 (88.8) | 8 (6.4) | 6 (4.8) |
| Eye redness | 68 (54.4) | 48 (38.4) | 9 (7.2) |
| Eye pain | 74 (59.2) | 44 (35.2) | 7 (5.6) |
| Heavy eyelids | 97 (77.6) | 26 (20.8) | 2 (1.6) |
| Dry eyes | 94 (75.2) | 29 (23.2) | 2 (1.6) |
| Blurred vision | 92 (73.6) | 30 (24.0) | 3 (2.4) |
| Double vision | 111 (88.8) | 14 (11.2) | 0 (0.0) |
| Difficulty focusing on near objects | 98 (78.4) | 27 (21.6) | 0 (0.0) |
| Photophobia | 72 (57.6) | 42 (33.6) | 11 (8.8) |
| Halos | 108 (86.4) | 10 (8.0) | 7 (5.6) |
| Worsening vision | 109 (87.2) | 13 (10.4) | 3 (2.4) |
| Headache | 17 (13.6) | 103 (82.4) | 5 (4.0) |

Headache was the most frequently reported symptom, with 108 (86.4%) lecturers experiencing it either occasionally or often/always. This was followed by eye redness in 57 (45.6%), eye pain in 51 (40.8%), photophobia in 53 (42.4%), and itching in 43 (34.4%) lecturers. Burning sensation was the least frequently reported symptom, occurring in 9 (7.2%) lecturers (Table 2).

**Table 3: Prevalence of computer vision syndrome among university lecturers (n= 125)**

| CVS status | Frequency (n) | Percentage (%) |
|---|---|---|
| CVS present | 38 | 30.4 |
| No CVS | 87 | 69.6 |
| **Total** | **125** | **100.0** |

The prevalence of computer vision syndrome among the university lecturers was 30.4% (38/125; 95% CI: 23.0-39.0%), while 87 (69.6%) did not have CVS (Table 3).

**Table 4: Computer-use practices among university lecturers (n = 125)**

| Computer-use practice | Frequency (n) | Percentage (%) |
|---|---|---|
| **Sitting position while using VDT** | | |
| Face at the level of the computer screen | 105 | 84.0 |
| Face not at the level of the computer screen | 20 | 16.0 |
| **Viewing distance** | | |
| ≤50 cm (<¾ arm's length) | 100 | 80.0 |
| >50 cm (>¾ arm's length) | 25 | 20.0 |
| **Level of the top of the computer screen** | | |
| Above eye level | 6 | 4.8 |
| At eye level | 88 | 70.4 |
| Below eye level | 31 | 24.8 |

Most lecturers, 105 (84.0%), reported that their face was at the level of the computer screen during use. A viewing distance of ≤50 cm was reported by 100 (80.0%) lecturers. Regarding screen position, 88 (70.4%) reported that the top of the computer screen was at eye level, while 31 (24.8%) positioned it below eye level and 6 (4.8%) above eye level (Table 4).

**Table 5: Duration and frequency of computer use among university lecturers (n = 125)**

| Computer-use characteristic | Frequency (n) | Percentage (%) |
|---|---|---|
| **Duration of computer use (years)** | | |
| 1-3 | 36 | 28.8 |
| 4-6 | 30 | 24.0 |
| >6 | 59 | 47.2 |
| **Computer use (days per week)** | | |
| 3 | 4 | 3.2 |
| 5 | 86 | 68.8 |
| 6 | 14 | 11.2 |
| 7 | 21 | 16.8 |
| **Computer use (hours per day)** | | |
| 0-6 | 10 | 8.0 |
| 7-12 | 98 | 78.4 |
| >12 | 17 | 13.6 |

Nearly half of the lecturers, 59 (47.2%), had used computers for more than six years. Most, 86 (68.8%), reported computer use on five days per week, while 21 (16.8%) used computers daily. Regarding daily duration of use,

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue XI November 2026

the majority, 98 (78.4%), reported using computers for 7-12 hours per day, while 17 (13.6%) reported more than 12 hours per day (Table 5).

**Table 6: Protective practices and ocular-related characteristics among university lecturers (n = 125)**

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **Frequency of breaks during computer use** | | |
| Every 20 minutes | 53 | 42.4 |
| Every 60 minutes | 12 | 9.6 |
| Every 2 hours | 31 | 24.8 |
| More than every 2 hours | 29 | 23.2 |
| **Eyeglass use** | | |
| Yes | 33 | 26.4 |
| No | 92 | 73.6 |
| **Contact lens use** | | |
| Yes | 13 | 10.4 |
| No | 112 | 89.6 |
| **Previous eye surgery** | | |
| Yes | 1 | 0.8 |
| No | 124 | 99.2 |
| **Frequent voluntary blinking** | | |
| Yes | 28 | 22.4 |
| No | 97 | 77.6 |
| **Lighting condition of work area** | | |
| Very bright | 39 | 31.2 |
| Bright | 68 | 54.4 |
| Medium/dull | 16 | 12.8 |
| I don't know | 2 | 1.6 |
| **Adjustment of computer contrast to surrounding brightness** | | |
| Yes | 57 | 45.6 |
| No | 68 | 54.4 |
| **Use of anti-glare/VDT/blue-light filter** | | |
| Yes | 16 | 12.8 |
| No | 109 | 87.2 |
| **Use of lubricant eye drops during computer use** | | |
| Yes | 14 | 11.2 |
| No | 111 | 88.8 |

Regarding protective practices, 53 (42.4%) lecturers reported taking breaks every 20 minutes during computer use, while 60 (48.0%) took breaks every two hours or less frequently. Eyeglasses and contact lenses were used by 33 (26.4%) and 13 (10.4%) lecturers, respectively. Most lecturers, 107 (85.6%), described their working environment as bright or very bright, while 57 (45.6%) adjusted their computer contrast to the surrounding brightness. Only 16 (12.8%) used an anti-glare/VDT/blue-light filter, and 14 (11.2%) reported using lubricant eye drops while working on a computer (Table 6).

**Table 7: Association between workstation practices and computer vision syndrome among university lecturers (n = 125)**

| Daily practice using VDT | No CVS n (%) | CVS n (%) | Total n (%) | Test statistic ($\chi^2$) | P-value |
|---|---|---|---|---|---|
| **Sitting position** | | | | | |
| Face is at the level of the screen | 73 (69.5) | 32 (30.5) | 105 (100.0) | **0.002** | **0.966** |

| | | | | | |
|---|---|---|---|---|---|
| Face is not at the level of the screen | 14 (70.0) | 6 (30.0) | 20 (100.0) | | |
| **Viewing distance** | | | | | |
| ≤50 cm | 67 (67.0) | 33 (33.0) | 100 (100.0) | **1.597** | **0.206** |
| >50 cm | 20 (80.0) | 5 (20.0) | 25 (100.0) | | |
| **Level of the computer screen** | | | | | |
| Above the level of my eyes | 6 (100.0) | 0 (0.0) | 6 (100.0) | _ | **0.315[a]** |
| At the level of my eyes | 60 (68.2) | 28 (31.8) | 88 (100.0) | | |
| Below the level of my eyes | 21 (67.7) | 10 (32.3) | 31 (100.0) | | |

CVS = computer vision syndrome; VDT = visual display terminal. Percentages are row percentages. [a]Fisher–Freeman-Halton exact test used where expected frequencies were small.

From table 7, there was no statistically significant association between CVS and sitting position, viewing distance, or the level of the top of the computer screen (p >0.05).

**Table 8: Association between duration of computer use and computer vision syndrome among university lecturers (N = 125)**

| **Duration of computer use** | **No CVS n (%)** | **CVS n (%)** | **Total n (%)** | **Test Statistic($\chi^2$)** | **p-value** |
|---|---|---|---|---|---|
| **Years of computer use** | | | | | |
| 1-3 years | 26 (72.2) | 10 (27.8) | 36 (100.0) | **1.577** | **0.455** |
| 4-6 years | 23 (76.7) | 7 (23.3) | 30 (100.0) | | |
| More than 6 years | 38 (64.4) | 21 (35.6) | 59 (100.0) | | |
| **Days of computer use per week** | | | | | |
| 3 days | 4 (100.0) | 0 (0.0) | 4 (100.0) | _ | **0.655[a]** |
| 5 days | 60 (69.8) | 26 (30.2) | 86 (100.0) | | |
| 6 days | 9 (64.3) | 5 (35.7) | 14 (100.0) | | |
| 7 days | 14 (66.7) | 7 (33.3) | 21 (100.0) | | |
| **Hours of computer use per day** | | | | | |
| 0-6 hours | 8 (80.0) | 2 (20.0) | 10 (100.0) | **2.896** | **0.235** |
| 7-12 hours | 70 (71.4) | 28 (28.6) | 98 (100.0) | | |
| More than 12 hours | 9 (52.9) | 8 (47.1) | 17 (100.0) | | |

CVS = computer vision syndrome. Percentages are row percentages. [a]Fisher-Freeman-Halton exact test.

As shown in Table 8, there was no statistically significant association between the presence of computer vision syndrome and duration of computer use in years, number of days of computer use per week, or duration of computer use per day among university lecturers (p > 0.05).

**Table 9: Association between protective practices and computer vision syndrome among university lecturers (n = 125)**

| **Protective practice** | **No CVS, n (%)** | **CVS, n (%)** | **Total, n (%)** | **$\chi^2$** | **p-value** |
|---|---|---|---|---|---|
| **Frequency of breaks** | | | | **5.732** | **0.125** |
| Every 20 minutes | 37 (69.8) | 16 (30.2) | 53 (100.0) | | |
| Every 60 minutes | 9 (75.0) | 3 (25.0) | 12 (100.0) | | |
| Every 2 hours | 17 (54.8) | 14 (45.2) | 31 (100.0) | | |
| More than every 2 hours | 24 (82.8) | 5 (17.2) | 29 (100.0) | | |
| **Eyeglass use** | | | | **1.714** | **0.190** |
| Yes | 20 (60.6) | 13 (39.4) | 33 (100.0) | | |
| No | 67 (72.8) | 25 (27.2) | 92 (100.0) | | |

| | | | | | |
|---|---|---|---|---|---|
| **Contact lens use** | | | | **1.702** | **0.192** |
| Yes | 7 (53.8) | 6 (46.2) | 13 (100.0) | | |
| No | 80 (71.4) | 32 (28.6) | 112 (100.0) | | |
| **Frequent voluntary blinking** | | | | **0.052** | **0.820** |
| Yes | 19 (67.9) | 9 (32.1) | 28 (100.0) | | |
| No | 68 (70.1) | 29 (29.9) | 97 (100.0) | | |
| **Working-area lighting** | | | | _ | **0.613[a]** |
| Very bright | 29 (74.4) | 10 (25.6) | 39 (100.0) | | |
| Bright | 44 (64.7) | 24 (35.3) | 68 (100.0) | | |
| Medium/dull | 12 (75.0) | 4 (25.0) | 16 (100.0) | | |
| Do not know | 2(100.0) | 0(0.0) | 2(100.0) | | |
| **Adjustment of screen contrast** | | | | **2.055** | **0.152** |
| Yes | 36 (63.2) | 21 (36.8) | 57 (100.0) | | |
| No | 51 (75.0) | 17 (25.0) | 68 (100.0) | | |
| **Anti-glare/VDT filter use** | | | | **0.437** | **0.508** |
| Yes | 10 (62.5) | 6 (37.5) | 16 (100.0) | | |
| No | 77 (70.6) | 32 (29.4) | 109 (100.0) | | |
| **Lubricant eye-drop use** | | | | **0.210** | **0.646** |
| Yes | 9 (64.3) | 5 (35.7) | 14 (100.0) | | |
| No | 78 (70.3) | 33 (29.7) | 111 (100.0) | | |

Percentages are within categories. [a]Fisher-Freeman-Halton exact test was used for illumination. CVS = computer vision syndrome; VDT = visual display terminal.

As shown in Table 9, none of the protective practices assessed was significantly associated with the presence of computer vision syndrome among university lecturers ($p > 0.05$). There was no significant association between CVS and frequency of breaks, eyeglass use, contact lens use, frequent voluntary blinking, working-area lighting, adjustment of screen contrast, use of anti-glare/VDT filters, or lubricant eye-drop use.

**Table 10: Association between socio-demographic characteristics and computer vision syndrome among university lecturers (N = 125)**

| Socio-demographic characteristic | No CVS n (%) | CVS n (%) | Total n (%) | Test statistic($\chi^2$) | p-value |
|---|---|---|---|---|---|
| **Age (years)** | | | | _ | **0.175[a]** |
| 20-29 | 23 (63.9) | 13 (36.1) | 36 (100.0) | | |
| 30-39 | 44 (73.3) | 16 (26.7) | 60 (100.0) | | |
| 40-49 | 19 (76.0) | 6 (24.0) | 25 (100.0) | | |
| 50-59 | 1 (25.0) | 3 (75.0) | 4 (100.0) | | |
| **Sex** | | | | 0.102 | **0.750** |
| Male | 37 (71.2) | 15 (28.8) | 52 (100.0) | | |
| Female | 50 (68.5) | 23 (31.5) | 73 (100.0) | | |
| **Work experience (years)** | | | | _ | **0.218[a]** |
| 1-5 | 43 (75.4) | 14 (24.6) | 57 (100.0) | | |
| 6-10 | 23 (67.6) | 11 (32.4) | 34 (100.0) | | |
| 11-15 | 17 (68.0) | 8 (32.0) | 25 (100.0) | | |
| 16-20 | 4 (57.1) | 3 (42.9) | 7 (100.0) | | |
| >20 | 0 (0.0) | 2 (100.0) | 2 (100.0) | | |

CVS = computer vision syndrome.[a] Fisher–Freeman–Halton exact test

There was no statistically significant association between CVS and the sociodemographic characteristics of the

lecturers. Age (exact p = 0.175), sex ($\chi^2$ = 0.102, p = 0.750), and years of work experience (exact p = 0.218) were not significantly associated with CVS (Table 10).

**Table 11: Univariable logistic regression analysis of factors associated with computer vision syndrome among university lecturers (N = 125)**

| Variable | Category | No CVS, n | CVS, n | COR (95% CI) | p-value |
|---|---|---|---|---|---|
| **Sitting position** | At screen level (Ref.) | 73 | 32 | 1.00 | 0.966 |
| | Not at screen level | 14 | 6 | 0.978 (0.345-2.774) | |
| **Viewing distance** | ≤50 cm (Ref.) | 67 | 33 | 1.00 | 0.193 |
| | >50 cm | 20 | 5 | 0.508 (0.175-1.472) | |
| **Level of computer screen top** | At eye level (Ref.) | 60 | 28 | 1.00 | 0.106 |
| | Above eye level | 6 | 0 | Not estimable* | |
| | Below eye level | 21 | 10 | 1.020 (0.425-2.452) | |
| **Duration of computer use** | 1-3 years (Ref.) | 26 | 10 | 1.00 | 0.451 |
| | 4-6 years | 23 | 7 | 0.791 (0.259-2.418) | |
| | >6 years | 38 | 21 | 1.437 (0.582-3.546) | |
| **Days per week of computer use** | 5 days (Ref.) | 60 | 26 | 1.00 | 0.367 |
| | 3 days | 4 | 0 | Not estimable* | |
| | 6 days | 9 | 5 | 1.282 (0.392-4.198) | |
| | 7 days | 14 | 7 | 1.154 (0.417-3.191) | |
| **Hours per day of computer use** | 0-6 hours (Ref.) | 8 | 2 | 1.00 | 0.249 |
| | 7-12 hours | 70 | 28 | 1.600 (0.320-8.007) | |
| | >12 hours | 9 | 8 | 3.556 (0.577-21.918) | |
| **Frequency of breaks** | Every 20 minutes (Ref.) | 37 | 16 | 1.00 | 0.122 |
| | Every 60 minutes | 9 | 3 | 0.771 (0.184-3.228) | |
| | Every 2 hours | 17 | 14 | 1.904 (0.760-4.773) | |
| | More than 2 hours | 24 | 5 | 0.482 (0.156-1.488) | |
| **Eyeglasses use** | Yes (Ref.) | 20 | 13 | 1.00 | 0.197 |
| | No | 67 | 25 | 0.574 (0.249-1.324) | |
| **Working area lighting** | Bright (Ref.) | 44 | 24 | 1.00 | 0.414 |
| | Very bright | 29 | 10 | 0.632 (0.264-1.515) | |
| | Medium dull | 12 | 4 | 0.611 (0.178-2.104) | |
| | I refuse to answer | 2 | 0 | Not estimable* | |
| **Adjustment of contrast** | Yes (Ref.) | 36 | 21 | 1.00 | 0.152 |
| | No | 51 | 17 | 0.571 (0.265-1.233) | |
| **Anti-glare/VDT filter use** | Yes (Ref.) | 10 | 6 | 1.00 | 0.515 |
| | No | 77 | 32 | 0.693 (0.232-2.066) | |
| **Lubricant eye drops use** | Yes (Ref.) | 9 | 5 | 1.00 | 0.651 |
| | No | 78 | 33 | 0.762 (0.237-2.445) | |

COR = crude odds ratio; CI = confidence interval; Ref. = reference category. Not estimable due to zero outcome frequency.

There was no statistically significant association between the factors examined and the occurrence of CVS among university lecturers (p>0.05). Although lecturers who used computers for more than 12 hours daily had higher odds of CVS than those who used computers for 0–6 hours daily (COR = 3.556; 95% CI: 0.577-21.918), this association was not statistically significant (p = 0.249). Similarly, none of the other examined factors demonstrated a statistically significant association with CVS (Table 11).

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue XI November 2026

# DISCUSSION

The socio-demographic profile of the lecturers showed that almost half (48.0%) were aged 30-39 years, while participants aged 50-59 years constituted the smallest proportion. Females accounted for 58.4% of the study population. The predominance of relatively young adults is consistent with the age distribution reported by (Agbonlahor, 2019) among working-class adults in the Federal Capital Territory, where participants were predominantly young adults. It is also broadly comparable with Zenbaba et al. (2021), whose study of Ethiopian university instructors included a substantial proportion of younger academics. Most lecturers in the present study had relatively few years of occupational experience, with 45.6% having worked for 1-5 years and 27.2% for 6-10 years. The educational profile was consistent with the academic setting, with participants having either a bachelor's degree or a postgraduate qualification. Overall, these characteristics reflect a predominantly young to middle-aged academic workforce in whom computer use is an important component of routine professional activity.

Awareness of CVS was reported by 64.8% of the lecturers. This was higher than the 40% awareness reported by Akinbinu and Mashalla (2013) among workplace computer users in Abuja and the 53.4% reported by Uba-Obiano et al. (2022) among bank workers in Onitsha. The higher awareness observed in this study may reflect differences in educational background, occupational setting and increasing access to information on the effects of prolonged digital device use. Nevertheless, more than one-third of the lecturers were unaware of CVS despite routinely using digital devices for academic activities. This is important because awareness of digital eye strain may facilitate recognition of symptoms and adoption of appropriate work practices. Lema and Anbesu (2022) similarly identified knowledge of CVS as relevant to its occurrence in their systematic review and meta-analysis.

Despite this relatively high level of awareness, ocular and visual symptoms were common among the lecturers. Headache was the most frequently reported symptom, occurring in 86.4% of the participants while using a computer. Eye redness, ocular pain, itching, photophobia, blurred vision, foreign-body sensation, dry eye symptoms and difficulty focusing on near objects were also reported, although less frequently. The prominence of headache is consistent with previous studies identifying it as an important manifestation of CVS (Portello et al., 2012; Sheppard & Wolffsohn, 2018). Tesfaye et al. (2022), for example, reported headache, eye redness, blurred vision, burning sensation and eye irritation among the common symptoms experienced by academic staff. In contrast, Zenbaba et al. (2021) reported blurred vision, pain in and around the eye, and eye redness as prominent symptoms among Ethiopian university instructors. Similar ocular and visual symptoms have also been documented among Nigerian university students (Adepoju S. et al., 2025; Nwankwo et al., 2021). These variations in the relative frequency of individual symptoms may reflect differences in symptom definitions, assessment instruments, patient characteristics and patterns of digital-device exposure. The occurrence of headache alongside ocular surface and visual symptoms further demonstrates the varied symptom profile of CVS.

Although individual symptoms were frequently reported, the overall prevalence of CVS among the lecturers was 30.4% (95% CI: 23.0-39.0%), with 38 of the 125 lecturers meeting the study criterion for CVS. The difference between the high frequency of individual symptoms and the lower overall prevalence is explained by the CVS-Q scoring system, which considers the frequency and intensity of symptoms rather than simply the presence of individual symptoms. For each symptom, the frequency and intensity scores are combined according to the scoring procedure, and the resulting scores are summed across the 16 symptoms. Consequently, reporting one or more symptoms does not necessarily result in a cumulative score sufficient for CVS classification. Only participants who attained a total score of ≥6 were classified as having CVS. This distinction explains why headache was reported by 86.4% of the lecturers, whereas only 30.4% met the overall CVS classification criterion.

The prevalence observed in this study was substantially lower than the approximately 65% reported by Agbonlahor (2019) (Agbonlahor, 2019) among working-class adults in the Federal Capital Territory, Nigeria. It was also lower than the 51.5% reported by Boadi-Kusi et al. (2020) (Boadi-Kusi et al., 2020) among university administrative staff in Ghana and considerably lower than the prevalence reported among academic staff in Ethiopia. Zenbaba et al. (2021) (Zenbaba et al., 2021) reported a prevalence of 70.4% among university

instructors, while Tesfaye et al. (2022) (Tesfaye et al., 2022) reported 78.8% among academic staff at the University of Gondar. The prevalence was also below the pooled global estimate of 69.0% reported in the systematic review and meta-analysis by Ccami-Bernal et al. (2024) (Ccami-Bernal et al., 2024). These differences may be partly attributable to variations in the instruments used to identify CVS, symptom thresholds, recall periods, participant characteristics and case definitions. The present study employed the CVS-Q, with participants classified as having CVS if they obtained a total score of ≥6, in accordance with the scoring threshold described by Seguí et al (2015). This may partly explain why a high proportion of lecturers reported individual symptoms such as headache despite the overall CVS prevalence of 30.4%.

In addition to symptom burden and prevalence, ergonomic practices were assessed because of their potential relationship with CVS. Most lecturers (84.0%) reported that their face was at the level of the computer screen, while 80.0% used their devices at a viewing distance of 50 cm or less. Furthermore, 70.4% positioned the top of the computer screen at eye level, while 24.8% positioned it below eye level. Screen position and viewing distance are relevant ergonomic considerations because they may influence accommodative demand, ocular exposure, and head and neck posture during prolonged computer use. Previous studies and reviews have identified inappropriate posture, viewing distance and workstation characteristics as potential contributors to CVS (Boadi-Kusi et al., 2020; Lema & Anbesu, 2022). Boadi-Kusi et al. (2020) (Boadi-Kusi et al., 2020) demonstrated an association between poor ergonomic practices and CVS among university administrative staff in Ghana, while Zenbaba et al. (2021) (Zenbaba et al., 2021) found an association between bent-back sitting posture and CVS among university instructors. However, none of the ergonomic factors examined in the present study was significantly associated with CVS, indicating that the relationship between individual workstation characteristics and CVS may vary across study populations.

The lecturers also had substantial cumulative and daily computer exposure. Almost half (47.2%) had used computers for more than six years, while 24.0% had used them for 4-6 years. Most lecturers (68.8%) used computers five days per week, and 16.8% reported use on all seven days. Of particular relevance, 78.4% reported working on computers for 7-12 hours per day, while a further 13.6% reported more than 12 hours daily. These findings illustrate the extent to which prolonged digital-device use has become embedded in academic work. Tesfaye et al. (2022) (Tesfaye et al., 2022) identified years of computer use as one of the factors associated with CVS, while Zenbaba et al. (2021) (Zenbaba et al., 2021) reported that frequent computer use was significantly associated with the condition. Associations between prolonged computer use and CVS have also been reported in other occupational populations (Dessie et al., 2018; Ranasinghe et al., 2016). Prolonged near work may increase accommodative and vergence demands, while sustained attention to digital displays may reduce blink frequency and contribute to ocular surface discomfort (Sheppard & Wolffsohn, 2018). However, duration of computer use, number of days of use per week and daily hours of use were not significantly associated with CVS in the present study. This suggests that the relationship between computer exposure and CVS may not depend on duration of use alone but may involve the interplay of individual, ocular, ergonomic and environmental factors.

Protective practices also varied among the lecturers. While 42.4% reported taking a break every 20 minutes of computer use, more than half took breaks less frequently. Only 45.6% adjusted screen contrast in relation to surrounding illumination, while 12.8% used an anti-glare, VDT or blue-light filter and 11.2% used lubricant eye drops while working on a computer. These findings indicate that although some protective behaviours were practised, several measures were not widely adopted. Rest breaks are particularly relevant because they interrupt sustained near fixation and provide opportunities for blinking and relaxation of accommodation. Tesfaye et al. (2022) (Tesfaye et al., 2022) found rest breaks, workplace illumination and use of eye drops to be associated with CVS among academic staff, while Nwankwo et al. (2021) (Nwankwo et al., 2021) also reported an association between rest breaks and CVS among Nigerian undergraduates. However, none of the protective practices examined in the present study was significantly associated with CVS. The relatively low utilisation of some of these practices nevertheless identifies an opportunity for workplace eye-health education focusing on appropriate rest breaks, workstation arrangement and screen settings.

Overall, none of the sociodemographic, ergonomic, computer-use or protective-practice factors examined showed a statistically significant association with CVS. This differs from Zenbaba et al. (2021) (Zenbaba et al.,

2021), Tesfaye et al. (2022) (Tesfaye et al., 2022) and the systematic review by Lema and Anbesu (2022) (Lema & Anbesu, 2022), in which several individual, ergonomic and computer-use characteristics were associated with the syndrome. Associations with computer-use and ergonomic factors have similarly been reported by Ranasinghe et al. (2016), and Boadi-Kusi et al. (2020) (Boadi-Kusi et al., 2020; Ranasinghe et al., 2016). However, Agbonlahor (2019) similarly found that most factors examined among Nigerian working-class adults were not significantly associated with CVS. The variation across studies may reflect differences in study populations, exposure assessment and case definitions and further highlights the multifactorial nature of CVS. In the present study, the sample size was primarily calculated to estimate CVS prevalence, although associations between CVS and selected socio-demographic, computer-use, ergonomic and protective-practice factors were also examined. However, the relatively small number of participants with CVS (n=38) may have limited the statistical power to detect modest associations. Furthermore, the wide confidence intervals observed for some estimates indicate considerable uncertainty around the observed associations. Therefore, the absence of statistically significant findings should not be interpreted as evidence that these factors are unrelated to CVS. Larger studies with sample sizes specifically determined for association analyses are warranted. As the present study was cross-sectional, the findings should also be interpreted as associations rather than causal relationships.

The findings indicate that CVS is a relevant occupational eye-health concern among university lecturers, despite its lower prevalence compared with several previous studies. The frequent occurrence of ocular and visual symptoms, substantial daily computer exposure and inconsistent adoption of appropriate ergonomic practices highlight the importance of digital eye-health education within university workplaces. Workplace health programmes should therefore promote appropriate workstation ergonomics, regular breaks during prolonged screen use and timely eye assessment for lecturers experiencing persistent ocular or visual symptoms.

## CONCLUSION

Computer vision syndrome affected nearly one-third of university lecturers in Ondo West Local Government Area, indicating a notable burden of digital eye strain in this occupational group. Headache was the most frequently reported symptom, and prolonged computer use was common, with most lecturers spending several hours daily on digital devices. Although none of the socio-demographic, ergonomic, computer-use or protective-practice factors examined was significantly associated with CVS, the high level of digital-device exposure and inconsistent adoption of recommended ergonomic practices remain important considerations for occupational eye health. These findings underscore the need to promote awareness of CVS, healthy screen-use practices, appropriate workstation ergonomics and regular eye care among university lecturers.

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