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Prevalence and Predictors of Computer Vision Syndrome among Government Office Secretaries in Debre Tabor Regiopolitan City, Ethiopia

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Abstract

Introduction: Computer Vision Syndrome is an emerging occupational health problem linked to prolonged digital screen exposure. Evidence from Ethiopia shows a high burden among computer users; however, data on secretaries in smaller cities like Debre Tabor remain limited. This study assessed the prevalence and predictors of Computer Vision Syndrome among government office secretaries in Debre Tabor Regiopolitan City.

Methods: An institution-based cross-sectional study was conducted from Feb 5 to Mar 25, 2026 among 353 randomly selected secretaries. Data were collected using interviewer-administered questionnaires, observational checklists, and Snellen chart assessments. EpiInfo 7.2.3.1 and SPSS 25 were used for data entry and analysis. Binary and multivariable logistic regression models were used that identified factors associated with Computer Vision Syndrome at a significance level of $p < 0.05$.

Results: The prevalence of Computer Vision Syndrome was 50.7% (95% CI: 45.3–55.8). Significant predictors included diploma-level education (AOR=2.33), monthly salary $\geq$7200 Ethiopian birr (AOR=4.08), familiarity with eye disease (AOR=3.35), not taking breaks (AOR=2.82), lack of ergonomic chair (AOR=2.72), and maintaining a downward (AOR=2.62) or level gaze (AOR=2.58) while viewing the screen.

Conclusion: Half of the secretaries were affected by Computer Vision Syndrome. Individual, behavioral, and ergonomic factors significantly contributed to its occurrence. Improving ergonomic work environments, promoting regular breaks, and enhancing awareness of eye health are found to be essential to mitigate Computer Vision Syndrome.

Keywords: Computer Vision Syndrome, Secretaries, Occupational Health, Ethiopia.

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1 Introduction

The increasing reliance on computers and digital devices has created a new occupational health challenge known as Computer Vision Syndrome (CVS), also referred to as digital eye strain, which encompasses a group of ocular and visual symptoms resulting from prolonged screen exposure [1,2]. Common manifestations include eye strain, blurred or double vision, dryness, burning sensations, redness, headaches, and neck or shoulder pain [2–4]. These symptoms arise from sustained near work, reduced blink rate, improper ergonomics, and environmental conditions such as glare or inadequate lighting [5–7].

Globally, the prevalence of CVS is estimated to be high, with studies reporting figures ranging from 12% to over 90% depending on the population and setting [8]. Among office-based workers and administrative staff, the burden is substantially higher, with more than two-thirds experiencing visual discomfort associated with computer use [9]. In Ethiopia, meta-analytic evidence places the pooled prevalence of CVS among computer users at 73%, indicating a growing public health and occupational safety concern [10]. Studies conducted in major Ethiopian cities have reported high rates among secretarial employees, including 75.6% at Jimma University, 73% in Gondar, and 68.8% in Addis Ababa [11–13].

Secretarial workers constitute a high-risk occupational group as their daily tasks involve extended use of visual display terminals, often without adequate rest breaks [14]. Multiple factors have been implicated in the development of CVS, including prolonged screen time, poor workstation ergonomics, uncorrected refractive errors, and limited awareness of eye-health practices [15–18]. Inadequate workplace policies and insufficient ergonomic training further exacerbate the problem, leading to reduced productivity and compromised quality of life [19,20].

Despite its public health relevance, evidence on CVS among government office secretaries in smaller urban settings of Ethiopia, including Debre Tabor Regiopolitan City, is limited. The absence of local data hinders the design of evidence-based interventions to promote occupational eye health. Therefore, this study aimed to determine the prevalence of CVS and identify its predictors among secretaries in government offices in Debre Tabor Regiopolitan City, North Central Ethiopia.

2 Methods

2.1 Study Design and Setting

An institution-based cross-sectional study was conducted from Feb 5 to Mar 25, 2026 among secretarial workers employed in government offices of Debre Tabor Regiopolitan City, North Central Ethiopia. Debre Tabor serves as the administrative center of the South Gondar Zone and hosts numerous governmental institutions where secretaries routinely engage in computer-based tasks for prolonged hours.

2.2 Population and Eligibility Criteria

The source population included all secretaries working in government offices in the city. The study population comprised those who were available during the data collection period. Inclusion criteria were secretaries who used a computer for at least 4 hours per workday and had served in their current office for three months or longer [11,13]. Individuals with recent eye surgery, active ocular infection, or those on leave during data collection were excluded [12,21].

2.3 Sample Size Determination and Sampling Procedure

The sample size was calculated using a single population proportion formula, assuming a 73% prevalence of CVS from prior Ethiopian studies [10], a 5% margin of error, a 95% confidence level, and a 10% non-response rate. The final sample size was 353 participants. A list of secretarial staff was obtained from the City Administration Office. Participants were selected using a simple random sampling technique with proportional allocation to ensure representation from all institutions.

2.4 Data Collection Tools and Procedures

Data were collected using a structured, interviewer-administered questionnaire and an observational checklist adapted from validated instruments [14,22]. The questionnaire covered socio-demographic characteristics, work-related factors, ocular and medical history, and environmental/ergonomic practices. Visual acuity was screened using a Snellen chart at 6 meters. The questionnaire was translated into Amharic and back-translated to English for consistency. Four trained data collectors conducted the interviews under researcher supervision.

2.5 Operational Definitions

Computer Vision Syndrome (CVS): Presence of at least one symptom (e.g., eye strain, burning, blurred vision, headache) occurring after computer use and persisting for at least one week before data collection [10,11].

Prolonged computer use: Use of a computer for more than 4 hours per day [10].

Frequent break: Taking a rest period of $\geq$5 minutes every hour of computer work [13].

Ergonomic chair use: Sitting on an adjustable chair with back support and appropriate height alignment [23].

2.6 Data Quality Assurance

The questionnaire was pre-tested on 5% (n=18) of secretaries in a nearby town. Data collectors received two days of training. Completed questionnaires were checked daily for completeness and consistency.

2.7 Data Processing and Analysis

Data were entered into EpiInfo version 7.2.3.1 and analyzed using SPSS version 25. Descriptive statistics summarized participant characteristics and CVS prevalence. Binary logistic regression identified candidate variables ($p < 0.25$) for multivariable logistic regression to control for confounders. The Hosmer-Lemeshow test assessed model fit. Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI) were reported, and statistical significance was set at $p < 0.05$.

3 Results

3.1 Socio-demographic Characteristics

A total of 353 secretary workers from government offices in Debre Tabor Regiopolitan City participated in the study, yielding a 100% response rate. The mean ($\pm$SD) age of respondents was 33.9 $\pm$ 7.4 years, with a range of 21–53 years. More than half (55.8%) were females. Regarding educational attainment, 57.2% held a diploma and 42.8% had a bachelor's degree or above. The majority (71.4%) were married, and 60.3% had a monthly income below 7,200 ETB (Table 1).

3.2 Computer Vision Syndrome

In a study assessing the prevalence of CVS among secretary office workers in Debre Tabor, Regiopolitan City was found 50.7% (95% CI: 45.3–55.8).

3.3 Computer Vision Syndrome Symptoms of Secretary Workers

Eye irritation was the most common symptom, reported by 79.3% participants. Sleep disturbances affected 21%, reduced contrast sensitivity 11.3%, and cognitive fatigue 29.5%. Additionally, 52.7% participants experienced increased sensitivity to light (Table 2).

3.4 Environmental and Ergonomic Practice Related Factors

Most participants (91.5%) primarily used desktop computers for their office tasks, while only 8.5% used both desktops and laptops. A large proportion (76.2%) did not take breaks during device use, and among those who did, only 7.9% took breaks every 30 minutes or less, while 14.7% took breaks hourly. Although the use of anti-glare or blue-light filters was very low (96.3% not using them), nearly 70% adjusted their screen brightness and contrast according to ambient light (Fig. 1).

Table 1. Socio-demographic characteristics of secretary workers in government offices, Debre Tabor Regiopolitan City, 2026 (n = 353).

Variable	Category	Frequency (n)	Percent (%)
Sex	Male	156	44.2
	Female	197	55.8
Age (years)	21–30	109	30.9
	31–40	175	49.6
	> 40	69	19.5
Marital status	Single	101	28.6
	Married	252	71.4
Educational level	Diploma	202	57.2
	Degree and above	151	42.8
Monthly salary (ETB)	< 7200	213	60.3
	≥ 7200	140	39.7

3.5 Observational and Measured Parameters for CVS

From study participants 283 (80.2%) adjusted brightness and contrast properly. Additionally, over half 221, (62.6%) indicated that no blinds or curtains on windows (Table 3).

3.6 Behavioral Related Factors

Participants in the study reported spending an average of 6.8 hours per day on computer-related tasks (SD ±1.45). Secretarial office workers typically used computers 4.99 days per week on average (SD ±0.61). A significant majority—317 individuals (89.8%)—indicated using computers for 6 or more hours daily. In terms of weekly usage, 332 participants (94.1%) worked on computers 3–5 days per week.

Awareness of Computer Vision Syndrome (CVS) was noted among 128 participants (36.3%). Regarding eyeglass use, 82 participants (23.2%) were current users, but only 30 (8.5%) had prescriptions from an eye-care professional. Additionally, 72 participants (20.4%) reported being diagnosed with an eye condition, with allergic conjunctivitis being the most prevalent, affecting 45 participants (12.7%).

Chronic illnesses were reported by 14 participants (4.0%). Furthermore, 30 participants (8.5%) used lubricating eye drops during computer work, and 76 (21.5%) used digital devices outside the office. About 67 participants (19.0%) spent less than 3 hours on these devices outside work, while only 9 (2.5%) reported usage of 3 hours or more.

3.7 Factors Associated with CVS among Secretary Office Workers

Secretary office workers with a diploma were 2.33 times more likely to develop CVS compared to those with a degree or higher (AOR: 2.33, 95% CI: 1.33–4.08, $p = 0.003$). Workers earning a monthly salary of ≥7200 ETB were 4.08 times more likely to develop CVS compared to those earning <7200 ETB (AOR: 4.08, 95% CI: 2.08–7.99, $p < 0.001$). Additionally, workers who were familiar with eye diseases had a 3.35-fold higher likelihood of developing CVS than those who were not familiar (AOR: 3.35, 95% CI: 1.86–6.06, $p < 0.001$) (Table 4).

4 Discussion

This study investigated the prevalence and contributing factors of CVS among government office secretaries in Debre Tabor Regiopolitan City, located in North Central Ethiopia. The findings indicate that CVS is a significant occupational health issue, affecting approximately half of the participants. Several predictors including ergonomic conditions, behavioral habits, and individual characteristics were found to be significantly associated with the development of CVS. The overall prevalence of CVS in this study was 50.7% (95% CI: 45.3–55.8), mean-

Table 2. Symptoms reported by secretary workers in government offices, Debre Tabor Regiopolitan City, 2026 (n = 353).

Symptom	Characteristics	Frequency (n=353)	Percent (%)
Blurred vision	Yes	97	27.5
Eye strain	Yes	31	8.8
Redness of eyes	Yes	175	49.6
Watery eyes	Yes	37	10.5
Eye dryness	Yes	29	8.2
Double vision	Yes	26	7.4
Eye irritation	Yes	280	79.3
Burning sensation	Yes	290	82.2
Headache	Yes	200	56.7
Neck and shoulder pain	Yes	173	49.0
Sleep disturbance	Yes	74	21.0
Reduced contrast sensitivity	Yes	40	11.3
Cognitive fatigue	Yes	104	29.5
Increased sensitivity to light	Yes	186	52.7

ing that one in two secretaries experienced symptoms of digital eye strain. This rate is comparable to the global estimate of around 66% among computer users [10], but lower than the pooled national prevalence of 73% reported in a recent Ethiopian meta-analysis [11], as well as findings from studies conducted in Jimma (75.6%) [13] and Gondar (73%) [12]. These differences may be attributed to variations in participant demographics, definitions of CVS, workplace ergonomics, and awareness levels. Despite the relatively lower prevalence, the results underscore that even in smaller urban settings, secretaries are highly vulnerable to CVS, highlighting the need for targeted workplace interventions.

After adjusting for confounding variables, secretaries with a diploma-level education were more than twice as likely to develop CVS compared to those with a bachelor's degree or higher (AOR = 2.33; 95% CI: 1.33–4.08). This may reflect disparities in ergonomic knowledge, job responsibilities involving prolonged computer use, or lower health literacy regarding eye care. Additionally, individual's familiar with eye diseases had increased odds of experiencing CVS (AOR = 3.35; 95% CI: 1.86–6.06), possibly due to heightened symptom awareness and reporting, an observation consistent with previous studies on health perception [24]. Interestingly, a monthly salary of $\geq$ 7200 ETB was associated with a fourfold increase in CVS risk (AOR = 4.08; 95% CI: 2.08–7.99). This may suggest that higher-paid secretaries often hold more demanding roles involving extended screen time and fewer rest breaks, which align with other workplace-based studied [9,15]. The strongest predictor, however, was a history of eye disease, which increased the likelihood of CVS nearly twenty-fold (AOR = 19.78; 95% CI: 6.54–59.81). This finding is consistent with physiological evidence indicating that individuals with pre-existing ocular conditions such as refractive errors or dry eye have reduced tolerance to screen exposure and are more susceptible to visual strain [1,9,15].

Workplace ergonomics and behavioral practices also played a significant role. Secretaries who did not take breaks during computer tasks were nearly three times more likely to develop CVS (AOR = 2.82; 95% CI: 1.45–5.51), supporting evidence that continuous screen use reduces blink rate and causes reconciling fatigue [3,9]. This reinforces the value of practices like the "20-20-20 rule" (looking at a distant object for 20 seconds every 20 minutes). Similarly, not using ergonomic chairs significantly

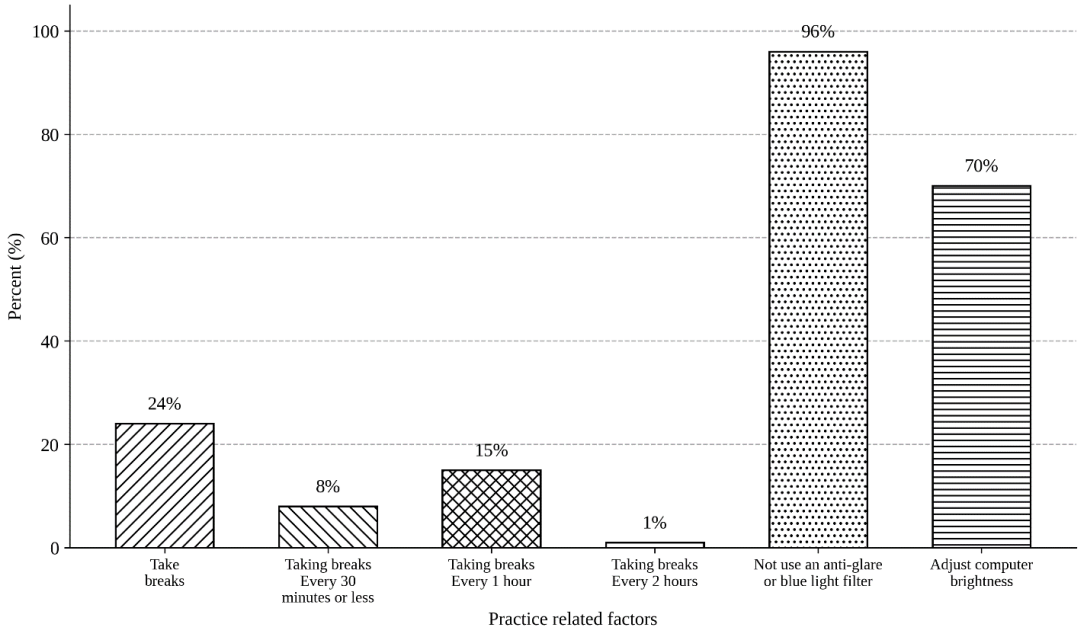

Figure 1. Environmental and ergonomic practice related factors of secretary workers in government offices, Debre Tabor Regiopolitan City, 2026 (n = 353).

increased CVS risk (AOR = 2.72; 95% CI: 1.38–5.38), as poor seating posture can lead to neck and shoulder strain and sub-optimal viewing angles, exacerbating visual discomfort [9]. Monitor gaze angle was another notable ergonomic factor. Compared to an upward gaze, both eye-level (AOR = 2.62; 95% CI: 1.15–5.97) and below-eye-level gazes (AOR = 2.58; 95% CI: 1.00–6.62) were linked to higher CVS risk. Although a slightly downward gaze is generally recommended to reduce ocular surface exposure, these associations may reflect poor workstation design or lighting glare that compromises visual comfort [1,9].

5 Conclusion

This study reveals that Computer Vision Syndrome is a prevalent condition among government secretaries in Debre Tabor City, Ethiopia. The syndrome is significantly influenced by a combination of individual factors (educational status, salary, pre-existing eye disease awareness) and modifiable work-related practices (lack of breaks, non-ergonomic chairs, improper screen gaze angle). A multi-faceted approach involving ergonomic improvements, enforced break schedules, and targeted health education is urgently recommended to mitigate the burden of CVS and safeguard the well-being and productivity of this vital workforce.

Declarations

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Author Contributions

Alebachew Amsalu (AA): Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing - Original Draft. Bezawit Molla Getahun (BMG): Conceptualization, Investigation, Writing - Review & Editing. Masitawal Demsie Goshu (MDG): Conceptualization, Methodology, Formal Analysis, Writing - Review and Editing. All authors read and approved the final manuscript.

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Table 3. Observational and measured parameters for CVS of secretary workers in government offices, Debre Tabor Regiopolitan City, 2026 (n = 353).

Variable	Category / Description	Frequency (n)	Percentage (%)
Artificial lighting orientation	Lights in front	199	56.4
Window treatments	No blinds or curtains	221	62.6
Screen settings	Brightness and contrast properly adjusted	283	80.2
Furniture	Matte (non-reflective) finishes	320	90.7
Ergonomic chair	Adjustable chair available	239	67.7
Screen gaze	Maintained gaze level with screen	234	66.3
Equipment	Laptop holder available	253	71.7
Equipment	Adjustable keyboard available	159	45.0
Vision	Snellen chart < 6/9	200	56.7

Table 4. Factors associated with computer vision syndrome among secretary workers in government offices, Debre Tabor Regiopolitan City, 2026 (n = 353).

Factor	Category	CVS Yes n(%)	CVS No n(%)	AOR (95% CI)	*p*-value
Education	Diploma	112 (63.6)	64 (36.4)	2.33 (1.33–4.08)	0.003
	Degree & above	67 (37.9)	110 (62.1)	1	
Salary (ETB)	≥7200	127 (66.1)	65 (33.9)	4.08 (2.08–7.99)	<0.001
	<7200	52 (29.1)	109 (62.6)	1	
Awareness of eye disease	Yes	85 (66.4)	43 (33.6)	3.35 (1.86–6.06)	<0.001
	No	94 (41.8)	131 (58.2)	1	
Breaks between tasks	No	142 (52.8)	127 (42.7)	2.82 (1.45–5.51)	0.002
	Yes	37 (44.0)	47 (56.0)	1	
Ergonomic chair	Yes	111 (46.4)	128 (53.6)	2.72 (1.38–5.38)	0.04
	No	68 (59.6)	46 (40.1)	1	
Gaze angle	Upward	25 (39.7)	38 (60.3)	2.58 (1.00–6.62)	0.049
	Downward	37 (66.1)	19 (33.9)	2.62 (1.15–5.97)	0.021
	At screen level	117 (50.0)	117 (50.0)	1	

Ethical Approval

Ethical clearance was obtained from the ethical review committee of Debre Tabor University. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author, [AA], upon reasonable request.

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