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Effect of the usage of visual display terminals on the accommodative and vergence systems of high school children in Cape Coast, Ghana

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Study Background: The accommodative and vergence systems are key visual parameters in ensuring binocularity and visual comfort with the usage of visual display terminals (VDTs). The purpose of this study was to determine the effect of the usage of VDTs, and its associated conditions namely, computer vision syndrome (CVS) and ergonomic factors, on the accommodative and vergence systems of high school students in Cape Coast, Ghana.

Methodology: This prospective school-based cross-sectional study employed multistage sampling technique to administer reliable questionnaires (on frequency of usage of VDT, ownership of VDT, ergonomic factors and presence of CVS symptoms) to high school students. Participants then underwent binocular vision examination. Diagnosis of binocular vision anomalies was based on the Integrative Analysis approach.

Findings: VDT users were not likely to be associated with the presence of non-strabismic binocular vision anomalies (NSBVA) (OR = 0.641, 95% CI = 0.202 – 2.031, p = 0.450). VDT users who had CVS (OR = 3.622, 95% CI =1.246 - 10.531, p = 0.018), poor ergonomic practice (OR = 3.251, 95% CI= 1.599 - 6.610, p = 0.001), myopia (OR = 2.728, 95% CI = 1.179 - 6.315, p = 0.019), hyperopia (OR = 2.965, 95% CI = 1.379 - 6.374, p = 0.005) and astigmatism (OR = 3.620, 95% CI [1.916, 6.839, p = 0.0001) were more likely to be associated with the presence of NSBVA. There were significant correlations between duration of usage of VDT, and the parameters of vergence and accommodation.

Conclusion and Significance: Prolong use of VDT was found to deteriorate the parameters of vergence and accommodation. The study highlights the importance of promoting good ergonomics and limiting time for VDT use to relieve symptoms of binocular vision anomalies.