

The Prevalence and Knowledge of University Students on Computer Vision Syndrome (CVS).

¹Kojo OseiFrimpong. ²Samuel Asare

¹Department of Maths/ICT Presbyterian University College, Agogo-Ghana

²Department of Maths/ICT, St. Monica's College of Education, Mampong – Ashanti, Ghana

Abstract

Computer Vision Syndrome is the combination of eye and vision problems associated with the use of computers. A quantitative descriptive study was conducted with students on Asante Akyem Campus, Agogo of the Presbyterian University College with the use of questionnaires. Prolonged and continuous use of computer usually leads to Computer Vision Syndrome and result to low productivity. The objectives of this study is to find out the prevalence of Computer Vision Syndrome among university students, to assess the knowledge of university students on Computer Vision Syndrome, to identify if students are knowledgeable on the preventive measures of CVS using a sample of 306 respondents. The results obtained revealed that, majority of respondents (52.1%) indicated backache, neck pain/shoulder (55.9%), tiredness of eyes (61.8%) and eye strain (52.6%). Respondents agreed that taking frequent break between computer use and the use of radiation filter on the screen, the use of computer lens were preventive measures of computer vision syndrome. It is recommended that Medical and dental Council organize training for students on Computer Vision Syndrome, and adequate education of students should be done on the effects of Computer use on the eye.

Keywords: Computer Vision Syndrome, Prevalence, Knowledge, Computer.

Date of Submission: 05-07-2020

Date of Acceptance: 21-07-2020

I. Background

The advancement of technology has made an impact in almost all aspect of human lives especially since the availability of computers, it has improved the processing speed of many tasks hence a lot of work can be done in minimal time, also we can engage in several tasks simultaneously by accessing enormous quantities of information (Himalaya S. R., 2015).

Computers and other digital electronic devices are gadgets that have made activities faster and simpler but have brought with them new problems related to health (Arumugam, Krishna, Subrani, & Kumar, 2014). Computers which were first produced by IBM in 1981 did not take into consideration the possible health hazard that its users may experience later (Akinbinu T. R., 2013).

Computer and the digital electronic devices are used in homes and at leisure activities is now almost universal for activities such as; internet, e-mail, online shopping, games, social interaction (e.g. What Sapp, Face book, Twitter, Vibe, YouTube, Digg, blogs etc.) (Rosenfield M. M., 2012). Personal computer is a common item these days in offices, colleges, universities and home (Reddy, Low, Lim, Low, Mardina, & Nursaleha, 2013). In 2015, the worldwide sales of personal computers have been projected to reach almost 517million units up from 372million in 2011 (Devesh & Al-Bimani, 2012). It had taken 27 years to reach 1billion computers in use and market researchers have suggested that it will take only 5 years to reach the next billion (Devesh & Al-Bimani, 2012).

The use of personal computers has increased the efficiency and easy access to information, written articles, and communication. Millions of people use computers for prolonged hours (Reddy, Low, Lim, Low, Mardina, & Nursaleha, 2013). Recently, large numbers of university students use computers for studies and for research, watching movies, playing computer games and online chatting, etc. (Devesh & Al-Bimani, 2012). Approximately 75% of all jobs in the United States now rely on computers (Rosenfield M. M., 2012).

The viewing of digital electronic screens is not restricted to desktop computers located in the workplace any longer instead, visual requirements today may include using laptops and tablet computers, electronic book readers, smart phones and other electronic devices either in the workplace, at home or in the case of portable equipment, at every location. The use of computer and other digital electronic gadget is not restricted to adults only. A study on 2000 American children between 8 and 18 years of age reported that in an average day they spend approximately 7.5 hours using entertainment media, 4.5 hours watching TV, 1.5 hours on a computer and over an hour playing video games (Rosenfield M. , Computer vision syndrome: a review of ocular causes and potential treatments, 2011).

According to Rosenfield(2012)67% of adults between 18 and 24 years of age own a smart phone. Also young adults send an average of 109 text messages a day and check their phones 60 times in a typical day (Rosenfield M. M., 2012).

These have increased the visual demands and may give rise to a variety of symptoms which have been termed Computer Vision Syndrome (CVS) (Rosenfield M. , Computer vision syndrome: a review of ocular causes and potential treatments, 2011).

Reports have suggested that between 64% and 90% of computer users experience visual symptoms including: eyestrain, headaches, ocular discomfort, dry eye, diplopia and blurred vision either at near or when looking into the distance after prolonged computer use (Rosenfield, Gurevich, Wickware, & Lay, 2010).

In study in Nigeria showed that, CVS may result in low productivity, reduced job satisfaction, increased error rate, blurred distant vision and impaired visual abilities (Akinbinu T. R., 2013). A lot of CVS related problems can be avoided by appropriate preventive measures, but the majority of computer users are not aware of CVS-related symptoms while some choose not to practice them (Akinbinu T. R., 2013).The awareness of eye problems associated to computer in developing countries has been minimal (Connecticut, 2010).

Not much research is done in Africa and specifically Ghana about CVS hence most computer users are ignorant about the condition, therefore eye care professionals refers to CVS as the top most occupational endemic of the 21st century (Akinbinu T. R., 2013).

Statement of Problem

Due to the fact that CVS can significantly affect productivity, of which education is not an exception, the youth, and for that matter university students use computer frequently for activities such as; assignments, researches, entertainment etc. (Arumugam, Krishna, Subrani, & Kumar, 2014). There are various health hazards of computer on its users which include its effect on the eye called Computer Vision Syndrome. It is found that one out of every four patients visiting ophthalmic OPD's are with the symptoms of CVS (Association American Optometric, 2005).

In the past two years Computer Vision Syndrome (CVS) has experienced a dramatic surge by about 15% worldwide (Himalaya S. R., 2015). Globally, nearly 60million people from CVS and one million new cases each year (Akinbinu T. R., 2013).

A million new cases of CVS occur every year (Himalaya s. r., 2015). More than 70% of all Computer users report some form of CVS. It impairs mental and physical well-being and impairs productivity (Arumugam, Krishna, Subrani, & Kumar, 2014). Hence this research is to access the prevalence and knowledge of students on Computer Vision Syndrome and to identify if they are equipped with the knowledge on the condition and its preventive measures (visual ergonomics).

Objectives

The main objective of this study is to assess the prevalence and knowledge of university students on Computer Vision Syndrome. In order to achieve this broad objective, the following under-listed specific objectives will be considered:

1. To find out the prevalence of Computer Vision Syndrome among university students.
2. To assess the knowledge of university students on Computer Vision Syndrome.
3. To identify if students are knowledgeable on the preventive measures of CVS.

Research Questions

1. How prevalent is Computer Vision Syndrome among students university students?
2. What is the level of knowledge on Computer Vision Syndrome among university students?
3. What is the level of knowledge of University students on prevention of Computer Vision Syndrome?

II. Review of Related Literature

Computer

“Computer is an advanced electronic device that takes raw data input from the user, processes these data under the control of a set of instructions (called program) and gives the results (output) and saves output for the future use. It can process both numerical and non-numerical (arithmetic and logical) calculations”. Computers have software and hardware components (Akinbinu T. R., 2013).

Computer Vision Syndrome

Personal computers have become one of the most common office tools. The daily continuous 2 to 3 hours computer use puts users at high risk of developing CVS (Rosenfield, Gurevich, Wickware, & Lay, 2010; American Optometric Association, 2005).

Computer Vision Syndrome (CVS) is “a complex eye and vision-related problem that results from prolonged computer use” (Selanger, 2014). Computer Vision Syndrome defined by the American Optometric Association as “the combination of eye and vision problems associated with the use of computers” (Rosenfield, Gurevich, Wickware, & Lay, 2010; American Optometric Association, 2005).

According to a study by Graney (2011), CVS occurs in about 70% of computer users hence it is labeled as number one occupational hazard in the 21st century.

Prevalence of Computer Vision Syndrome

A study done by Himalayan (2015) on Computer vision syndrome among nurses resulted in approximately two thirds of the study respondents reporting with moderate headache during or after working with the computer. It might be associated with sitting for lengthy periods in fixed postures at computer terminals. Fifty percent (50%) of the respondents reported with moderate fatigue and tiredness while working with computer. Almost all the participants complained of mild, moderate and severe blurred vision. A large proportion of them complained of moderate neck, shoulder or back pain. Factor like gender was not statistically associated with the incidence of computer vision syndrome (Himalaya S. R., 2015).

According to a study on prevalence of computer vision syndrome (CVS) among Information Technology Professionals Working in Chennai, the prevalence of CVS was found to be 69.3%; 62% (moderate) and high (7.3%). A maximum (66.5%) of computer professionals worked more 7-10 hours, 33.5% were working for more than 10 hours, and no one worked for 4-6 hours and less than 3 hours. It was concluded that there is moderate prevalence of Computer Vision Syndrome among computer professionals. There was no significant association between the incidence of Computer Vision Syndrome and age of the computer professionals, number of years working on computer, total hours of working on computer per day and total hours of working on computer at a stretch in a day (Arumugam, Krishna, Subrani, & Kumar, 2014).

A study among engineering students and medical students, the prevalence of CVS was 81.9% and 78.6% respectively. In the same study, 40% engineering students used computer between four to six hours and 10% of the medical students (Logaraj, Madhupriya, & Hedge, 2014).

Also a study conducted in Malaysia on computer vision syndrome: a study of knowledge and practices in University students conducted proved that, ninety percent of university students in Malaysia experienced symptoms related to CVS, symptoms were seen more often in those who used computer for more than 2 hours continuously per day. In the same study, it was reported that 89.9% of the 795 students had symptom of CVS and that headache was the most common symptom identified (Reddy, Low, Lim, Low, Mardina, & Nursaleha, 2013).

The findings revealed that 92(63.0%) of the total 146 respondents had computer vision syndrome. Respondents generally had almost ten years of working experiences with the computer indicating that they have mastered the basic computer use skills. It was concluded that prevalence of computer vision syndrome among administrative staff is high. It was suggested that increasing the knowledge and improving the attitude on visual ergonomics among the administrative staffs may reduce the prevalence of CVS (Zainuddin & Isa, 2014).

A study by Mohammad et al., (2015) among 642 students between the ages of eleven and eighteen years in Qazvin city of Iran. The research revealed that prolonged computer use can result in complications such as eye strain, eye and headaches, double and blurred vision, tired eyes, muscle strains, irritation, burning and itching eyes, dry eyes, eye redness, light sensitivity and other problems which happen to be the most common complaints among the respondents and that using computers for prolonged periods of time can lead to eye-related problems. The results of this study indicated that 63.86% of the subjects had refractive errors. The most prevalent (81.8%) eye-related problem in computer users was eyestrain and the least prevalent was dry eyes (7.84%) (Mohammad, Ebrahimi, Parisa, Rafat, Tahereh, & Mehran, 2015).

Likewise, in Nigeria, a study on 100 computer users aged between 18 and 40 years. It was seen that 74(74%) respondents experienced at least one symptom of CVS. Headache and eyestrain were the most common symptom of CVS among the population (Akinbinu T. R., 2013).

The symptoms most experienced by respondents when using the computer were: Headache (30.94%) and Eyestrain (30.94%) in a research by Ihemedu&Omalase (2010). Double vision was experienced by 12.95%, Watery eyes were reported by 10.79%, Blur vision and Redness were experienced by 10.07% and 4.31% respectively (Ihemedu & Omolase, 2010).

In a cross sectional study of 136 computer users, Sen& Richardson (2007) report that 55% had burning sensation, 61% reported some headache, about less than half (46%) complained of eye redness. The majority (87%) complained of some problems of eye fatigue. After analysis, it was found that eye fatigue was the symptom with the highest score (4.5), followed by burning sensation (3.3), headache (3.3), focusing problem (2.7), redness (2.7) and double vision (2.1) (Sen & Richardson, 2007).

Knowledge of Computer Vision Syndrome

A study in Malaysia on Effect of Human and Interaction with Technology; Computer Vision Syndrome Among University Administrative Staff had hundred and forty-six respondents (response rate 88%), majority

(64.4%) of the respondents had good knowledge on computer vision syndrome and visual ergonomics but 35.6% did not have good knowledge. There was a significant association between gender and level of knowledge on visual ergonomics, 52% male staff had poor knowledge on visual ergonomics as compared to females (27.1%). But age and ethnicity had no significant association with knowledge on visual ergonomics (Zainuddin & Isa, 2014).

According to a study on computer vision syndrome: a study of knowledge and practices in University students conducted in Malaysia suggested that majority of students 691(87%) out of a total of 795 students were aware of the bad effects of prolonged use of computer on the eye (Reddy, Low, Lim, Low, Mardina, & Nursaleha, 2013).

An Australian study of over 1000 computer workers found 63.4% reported symptoms had uncontrolled conditions; this percentage was reduced to 25.2% when an optimized, ergonomic desk and frequent work breaks were provided (Rosenfield M. , Computer vision syndrome: a review of ocular causes and potential treatments, 2011).

In Nigeria a qualitative descriptive cross sectional study by Akinbinu, 2013 on Knowledge of Computer Vision Syndrome among Computer users in the Securities and Exchange Commission in Abuja. The respondent for the research were between the ages of 18 to 40 years. It was reported 45% of the respondents spend about 6 to 8 hours with the computer daily. 27 respondents which made (27%) out of a total of 100 respondents had knowledge of Computer Vision Syndrome., hence suggesting that the youth in this environment had poor Knowledge about Computer Vision Syndrome (Akinbinu T. R., 2013).

Similarly, a study on the effectiveness of a planned teaching program to improve the knowledge regarding “ergonomics for computer use” among selected staff of Majan College in Oman. The study had a pre-test; thus then assessment of the knowledge of respondents before the teaching program and a post-test which is the assessment of the knowledge level after the teaching sessions. The pre-test scores, 62% of males and 61% of females had inadequate knowledge computer ergonomics including visual ergonomics. The pre-test level of knowledge clearly indicates a need to educate the staff of various institutions on the basic ergonomic measures related to the computer. However, zero percent in the number of respondents had inadequate level of knowledge is a clear indication that all the staff have benefited from the planned teaching program. Hence they recommended the need for ergonomic training to the employees of different organizations. (Devesh & Al-Bimani, 2012).

Prevention of Computer Vision Syndrome (CVS)

- **Conscious Blinking** - At the end of 30 minutes of computer work, blink at least 10 times; it gives rest to the eyes and helps in tear spread and avoids dryness and irritation.
- **Periodic Exercise:**It is better to have some exercise after every half an hour of continuous computer work—for instance standing, moving about or exercise arms, legs, back, neck and shoulders. The rule of thumb is 15minutes rest for every 2 hours of continuous computer use, or a 20 / 20/20 exercise is also used; every 20 minutes of computer use should stare at a distant of 20 inches for 20 seconds.
- **Use of Tear Substitutes:**Artificial tear drops can be used if symptoms persist; 1drop 3 or 4 times a day.
- **Eye Examination:** Computer users should have an eye exam before they start working on a computer and thereafter get our eyes examined once a year preferably by an eye doctor who is specialized in computer vision care.
- **Computer Glasses:**Even people with normal vision would need glasses just for computer use. They allow eyes to focus more clearly and reduce strain from monitor use. Bifocal computer glasses with upper segment set for monitor and lower segment for keyboard or desktop are available. Progressive lenses also can help in reducing CVS. Tinted lenses (grey or brown preferred) reduce problems with glare and flicker. Anti-reflection coating also can prevent glare and reflections.
- **Pinhole Glasses:** Reduce ultraviolet and other forms of radiations and reduce glare from above and sides; increase depth of focus, decrease effort of accommodation and reduce possibility of developing myopia from constant near work.
- **Monitor Position:** The computer screen should be directly in front of you and 15 to 20 degrees below eye level (about 4 or 5 inches) as measured from the center of the screen so you don't have to twist your head or neck.
- **Glare:** (for example, from windows, lights): If there is no way to minimize glare from light sources, a screen glare filter can be used. The aim is to reduce the glare so that you do not need to assume an awkward posture in order to clearly see the information on your screen.
- **Lighting:** Limit and focus light for computer tasks”. (Connecticut, 2010).

III. Methodology

A quantitative descriptive research design was used for the study. A sample size of three hundred and six (306) students was selected by stratified and systematic sampling methods. Questionnaires was administered to the three hundred and six respondents for data collection. Data was analysed using Statistical Package for Social Sciences (SPSS) Version 24.0.

IV. Analysis of Results

Demographic Data

The demographic data involves the background of respondents; it involves age, marital status, occupation, educational level of respondents, etc.

Table 1: Demographic Data

Age	Frequency	Percentage%
Below 20 years	42	13.7
20-30 years	249	81.4
30-40 years	12	3.9
Above 40 years	3	1.0
Total	306	100.0
Gender		
Male	158	51.6
Female	148	48.4
Total	306	100.0
Level		
100	91	29.7
200	43	14.1
300	67	21.9
400	105	34.3
Total	306	100.0
Department		
PA	175	57.2
Nurse	131	42.8
Total	306	100.0
Stream		
Regular	252	83.2
Weekend	51	16.8
Total	303	100.0

Source: Field Survey, 2019

Results from table 4.1 showed information on respondents' demography; it was revealed that majority of respondents (81.4%) were between 20-30 years, 13.7% were below 20 years, 3.9% were between 30-40 years whilst 1% was above 40 years. Majority of respondents were males (51.6%) whilst 48.4% were females. 34.3% of respondents were in level 400, 29.7% were in level 100, 21.9% were in level 300 and 14.1% were in level 200. 57.2% were Physician Assistant and 42.8% were nurses. As high as 83.2% of respondents were regular students whilst 16.8% were weekend students.

Likewise in a study by Himalaya S. R. (2015) three fourth (75%) of the study participants were in the age of <30 years. But both males (58%) and females (42%) more or less equally participated in the study. Similarly, out of 179 computer professionals and in a research conducted by Arumugam, Krishna, Subrani, & Kumar (2014) maximum of them (77.6%) were in the age group of <30yrs which is similar to a study done in Malaysia.

Also, one hundred and forty six respondents participated, similarly majority (49.3%) were

20-29 years old, but on the contrary in the same study, 50(34.2%) were male and 96(65.8%) were female (Zainuddin & Isa, 2014).

Prevalence of Computer Vision Syndrome

Table 2: Prevalence of Computer Vision Syndrome

Usage of computer	Frequency	Percentage%
Yes	297	97.1
No	9	2.9
Total	306	100.0
Kind(s) of computer do you use		
Laptop		
Yes	273	89.2
No	33	10.8
Total	306	100.0
Mobile phones		

The Prevalence and Knowledge of University Students on Computer Vision Syndrome (CVS).

Yes	189	61.8
No	117	38.2
Total	306	100.0
Table 2 Continued		
Desktop		
Yes	55	11.8
No	251	88.2
Total	306	100.0
Tablet		
Yes	55	18.0
No	251	82.0
Total	306	100.0
Palmtops		
Yes	3	1.0
No	303	99.0
Total	306	100.0
Length you have been using computer		
Less than a year	30	9.8
1-3 years	55	18.0
3-5 years	109	35.6
5-10 years	64	20.9
More than 10 years	48	15.7
Total	306	100.0
How often you use computers		
Continuously	109	36.0
Hourly	6	2.0
Daily	107	35.3
Weekly	9	3.0
Occasionally	18	5.9
Anytime the need arises	54	17.8
Total	303	100.0
Hours in a day do you spend on your computer		
Totally		
Less than 1 hour	6	2.0
1-2 hours	73	23.9
2-3 hours	53	17.3
3-5 hours	70	22.9
Over 5 hours	104	34.0
Total	306	100.0

Source: Field Survey, 2019

With regards to prevalence of computer vision syndrome, table 4.2 showed that as high as 97.1% (297) of respondents used a computer. On the kind of computer respondents used, Majority of respondents 273 (89.2%) used laptops, and mobile phones (61.8%). Respondents did not use desktop 270 (88.2%), tablet 251(82%), and palmtops 303 (99%).

According to Himalaya S. R. (2015); the research revealed that majority (64%) were using device other than PC and Laptop. 33-47% of them reported that they were using computer devices for internet and word processing types of jobs. However, it was proved that using small computer screens and prolonged use (in years) of computers may also lead to computer vision syndrome.

35.6% of respondents had used a computer for 3-5 years, 20.9% said 5-10 years, 18% said 1-3 years, 15.7% said more than 10 years whilst 9.8% said less than a year. This showed that respondents had used a computer for 3-5 years. Also, it was revealed that 34% (104) of respondents spent over 5 hours in a day on their computer totally, 23.9% (73) said they spent 1-2 hours, 22.9% (70) said 3-5 hours, 17.3% (53) said 2-3 hours whilst 2% (6) said less than 1 hour, this showed that majority of respondents spent over 5 hours on their computer totally.

On how often respondents used computers, 36% (109) of respondents said they used it continuously, 35.3% said daily, 17.8% said anytime the need arises, 5.9% said occasionally, 3% said weekly whilst 2% said hourly. Respondents therefore used the computer continuously.

Arumugam, Krishna, Subrani, & Kumar (2014) in a study concluded that, regarding the total number of hours working on computer per day, maximum (66.5%) of computer professionals were working more 7-10 hours, 33.5% were working for more than 10 hours, no one was working for 4-6 hours and less than 3 hours the research also revealed that there was no significant association between the incidence of Computer Vision Syndrome and total number of hours of working on computer. Jack (2002) who conducted a study relating to work mentally and vision supported the findings of the study researcher found that the major cause of Computer Vision Syndrome was due to prolonged use of computer without precaution. (Jack, 2002).

Table 3. Prevalence of Computer Vision Syndrome Continued

Ever experienced any of these symptoms while using /after using a computer	Frequency	Percentage%
Backache		
Yes	159	52.1
No	147	47.9
Total	306	100.0
Neck pain/shoulder		
Yes	161	52.6
No	145	47.4
Total	306	100.0
Tiredness of eye		
Yes	189	61.8
No	117	38.2
Total	306	100.0
Watering of eyes		
Yes	132	43.1
No	174	56.9
Total	306	100.0
Redness of eyes		
Yes	57	18.6
No	249	81.4
Total	306	100.0
Eye strain (irritation, heaviness		
Yes	161	52.6
No	145	47.4
Total	306	100.0
Redness of eyes		
Yes	57	18.6
No	249	81.4
Total	306	100.0
Blurring of vision		
Yes	90	29.4
Table 3 Continued		
No	216	70.6
Total	306	100.0
Dry eye/ discomfort		
Yes	41	13.4
No	265	86.6
Total	306	100.0
Double vision		
Yes	33	10.8
No	273	89.2
Total	306	100.0
Headache		
Yes	145	47.4
No	161	52.6
Total	306	100.0

Source: Field Survey, 2019

With regards to symptoms respondents had experienced before, majority of respondents (52.1%) of respondents indicated backache, neck pain/shoulder (55.9%), tiredness of eyes (61.8%) and eye strain (52.6%). But not watering of eyes (56.9%), redness of eyes (81.4%), blurred vision (70.6%), double vision (89.2%), dry eye/discomfort (86.6%) and Headache (52.6%).

However these findings were different from in the a research conducted by Kamil-Mohammed (2008) main vision syndromes in this study were eyestrain (81.8%), eye pain (50.5%), headache (40.2%), blurred vision, (37.4%) watering (32.2%) and redness (43.3%), burning sensation (18.4%), dizziness (12.5%) and neck pain (11.5%).

Also Bali, Navin, & Thakur(2007) reported that the chief symptoms among Indiana ophthalmologists who were using computers at their hospitals/offices were eyestrain (97.8%), Headache (82.1%), tiredness and burning sensation (79.1%), watering (66.4%), and redness (61.2%), shoulder pain (44.0%) and neck pain (35.8%) whose symptoms were distinct from the findings in this research.

Knowledge of Computer Vision Syndrome

Table 4 Knowledge of Computer Vision Syndrome

The use of computer has adverse effects on the eyes of users	Frequency	Percentage%
Yes	282	94.9
No	15	5.1
Total	297	100.0
How you knew computer vision syndrome		
Doctor	81	27.3
Friends	39	13.1
Relative	15	5.1
Colleagues	36	12.1
Radio / newspaper /magazines	114	38.4
School teacher	6	2.0
Table 4 Continued		
Just knew from this questionnaire	6	2.0
Total	297	100.0
The symptoms you are experiencing are related to the use of a computer		
Yes	181	62.8
No	107	37.2
Total	288	100.0
When computer usage harmful to the eyes		
Using it several times but for short periods		
Yes	32	10.7
No	268	89.3
Total	300	100.0
Continues usage		
Yes	253	9.1
No	47	90.9
Total	300	100.0
Reading books alongside computer use		
Yes	27	10.8
No	269	89.2
Total	296	100.0
People with already existing eye conditions		
Yes	96	32.0
No	204	68.0
Total	300	100.0
Improper positioning during computer use		
Yes	149	49.7
No	151	50.3
Total	300	100.0
Humid environment		
Yes	18	6.0
No	282	94.0
Total	300	100.0

Source: Field Survey, 2019

Table 4 depicted information knowledge of computer vision syndrome, as high as 94.9% of respondents revealed that the use of computer had adverse effects on the eyes of the users. Also, 38.4% of respondents got to know of computer vision syndrome through the radio/newspaper/magazines, 27.3% said from doctors, 13.1% said from friends, 12.1% said from colleagues, 2% said from school teacher and questionnaire. This showed that respondents got to know of computer vision syndrome through the radio/newspaper/magazines. Majority of respondents (62.8%) noted that the symptoms they were experiencing were related to the use of a computer whilst 37.2% said it was not.

Concerning when the computer usage was harmful to the eyes, majority of respondents (84.3%) noted continues usage. Respondents did not note or acknowledge using the computer several times but for short periods (89.3%), reading books alongside computer use (90.9%), people with already existing eye conditions (68%), improper positioning during computer use (50.3%) and humid environment (94%).

According to Himalaya S. R.(2015), a factor like gender was not statistically associated with the incidence of computer vision syndrome which was contradictory to Shantakumari,Eldeeb, Sreedharan, & Gopal (2014) study findings that suggest that females had significantly higher incidence of headaches and blurred distant vision than males.

Table 5 Knowledge on Computer Vision Syndrome continued

Adverse effects of computer usage	Frequency	Percentage%
Backache		
Strongly agree	148	51.9
Agree	92	32.3
Uncertain	33	11.6
Disagree	3	1.1
Strongly disagree	9	3.2
Total	285	100.0
Neck pain / shoulder pain		
Strongly agree	36	12.5
Agree	94	32.6
Uncertain	89	30.9
Disagree	39	13.5
Strongly disagree	30	10.4
Total	288	100.0
Eye twitching		
Strongly agree	19	6.6
Agree	85	29.5
Uncertain	118	41.0
Disagree	27	9.4
Strongly disagree	39	13.5
Total	288	100.0
Table 5 Continued		
Eye itching		
Strongly agree	48	16.7
Agree	110	38.2
Uncertain	80	27.8
Disagree	22	7.6
Strongly disagree	28	9.7
Total	288	100.0

Source: Field Survey, 2019

Majority of respondents (51.9%) strongly agreed that backache was an effect of computer syndrome, 32.3% agreed, 11.6% were uncertain, 3.2% strongly disagreed.

Concerning neck pain, 40.6% of respondents strongly agreed, 38.5% agreed, 13.5% were uncertain, 5.2% strongly disagreed, while 2.1% disagreed. This showed that respondents strongly agreed that neck pain was an effect of computer syndrome.

On eye twitching, 41% of respondents were uncertain, 29.5% agreed, 13.5% strongly disagreed, 9.4% disagreed, while 6.6% strongly agreed. This showed that respondents were uncertain on eye twitching as an effect. With regards to eye itching, 38.2% of respondents agreed, 27.8% were uncertain, 16.7% strongly agreed, 9.7% strongly disagreed whilst 7.6% disagreed. Respondents therefore, agreed that eye itching was an effect.

Table 6: Knowledge on Prevention of Computer Vision continued

Measures that can prevent /relieve the symptoms	Frequency	Percentage%
Use of radiation filter on the screen		
Strongly agree	92	31.9
Agree	110	38.2
Uncertain	52	18.1
Disagree	19	6.6

Strongly disagree	15	5.2
Total	288	100.0
Wash your eyes with water		
Strongly agree	18	6.3
Agree	37	12.8
Uncertain	105	36.5
Disagree	79	27.4
Strongly disagree	49	17.0
Total	288	100.0
Watch video		
Strongly agree	15	5.2
Table 6 Continued		
Agree	9	3.1
Uncertain	45	15.6
Disagree	133	46.2
Strongly disagree	86	29.9
Total	288	100.0
Use computer lens		
Strongly agree	95	32.6
Agree	108	37.1
Uncertain	48	16.5
Disagree	21	7.2
Strongly disagree	19	6.5
Total	291	100.0

Source: Field Survey, 2019

Also, from table 6, on the use of radiation filter on the screen, 38.2% of respondents agreed, 31.9% strongly agreed, 18.1% were uncertain, 6.6% disagreed, whilst 5.2% strongly disagreed. This showed that respondents agreed that the use of radiation filter on the screen was a preventive measure of computer vision syndrome.

Again, on wash your eyes with water, 36.5% of respondents were uncertain, 27.4% disagreed, 17% strongly disagreed, 12.8% agreed while 6.3% strongly agreed. This also showed that respondents were uncertain on wash your eyes with water as a preventive measure of computer vision syndrome.

On watch video as a preventive measure, 46.2% of respondents disagreed, 29.9% strongly disagreed, 15.6% were uncertain, 5.2% strongly agreed while 3.1% agreed. Respondents therefore disagreed that watching video was a preventive measure of computer vision syndrome. On the use of computer lens, 37.1% of respondents agreed, 32.6% strongly agreed, 16.5% were uncertain, 7.2% were disagreed, while 6.5% strongly disagreed. This also showed that respondents agreed that the use of computer lens was a preventive measure of computer vision syndrome.

V. Conclusions

Majority of respondents had symptoms of Computer Vision Syndrome; backache, neck pain/shoulder pain, and eye strain (irritation) and using a computer for 3-5 years. Respondents spent over 5 hours in a day on their computer, and they used the computer continuously. This confirms a high prevalence of Computer Vision syndrome among University students.

Respondents of this study agreed that the use of computer had adverse effects on the eyes of the users, it was noted that the symptoms they were experiencing were related to the use of a computer. Computer usage was harmful to the eyes, when continuously used. Most respondents heard of computer vision syndrome from the radio/newspaper/magazines. It was noted that the symptoms they were experiencing were related to the use of a computer.

Taking of breaks between uses of computer was a way to prevent computer vision syndrome. Respondents agreed that the use of radiation filter on the screen, the use of computer lens were preventive measures of computer vision syndrome. Respondents disagreed that playing a computer game, watch video and conscious blinking of the eye were preventive measures of computer vision syndrome. This implies that students do not have enough knowledge on the preventive measures on CVS. Because majority of the students agreed on just a few preventive measures of computer vision syndrome.

References

- [1]. Ahmed, S. (2009). *Methods in Sample Surveys*. John Hopkins University.
- [2]. Akinbinu, T. R. (2013). *Knowledge Of Computer Vision Syndrome Among Computer Users In The Workplace In Abuja, Nigeria*. Dissertation, 1-90.
- [3]. Akinbinu, T. R., & Mashalla, Y. J. (2014). *Impact of computer technology on health: Computer vision Syndrome*. Academic Journal, 1-6.
- [4]. American Optometric Association. (2005, June 11). *Caused-By-My-Your-Computer*. The effects of Video Display Terminal Use One, 11-21.

- [5]. Anshel, J. (2006). CVS: Constructing a new approach to visual ergonomics , Optometric management. Orlando Florida: ASSE professional Development Conference.
- [6]. Arumugam, S., Krishna, K., Subrani, R., & Kumar, S. (2014). Prevelence of computer vision syndrome among IT professionals. *World Journal of medicine*, 312-314.
- [7]. Association American Optometric. (2005, June 11). Caused-By-My-Your-Computer. pp. 11-21.
- [8]. Bali, J., Navin, N., & Thakur, B. (2007). Computer Vision Syndrome: A Study of the Knowledge, attitude and practices in Indian Ophtamologists. *Indian j Ophtamol*, 289-293.
- [9]. Baral, H. (2010). *Computer Fundamentals*. london: Registered Independent School.
- [10]. Burns, N., & Grove, S. (2003). The practice of nursing research: conduct, critique and utilization. *Journal of Nurse-Midwifwery*, 625-272.
- [11]. Cambridge Advanced Learners dictionary and thesaurus. (2016). Retrieved April 20, 2016, from Cambridge University Press: <http://www.dictionarry.cambridge.org/dictionary/intimacy>
- [12]. Chiemeke, S. A., & Ajayi, O. (2007). 'Evaluation of vision-related problems amongst computer users: a case study of University of Benin, Nigeria. *Proceedings of the world congress on Engineering*, 2 -4.
- [13]. Connecticut, H. (2010). *Computer Vision Syndrome*. United Health Vision Care, 1-4.
- [14]. Crowton, H. (2005). Chronic Fatigue Can Be Caused By Your Computer. *health guidance .org*, 711.
- [15]. Dawson, B., & Trapp, R. (2004). *Basic and Clinical Biostatistics*. USA: Launge/McGaw-Hill.
- [16]. Devesh, S., & Al-Bimani, n. (2012). A study on the effectiveness of a planned teaching programme to improve the knowledge regarding "ergonomics for computer use"amongselected staff of majan college – muscat – sultanate of oman. *Asian transactions on science & technology*, 2221-4283.
- [17]. dictionary.cambridge.org/dictionary/english/intimate. (n.d.). Retrieved April 20, 2016, from www.cambridgedictionary.org.
- [18]. Graney, M. (2011, may 31). Computer vision syndrome: a growing occupational health problem. pp. 1-6.
- [19]. Himalaya, s. r. (2015). Computer vision syndrome among nurses. *computer vision syndrome among nurses*, 1-5.
- [20]. Himalaya, S. R. (2015). Computer vision syndrome among nurses. *computer vision syndrome among nurses*, 1-5.
- [21]. Ihemedu, C., & Omolase, C. (2010). 'The level of awareness and utilization of computer shields among computer users in a Nigerian community'. *Asian Journal of Medical sciences*, 49 -52.
- [22]. J.M.S, A. (2005). Computer vision Syndrome. *Computer Vision syndrome*, 248-251.
- [23]. Jack, R. (2002). *Work and Vision Software*. 343-345.
- [24]. Kamil-Mohammed, M. (2008). Computer users cautioned against syndrome. *Regional news, Ghanaweb*, 1-2.
- [25]. Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 607-610.
- [26]. Logaraj, M., Madhupriya, V., & Hedge, S. (2014). Computer Vision Syndrom among medical and engineering student in Chennai. *Ann Medical Health*, 179-185.
- [27]. Medicinet.com. (1996-2006). Retrieved April 20, 2016, from Medicinet.inc: www.medicinet.com
- [28]. Meiya, L. (2010). How to Protect you Eye from Computer Vision Syndrome. *Isight*, 1-6.
- [29]. Mohammad, K., Ebrahimi, M., Parisa, S., Rafat, B., Tahereh, S., & Mehran, G. (2015). Computer Vision Syndrome in Eleven to Eighteen-Year-Old Students in Qazvin. *Biotech Health Sci.*, 18-23.
- [30]. Papert, S. (1984). *New Theories for New Learning*. *Technology and Learning*, 422-428.
- [31]. Parahoo, K. (1997). *Nusing research:Principles, Processes and Issues*. Macmillan.
- [32]. Reddy, S., Low, C., Lim, Y., Low, L., Mardina, F., & Nursaleha, M. (2013). Computer vision syndrome: a study of knowledge and practices in university students. *Computer Vision Syndrome*, 161-168.
- [33]. Rosenfield, M. (2011). Computer vision syndrome: a review of ocular causes and potential treatments. *Ophthalmic Physiol Opt*, 502–515.
- [34]. Rosenfield, M. M. (2012). Today's technology: Yesterday's Eye exam. *America academy of optometry*, 1-8.
- [35]. Rosenfield, M., Gurevich, R., Wickware, E., & Lay, M. (2010). Computer vision syndrome: Accomodative and vergence facility. *Journal of Behaviour Op*, 119-122.
- [36]. Sanou, B. (2000). ICTFacts & Figures,The world in 2015. MDGs 2015: ICT revolution and remaining gaps, 1-6.
- [37]. Sanou, B. (2015). ICTFacts & Figures,The world in 2015. MDGs 2000-2015: ICT revolution and remaining gaps, 1-6.
- [38]. Selanger, S. (2014). Effects of human and and technology:CVS among administrative staff in a public university. 1-4.
- [39]. Sen, A., & Richardson, S. (2007). 'A study of computer-related upper limb discomfort and . *J. Human Ergol* , 45 -50.
- [40]. Shantakumari, N., Eldeeb, R., Sreedharan, J., & Gopal, K. (2014). Computer Use and Vision_Related Problems Among University Students . *Ann Med Health Sci Res*, 482-487.
- [41]. Zainuddin, H., & Isa, M. (2014). Effects of human and and technology:CVS among administrative staff in a public university. *International Journal of Business Humanities and Technology*, 1- 4.

Kojo OseiFrimpong. "The Prevalence and Knowledge of University Students on Computer Vision Syndrome (CVS)." *IOSR Journal of Computer Engineering (IOSR-JCE)*, 22(4), 2020, pp. 31-41.