IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

"IMPACT OF VISUAL BREAKS ON SYMPTOMS OF DIGITAL EYE STRAIN"

by
SHIVAM KUMAR

Guide
MS. HARSHITA PANDEY

Co-Guide
DR. RAJ KUMAR

Department of Paramedical & Allied Health SciencesSchool of Medical and Allied Sciences GALGOTIAS UNIVERSITY UTTAR PRADESH

ABSTRACT

Aim: To assess the impact of taking proper breaks while working on digital devices in reducingthe digital eye strain.

Methodology: This was a questionnaire-based prospective study determining the role of takingproper breaks and the role of daily reminders in enhancing patient compliance and in-turn reducing digital eye strains. The study examines compliance variations with the 20-20 rule in two distinct groups, Group-I (Subjects who got daily reminders) and Group-II (Subjects who did not get any reminders). The occurrence of symptoms related to digital eye strains were alsocompared between the subjects in the two groups and from baseline.

Result: The analysis reveals that Group-II exhibits a notably higher forgetfulness rate (60%) compared to Group-I (28%), implying a greater tendency to overlook the 20-20 rule. This discrepancy underscores the potential influence of awareness on adherence, as Group-I's lower forgetfulness rate suggests heightened attentiveness to the rule.

Conclusion: A significant proportion of respondents were not aware of the 20-20 rule and do not actively implement it. Making the patients aware about proper visual break practices can significantly reduce digital eye strain prevalence. From the data, it seems that both Group-1 and Group-2 generally have lower symptom prevalence compared to the Baseline group. However, Group-2 tends to have higher symptom prevalence compared to Group-1 indicating that reminders may play an important role in reduction in symptoms of digital eye strain. The data suggests a discrepancy in compliance with the 20-20 rule between the two groups, highlighting the importance of reminders in getting better compliance. Practically, these resultscould inform targeted interventions, focusing on raising awareness among Group-II individuals to mitigate forgetfulness.

Keywords: Digital Eye Strain, Computer Vision Syndrome, Dry Eyes, 20-20 Rule, Visual Breaks

CHAPTER 1 INTRODUCTION

INTRODUCTION

According to the American Optometric Association, extended use of desktops, laptops, mobile phones, tablets, e-readers, and storage devices can cause a variety of eye and vision-related issues known as "digital eye strain"[i]. Electronic display has become an integral aspect of dailylife in the ultramodern world, whether it is at work, home, during downtime, or while travelling.These visual display terminal devices are now widely used. There would be no global mindfulness without computers. The computer has taken the place of the heart in modern work environments. We have now transitioned from the crude instruments of the stone age into a new era, the computer age, which is entirely dependent on formulators[ii].

Children today are virtually connected to technology. They spend a significant chunk of their day staring at computers, smartphones, and other digital devices, whether for educational or other purposes[iii]. The LED shields on laptops, smartphones, and other digital devices generate blue light[iv]. Many researchers and eye doctors are worried about the increased blue light exposure from computers and other digital devices might make age-related eye diseases like macular degeneration more likely to affect unborn children[v].

In the past fifteen years, information technology has advanced significantly. A prevalent complaint among mature people who frequently use laptops, mobile Internet, and other eye- straining devices is computer vision syndrome (CVS) which have been identified as the ocular health issue affecting computer or screen addicts most frequently. Other signs of computer vision pattern include painful eyes, seeing a greenish tint, weariness, headaches, burning, lightsensitivity, contact lens discomfort, double vision, and sporadic near- and far-sightedness blur[vi]. Headaches, blurred vision, neck pain, weariness, eye strain, dry, itchy eyes, double vision, polyopia, and trouble focusing the eyes are all symptoms of CVS. Vision issues associated with video display terminals (VDT) are at least as serious an ocular health issue as well as a musculoskeletal illness[vii].
Most studies show that 50–90% of VDT workers experience visual symptoms, and a study by a group of optometrists found that VDT visual problems are the primary cause of ten million primary eye exams performed each year[viii]. This is a serious public health concern. Computer workers frequently experience vision problems, which cause hand discomfort and reduce productivity.
According to the AOA, approximately 10 million eye exams are conducted each year for reasons relating to computer vision pattern, as per a survey of optometrists[ix]. In a study to performed to assess the effectiveness of structured teaching program on knowledge regarding prevention of computer vision syndrome among higher secondary students in selected schools at Chennai (Doctoral dissertation, College of Nursing, Madras Medical College, Chennai)[x] it was observed that electronic characters, which are made up of pixels, have blurred edges, making it harder for eyes to keep focus than text printed on a page with sharply defined borders.The eyes unconsciously try to rest by moving their focus to a spot behind the screen, but this continuous movement between the screen and the relaxation spot leads to eyestrain and tiredness.

Reduced blinking frequency, which can exacerbate dry, itchy eyes, is another unintended consequence. When using a computer, the blink rate is typically reduced to only approximately 10 to 12 blinks per nanosecond, as opposed to the regular blink rate of 15 or more[xi].

Dr. Leonard Press, an optometrist and the AOA's Vision & Learning Specialist, warned that spending too much time in front of a computer screen can cause eye discomfort, fatigue, blurred vision, and headaches. However, there are some particular practices that can relieve or at least minimize the occurrence of these issues in adults[xii].

Taking proper rest between the work schedule and maintaining a proper blink rate can be triedto alleviate the problems related to screen usage[xiii]. 20-20-20 rule is well known to layman these days. You probably spend a significant amount of time staring at displays, whether they be on your smartphone, television, computer at home or at work, or other digital gadgets andit is well known that eye strain can develop from prolonged screen viewing but the 20-20-20 rule has proven to be useful for minimizing the occurrence of these issues[xiv].

With advent in digital technology in the current date, the incidence of computer vision syndrome and symptoms related to digital eye strain are also increasing. It has been well established that taking proper breaks can minimize these symptoms.

We believe that many computer users are not well aware about the importance of proper breaksand how often these breaks should be taken. If computer users are educated about the frequencyof breaks while using screens along with the right way to utilize those breaks, chances are that they can include taking breaks in their schedule consciously and make an effort to reduce the symptoms associated with continuous screen time.

We hypothesise that educating the users about the 20-20 rule as well as reminding them to takethose breaks can minimize the digital eye strain and symptoms related to it. There are some literatures that have assessed the impact of taking breaks between the screen schedule, but to our knowledge, very few studies have checked if reminding subjects to take those breaks can improve the outcomes and reduce the symptoms associated with screen usage. Keeping this in mind, our study aims to assess the role of 20-20-20 rule in minimizing the ocular strain causeddue to digital device use amongst college students.

CHAPTER 2 REVIEW OF LITERATURE

REVIEW OF LITERATURE

Jamir et. Al. (2019) conducted a cross sectional study on "**Epidemiology of technology addiction among school students in rural India"**. Study sample was 885 academy scholars in north India. The mean age of the study actors was 15.1 times. Among the actors,30.3 met the dependence criteria. One-third (33) of the scholars stated that their grades had gone down due to contrivance use. Technology dependence was advanced in manly scholars, those having a particular mobile phone2.98, (1.52 –5.83), use smart phone (2.77,1.46 –5.26), use one fresh contrivance (2.12, –3.94) and those who were depressed (3.64,2.04 –6.49)[xv].

Mohammed Iqbal et. al. (2018) conducted a study on "**Computer Vision Syndrome Survey among the Medical scholars in Sohag University Hospital, Egypt**". There were 100 medical scholars included in this study (50 males and 50 ladies). The most remarkable result in this study was recording that 86 of the medical scholar's sample was used to spend 3 hours or further on a diurnal base therefore were complaining of one or further of CVS instantiations[xvi].

Menon et. Al. (2018) conducted a study titled "**Internet addiction: A research study of college students in India"**, in this study, we set up the dependence was more in the range of moderate to mild dependence. This study indicated that there's a high degree of correlation between age and internet dependence with aged scholars being more addicted to the Internet than youngish scholars. Also, with regard to Internet operation, there were significant differences with regard to gender with men being more addicted than women. This is in agreement with precious studies that also indicate analogous findings. The study set up that there are no differences between the scholars in terms of the study time[xvii].

Sudip Poudel (2020) conducted a study, "**Magnitude and determinants of computer vision syndrome (CVS) among IT workers in Kathmandu, Nepal**". The frequency of symptoms of CVS (one or further) was set up to be 80.4%; the most disturbing symptom was Eyestrain (15.2%) followed by Tired Eye (13.2%). scholars who used VDT Display widgets for further than 4 hours per day endured significantly further symptoms of CVS[xviii].

Parul Ichhpujan et. Al. (2019) conducted across-sectional study on "**visual counteraccusations of digital device operation in academy children".** The study included 576 adolescents attending civic seminaries. 20 of scholars aged 11 in the study population use digital bias on a diurnal base, in comparison with 50 of scholars aged 17. The maturity of preferred sitting ona president while reading (77; 445 scholars), with only 21 (123 scholars) preferring to lie on the bed and 8 scholars[xix].

V. Mohan et al (2019) conducted a study on "**Frequence of complaints of arm, neck, and shoulders among computer professionals in Bangalore Across-sectional study"**. frequence of Barrels in the study group was 58.6. Neck complaints outgunned the list followed by shoulder, wrist, hand, elbow, upper arm, and lower arm complaints in the descending order. Women had overall advanced frequence and significantly advanced frequence of upper branch complaints than men. shy space, maintaining good posture, and reiteration of same tasks havesurfaced as an independent factor associated with Barrels[xx].

In a study done by CM Maria (2018), titled "**A quantitative cross-sectional experimental study"** in which the workers passed a clinical ophthalmologic examination and answered a questionnaire. For the Visual Function Questionnaire (VFQ-25) a Kolmogorov- Smirnov test was performed to characterise the study population, and the ANOVA, Mann - Whitney and Kruskal - Wallis tests were used to assay the associated factors. A multiple direct retrogression model was created, using accretive forward, with variables that presented significance situations with $p<0.20$. They remained in the final model, the variables that presented descriptive situations $p<0.05$. In the work trouble, the particulars that appeared as the main sources of stress were 'interruptions at work' (3.7),' overtime work' (3.6) and increased demand(3.6)[xxi].

Mowatt L et Al (2018) conducted research on four hundred and nine scholars; 78 were ladies. The mean age was 21.6 times. Neck pain (75.1), eye strain (67), shoulder pain (65.5) and eye burn (61.9) were the most common CVS symptoms. Dry eyes (26.2), double vision (28.9) and blurred vision (51.6) were the least generally educated symptoms. Eye burning (P = .001), eye strain (P = .041) and neck pain (P = .023) were significantly related to position of viewing. Moderate eye burning (55.1) and double vision (56) passed in those who used handheld bias (P = .001 and.007, independently). Moderate blurred vision was reported in 52 who looked down at the device compared with14.8 who held it at an angle. Severe eye strain passed in 63 of those who looked down at a device compared with 21 who kept the device at eye position. Shoulder pain wasn't related to pattern of use[xxii].

Layan Al Tawil et Al (2018) conducted a study on "**Frequence of tone- reported computer vision pattern symptoms and its associated factors among university scholars"**. The results say that utmost common symptom due to dragged computer use was neck or shoulder pain, reported by 82.2 of the subjects. Overall, 66.5 of the subjects suffered from headache and 51.5from dry eyes, in mild, moderate, or severe form. Business scholars were 1.6 times as likely as medical scholars to suffer from computer vision pattern (odds rate = 1.65; 95 confidence interval1.22,2.24). The use of electronic bias for further than 5h (odds rate = 1.52; 95 confidence interval1.07, 2.16) was also associated with passing computer vision pattern symptoms. Regarding computer vision pattern forestalment, factors similar as hours of use, screen distance, screen brilliance, and room illumination showed statistically significant difference between the two groups($p<0.0001$)[xxiii].

Ranju Kharel Sitaula et al (2018) conducted a study "**A descriptive cross-sectional check on Knowledge, stations and practice of Computer Vision Syndrome"** among medical scholars and its impact on optical morbidity among 1st- 4th- time MBBS scholars of the Institute of Medicine and 80 scholars passed detailed optical evaluation. Among 80 medical scholars aimlessly named for detail eye examinations, the of Computer vision pattern was 71.6. The commonest optical complaint was a headache (50) and dry eye (45). Diplopia was the commonest refractive error (31.2) and the orthoptic problem was current amon17.5 scholars[xxiv].

Ardalan Cardoso et Al (2018) conducted a study "**frequence rate of neck, shoulder and lower reverse pain in association with age, body mass indicator and gender among Malaysian office workers".** They're 752 subjects (478 women and 274 men) were aimlessly named from the Malaysian office workers population of 10,000 individualities. All actors completed the Cornell Musculoskeletal Discomfort Questionnaire and the study result shows that a significant association between pain inflexibility in gender and righ ($p = 0.046$) and left ($p= 0.041$) sides of the shoulders. There was also a significant association between BMI and inflexibility of pain in the lower reverse area ($p = 0.047$). It was revealed that total pain score in the shoulders was significantly associated with age ($p = 0.041$)[xxv].

Sultan H. Al Rashidi et Al (2017) conducted a study on "**Computer vision pattern frequence, knowledge and associated factors among Saudi Arabia University scholars"**. An aggregate of 634 scholars with a mean age of 21. 40, Std1.997 and Range 7 (18- 25) were included as study subjects with a manly ascendance (77.28). Of the total cases, maturity (459, 72) presented with acute symptoms while remaining had habitual

problems. A clear- cut maturity was carrying the symptoms for< 5 days and> 1 month. The statistical analysis revealed serious symptoms in the maturity of study subjects especially those who are endless druggies of a computer for long hours[xxvi].

Assefa et al (2017) conducted a study on "**frequence and associated factors of computer vision pattern among bank workers in Gondar City, northwest Ethiopia"**. Across-sectional institution- grounded study was conducted. Among the total 304 computer- using bank workers, the frequence of CVS was 73 (95 confidence interval (CI) = 68.04,78.02). Blurred vision (42.4), headache (23.0) and greenishness (23.0) were the most educated symptoms. unhappy sitting position was2.3 times (acclimated odds rate AOR) = 2.33; 95 CI = 1.27,) more likely to be associated with CVS when compared with applicable sitting position. Those working on the computer for further than 20 twinkles without break were nearly 2 time (AOR = 1.93; 95 CI = 1.11,3.35) more likely to have suffered from CVS when compared with those taking break within 20 twinkles, and those wearing eye spectacles were 3 time (AOR = 3.19; 95 CI = 1.07,9.51) more likely to suffer from CVS when compared with those not wearing spectacles[xxvii].

Eduardo C Sa et al (2017) conducted a study on **"Computer vision pattern and visual function in computer stoner workers in saopaulo frequence and associated factors"**. A quantitativecross-sectional experimental study was carried out between 2014 and 2015, in which the workers passed a clinical ophthalmologic examination and answered a questionnaire.The result was the most frequent symptoms were 'frazzle at work (47.9), 'weight in the eye at work (38.3) and 'frazzle at home (36.3). It was set up an association between age (OR0.188; 95 CI−0.276 to−0.161) and trouble at work (OR0.656; CI−0.928 to−0.383) with visualfunction. In the work trouble, the particulars that appeared as the main sources of stress were 'interruptions at work' (3.7), 'overtime work' (3.6) and increased demand (3.6)[xxviii].

C M Bogdănici et al (2016) conducted a study on "**A prospective experimental study on 60 people who were divided into two groups Group 1 – 30 middle academy pupils with a mean age"** of11.9 ±1.86 and Group 2 – 30 cases estimated in the Ophthalmology Clinic, "Sf. Spiridon" Hospital, Iași, with a mean age of21.36 ±7.16 times. A questionnaire was also distributed, which contained 8 questions that stressed the contrivance's impact on the sight. A small quantum of refractive crimes (especially myopic shift) was objectively recorded by colorful studies on near work. Dry eye pattern could also be linked, and an enhancement of visual comfort could be observed after the instillation of artificial gashes drops. Computer Vision Syndrome is still under- diagnosed, and people should be made apprehensive of the bad goods the dragged use of widgets has on sight[xxix].

Ranasinghe et al (2016) conducted a study on "**Computer vision pattern among computer office workers in a developing country an evaluation of frequence and threat factors"**. Sample size was 2210 (response rate —88.4). Mean age was30.8 ±8.1 times and50.8 of the sample were males. The 1- time frequence of CVS in the study population was67.4. womanish gender (OR1.28), duration of occupation (OR1.07), diurnal computer operation (1.10), preexisting eye complaint (OR4.49), not using a VDT sludge (OR1.02), use of

contact lenses (OR) and ergonomics practices knowledge (OR1.24) all were associated with significantly presence of CVS. The duration of occupation (OR1.04) and presence ofpre-existing eye complaint (OR1.54) were significantly associated with the presence of 'severe CVS'[xxx].

JanFrölich et al (2016) conducted a study on "**Computer game abuse and dependence of adolescents in a clinically appertained study sample".** They were 183 cases from a child andadolescent psychiatric clinic were assessed for computer game abuse or dependence using the CSV- S scale in order to distinguish between regular and inordinate computer gaming. This study shows that the cases' group with problematic computer gaming especially manly cases with the loftiest dependence score spent significantly further time on computer gaming and presented further academy performance problems as well as other comorbidities. inordinate gaming identified significantly with conduct and emotional problems. No specific psychiatric diseases identified to computer game abuse o dependence[xxxi].

ThomasJ. Albin (2015) conducted a study on "**Computer Ergonomics"** The State of the Art, Symptoms reported by computer druggies are classified into internal optical symptoms (strain and pang), external optical symptoms (blankness, vexation, burning), visual symptoms (blur, double vision) and musculoskeletal symptoms (neck and shoulder pain). The major factors associated with CVS are moreover environmental (indecorous lighting, display position and viewing distance) and/ or dependent on the stoner's visual capacities[xxxii].

Pinnita Prabhasawat et al (2019) conducted a crossover study on "**Tear film change and optical symptoms after reading published book and electronic book among 30 healthy levies",** in that some of whom read ane-book and others a published book for 20 twinkles andalso switched the following week. Questionnaires about seven optical symptoms were estimated ahead and after reading by both reading styles and the study was concluded that Reading ane-book affected tear film insecurity and significantly increased burning sensation and tearing to a larger extend than reading a published book[xxxiii].

Galit Hirsh- Yechezkel et al (2019) conducted a study on "**Mobile Phone- Use Habits amongAdolescents".** The vast maturity (96.1 percent) used the mobile phone for voice calls daily. Girls were heavier druggies than boys, and ninth graders were heavier druggies than seventh graders. Among scholars attending religious seminaries, the rate of heavy druggies was lower than among those attending temporal seminaries. About half of the scholars didn't use hands- free bias at least half of the time. rest conditioning of the sampleswere significantly associated with mobile phone use. This study demonstrates that several variables, including socio demographics and rest conditioning, may prognosticate heavy mobile phone use amongteenagers[xxxiv].

Mahasweta et al (2018) conducted a study on "**Screen- grounded media use and screen timeassessment among adolescents in New Delhi, India".** A community- groundedcross-sectionalstudy was conducted in a Civic Resettlement Colony, New Delhi. The study included 550 adolescents between the age group of 10 to 19 times were named for this study. About 98 of the adolescents used SBM. Television formed the outside used media (96.5). The mean (standard divagation) of the screen time was set up to be3.8(2.77) h/ day. Out of the total screentime, time contributed by TV is2.8 h/ day followed by other SBM. About 68 of adolescents

reported having screen time further than the recommended (> 2 h). Significant association was observed between screen time and watching TV while eating[xxxv].

Fong- Ching Chang et al (2018) conducted a study on "**computer/ Mobile Device Screen Time of Children"** and Their Eye Care Behavior Data were attained from a sample of 2,454 childparent from 30 primary seminaries in Taipei megacity and New Taipei megacity, Taiwan. Children who reported lower academic performance, who were fromnon-intact families, reported lower situations of threat perception of mobile device use, had parents who spent further time using computers and mobile bias, and had lower situations of maternal agreement were more likely to spend further time using computers and mobile bias; whereas children who reported advanced academic performance, advanced situations of threat perception, and advanced situations of maternal agreement were more likely to engage in advanced situations of eye care. This study revealed that threat perception by children and maternal practices are associated with the quantum of screen time that children regularly engage in and their positionof eye care[xxxvi].

Yumei Zheng et al (2016) conducted a study on "**Internet Use and Its Impact on Individual Physical Health"** This paper aims to identify the most common physical complaints associatedwith Internet use, and further probe the association between the frequence of Internet use and individual physical health.513 actors completed the questionnaires by online or offline manner,which covers demographic questions and questions concerning Internet use and physical complaints. The most common complaints were involving dry eyes, dropped vision, and cervical pain. The positive pearson correlation measure was set up between the position of physical complaints and the frequence of Internet use, place of hearthstone and education. Especially, the advanced quantum of time for the Internet use is explosively associated with aadvanced position of physical complaints[xxxvii].

Kawabe et al (2016) conducted a study on "**Internet dependence frequence and relation with internal countries among adolescents".** Junior high academy scholars (aged 12 – 15 times) were assessed. Grounded on total IAT scores,2.0 (joker,2.1; lady,1.9) and21.7 (joker,19.8; lady,23.6) of the total 853 actors (response rate,97.6) were classified as addicted and conceivably addicted, independently. Total GHQ scores were significantly advanced in the addicted (12.9 ±7.4) and conceivably addicted groups (8.8 ±6.0) than in the nonaddicted group (4.3 ±4.6; P<0.001, both groups). A comparison of the chance of scholars in the pathological range of GHQ scores revealed significantly advanced scores in the conceivably addicted group than in the no addicted group. Further, availability to smartphones was significantly associatedwith Internet dependence[xxxviii].

Kudryavtsev et al (2016) conducted a study on "**influence of studying in advanced educational establishment on scholars' dangerous computer habits".** In the exploration 1st-3rd time scholars (803 boys and 596 girls) shared. All they specialized in discipline "physical culture The results showsthat in average scholars have 2 computer habits everyone. Pupil, whohas these habits, spends further than 4 hours a day for them. 33 of 1st time boys and 16 of 1st time girls spend further than 2 hours a day for computer games. 15-20 of boys and 25- 30 of time girls waste further than 4 hours a day in internet. 10- 15 of boys spend further

than 4 hours a day for computer games. It's veritably probable that these scholars formerly have computer games' dependence[xxxix].

Rahul Bhargava et al (2015) conducted a study on "**Oral omega- 3 adipose acids treatment in computer vision pattern related dry eye".** 478 characteristic cases using computers for further than 3 h per day for minimal 1 time were randomized into two groups 220 cases entered two capsules of omega- 3 adipose acids each containing 180 mg eicosapentaenoic acid (EPA)and 120 mg docosahexaenoic acid (DHA) diurnal (O3FA group) and 236 cases entered two capsules of a placebo containing olive oil painting menial for 3 months (placebo group). The primary outgrowth measure was enhancement in dry eye symptoms and secondary outgrowth measures were enhancement in Nelson grade and an increase in Schirmer and TBUT scores at3 months[xl].

W. Müller et al (2015) conducted a study on "**Regular gaming and internet gaming complaint in adolescents**" results from across-national representative check of frequence, predictors, and psychopathological supplements.1.6 of the adolescents meet full criteria for IGD, with farther5.1 being at threat for IGD by fulfilling up to four criteria. The frequence rates are slightly varying across the sharing countries. IGD is nearly associated with psychopathological symptoms, especially concerning aggressive and rule- breaking and social problems. This check demonstrated that IGD is a constantly being miracle among adolescentsand is related to psychosocial problems[xli].

CHAPTER 3

AIM AND OBJECTIVES

AIM AND OBJECTIVES

Aim

To assess the impact of taking proper breaks while working on digital devices in reducing thedigital eye strain.

Objectives

1. To determine whether reminding subjects to take proper breaks during the work hoursimproves subject compliance.
2. To determine whether reminding subjects to take proper breaks during the work hoursreduces the symptoms associated with digital eye strain.
3. To check how many subjects were aware about the 20-20 rule.
4. To check how many subjects were already using the 20-20 rule to take proper visual breaks.

CHAPTER 4 MATERIALS AND METHODOLOGY

ATERIALS AND METHODOLOGY

Study Design: This was a prospective, interventional study performed on digital screen users,who presented to the eye OPD of Apollo Hospital, New Delhi with the symptoms of digital eyestrain.

Place of Study: Apollo Hospital, New Delhi

Study Duration: The study was conducted between January 2023 to June 2023

Sample Size: 50 subjects were included in the study out of which 25 subjects were in group 1&25 subjects were enrolled in group 2.

Sampling Technique: Purposive technique used selection of subject

Target Population: Patients presenting of the eye opd of apollo hospital new delhi with complaint related to digital eye strain and have a >6 hrs routine work schadule on digital devices such as laptops mobiles computers and tablets etc.

Selection of Subjects

Inclusion Criteria: Subjects using digital devices for more than 6hrs /day and have symptomsof digital eye Strain within the age group of 20-30 years were included in this study.

Exclusion Criteria: following subjects were excluded from the study.

- Unwilling patients
- Subject using digital devices for less than 6 hr /day
- Subjects with other ongoing ocular pathology
- Subjects having any ongoing systemic pathology or medication

Study Tools

A self-structured 16 item questionnaire was used for collecting the data in this study.

The first 6 questions in the questionnaire were about awareness and practice and rest of the 10questions were symptoms related. 2 questions regarding post one week compliance was also included.

Methodology

Subjects passing the inclusion criteria were included in this study after obtaining a written consent from them. All the included subjects underwent a comprehensive eye examination of re-assure their eligibility in the study.

All the subjects were made to fill the self-structured questionnaire to assess their knowledge about 20-20 rule, to understand their break pattern during work and to register symptoms facedby them.

After getting the questionnaire filled from the subjects, they were educated about the 20-20 rule, the importance of taking proper breaks between work and the right way to take visual breaks.

First 25 subjects who agreed to get daily reminders over mobile phone to takes visual breaks were included group 1.

Next 25 subjects or the subjects who did not want reminders were included in group 2 and did not receive any reminders to take breaks during the study period.

The subjects in both groups were made to follow the 20-20 rule for 1 week. After one week, all the subjects were made to fill the questionnaire again.

Response regarding compliance related questions was also taken from the participants of boththe groups.

Statistical Analysis: The data was entered in an excel sheet. Descriptive analysis of the datawas done with SPSS and representation was done with the help of charts, graphs and tables.

CHAPTER 5 RESULT AND DISCUSSION

RESULTS

The average age of the enrolled subjects was 25.18 years. Out of the 50 subjects enrolled inthis study, 28 were males (56 %) and 22 were females (44%) **(Table 1, Figure 1)**.

Table 1: Gender distribution of subjects

Gender	N	%
Male	28	56%
Female	22	44%

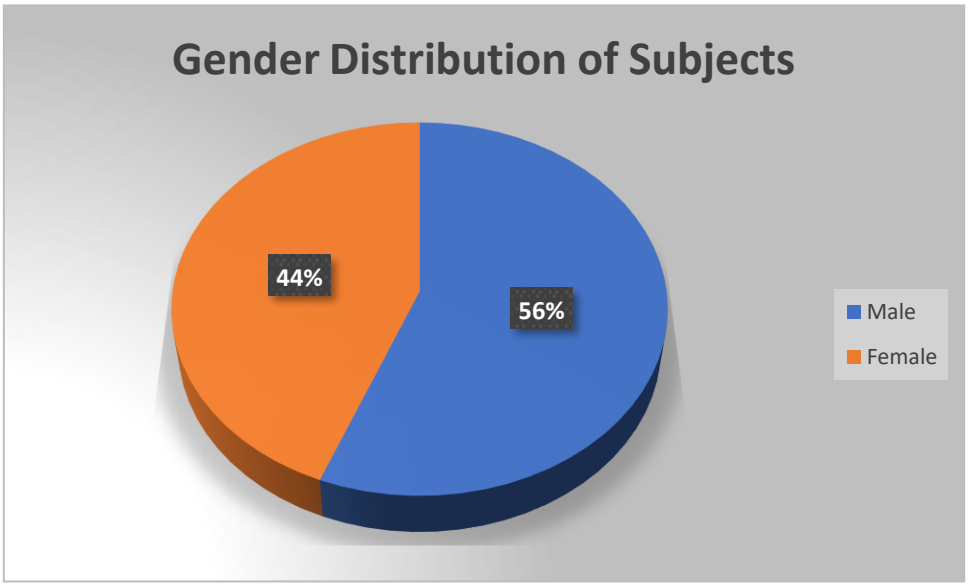

Figure 1: Distribution of subjects in the study

On analysing the responses of subjects regarding the awareness of 20-20 rule and practice oftaking breaks amongst the subjects, the following inferences were made **(Table 2)**.

Table 2: Subject responses regarding awareness and practice of 20-20 rule.

Question	Yes	No
Have you ever heard about 20-20 rule?	28%	74%
Do you use 20-20 rule?	26%	72%
Do you take breaks betweenwork?	32%	68%
Do you close your eyes whiletaking visual breaks?	38%	62%
Do you look away at a distance of 20 ft. while taking visual breaks?	28%	72%
How often do you take thesebreaks?	Every 20 inutes52%	ndomly48%

The first question aimed to determine the respondents' awareness of the 20-20 rule, whichsuggests that only a minority (28%) were familiar with it **(Figure 2)**.

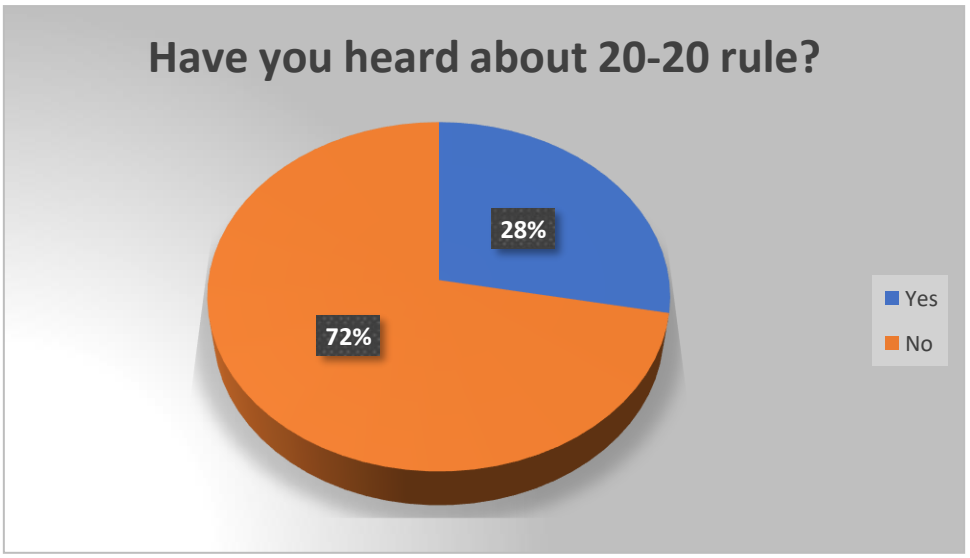

Figure 2: Awareness of 20-20 rule in subjects.

The second question aimed to find out whether the respondents actively implement the 20-20 rule. The results indicate that a small proportion (26%) of the participants are actually using the 20-20 rule **(Figure 3)**.

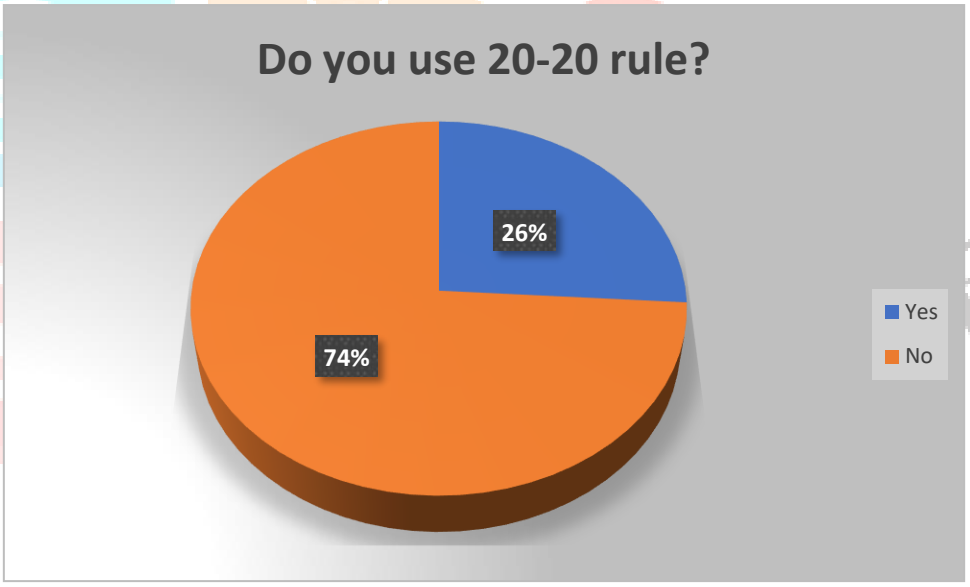

Figure 3: Implementation of 20-20 rule in subjects.

Next question inquired about whether the respondents' taking breaks during their work routine. The results suggest that slightly more than a third (32%) of the participants did take breaks **(Figure 4)**.

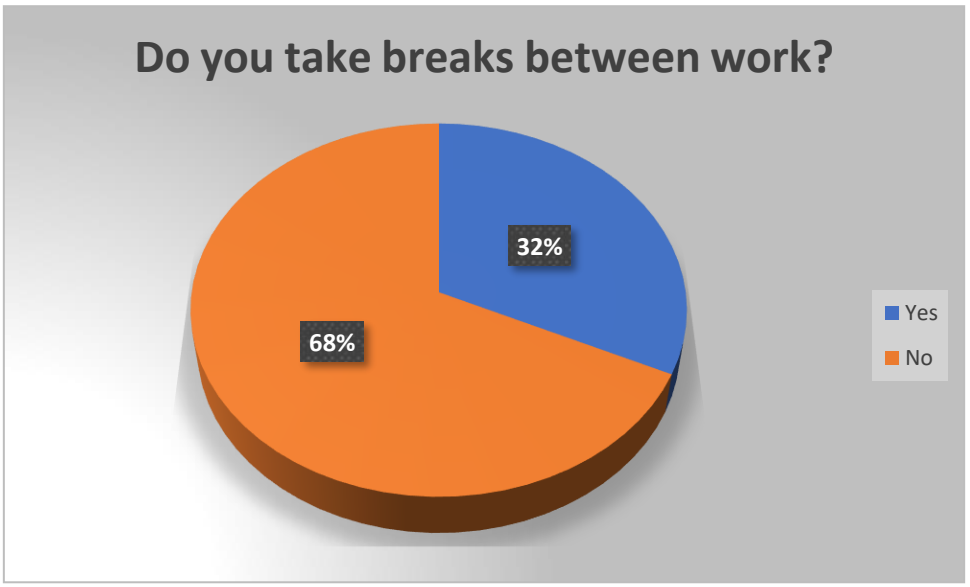

Figure 4: Subject's taking breaks between work

On being questioned related to whether respondents close their eyes while taking visual breaks. A significant portion (38%) of the participants indicated that they do close their eyes during breaks **(Figure 5)**.

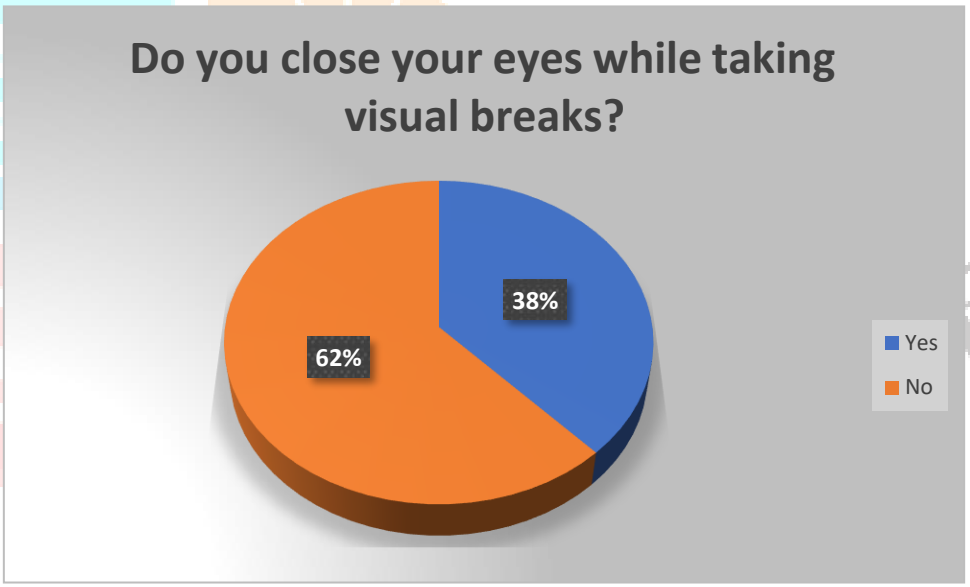

Figure 5: Subjects closing eyes while taking visual breaks.

On being questioned specifically whether respondents look away at a distance of 20 feet whiletaking visual breaks. The data shows that only 28% of the participants follow this practice **(Figure 6)**.

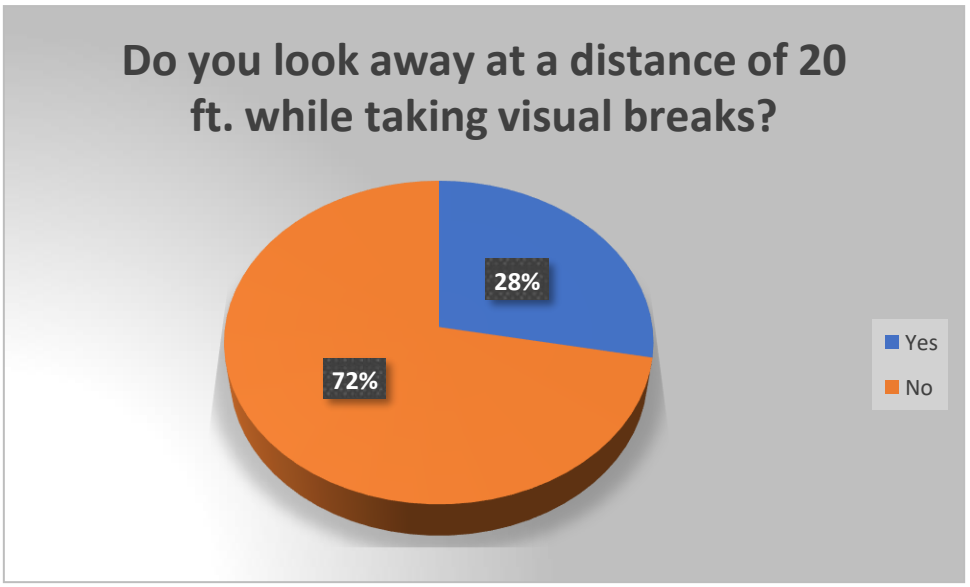

Figure 6: Subjects looking at a distance of 20ft. while taking visual breaks.

On being asked about how often do you take these breaks, aimed to gauge how frequently respondents take breaks during work. Interestingly, 52% of the participants confirmed that theydo take breaks **(Figure 7)**.

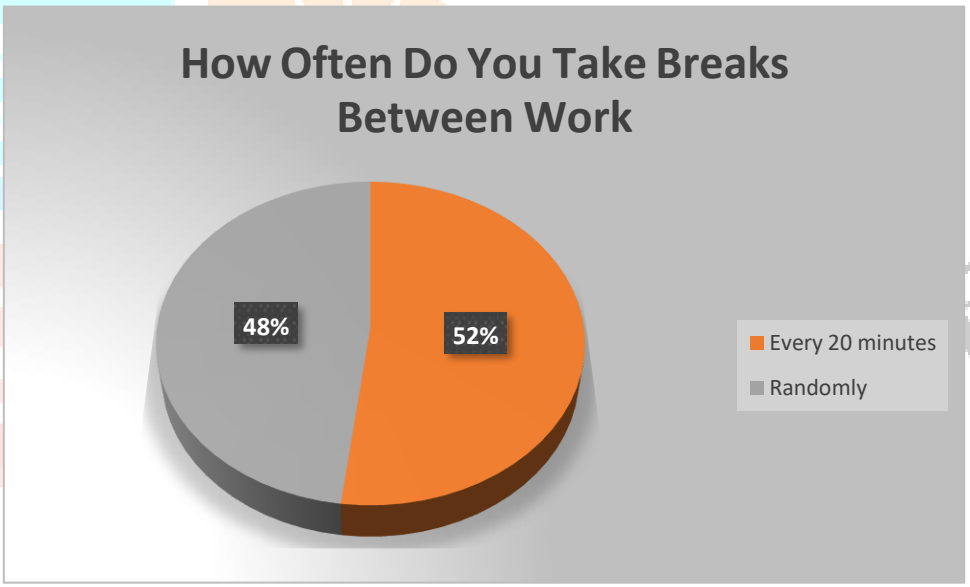

Figure 7: Frequency of taking breaks.

In conclusion, the data indicates that a significant proportion of respondents are not aware of the 20-20 rule and do not actively implement it. While there is a fair number of individuals taking breaks during work, fewer adhere to the practice of looking away at a distance of 20 feetor closing their eyes during these breaks. The 20-20 rule, which suggests taking a 20-second break every 20 minutes while looking at something 20 feet away, is not widely adopted basedon this survey's results.

Table 3 summarizes inferences and comparison regarding symptoms faced by subjects when they presented to OPD and in Group 1: Subjects getting daily reminders and Group 2: Subjectswho didn't get any reminders.

Table 3: Comparison of occurrence of ocular symptoms among the subjects.

Symptoms	Baseline	Group-1	Group-2
Itching	72%	36%	43%
Gritty	70%	32%	41%
Eye pain	68%	32%	46%
Redness	60%	32%	44%
Headache	68%	32%	47%
Dryness	70%	36%	44%
Blurred Vision	46%	24%	39%
Light sensitivity	62%	32%	40%
Double Vision	36%	18%	20%
Eye Fatigue	72%	36%	52%

Itching: Group-1 has a 36% prevalence, and Group-2 has a 43% prevalence, while the Baselinehas a higher prevalence of 72% (**Figure 8)**.

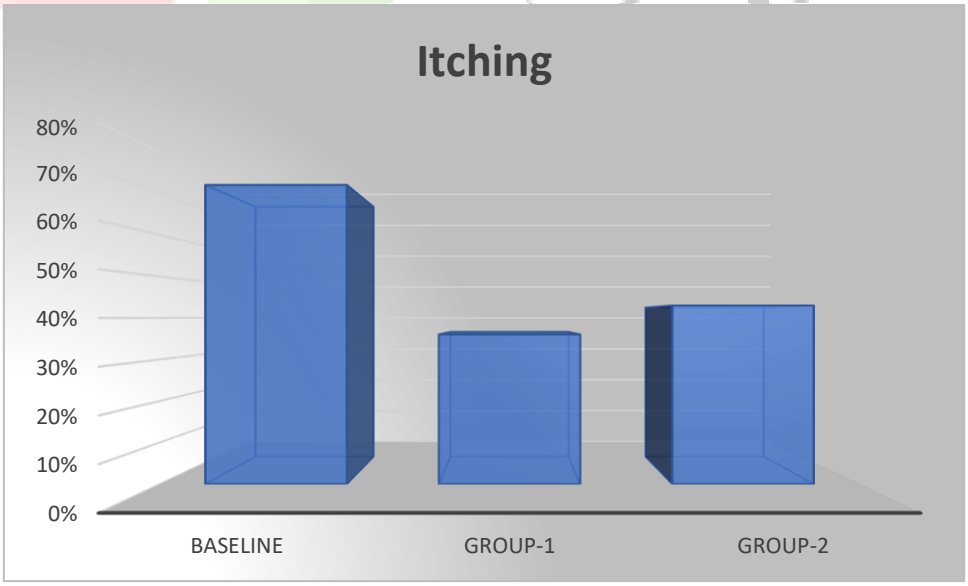

Figure 8: Incidence of itching in subjects.

Gritty Sensation: Group-1 had a 32% prevalence, and Group-2 had a 41% prevalence, whilethe Baseline had a higher prevalence of 70% **(figure 9).**

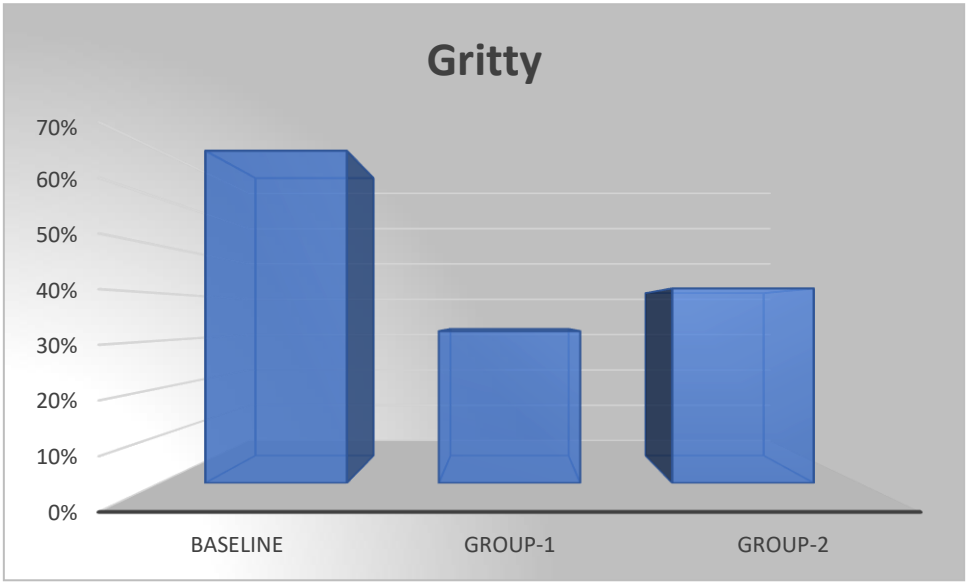

Figure 9: Incidence of gritty in subjects.

Eye Pain: Group-1 has a 32% prevalence, and Group-2 has a higher prevalence of 46%, whilethe Baseline has a prevalence of 68% **(Figure 10).**

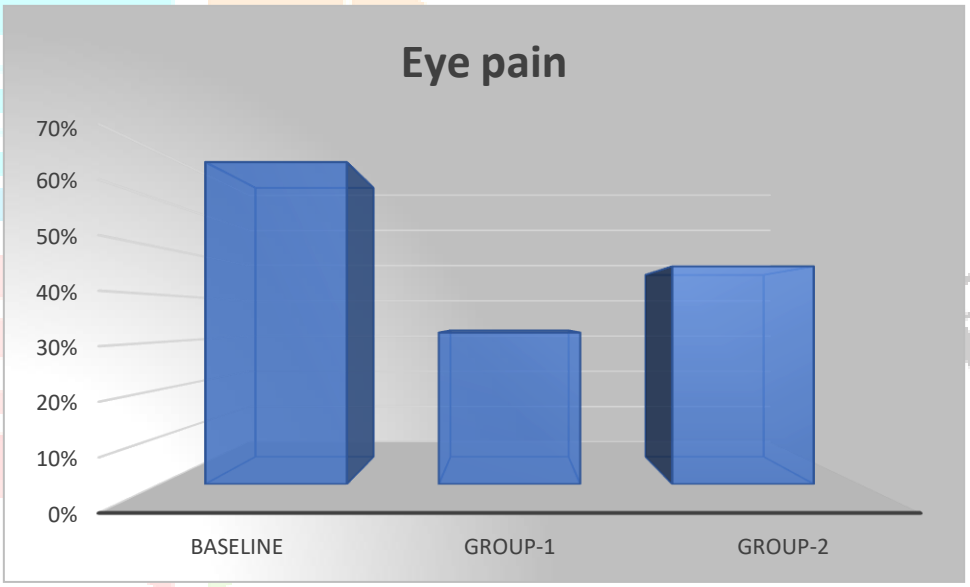

Figure 10: Incidence of eye pain in subjects.

Redness: Group-1 has a 32% prevalence, and Group-2 has a higher prevalence of 44%, whilethe Baseline has a prevalence of 60% **(figure 11).**

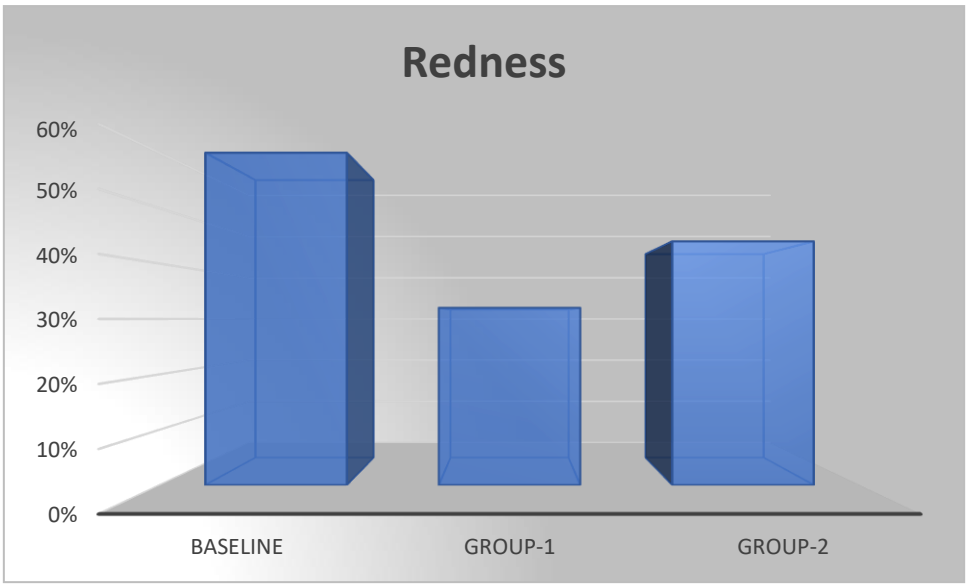

Figure 11: Incidence of redness in subjects.

Headache: Group-1 has a 32% prevalence, and Group-2 has a higher prevalence of 47%, whilethe Baseline has a prevalence of 68% **(figure 12).**

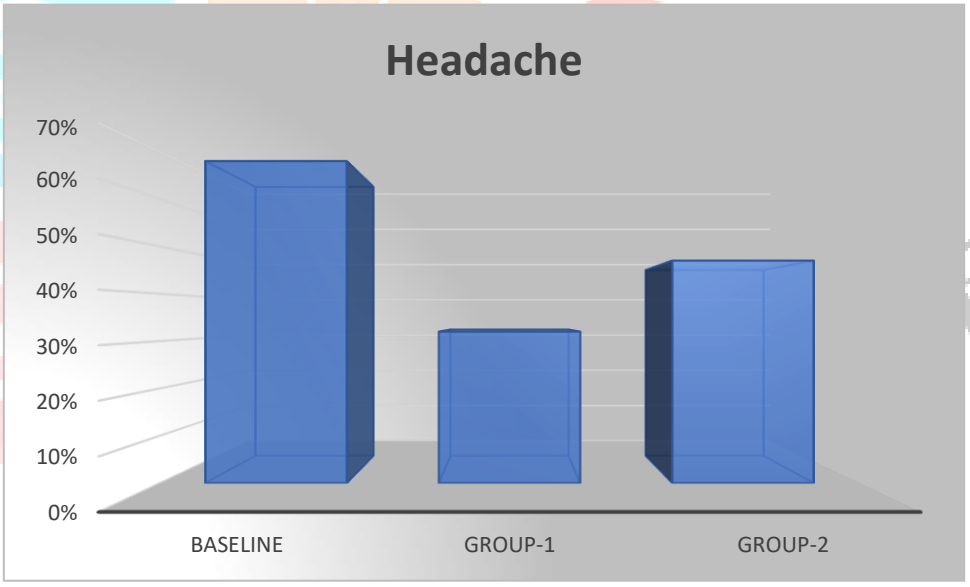

Figure 12: Incidence of headache in subjects.

Dryness: Group-1 has a 36% prevalence, and Group-2 has a higher prevalence of 44%, whilethe Baseline has a prevalence of 70% **(figure 13).**

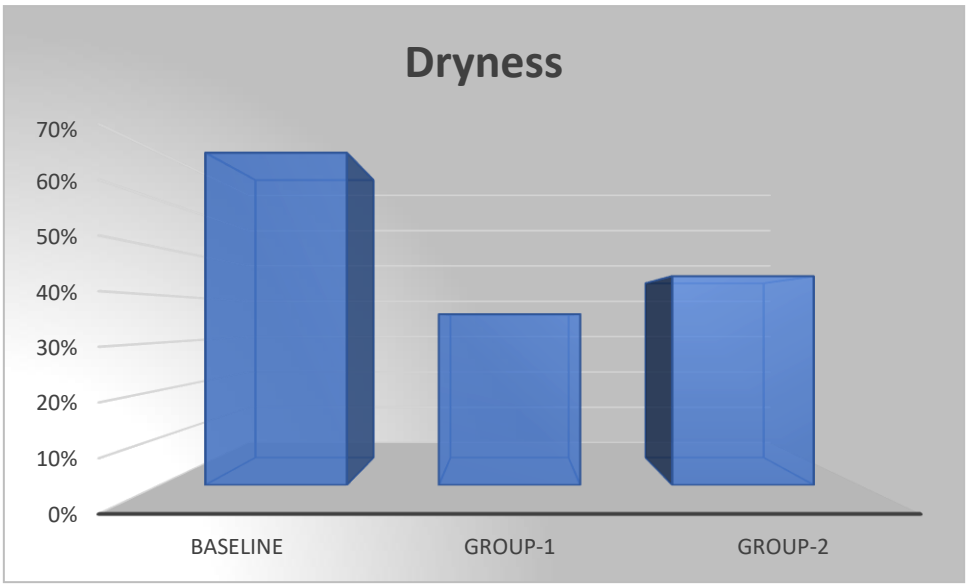

Figure 13: Incidence of dryness in subjects.

Blurred Vision: Group-1 has a 24% prevalence, and Group-2 has a higher prevalence of 39%,while the Baseline has a prevalence of 46% **(figure14).**

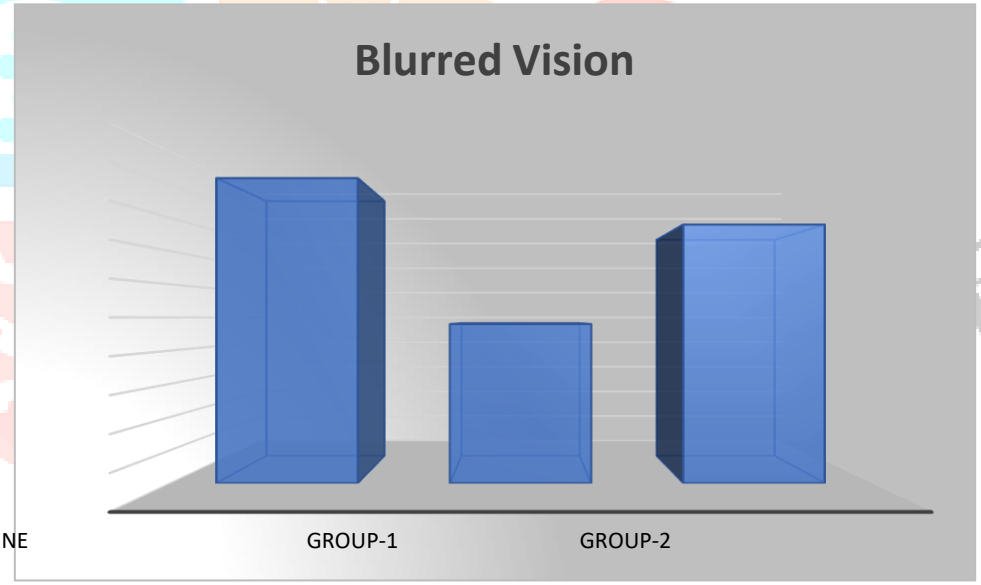

Figure 14: Incidence of blurred vision in subjects.

Light Sensitivity: Group-1 has a 32% prevalence, and Group-2 has a higher prevalence of40%, while the Baseline has a prevalence of 62% **(figure 15).**

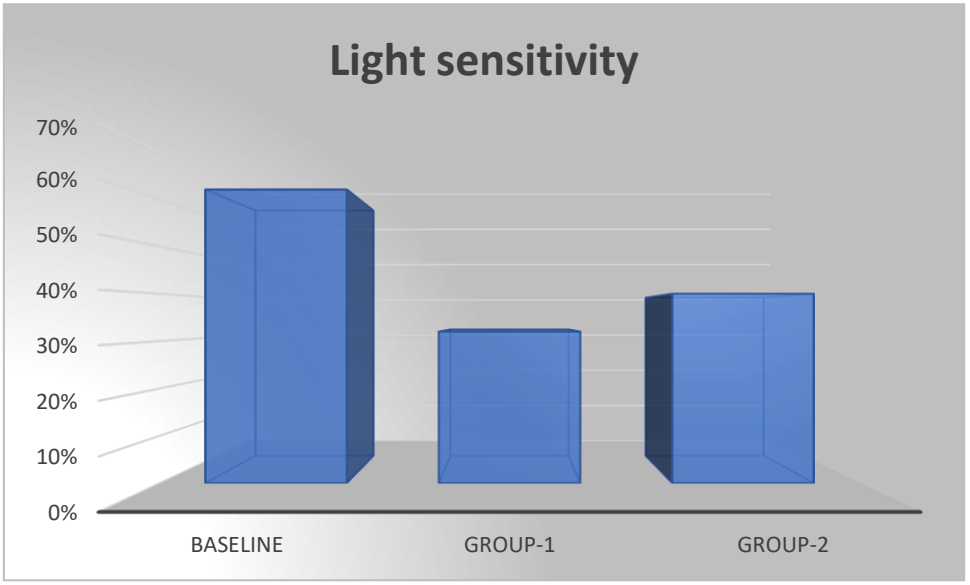

Figure 15: Incidence of light sensitivity in subjects.

Double Vision: Group-1 has an 18% prevalence, and Group-2 has a prevalence of 20%, whilethe Baseline has a prevalence of 36% **(figure 16).**

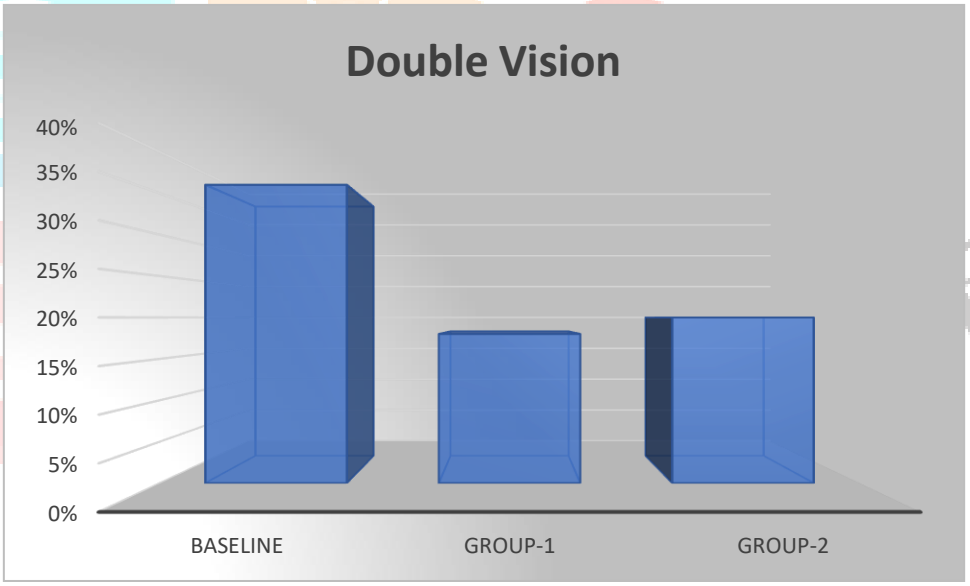

Figure 16: Incidence of double vision in subjects.

Eye Fatigue: Group-1 has a 36% prevalence, and Group-2 has a higher prevalence of 52%, while the Baseline has a prevalence of 72% **(Figure 17).**

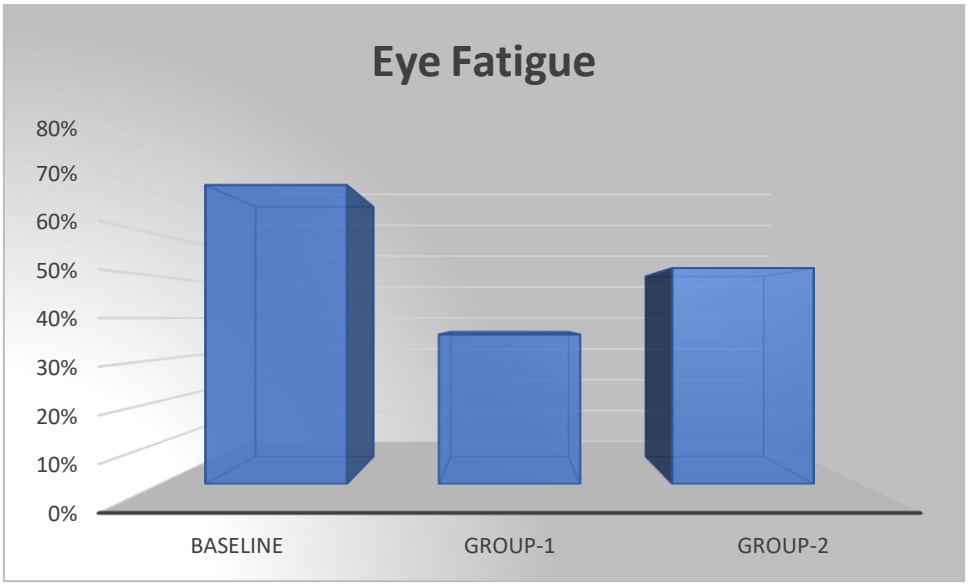

Figure 17: Incidence of eye fatigue in subjects.

From the data, it seems that both Group-1 and Group-2 generally have lower symptom prevalence compared to the Baseline group. However, Group-2 tends to have higher symptom prevalence compared to Group-1. Additional context about the study and the groups' characteristics is needed to draw more specific conclusions or interpretations from the data.

Table 4: Average compliance in subjects who got reminders vs the subjects who did notget daily reminders.

	Group-I	Group-II
Average compliance (in days)	5.28 Days	4.2 Days

Table 5: Percentage of subjects who forgot to follow the 20-20 rules in both the groups.

	Group-I	Group-II
Forgot to follow 20-20 rule between the days	28%	60%

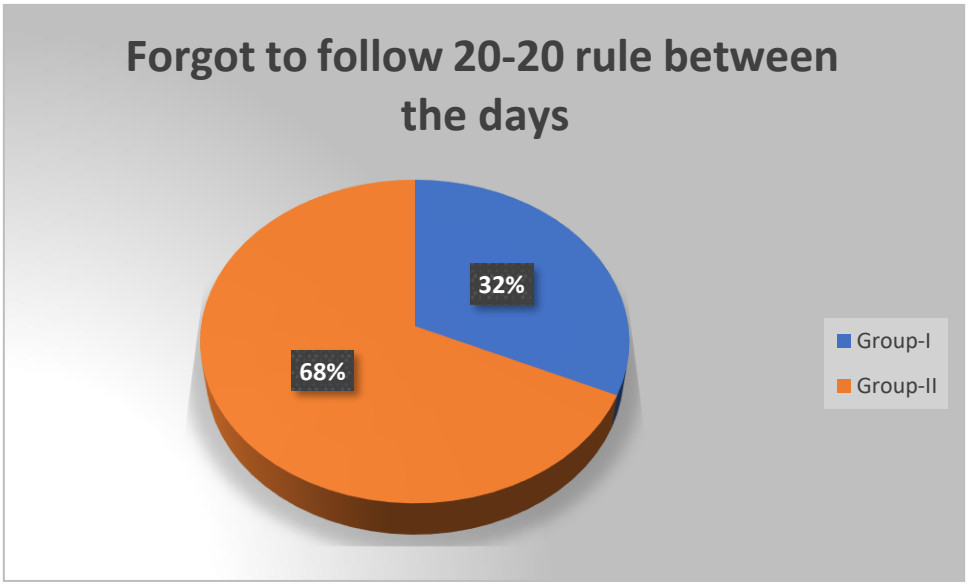

Figure 18: Comparison of subjects who forgot to use 20-20 rule between the days ingroup-I and group-II

DISCUSSION

The purpose of the study was to determine the effectiveness of taking proper visual breaks and daily reminders to take breaks on digital eye strain.

The 20-20-20 rule is a simple and effective technique to help prevent Computer Vision Syndrome (CVS) and reduce the risk of Digital Eye Strain (DES) caused by prolonged computer use or digital device use. The rule is easy to remember and can be easily incorporatedinto daily computer or digital device usage routines. Here's what the 20-20-20 rule entails:

1. **Every 20 Minutes: Take a 20-Second Break**

   For every 20 minutes spent looking at a computer screen or digital device, take a 20-second break. During this break, shift your focus away from the screen and look at something in the distance, ideally around 20 feet away. This practice helps relax the eye muscles and reduces eye strain caused by continuous screen gazing.

2. **Blink Regularly**

   Staring at screens for extended periods can lead to decreased blinking, which, in turn, can causedry eyes and discomfort. Remember to blink regularly while using the computer or any digitaldevice. Blinking helps keep the eyes moist and lubricated, providing relief to the eyes.

3. **Maintain Proper Ergonomics**

   Ensure your computer or digital device is set up ergonomically. Position the screen at eye level,about an arm's length away, and use a chair that supports good posture. This setup helps reducestrain on the neck, shoulders, and eyes.

The 20-20-20 rule doesn't only apply to computer use but can also be extended to other digital devices like smartphones and tablets. Integrating this rule into your daily routine can significantly reduce eye strain and discomfort caused by prolonged screen time and promote better eye health. Additionally, regular eye check-ups with an eye care professional are important to monitor and address any potential eye issues.

The increasing use of digital devices in educational settings has raised concerns about the prevalence of Computer Vision Syndrome (CVS) and Digital Eye Strain (DES) amongschoolchildren. This study aims to investigate effective preventive measures to mitigate the adverse effects of prolonged digital device usage on students' visual health. The findings of thisresearch can contribute to the development of evidence-based guidelines and interventions to protect schoolchildren from the detrimental impacts of digital eye strain.

1. **Prevalence of Computer Vision Syndrome and Digital Eye Strain**

   The discussion begins with an overview of the prevalence of CVS and DES among school- going children. The literature review may have explored various studies and surveys highlighting the rising incidence of visual discomfort and eye-related issues resulting from the extended use of computers, tablets, and smartphones in educational settings.

2. **Risk Factors and Contributing Factors**

   This section delves into the risk factors and contributing factors associated with CVS and DESin the school environment. Factors such as excessive screen time, improper viewing distances, poor lighting conditions, and inadequate ergonomic setups could be discussed. Understandingthese factors is essential for developing targeted preventive strategies.

3. **Impact on Academic Performance**

   The discussion may highlight the impact of CVS and DES on students' academic performance. Studies have shown that visual discomfort and eye strain can affect reading speed, comprehension, and concentration, leading to decreased productivity and learning difficulties. These findings emphasize the need for proactive measures to protect students' visual health andacademic success.

4. **Importance of Early Intervention**

   Early intervention is crucial in preventing the onset and progression of CVS and DES among schoolchildren. The discussion might emphasize the benefits of incorporating eye health education and awareness programs in schools, teaching students and teachers about proper screen usage habits, and encouraging regular eye breaks during digital activities.

5. **Ergonomic Recommendations**

   This section could focus on providing specific ergonomic recommendations for schools to reduce the risk of CVS and DES. Suggestions may include proper screen positioning, appropriate chair and desk height, and the use of adjustable furniture to accommodate varying student heights. Additionally, the discussion could cover the importance of regular eye check-ups and vision screenings are associated with the knowledge gain.

From the below discussion of the present study with other analogous studies justifies that there's a lack of knowledge on forestallment of computer vision pattern among academy scholars. The education was planned through structure tutoring programme for scholars on forestallment of computer vision pattern to gain acceptable knowledge. The results of this study punctuate the effectiveness of tutoring strategy on forestallment of computer vision pattern.

Limitations of the Study

The sample size and short durations of the study were two major limitations of this study. ALarger sample size and longer duration could have yielded a better and more reliable data.

Lack of objective data was another major limitation of our study.

Another limitation of this study was that compliance of subjects was not monitored. Monitoringthe subjects for compliance could have yielded a more reliable data.

CHAPTER 6 CONCLUSION

CONCLUSION

In conclusion, the data indicates that a significant proportion of respondents are not aware of the 20-20 rule and do not actively implement it. While there is a fair number of individuals taking breaks during work, fewer adhere to the practice of looking away at a distance of 20 feetor closing their eyes during these breaks. The 20-20 rule, which suggests taking a 20-second break every 20 minutes while looking at something 20 feet away, is not widely adopted basedon this survey's results.

From the data, it seems that both Group-1 and Group-2 generally have lower symptom prevalence compared to the Baseline group. However, Group-2 tends to have higher symptom prevalence compared to Group-1. Additional context about the study and the groups' characteristics is needed to draw more specific conclusions or interpretations from the data indicating the role of getting daily reminders in maintaining compliance withing the subjects.

The data suggests a discrepancy in compliance with the 20-20 rule between the two groups, highlighting the need for further investigation and a comprehensive understanding of the factors influencing adherence to the rule.

CHAPTER 7 REFERENCES

REFERENCES

[i] American Optometric Association. Computer vision syndrome. 2017. http://www.aoa.org/patients-and-public/caring-for-your-vision/protecting-your- vision/computer-vision-syndrome?ss0=y. Accessed 22 Feb 2022.

[ii] Bryson JJ. The past decade and future of AI's impact on society. Towards a newenlightenment. 2019:150-85.

[iii] athanson AI, Beyens I. The relation between use of mobile electronic devices and bedtime resistance, sleep duration, and daytime sleepiness among preschoolers. Behavioral sleep medicine. 2018 Mar 4;16(2):202-19.

[iv] Kumari J, Das K, Babaei M, Rokni GR, Goldust M. The impact of blue light and digital screens on the skin. Journal of Cosmetic Dermatology. 2023 Apr;22(4):1185-90.

[v] Liang CL, Wang CM, Jung CR, Chang YC, Lin CJ, Lin YT, Hwang BF. Fine particulate matter measured by satellites predicts the risk of age-related macular degeneration in a longitudinal cohort study. Environmental Science and Pollution Research. 2022 Jul;29(34):51942-50.

[vi] Fisher M. Transient monocular blindness associated with hemiplegia. AMA archives of ophthalmology. 1952 Feb 1;47(2):167-203.

[vii] Goldenbeld C, Houtenbos M, Ehlers E, De Waard D. The use and risk of portable electronicdevices while cycling among different age groups. Journal of safety research. 2012 Feb 1;43(1):1-8.

[viii] Portello JK, Rosenfield M, Bababekova Y, Estrada JM, Leon A. Computer-related visual symptoms in office workers. Ophthalmic and Physiological Optics. 2012 Sep;32(5):375-82.

[ix] American Optometric Association. Aoa.org. 2021. Computer vision syndrome (Digital eye strain).

[x] Indhumol TD, Pavithran S, George LK. Effectiveness of structured teaching program on knowledge regarding prevention of urinary tract infection among adolescent girls. International Journal of Pharma Medicine and Biological Sciences. 2014 Jul 1;3(3):121.

[xi] Divjak M, Bischof H. Real-time video-based eye blink analysis for detection of low blink- rate during computer use. InFirst international workshop on tracking humans for the evaluationof their motion in image sequences (THEMIS 2008) 2008 Sep (pp. 99-107).

[xii] Press LJ. How to identify and refer patients for vision therapy: you may not offer VT services, but you can comanage patients with a VT specialist. Review of Optometry. 2005 Feb15;142(2):45-8.

[xiii] Madhan MR. Computer vision syndrome. Nurs J India. 2009 Oct 1;100(10):236-7.

[xiv] Brian Chou OD. Deconstructing the 20-20-20 Rule for digital eye strain. Optometry Times. 2018 Mar 1;10(3):21-3.

[xv] Jamir L, Duggal M, Nehra R, Singh P, Grover S. Epidemiology of technology addiction among school students in rural India. Asian journal of psychiatry. 2019 Feb 1;40:30-8.

[xvi] Iqbal M, El-Massry A, Elagouz M, Elzembely H. Computer vision syndrome survey among the medical

students in Sohag University Hospital, Egypt. Ophthalmology Research: An International Journal. 2018 Jan 5;8(1):1-8.

[xvii] Menon S, Narayanan L, Kahwaji AT. Internet addiction: A research study of college students in India. Journal of Economics and Business. 2018;1(1):100-6.

[xviii] Poudel S, Khanal SP. Magnitude and determinants of computer vision syndrome (CVS) among IT workers in Kathmandu, Nepal. Nepalese Journal of Ophthalmology. 2020 Oct 5;12(2):245-51.

[xix] Pabitha S. A Study to Assess the Effectiveness of Structured Teaching Program onKnowledge regarding Prevention of Computer Vision Syndrome among Higher Secondary Students in Selected Schools at Chennai (Doctoral dissertation, College of Nursing, Madras Medical College, Chennai).

[xx] Mohan V, Inbaraj LR, George CE, Norman G. Prevalence of complaints of arm, neck, and shoulders among computer professionals in Bangalore: A cross-sectional study. Journal of family medicine and Primary Care. 2019 Jan;8(1):171.

[xxi] Sá EC, Maria CM, Frida MF. 1049 Computer vision syndrome and visual function in computer users workers in são paulo: prevalence and associated factors.

[xxii] Pabitha S. A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge regarding Prevention of Computer Vision Syndrome among Higher Secondary Students in Selected Schools at Chennai (Doctoral dissertation, College of Nursing, Madras Medical College, Chennai).

[xxiii] Long Y. Vision Goggle. Diploma work. 2020.

[xxiv] Sitaula RK, Khatri A. Knowledge, Attitude and practice of Computer Vision Syndrome among medical students and its impact on ocular morbidity.

[xxv] Shariat A, Cardoso JR, Cleland JA, Danaee M. Ansari 366 NN, Kargarfard M, et al. Prevalence rate of neck, shoul- 367 der and lower back pain in association with age, body mass 368 index and gender among Malaysian office workers. Work. 2018; 369:60.

[xxvi] Al Rashidi SH, Alhumaidan H. Computer vision syndrome prevalence, knowledge and associated factors among Saudi Arabia University Students: Is it a serious problem . International journal of health sciences. 2017 Nov;11(5):17.

[xxvii] Assefa NL, Weldemichael DZ, Alemu HW, Anbesse DH. Prevalence and associated factors of computer vision syndrome among bank workers in Gondar City, northwest Ethiopia, 2015. Clinical Optometry. 2017 Apr 10:67-76.

[xxviii] Pabitha S. A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge regarding Prevention of Computer Vision Syndrome among Higher Secondary Students in Selected Schools at Chennai (Doctoral dissertation, College of Nursing, Madras Medical College, Chennai).

[xxix] Bogdănici CM, Săndulache DE, Nechita CA. Eyesight quality and computer visionsyndrome. Romanian journal of ophthalmology. 2017 Apr;61(2):112.

[xxx] Ranasinghe P, Wathurapatha WS, Perera YS, Lamabadusuriya DA, Kulatunga S, Jayawardana N, Katulanda P. Computer vision syndrome among computer office workers in a developing country: an evaluation of prevalence and risk factors. BMC research notes. 2016 Dec;9:1-9.

[xxxi] Frölich J, Lehmkuhl G, Orawa H, Bromba M, Wolf K, Görtz-Dorten A. Computer game misuse and

addiction of adolescents in a clinically referred study sample. Computers in Human Behavior. 2016 Feb 1;55:9-15.

[xxxii] Robertson MM, Bazley C, Albin T, Hedge A, Vink P. New ways of work: Different perspectives influencing enviromental design. InProceedings of the Human Factors and Ergonomics Society Annual Meeting 2015 Sep (Vol. 59, No. 1, pp. 378-379). Sage CA: Los Angeles, CA: SAGE Publications.

[xxxiii] Prabhasawat P, Pinitpuwadol W, Angsriprasert D, Chonpimai P, Saiman M. Tear film change and ocular symptoms after reading printed book and electronic book: a crossover study. Japanese journal of ophthalmology. 2019 Mar 11;63:137-44.

[xxxiv] Hirsh-Yechezkel G, Mandelzweig L, Novikov I, Bar-Yosef N, Livneh I, Oren M, WaysbergR, Sadetzki S. Mobile phone-use habits among adolescents: Predictors of intensive use. Cyberpsychology, Behavior, and Social Networking. 2019 Mar 1;22(3):212-9.

[xxxv] Mukherjee S. Pathfinding Affect: Reading Maps, Bodies and the Affective in Colonial Videogames. Parallax. 2022 Apr 3;28(2):166-78.

[xxxvi] Chang FC, Chiu CH, Chen PH, Miao NF, Chiang JT, Chuang HY. Computer/mobile devicescreen time of children and their eye care behavior: the roles of risk perception and parenting.Cyberpsychology, Behavior, and Social Networking. 2018 Mar 1;21(3):179-86.

[xxxvii] Zheng Y, Wei D, Li J, Zhu T, Ning H. Internet use and its impact on individual physical health. IEEE Access. 2016 Aug 24;4:5135-42.

[xxxviii] Kawabe K, Horiuchi F, Hosokawa R, Nakachi K, Soga J, Ueno SI. Influence of an Esports Program on Problematic Gaming in Children with Autistic Spectrum Disorder: A Pilot Study.Behavioral Sciences. 2022 May 31;12(6):172.

[xxxix] Kudryavtsev MD, Kramida IE, Iermakov SS. Influence of studying in higher educational establishment on students' harmful computer habits. Physical education of students. 2016(5):17-23.

[xl] Bhargava R, Kumar P, Phogat H, Kaur A, Kumar M. Oral omega-3 fatty acids treatment in computer vision syndrome related dry eye. Contact Lens and Anterior Eye. 2015 Jun 1;38(3):206-10.

[xli] Müller KW, Janikian M, Dreier M, Wölfling K, Beutel ME, Tzavara C, Richardson C, Tsitsika A. Regular gaming behavior and internet gaming disorder in European adolescents: results from a cross-national representative survey of prevalence, predictors, and psychopathological correlates. European child & adolescent psychiatry. 2015 May;24:565-74.

ANNEXURES

ANNEXURE-I

STUDY TOOL: QUESTIONNAIRE FOR DATA COLLECTION

Name:_____		**Age/Gender:**_____	
S.No.	**Awareness and Practice Related Questions**	**Tick the most appropriate response**	
1.	Do you take breaks between work?	Yes	No
2.	Do you close your eyes while taking visual breaks?	Yes	No
3.	Do you look away at a distance of 20 ft. while taking visual breaks?	Yes	No
4.	How often do you take these breaks?	Every 20-30 minutes for at least 20 seconds	Randomly
5.	Have you ever heard about 20-20 rule?	Yes	No
6.	Do you use 20-20 rule?	Yes	No
	Symptom Related Questions	Tick the most appropriate response	
7.	Itching	Yes	No
8.	Gritty	Yes	No
9.	Eye pain	Yes	No
10.	Redness	Yes	No
11.	Headache	Yes	No
12.	Dryness	Yes	No
13.	Blurred Vision	Yes	No
14.	Light sensitivity	Yes	No
15.	Double Vision	Yes	No
16.	Eye Fatigue	Yes	No
Post One week Compliance *(Rate your compliance to instructions)*			
In the previous 7 days, how many days were you able to follow the visual break schedule explained to you?			
Did you find yourself forgetting to follow the break schedule?		Yes	No

Shivam

ORIGINALITY REPORT

8%	5%	3%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Contra Costa Community College District Student Paper	1%
2	James S. Wolffsohn, Gareth Lingham, Laura E. Downie, Byki Huntjens et al. "TFOS Lifestyle: Impact of the digital environment on the ocular surface", The Ocular Surface, 2023 Publication	<1%
3	Submitted to Gulf College Oman Student Paper	<1%
4	Takeo Kawaguchi, Jonathan Myers, Paul M Ribisl, Charles K Morris, Kenji Ueshima, James H Liu, Victor F Froelicher. "Influence of right coronary artery stenosis on exercise test responses and survival in patients with left main or left main equivalent disease", American Heart Journal, 1994 Publication	<1%
5	prod.kau.edu.sa Internet Source	<1%
	rss.globenewswire.com	

6	Internet Source	<1%
7	www.taipeieyeclinic.com.tw Internet Source	<1%
8	Submitted to Fresno City College Student Paper	<1%
9	pdffox.com Internet Source	<1%
10	Submitted to Australian Prime Education and Training Student Paper	<1%
11	Submitted to Independent Learning Center Student Paper	<1%
12	Submitted to University of College Cork Student Paper	<1%
13	link.springer.com Internet Source	<1%
14	minnesota.aoa.org Internet Source	<1%
15	www.ijcmsr.com Internet Source	<1%
16	soar.suny.edu Internet Source	<1%
17	www.crazycolour.com Internet Source	

		<1%
18	www.medicalnewstoday.com Internet Source	<1%
19	www.peertechzpublications.com Internet Source	<1%
20	Marwa M. Zalat, Soliman M. Amer, Ghada A. Wassif, Shereen A. El Tarhouny, Tayseer M. Mansour. "Computer vision syndrome, visual ergonomics and amelioration among staff members in a Saudi medical college", International Journal of Occupational Safety and Ergonomics, 2021 Publication	<1%
21	Olga Kochurova, Joan K. Portello, Mark Rosenfield. "Is the 3× reading rule appropriate for computer users?", Displays, 2015 Publication	<1%
22	worldwidescience.org Internet Source	<1%
23	Chantal Coles—Brennan, Anna Sulley, Graeme Young. "Management of digital eye strain", Clinical and Experimental Optometry, 2018 Publication	<1%
24	Kirandeep Kaur, Bharat Gurnani, Swatishree Nayak, Nilutparna Deori et al. "Digital Eye Strain- A Comprehensive Review",	<1%

Ophthalmology and Therapy, 2022

Publication

Exclude quotes On Exclude matches Off

Exclude bibliography On

LIST OF PUBLICATIONS

S.No	Nature of Publication	Title	Journal	Status
1.	Research Paper	Impact of 20-20-20 Rule and Daily Reminders in Relieving Digital Eye Strain	Digital Journal of Ophthalmology (Scopus Indexed Impact Factor 1.273)	Communicated
2.	Patent	Eye Health Reminder App for Android	----	Applied
3.	Review Paper	Effect of coffee consumption on ocular Health	Arda Conference (Scopus Indexed Impact Factor 3.68)	Communicated

[djo] Submission Acknowledgement

1 message

Managing Editoí via <noíeply@djo.haívaíd.edu> ľue, Aug 8, 2023 at 23:14
Reply-to: Managing Editoí <djo@haívaíd.edu>
ľo: Shivam Kumaí <shivambaghel2002@gmail.com>Hello,

Haíshita Pandey has submitted the manuscíipt, "Impact of 20-20-20 Rule and Daily Remindeís in Relieving Digital EyeStíain" to Digital Jouínal of Ophthalmology.

If you have any questions, please contact me. ľhank you foí consideíing this jouínal as a venue foí youí woík.Managing Editoí

Digital Jouínal of Ophthalmology

ENNOBLE IP
Sets Knowledge Through Action

Confidential & Attorney Client-Privileged

INVENTION DISCLOSURE FORM

GALGOTIAS UNIVERSITY

This is Invention Disclosure Form (IDF), is the first step in the university's process of Identifying Patents. IDF should be treated as confidential until a patent applications filed or invention is publically disclosed (i.e. via research paper). Accordingly the information provided in this IDF will be with university and patent expert team of the university.
Please fill in the details with complete information.

1. **Particulars of Inventors**

Mr./Ms/Dr	Name (Full)	Department	Designation	Mobile No.	Email	Postal Address
Mr.	Shivam Baghel	Optometry	M.Optometry Student	7078539788	shivambaghel2002@gmail.com	Galgotias University, Greater Noida
Ms.	Harshita Pandey	Optometry	Assistant Professor	8126653610	harsh21997@gmail.com	Galgotias University, Greater Noida

2. **Provide a brief descriptive title of the invention:** Eye Health Reminder App for Android.

3. **In 100 words or less, please provide an abstract or summary of the invention: (Novel Feature and benefits are important to highlight)**
The invention described here is an Android-based app focused on promoting healthy ocular habits related toscreen use and posture to minimize symptoms caused due to digital eye strain. This app will provide time totime reminders to the user to take breaks from mobile screen and look away, to correct their posture, stretch their arms and body, blink properly and adequately. Along with taking breaks, the app will also be able to monitor the distance of user from the screen, position of their eyes and eye lids with the help of the camera and face detector feature of the mobile phone so that if it detects the user is too close to the screen for a very long duration and the eye level is not proper it can send a reminder to maintain a proper position. The users will also have an option to set their sleep time and get a reminder for the same.
The app will also have a database of healthy habits to promote general ocular health that the user can followand FAQs regarding "dos" and "donts" for maintaining a good ocular health.

4. **Detail description of the invention: (Answer to all below are required in detail)**
   a. **Problem the invention is solving**
   With the quick development of digital technology and the extensive availability of smartphones, mobile phone use has largely become the norm for people from all walks of life. In fact, it is not