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Effect of Eye Exercises On Ocular Fatigue Due to Use of Screen Time in Young Adult

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Abstract

Background: A mobile phone is one of the essentials of modern living. Adult mobile phone use was noted as one of the key sources of communication in a 2007 international study. When used for lengthy periods of time, the shorter wavelength of blue light, which is the basis of smartphone technology, increases the risk of eye damage. **Material and Methods:** The study was carried out on healthy individual working in it sector of age group 18 to 22 years performing yoga regularly were included in the study. After of training the informed consent and of then details regarding their present, past, person and medical history. Once the inclusion & exclusion criteria have been satisfied height and weight were recorded using standard protocol along with recording g of Snellen's chart. **Results:** In the present study Snellen's chart was used to check visual acuity in normal healthy subject and to see the effects of pranayama and eye exercise on visual acuity. Result suggested that there was significant improvement visual acuity in subject practicing pranayama along with eye relaxation exercise as compared with control group. **Conclusion:** The findings of the current study indicate that practising pranayama for eight weeks while also engaging in eye exercises helps to increase visual acuity. The visual acuity of the control group participant, who had not practised pranayama, did not improve.

Keywords: Eye exercises, screen time and young adult.

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Introduction

One of the important items in modern life is a mobile phone. In a 2007 international study, adult mobile phone use was identified as one of the significant forms of communication.[1] The shorter wavelength of blue light, which is the foundation of smartphone technology, increases the risk of eyesight damage when utilised for extended periods of time.[2] It has been reported that a head movement of 2.5 cm places an additional 0.4 kg of weight on the neck and upper torso. Gregi et al.[3] According to video screen presented electromyography (EMG) results from the sternocleidomastoid and upper trapezius muscles, muscular activity is maintained at a maximum of 5%. Straker and others.[4] If visual tiredness persists in daily life, it can impair visual processing and lead to a number of issues, including decreased visual acuity, ocular

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discomfort, and damaged corneal epithelial cells. The processing of visual signals that links the vestibular organ system to the somatosensory network is negatively impacted by this ongoing visual fatigue, and this disruption of the body's postural control systems is another consequence.[5-7] Utilising a cell phone is considered as simple, particularly by younger generations. For them, using Google Maps to find a destination, Spotify or Tidal to listen to music, Facebook Tweeter to obtain daily updates, etc., are all natural behaviors. They are unable to envision life without smartphones. (8) Information technology has become a blessing for a person's overall growth. The frequency of eye complaints has increased due to excessive television viewing and time spent on social networking websites on computers and mobile devices. Common ocular problems include itchiness, redness, burning, tears up in the eyes, headaches, double vision, eye strain, and blurred vision are the most common reasons why individuals visit an ophthalmologist.[9-10] A Snellen eye chart is typically used to test visual acuity. ophthalmologist will ask you to read a series of letters written in numerous lines, from biggest to smallest, as part of an eye exam. Eye charts can be used to test how well you can see at a distance and this where the term "6/6 vision" originates. Visual acuity objectives If you suspect a vision issue or notice a change in your vision, you may require an eye exam. The most popular visual function test uses optotype charts and projection devices to measure visual acuity. It is almost always used in ophthalmology and optometry for screening, refraction, and disease progression tracking, as well as in occupational testing and licensing for vision-demanding professions. like flying and driving. Optotype acuity testing is also utilized to describe observers' visual resolving abilities in basic and clinical vision studies. Age-related eye conditions such macular degeneration, cataracts, diabetes, retinopathy, and glaucoma are common causes. Bipolar and ganglion nerve cells' stratum of visual fibres. Anopia is the full loss of vision in one eye. Blindness of the visual field is referred to as hemianopia. Loss of the right or left portions of the visual field in both eyes is referred to as homonymia. Hemianopia heteronomous. Different fields of vision were lost in each of the two. In this technique, two flat or semi-spherical objects are brought into contact while being subjected to regulated loads. The degree of deformation in the zone of contact depends on the work of adhesion between surfaces and any external loads applied to them if one of the contacting materials is deformable and if their surfaces are smooth. Instead of expanding the cell's volume, it is preferable to increase the density of spots on mirrors to lengthen the beam's travel inside the enclosure. The first such high-density cell was constructed utilising two astigmatic mirrors.[11] This design's flaw is that focal lengths in orthogonal planes must be defined to a tolerance of 100 ppm in order to achieve the requisite N separation, which makes it difficult to build.[12] The optical quality of the eye, particularly the existence of refractive defects (such as defocus and astigmatism), limits human vision. Higher-order aberrations (HOAs), such as trefoil, coma, and spherical aberration, also influence the eye, but they have a negligible effect on high-contrast visual acuity (HCVA) in healthy eyes.[13] suggested two distinct methods to create a dense pattern multipass cell. Two matching cylindrical mirrors were employed in the initial strategy. One can create a broad variety of re-entrant Lissajous patterns by moving the major axes of one mirror with respect to another mirror along Z-axes. In the second method, a cylindrical mirror is used to replace just one spherical mirror in a spherical cavity. Rays are never truly re-entrant, which is a major shortcoming of the second strategy. As a result, near reentrant solutions are used. Using a cylindrical lens placed inside a spherical resonator, we present in this study a straightforward technique for obtaining dense multi pass patterns. The cell is offered with a theoretical description and stability requirements. Aspects of design that lead to certain useful designs are discussed.[14] Since it is considered that patients have become accustomed to the distortion caused by their natural astigmatism, astigmatic correction is frequently provided gradually in clinical practise. But only recently have researchers looked into how well astigmatic people adjust to their own astigmatism and recalibrate after having it corrected.[15] Reduced Snellen

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test type, which at a distance of 35 cm subtends the same angle at the eye that the test type does at a distance of 6 metres. Four lines of Times Roman typeface suggested by the faculty of ophthalmologists (Law, 1951): N, 5, N, 8, N, 10, and N, 12. a part of the G.P.O. telephone directory as a photograph. Convergence fixation using a vertical line and centre dot. This angle has been shown to be helpful for measuring the ocular muscle abnormalities that are most noticeable when the eyes are held in an oblique position. At the R.A.F. central medical establishment, the study was conducted to found determine the extent of amblyopia-related visual impairment. In the preceding paper in this issue (Catford, 1956), the results are provided.[16] Yoga is a traditional Indian science that incorporates breathing exercises, cleaning rituals, controlled breathing, and meditation.[17] In people with increasing myopia, a combination of yoga practise and reduced symptoms of visual strain.[18] As with every other muscle in the body, we must perform exercise regularly in order to maintain the health of these muscles.[19] All extraocular muscles are expected to be strengthened through yogic yoga, which also prevents eye strain. People who use computers for lengthy periods of time have been demonstrated to benefit from yoga in terms of ocular symptoms.[20] To find the effect of eye exercises on ocular fatigue due to the use of screen time in young adults.

Methodology

Study Design

The study will be done at the department of physiology, in Rama Medical College and Hospital Kanpur (U.P)

Sample size

95 participants working in IT sector.

Material Used

Snellen chart that used six meters at the standard measurement distance. It is a chart used for testing distant vision which is tested by the ability if the subject to recognize test letters on the chart. Trial frame, Trial box, Shellen chart & Near vision chart.

Inclusion Criteria

1. Subject with or without refractory error.
2. both male and female subject.
3. Subject in 18-25 year.
4. Subject with so much score as per Likert scale.

Exclusion Criteria

1. Subject with colour blindness.
2. Subject with diseases eye infections, eye injury, post-surgery.
3. Subjects with any eye disease are excluded from the study.

Consent taking

Written informed consent will be obtained from each person before the procedure.

Methodology

The study was carried out on healthy individual working in it sector of age group 18 to 22 years performing yoga regularly were included in the study. After of training the informed consent and of then details regarding their present, past, person and medical history. Once the inclusion & exclusion criteria have been satisfied height and weight were recorded using standard protocol along with recording g of Snellen's chart.

Before recount the parameters, the subject was asked to relax physically and mentally for the subject were trained the guidance of certified yoga and exercises teacher they carried out yoga

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exercises for 15 daily the yoga practices include palming and kapalbhati near and for focusing with kapalbhati, shifting with kapalbhati scheduled as follows-

Procedure of Yoga and Exercise Ocular

Each ocular yoga and exercises practice session in volves the following steps in sequence: palming, blinking, sideway, viewing, forward and sideway viewing, diagonal viewing, rotation viewing, preliminary nose-tip gazing, near and distant viewing, concentrated gazing, and acupressure point on the palm. Subjects in the exercise group did the exercise for 25-30 minutes an average of days/ week:

1. Eye movement
2. Eye focusing
3. Palming and visualization with kapalbhati
4. Blinking
5. Shifiting with kapalbhati
6. Splashing
7. Sunning

RESULTS

The study was performed on IT sector working people in Kanpur, before yoga practice and after yoga practice in RAMA MEDICAL COLLEGE DEPARTMENT OF PHYSIOLOGY. Yoga is known to have beneficial effects of eye exercises on ocular fatigue. In the present study Snellen's chart was used to check visual acuity in normal healthy subject and to see the effects of pranayama and eye exercise on visual acuity. Result suggested that there was significant improvement visual acuity in subject practicing pranayama along with eye relaxation exercise as compared with control group.

Table 1: Shows the mean age distribution of female and Male.

Gender	N	Mean	Std. Deviation	Std. Error Mean
Female	54	21.04	1.359	.185
Male	41	21.12	1.345	.210

Table 2: Shows the mean weight distribution of female and Male.

Gender	N	Mean	Std. Deviation	Std. Error Mean
Female	54	55.98	6.033	.821
Male	41	56.00	5.740	.896

Table 3: Shows the mean height distribution of female and Male.

Gender	N	Mean	Std. Deviation	Std. Error Mean
Female	54	163.06	6.290	.856
Male	41	163.34	6.231	.973

Table 4: Shows the mean difference between before and after the righty acuity

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	1.7105	1.24751	.12799	.143	1.72
After	1.4474	.80713	.08281		

Table 5: Shows the mean difference between before and after the left acuity.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	1.7421	1.22227	.12540	.001	1.77
After	1.4789	.81187	.08330		

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Table 6: Shows the mean difference between before and after sleep hours

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	5.8632	1.05800	.10855	.000	-7.162
After	6.7158	.47631	.04887		

Table 7: Shows the mean difference between before and after screen time.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	2.8526	.88688	.09099	.018	11.404
After	1.5684	.64664	.06634		

Table 8: shows the mean difference between before and after SORE /ACHING EYE.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.4842	.66626	.06836	.000	2.050
After	.3158	.44395	.04555		

Table 9: shows the mean difference between before and after the irritated eye

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.6105	.71896	.07376	.000	1.994
After	.4316	.49792	.05109		

Table 10: Shows the mean difference between before and after the watery eye.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.6211	.82744	.08489	.000	1.994
After	.4053	.57563	.05906		

Table 11: Shows the mean difference between before and after the DRY EYE.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.4632	.68121	.06989	.000	2.649
After	.2389	.46547	.04776		

Table 12: Shows the mean difference between before and after the EYESTRAIN.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.8105	.85421	.08764	.004	3.087
After	.4789	.60545	.06212		

Table 13: Shows the mean difference between before and after the HOT/BURNING EYE

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.4211	.77978	.08000	.000	1.705
After	.2632	.45454	.04663		

Table 14: Shows the mean difference between before and after the blurred vision

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.6737	.77791	.07981	.000	1.341
After	.4200	.51211	.05254		

Table 15: Shows the mean difference between before and after the DIFFICULTY FOCUSING VISION

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.5895	.81860	.08399	.000	2.080
After	.3768	.56821	.05830		

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Table 16: Shows the mean difference between before and after the DISOMFORT.

	Mean	Std. Deviation	Std. Error Mean	Sig.	t
Before	.5053	.68220	.06999	.000	1.58
After	.3684	.49039	.05031		

Table 17: Shows the mean difference between before and after the DOUBLE VISION

	Mean	Std. Deviation	Std. Error Mean	Sig.	T
Before	.18	.437	.045	.43	0.342
After	.16	.408	.042		

Table 18: Shows the mean difference between before and after the RIGHTY ACUITY

	Mean	Std. Deviation	Std. Error Mean	Sig.	T
Before	1.7105	1.24751	.12799	.143	1.72
After	1.4474	.80713	.08281		

Table 19: Shows the mean difference between before and after the LEFT ACUITY

	Mean	Std. Deviation	Std. Error Mean	Sig.	T
Before	1.7421	1.22227	.12540	.001	1.77
After	1.4789	.81187	.08330		

DISCUSSION

Our study result is comparable with that of Shirley Telles et al, they studied the visual discomfort in 95 professional computer users before and after yoga, their results suggested that the yoga practice reduce visual discomfort, while the group who had no yoga intervention showed an increase in discomfort at the end of sixty days.[21] Vision is a function of both body and mind. Developmentally the eye is an extension of the brain, and it's the mind that sees. As a result of this body-mind connection the eye only relax fully when the mind is relaxed. The mind relaxes when it is focused on just one thing at a time.[22] The extra ocular muscles need to be flexible and energized to preserve clear and accurate focus. As we relax, muscles relax. This enables them to return to their natural state and move freely. Vision is a function of body as well as mind. Developmentally the eye is an extension of the brain, and it's the mind that sees. As a result of this body -mind coordination the eye only relaxes completely when the mind is relaxed. The mind relaxes when it is focused on just one thing at a time.[23] Significant positive results of our study are may be due to improvement in blood supply and nutrients to all eye. A regular exercise of extraocular muscle which controls the movement of the eye. A regular exercise of extraocular muscle restores the normalcy of the eyeball in relation to size and shape which is the most important for normal vision. In contrast to the yoga group in this study, the control group had no differences in their eye fatigue scores. The differences between the two group, besides the eye-yoga effects, may be influenced by psychological benefits gained by participants in the yoga group from attending frequent meetings with the instructor. This supports the concept that psychological effects could be an additional factor in the yoga group1 exercise, implying that follow-up studied are needed to establish rigorous methodological evidence to support the relief of eye fatigue through an eye -yoga program. The present study has some limitation. The eye fatigue scale was self-rated, with no comparison with objective indicators of eye fatigue. This study was not conducted under strictly controlled research conditions; for example, some participants wore contact lenses, which may lead to higher levels of any eyes. Despite this limitation, these finding suggest that yogic eye exercise can relieve eye fatigue levels in young adult students. This study used the "comparison of reference activity "method to obtain the median frequency values. As the potential effects and

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to stretching and stabilization exercises on muscle fatigue and other condition are great, efforts are needed in the future to secure an identical external environment and a sufficient number of target subjects by using more quantitation and controlled methods that integrate with other factors. In the result of this demonstrated that visual fatigue caused by smartphone use interferes for smartphone user to reduce visual fatigue by taking appreciate rest. Also, proper guidelines on the use of smartphones should be proposed on various symptoms caused fatigue from smartphones.

CONCLUSION

The result of the present study suggests that practice of pranayama along with eye exercises for 8 week improves the visual acuity. In contrast, the control group subject who had not practiced pranayama do not show any improvement in the visual acuity. It suggests that pranayama along with eye exercises can be used as potential non-pharmacological measure for visual acuity improvement. The purpose of this review is to identify some of the environmental (for example thermal, and chemical) factors that cause alterations to the eye, resulting in complaints in office-like environments. The result of the present study suggest that a combination of yoga techniques practiced for 60 days improve self-rated visual discomfort in computer professionals.

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