

A pilot study on Effects of Eye Yogic Exercises & alternative Therapies on Eyesight Improvement

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I. BACKGROUND

Refractive error (RE) is one of the most common ocular conditions affecting all age groups, areas, economic status group and sex. The uncorrected refractive errors are a major cause of treatable visual impairment and blindness. More than 40% of the population needs refractive correction and the need for eyeglasses, contact or surgeries is growing continuously.

There are 4 common types of refractive errors: Nearsightedness (myopia) makes far-away objects look blurry, Farsightedness (hyperopia) makes nearby objects look blurry, Astigmatism can make far-away and nearby objects look blurry or distorted and Presbyopia makes it hard for middle-aged and older adults to see things up close. The highest prevalence of myopia and astigmatism is seen in South-East Asian adults. Refractive error in India is a major public health problem and requires concerted efforts from various stakeholders including the health care workforce, education professionals and parents, to manage this issue.

There are alternative therapy techniques existing from a long time but it lacks evidential studies over non pharmacological treatment approaches in treating RE. The alternative therapies known are types of Eye Yogic exercise (Reading Exercise, Watching, Near/Far focus, types of Eye moments, Eye wash, types of Palming, types of Trataka,) *Hydrotherapy, Acupressure Points, Kunjal, Jalneti, Sutra & Rubber Neti, Yoga Asana etc.* Centre for vision improvement solution is a non-surgical and customized program, natural vision improvement program which is non -invasive, cost effective, with no side effects unlike the other available solutions. It is unique as it involves different modes of therapies like Naturopathy (Hydrotherapy, Mud therapy), Eye Yogic Exercises, Acupressure, Vision Therapy, and Nutrition and

treat people with combined use of these. Some initial evidential studies have been carried out scientifically involving Optician and Statistician which have been presented in this article.

II. MATERIAL AND METHODS

A descriptive comparative study was conducted at the Centre for Vision Improvement. The subjects for the study were obtained from the Centre for Vision improvement C- 133 Raju Park New Delhi- 110062. A total of 95 subjects who have refractive errors were included in this study. The inclusion criteria in the study group were person who have any one of the three refractive errors - Myopia, Hyperopia and Astigmatism. Person with presbyopia were not included. The subjects with a cutoff point of VA of 6/12 or more. The methodology of both the assessment and the therapy was explained to the subjects. The consent form was provided, and informed consent was obtained from all of them. A detailed history and eye examination for visual acuity of the subjects were performed and recorded. The subjects underwent the Centre for Vision improvement programmer for one to two months. The clinical eye examination was conducted after the program and comparison was made between the pre and post vision therapy program.

Results: in different age group

In our study, we conduct Pre and post Visual acuity tests with 95 subjects. We arranged them into two groups, group A and group B on the basis of equal number of participants on the basis of age. Group A had age range 4 year to 20 year with mean age 11.62 ± 3.86 . & group B with age range 21 years to 50 years, had mean age 31.13 ± 7.89 .

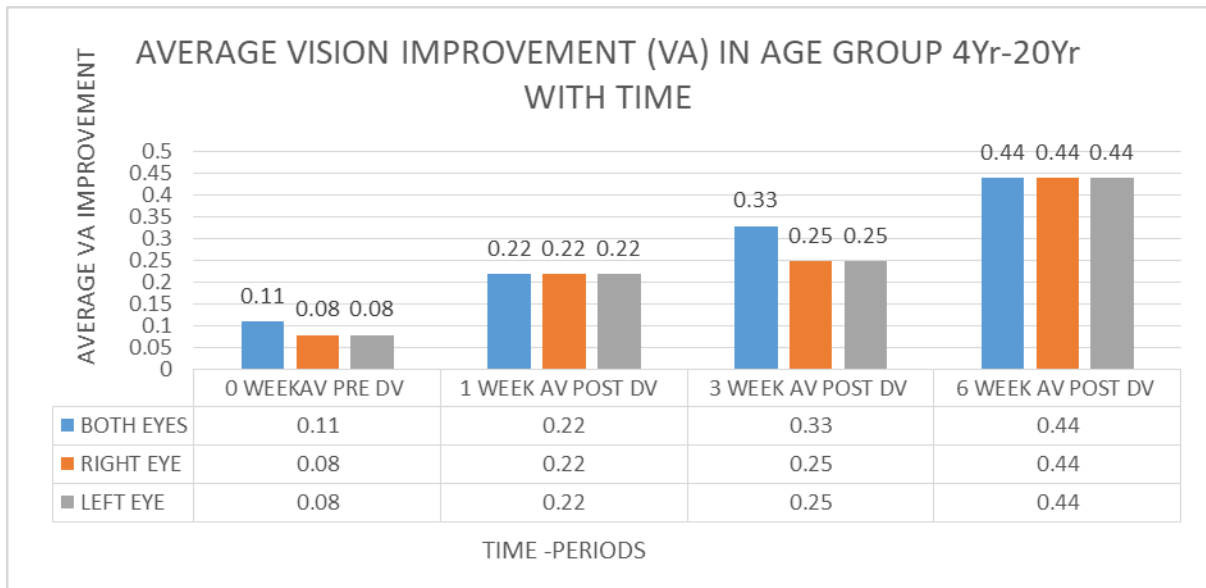


Figure 1

SUBJECT(N)	PRE	POST	BOTH EYE AV VI		POST AV	IMPROVEMENT
			POST	POST		
96	W-0	W-1	W-3	W-6	IN 6 WEEK	6W-0W
AVERAGE DV	0.11	0.22	0.33	0.44	0.33	0.33

AVERAGE DV	0.08	0.22	RIGHT EYE AV VI		0.3	0.36
			0.25	0.44		
			LEFT AV VI			
AVERAGE DV	0.08	0.22	0.25	0.44	0.3	0.36

Table -1

Group- A examined with average direct vision value (DV) of both eye (BE) was 0.11 (2/18 Visual acuity) and recorded as pre-test average direct vision of both eye. After apply the regular eye yoga therapy treatment program on group- A, we observed the average improvement among subjects after 7 days (1 week) 0.22 (3/12 VA) from 0.11 (2/18 VA), after 3 week 0.33 (4/12 VA) and after 6 weeks to 0.44 (4/9 VA). We observed the average improvement of DV of both eye after complete the program of 6 weeks (total practice day) and noted the difference of average improvement is 0.33 (4/12 VA) (as shown in figer-1, & table 1).

Average Direct vision of RE was 0.08 (1/12 VA). After 1 week following the regular exercise program result improve 0.22 (2/9 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.44 (4/9VA) (Consider figure 1 & Table 1).

Average Direct vision of LE was 0.08 (1/12 VA). After 1 week following the regular exercise program result improve 0.22 (2/9 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.44 (4/9VA) (Consider figure 1 & Table 1). We also observe that after 4 weeks some participants did not come regularly for exercise. So, their results also was not improved satisfactory in the comparatively who attend the exercises regularly.

Group- B examined with average direct vision value (DV) of both eye (BE) was 0.16 (2/12 VA) and recorded as pre-test average direct vision of both eye. After apply the regular eye yoga therapy treatment program on group- B, we observed the average improvement among subjects after 7 days (1 week) 0.22 (3/12 VA) from 0.16 (2/12 VA), after 3 week 0.25 (3/12 VA) and after 6 weeks to 0.33 (4/12 VA). We observed the average improvement

of DV of 0.266 (3/12 VA both eye after complete the program of 6 weeks (total practice day) and noted the difference of average improvement as 0.33 (4/12 VA) (shown in figer-2 & table 2).

Average Direct vision of RE was 0.11 (2/18 VA). After 1 week following the regular exercise program result improve 0.16 (2/12 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual

acuity was improved by 0.33 (4/12VA) (Consider figure 2 & table 2). Average Direct vision of LE was 0.16 (2/12 VA).

After 1 week following the regular exercise program result improve 0.22 (2/9 VA) And with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.33 (4/12VA) (Consider figure 2 & table 2). We also observe that improvement in the age group of 21-54 was less than the age group of 4-20.

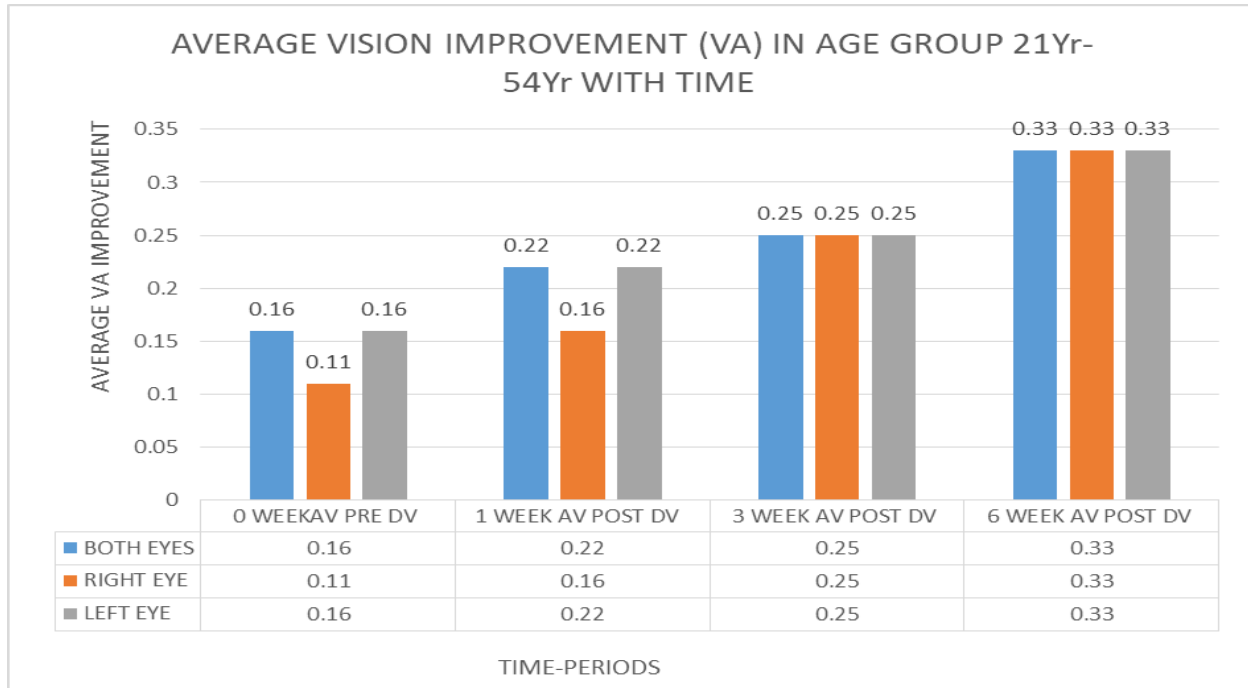


Figure 2

	PRE	POST	BOTH EYE AV VI			
SUBJECT(N)	PRE	POST	POST	POST	POST AV	IMPOVEMENT
96	W-0	W-1	W-3	W-6	IN 6 WEEK	6W-0W
AVERAGE DV	0.16	0.22	0.25	0.33	0.26	0.17
			RIGHT EYE AV VI			
AVERAGE DV	0.11	0.16	0.25	0.33	0.24	0.22
			LEFT AV VI			
AVERAGE DV	0.16	0.22	0.25	0.33	0.26	0.1

Table 2

Gender Based Results

In our study, we conduct Pre and post Visual acuity tests with 95 subjects. We arranged them into two groups, on the basis of gender.

Male Group examined with average direct vision value (DV) of both eye (BE) was 0.08 (2/18 Visual acuity) and recorded as pre-test average direct vision of both eye. After apply the regular eye yoga therapy treatment program on group- A, we observed the average improvement among subjects after 7 days (1 week) 0.22

(3/12 VA) from 0.08 (2/18 VA), after 3 week 0.33 (4/12 VA) and after 6 weeks to 0.44 (4/9 VA). We observed the average improvement of DV of both eye after complete the program of 6 weeks (total practice day) and noted the difference of average improvement is 0. (4/12 VA) (As shown in figer-3 & Table3).

Average Direct vision of RE was 0.16 (2/12 VA). After 1 week following the regular exercise program result improve 0.22 (2/9 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual

acuity was improved by 0.33 (4/12VA) (Consider figure 3 & Table 3).

Average Direct vision of male group of LE was 0.16(2/12 VA). After 1 week following the regular exercise program result improve 0.16 (2/12 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.33 (4/12VA) (Consider figure 3 & table 3).

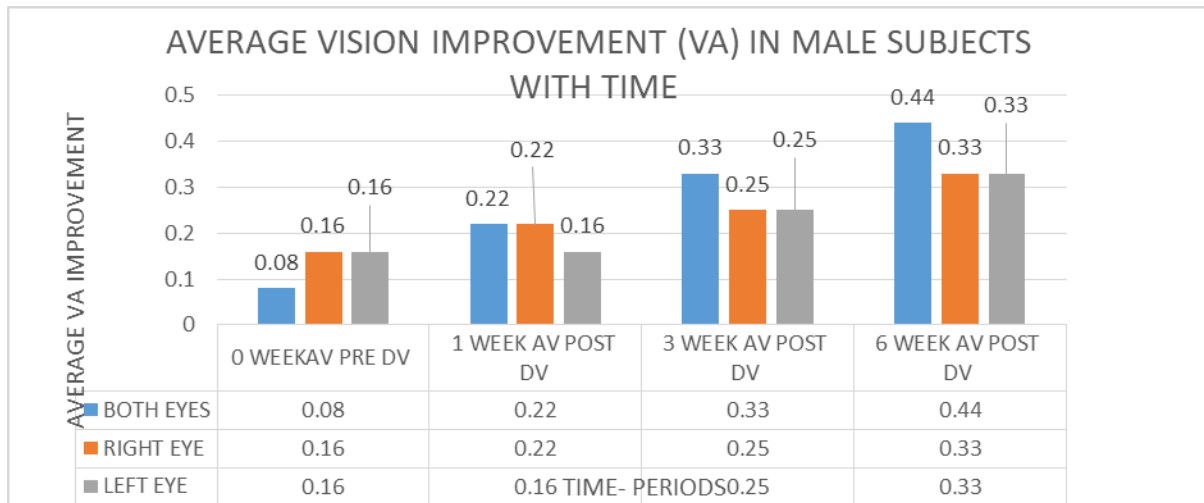


Figure 3

				BOTH EYE AV VI		
SUBJECT(N)	PRE	POST	POST	POST	POST AV	IMPROVEMENT
96	W-0	W-1	W-3	W-6	IN 6 WEEK	POST-PRE
AVERAGE DV	0.08	0.22	0.33	0.44	0.33	0.36
				RIGHT EYE AV VI		
AVERAGE DV	0.16	0.22	0.25	0.33	0.26	0.17
				LEFT AV VI		
AVERAGE DV	0.16	0.16	0.25	0.33	0.24	0.17

Table 3

Female group examined with average direct vision value (DV) of both eye (BE) was 0.22 (2/9 VA) and recorded as pre-test average direct vision of both eye. After apply the regular eye yoga therapy treatment program on group- B, we observed the average improvement among subjects after 1 week 0.33 (2/6 VA), after 3

week 0.33 (2/6 VA) and after 6 weeks to 0.44 (4/9 VA). We observed the average improvement of DV of 0.266 (3/12 VA both eye after complete the program of 6 weeks. (Shown in figer-4 & table 4).

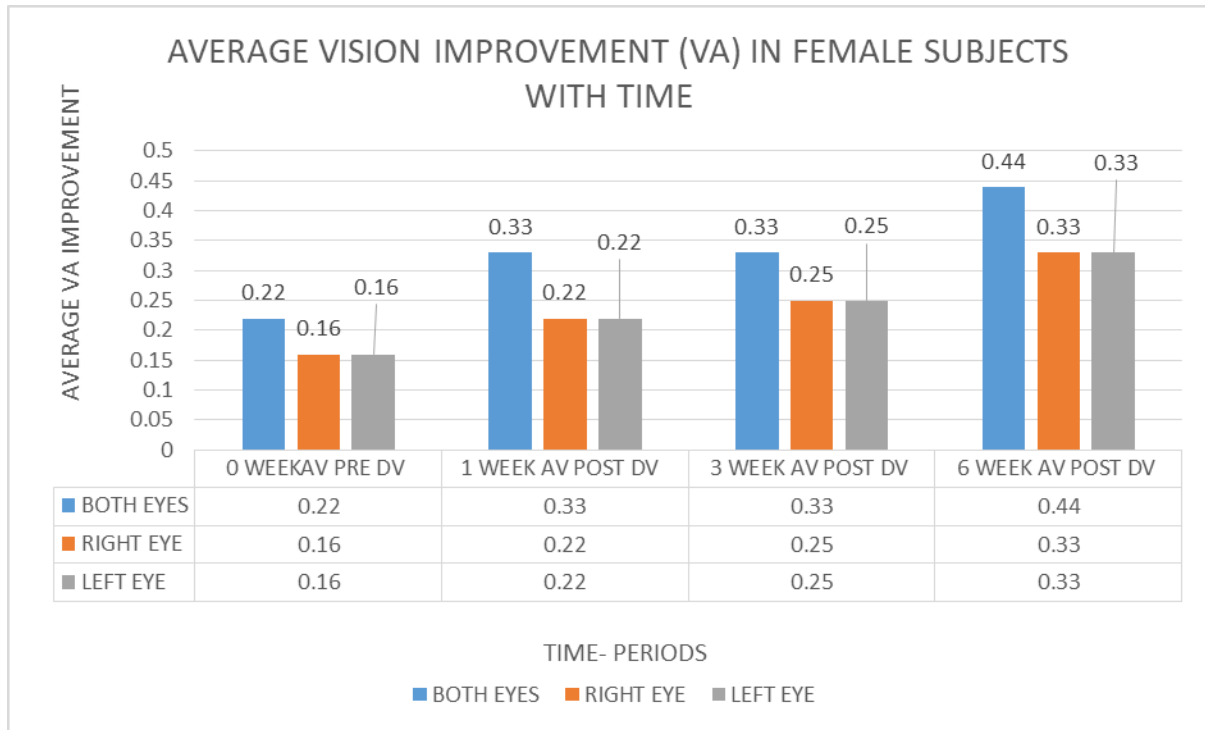


Figure 4

		BOTH EYE AV VI					
SUBJECT(N)	PRE	POST	POST	POST	POST AV	IMPOVEMENT	
41	W-0	W-1	W-3	W-6	IN 6 WEEK	6W-0W	
AVERAGE DV	0.22	0.33	0.33	0.44	0.36	0.22	
		RIGHT EYE AV VI					
AVERAGE DV	0.16	0.22	0.25	0.33	0.26	0.17	
		LEFT AV VI					
AVERAGE DV	0.16	0.22	0.25	0.33	0.26	0.17	

Table 4

Average Direct vision of RE was 0.16 (2/12 VA). After 1 week following the regular exercise program result improve 0.22 (2/9 VA) and with the continuous practice in 3 weeks result Improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.33 (4/12VA) (Consider figure 4 & table 4).

Average Direct vision of LE was 0.16 (2/12 VA). After 1 week following the regular exercise program result improve 0.22

(2/9 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA).

Average Vision Improvement in total subjects with different time period

A total of 95 subjects examined with average direct vision value (DV) of both eye (BE) was 0.16 (2/12 Visual acuity) and recorded as pre-test average direct vision of both eye. After apply the regular eye yoga therapy treatment program. We observed the average improvement among subjects after 7 days (1 week) 0.22

(2/9 VA), after 3 week 0.25 (3/12 VA) and after 6 weeks to 0.44 (4/9 VA). (As shown in figer-5).

Average Direct vision of RE was 0.11 (2/18 VA). After 1 week following the regular exercise program result improve 0.22 (2/9 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.33 (4/12 VA) (Consider figure 5).

Average Direct vision of LE was 0.16 (2/12 VA). After 1 week following the regular exercise program result improve 0.22 (2/9 VA) and with the continuous practice in 3 weeks result improved to 0.25 (3/12 VA). After six weeks post direct visual acuity was improved by 0.33 (4/9VA) (Consider figure 5)

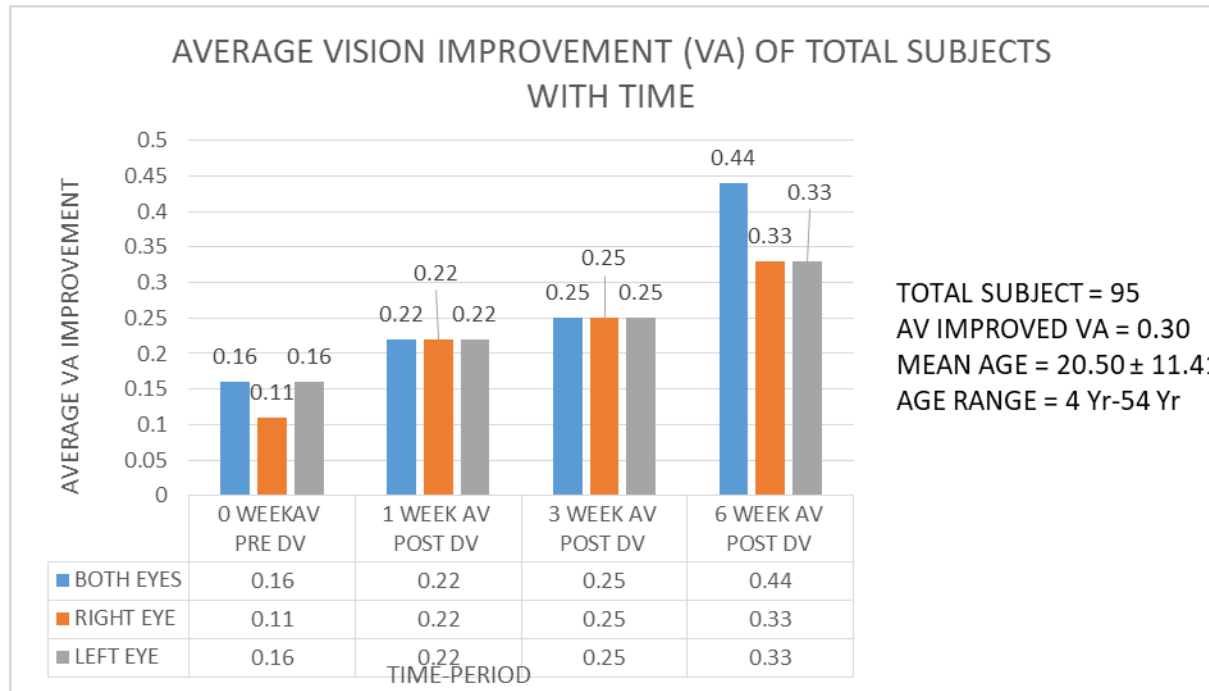


Figure 5

		BOTH EYE AV VI					
SUBJECT(N)	PRE	POST	POST	POST	POST AV	IMPOVEMENT	
96	W-0	W-1	W-3	W-6	IN 6 WEEK	POST-PRE	
AVERAGE DV	0.16	0.22	0.25	0.44	0.3	0.28	
		RIGHT EYE AV VI					
AVERAGE DV	0.11	0.22	0.25	0.33	0.26	0.22	
		LEFT AV VI					
AVERAGE DV	0.16	0.22	0.25	0.33	0.26	0.17	

Table 5

Vision improvement comparison among different categories

We found that there is no difference in improvement between male and female. But age matters a lot as we observe better result 0.44 (4/9 VA) in the age group of 4-21 and 0.33 in the

age group of 21-54. The improvement average difference is 0.11 (2/18 VA).

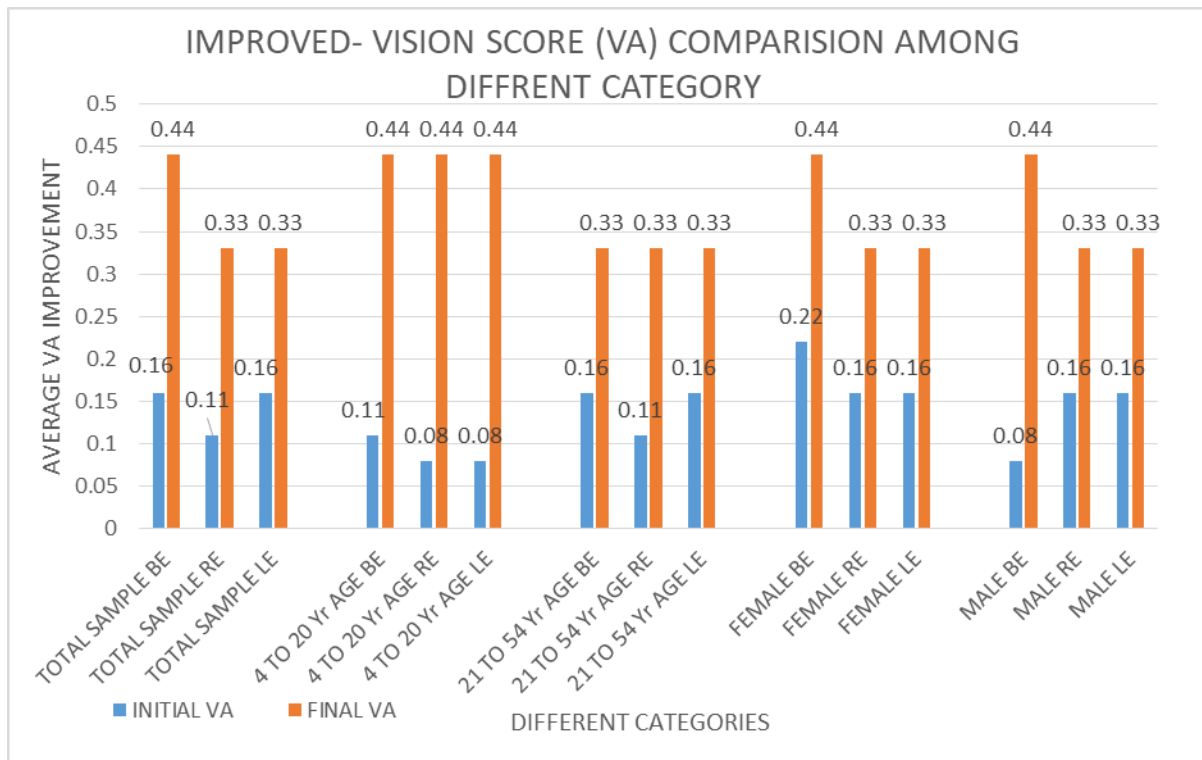


Figure 6

DIFFERENT CATEGORIES	INITIAL VA	FINAL VA
TOTAL SAMPLE BE	0.16	0.44
TOTAL SAMPLE RE	0.11	0.33
TOTAL SAMPLE LE	0.16	0.33
4 TO 20 Yr AGE BE	0.11	0.44
4 TO 20 Yr AGE RE	0.08	0.44
4 TO 20 Yr AGE LE	0.08	0.44
21 TO 54 Yr. AGE BE	0.16	0.33
21 TO 54 Yr. AGE RE	0.11	0.33

21 TO 54 Yr. AGE LE	0.16	0.33
FEMALE BE	0.22	0.44
FEMALE RE	0.16	0.33
FEMALE LE	0.16	0.33
MALE BE	0.08	0.44
MALE RE	0.16	0.33
MALE LE	0.16	0.33

Table 6

Perfect vision 6/6

Out of 95 participants 7% achieved 6/6 within first week, when they started, their vision was 6/9. And in the second week it

increase by 1% total 8 % achieve 6/6. After a complete program of 6 weeks 23% of participants achieve a perfect vision of 6/6. (Consider below table Figure 7 & table 7)

TIME-PERIODS	NUMBER OF PARTICIPANTS	NUMBER OF 6/6 ACHIVERS
1WEEK	95	7 (07 %)
3WEEK	88	8 (09 %)
6WEEK	80	7 (09 %)
Total after 6 week	95	22 (23%)

Table 7

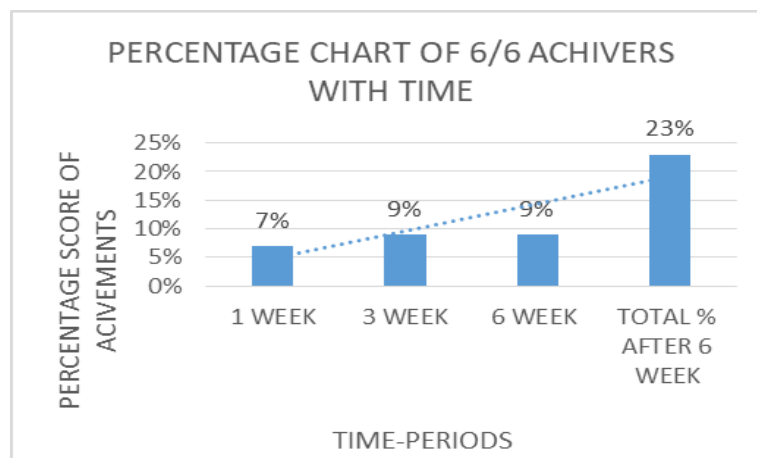


Figure 7

Conclusion

we found improvement in the Visual acuity of 90+ subjects out of 95. The average improvement was 0.33-0.44 in male-female respectively. It was further seen that the subjects in the age group of 6- 17yrs shows better results in comparison to the subjects above 17 yrs. We also found that there is no difference in improvement between male and female. But age matters a lot as we observe better result 0.44 (4/9 VA) in the age group of 4-21 and 0.33 in the age group of 21-54. The improvement average difference is 0.11 (2/18 VA).

III. DISCUSSION:

The World Health Organization has estimated that there are approximately 314 million people living with vision impairment. REs are quite common in India and the prevalence of myopia or hyperopia itself is in adults is 53.1%. If we add Astigmatism, it will go further higher. India is a developing country and a major junk of Indian population falls under below poverty line who are unable to access the available correction methods which require continuous screening and monitoring in most of the cases. Near about 10.2% of adults in India are estimated to have uncorrected RE. The numbers are higher in children. RE causing visual impairment and blindness found to be ranging from 5-11% in people over 50 in various studies and reviews.

The numbers and prevalence RE as a cause of visual impairment and blindness is significant enough for us to concentrate on the working on reducing RE a providing a productive and better life to people. [29]

The situation further worsen in the rural India which is probably not due to genetics or environmental reasons but due to lack of knowledge, access to screening and treatment, finances and also due to social believes. Worldwide, URE is the leading cause of vision impairment and the second leading cause of blindness in developing countries, including India.[1], [2] Visual impairment and blindness caused by URE in adults can have severe impact on social and economic well-being, including limiting the educational and employment opportunities of economically active persons.[3] Globally, economic loss due to lost productivity caused by URE was estimated around \$269 billion [4] and due to uncorrected presbyopia was US\$11.023 billion.[5],

There is no doubt that the existing cosmetic and medical treatments are effective solutions which has been scientifically proved based on the evidential studies but it is also true that these solutions are not permanent , don't have 100% success rate and come with risk of possible side effects which could be both minor or major. These methods and spectacles, contact lenses and RE correction surgeries like LASIK sugery. The spectacles are the most cost effective and without side effects method but it is not a permanent solution in all as the RE can change with time and has the cosmetic effects. The contact lenses can cause complications which could be minor complications like discomfort, redness, itching etc. and also complications keratitis, conjunctivitis etc. L that are troublesome for the patients.

Despite the success of laser refractive surgery to correct low order aberrations, the incidence of postoperative symptoms like glare, halos and reduced night vision remains to be relatively high.1, 2, 3 these visual outcomes can duster the quality of life of patients. Both the contact lenses and surgeries are expensive

treatment. Therefore the age factor, cost of the treatment, complications limit its applications. Recent claims of genetic modulation therapy are under evaluation and its success rate is doubtful.

There are various alternative therapy available and practiced in various countries like Eye exercise, Trataka Yoga Kriya , eye exercises, Acupuncture etc. It is practiced in many reputed institutes of India like School for perfect eyesight at Pondicherry. . There have been various studies published on these methods efficacy and acceptance.

Et al reported a performance enhancement for the detection of visual targets when presented in very rapid succession (i.e., separated by one or no distractors) following repetitive eye movements. Although the RSVP task did not demonstrate any differences in reaction time following the eye exercises, there was a significant increase in letter identification accuracy in the experimental group on.

In a prospective, randomized, controlled, cross-over trial, Lam et al (2011) evaluated the safety and adjunctive effect of acupuncture added to refractive correction for anisotropic amblyopia in younger children. The authors concluded that acupuncture is a potentially useful complementary treatment modality that may provide sustainable adjunctive effect to refractive correction for anisotropic amblyopia in young children. et al noted one line improvement was noted in Snellen's chart reading. They also reported a moderate improvement in clarity of vision, contrast sensitivity, and fineness of objects. It is an encouraging finding that a non-pharmacological, low cost, relaxation technique can improve the quality of vision, by which it indirectly checks the progression of the disease condition. Both these techniques act as adjuvant therapy hence one should adopt pharmacological interventions (medical management), life style, and diet modifications to get a better result.

The genetics, diet, life style and occupation also play a major role in development of RE. The children of people with RE have higher incidence of RE. The children and adults with unhealthy eating habits and involved in continuous use of phones and computers have higher incidence of RE. Although much can't be done about Genetics but better nutrition and lifestyle modifications can help significantly.

Centre for vision improvement solution is a non-surgical, customized, natural vision improvement program. It is a non -invasive, cost effective and permanent solution with no side effects unlike the other available solutions. It is unique as it involves different modes of therapies like Naturopathy (hydrotherapy, mud therapy), Eye Yogic Exercises, Acupressure, Vision Therapy, and Nutrition and treat people with combined use of these. Our vision therapy method of Vision therapy could be a permanent, economical and without side effects therapy. Although it needs more evidential data for the scientific society to believe in the same.

There are various studies suggesting use of réfraction as better way to assess the REs compared to estimating REs based on vision improvement with pin hole. There is a difference of opinion on the cutoff point of 6/18 or 6/12 in these studies.

We choose 6/12 as the cutoff point and pin whole assessment for our study.

In our study, we found improvement in the Visual acuity of 90+ subjects out of 95. There was less improvement in those

people, who practice it occasionally. We noticed better outcomes in case of Astigmatism and Hyperopia. Visual acuity improves faster in these conditions. It was further seen that the subjects in the age group of 6- 17yrs shows better results in comparison to the subjects above 17 yrs.

The results in our study show significant and encouraging results but there is a need to collect more data to present a concrete and unchallengeable solution

IV. CONCLUSION

The initial study results shows considerable improvement in the refractive error and visual acuity of the subjects. This needs to be interpreted cautiously at this stage and needs to further evaluate in details.

REFERENCES

- [1] J Ophthalmic Vis Res. 2017 Apr-Jun; 12(2): 193–204. Contact Lens-related Complications: A Review Fateme Alipour et al
- [2] Sethu Sheeldevi et al, Prevalence of refractive errors, uncorrected refractive error, and presbyopia in adults in India: A systematic review, Vol: 67, issue 5, 2019, Pg 583-592
- [3] Visual outcomes and management after corneal refractive surgery: A review Ane Murueta-Goyena, Pilar Cañadas J Optom. 2018 Apr-Jun; 11(2): 121–129. Published online 2017 Nov 26. doi: 10.1016/j.optom.2017.09.002
- [4] Eye Exercises Enhance Accuracy and Letter Recognition, but Not Reaction Time, in a Modified Rapid Serial Visual Presentation Task Paula Di Noto, Sorin Uta, Joseph F. X. DeSouza PLoS One. 2013; 8(3): e59244. Published online 2013 Mar 19. doi: 10.1371/journal.pone.0059244
- [5] http://www.aetna.com/cpb/medical/data/100_199/0135.html
- [6] A clinical study to evaluate the efficacy of Trataka Yoga Kriya and eye exercises (non- pharmacological methods) in the management of Timira (Ammetropia and Presbyopia)G. Gopinathan, Kartar Singh Dhiman, R. Manjusha Ayu. 2012 Oct-Dec; 33(4): 543–546. doi: 10.4103/0974-8520.110534
- [7] Young, T. L. (2009). Molecular genetics of human myopia: An update. Optometry and Vision Science, 86(1), E8-E22.

- [8] Edward, M. H. (1996). Do variations in normal nutrition play a role in the development of myopia. Optometry and Vision Science, 73, 638-643. Volume: 6 issue: 2,
- [9] K. Jayaraman¹, Mohammad Iranmanesh², Chuan Chin Liang¹, Mahboobeh Iranmanesh³ Mutti, D. O. (2010). Hereditary and environmental contributions to emmetropization and myopia. Optometry and Vision Science, 87, 255-259.
- [10] <https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/refractive-errors>
- [11] Tiwari KK, Shaik R, Aparna B, Brundavanam R. A comparative study on the effects of vintage nonpharmacological techniques in reducing myopia (Bates eye exercise therapy vs. Trataka Yoga Kriya). Int J Yoga 2018;11:72-6
- [12] Dandona R, Dandona L. Refractive error blindness. Bull World Health Organ 2001;79:237-43.
- [13] Resnikoff S, Pascolini D, Mariotti SP, Pokharel GP. Global magnitude of visual impairment caused by uncorrected refractive errors in 2004. Bull World Health Organ 2008;86:63-70.
- [14] Naidoo KS, Jaggernath J. Uncorrected refractive errors. Indian J Ophthalmol 2012;60:432-7.
- [15] Prevalence of refractive errors, uncorrected refractive error, and presbyopia in adults in India: A systematic review Year: 2019, Vol:67, issue 5, Pgs 583-592
- [16] Clin Exp Optom. 2018 Jul;101(4):495-503. doi: 10.1111/cxo.12689. Epub 2018 Apr 22.

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