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Original Research Article

Assessment of Effectiveness of Trataka Exercise on Vision and Aesthenopia among Student Nurses with Refractive Error

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ABSTRACT

Topic: A study to assess the effectiveness of trataka exercise on vision and aesthenopia among student nurses with refractive error in a selected college of nursing of Delhi.
Objectives: The objectives of the study were to assess the effectiveness of trataka exercise on vision among student nurses and to assess the effectiveness of trataka exercise on aesthenopia among student nurses.
Methodology: A quantitative research approach (true experimental) with pre – test - post – test control group design was used. Purposive sampling technique was adopted to select 30 student nurses with refractive error from Rufaida College of Nursing, Delhi. Data was collected using standard Snellen's chart and a structured checklist. The tool was validated and reliability of the tool was established as 0.8 using KR – 20.
Results: There was no significant difference in vision of student nurses who received trataka exercise in the experimental group at 0.05 level of significance. In the experimental group there was significance difference in aesthenopia in student nurses who received trataka exercise at 0.05 level of significance. In the control group there was no significant difference in both vision and aesthenopia at 0.05 level of significance.
Conclusion
Student nurses who performed trataka exercise showed decrease in aesthenopia than those who were not administered the exercise. There was no significant difference in vision in the experimental group and control group after the intervention. Trataka exercise was an effective method for the management of aesthenopia among student nurses with refractive error.

Key words: Trataka exercise, aesthenopia, refractive error

INTRODUCTION

Humans have five senses: the eyes to see, the tongue to taste, the nose to smell, the ears to hear, and the skin to feel. By far the most important organs of sense are our eyes. We perceive up to 80 per cent of all impressions by means of our sight. And if other senses such as taste or smell stop working, it's the eyes that best protect us from danger. Low vision and blindness have dire effects on individuals, families, and communities. These effects range from a decrease in quality of life and increased mortality to large-scale economic consequences.

Visual disturbance is represented as one of the most complex problem in the field of ophthalmology and has been of great interest ever since the dawn of human life. Now a days, myopia especially in

children and adolescence is quite common ophthalmic disease and seldom exceeds 5-6 D (dioptre). Glasses neutralize the effect of such conditions but do not relieve the cause of the trouble, so in many cases, despite using glasses the disease continues to progress. Estimates of the number of people worldwide with refractive error range from 8 million to 2.3 billion. [1] Ocular complaints of computer users have been grouped together and collectively termed as computer vision syndrome (CVS). [2] It is defined by the American Optometric Association as a complex of eye and vision problems related to activities, which stress the near vision and which are experienced in relation or during the use of computer. Blurred vision, dry eyes, burning sensation, redness of eyes and headache are the main symptoms resulting from improper use of computers. [3]

Apart from the duration of usage, factors such as poor lighting, glare, screen brightness, vision problems and improper work station setup also account for eye and visual problems associated with computer usage. [4] Sustained periods of close screen work results in visual fatigue symptoms such as sore eyes and increased glare sensitivity. [5] Dry eyes and related symptoms are associated with reduced blink rate and horizontal gaze causing wider opening of the palpebral fissure that lead to increased evaporation through exposed area. [6] The discomfort associated with computer usage has not yet been proven to result in permanent damage, but may cause a reduction in work accuracy. This can reduce productivity by as much as 40%. [7] The extensive use of computers as a tool in teaching and learning in universities necessitates introspection into the extent of the disorder's effect on the population of students tested.

Objectives of the study

1. To assess the effectiveness of trataka exercise on vision among student nurses.
2. To assess the effectiveness of trataka exercise on aesthenopia among student nurses.

MATERIALS AND METHODS

Research Approach: Quantitative approach (true experimental)

Research Design: Pre – test Post – test Control Group Design

Variables under study

Independent variable: In the present study, the independent variable is trataka exercise.

Dependent Variable: In this study the dependent variables are vision and aesthenopia among student nurses with refractive error.

Setting of the study: The setting for the pilot study and final study was Rufaida College of Nursing, Jamia Hamdard, New Delhi

Population: Population comprised of student nurses with refractive error studying at Rufaida College of Nursing, Jamia Hamdard, New Delhi

Sample: The sample comprised of student nurses belonging to the age group of 15 – 25 years studying at Rufaida College of Nursing, New Delhi.

Sampling technique: Purposive sampling technique was used. A total of 30 student nurses were selected, out of 30, 15 each were randomly assigned to experimental and control group using lottery method.

Procedure

- Ethical permission was taken from the Institutional Ethical Committee of Jamia Hamdard, New Delhi to conduct the research study.
- Permission was obtained, to conduct the research study, from the principal of Rufaida College of Nursing, Jamia Hamdard, New Delhi.
- Snellen’s chart was used to assess vision. Snellen’s chart is a standardized tool. A structured checklist to assess aesthenopia among student nurses with refractive error was developed.
- The structured checklist consisted of 17 items. The maximum score was 17 and the minimum score was 0.

- The researcher had undergone one month training in trataka exercise from Morarji Desai National Institute of Yoga, New Delhi.
- Procedure of trataka exercise and the protocol for assessing the administration of trataka exercise to the student nurses were developed.
- The content validity of the tool was established by giving it to 7 experts from the field of medical science, medical education, nursing science and nursing education.
- The reliability of the tool was obtained as 0.8 by Kuder-Richardson Formula 20 (KR-20). The reliability of the procedure protocol was established through inter rater reliability and r was 0.96.
- Formal administrative approval was obtained from the concerned authority to conduct the final study.
- The student nurses who met the inclusion criteria were selected using purposive sampling technique. The purpose of the study was explained to the participants. After obtaining their willingness to participate in the study the data were collected from the sample subjects.
- On day 1, vision was assessed using Snellen's chart and aesthenopia was assessed using structured checklist in both the groups.
- Trataka exercise was administered for 10 minutes in the experimental group for 2 weeks. No intervention was administered in the control group.
- On 15th day post- test vision and aesthenopia was assessed in both the groups.

STATISTICAL ANALYSIS

- The data was analysed using descriptive and inferential statistics. The vision scores were represented using logMAR.
- Frequency and percentage distribution to describe the demographic characteristics of the student nurses.
- 't' value computation to determine the significance of difference between mean pre – test and mean post – test vision scores in the experimental and control group.
- 't' value computation to determine the significance of difference between mean post – test vision scores in the experimental and control group.
- 't' value computation to determine the significance of difference between mean pre – test and mean post – test aesthenopia scores in the experimental and control group.
- 't' value computation to determine the significance of difference between mean post – test aesthenopia scores in the experimental and control group.

RESULTS

Frequency and percentage distribution of student nurses by their age, gender, religion, educational background, marital status, type of family, income and duration of diagnosis.

Table – 1: Comparison of demographic characteristics of student nurses with refractive error in the experimental and control group. $n_1 + n_2 = 30$

S. No	Sample Characteristics	Experimental Group		Control Group		Test applied	p value
		F	%	F	%		
1.	**Age(in years)**						
1.1	15 – 20	9	60	8	53.33	Chi – square	0.5
1.2	21 – 25	6	40	7	46.67		NS
2.	**Gender**					Test cannot be performed.	
2.1	Male	-	-	-	-		
2.2	Female	15	100	15	100		
3.	**Religion**						
3.1	Hindu	5	33.33	4	26.67	Fisher's exact test	0.76
3.2	Muslim	7	46.67	9	60		NS
3.3	Christian	3	20	2	13.33		
4.	**Educational Background**						
4.1	DGNM	6	40	8	53.33	Fisher's exact test	0.27
4.2	BSc Nursing	7	46.67	3	20		NS
4.3	PBBSc Nursing	-	-	2	13.33		
4.4	MSc Nursing	2	13.33	2	13.33		

To be continued table 1….							
5.	**Marital Status**						
5.1	Single	15	100	12	80	Fisher's exact test	0.2
5.2	Married	-	-	3	20		NS
6.	**Family Type**						
6.1	Nuclear Family	12	80	8	53.33	Fisher's exact test	0.24
6.2	Joint Family	3	20	7	46.67		NS
7.	**Family Income**						
7.1	8000 – 15000	1	6.67	-	-		
7.2	16000 – 30000	5	33.33	3	20	Fisher's exact test	0.27
7.3	31000 – 50000	4	26.67	9	60		NS
7.4	Above 50000	5	33.33	3	20		

NS – Not significant at 0.05 level, p>0.05 level

Table – 2: Comparison of clinical records of subjects by history of other illness and duration of diagnosis in the experimental and control Group $n_1 + n_2 = 30$

S.No	Sample Characteristics	Experimental Group		Control Group		Test Applied	P value
		F	%	F	%		
8.	**Other Illness**						
8.1	Yes	3	20	2	13.33	Fisher's exact test	1
8.2	No	12	80	13	86.67		NS
9.	**Duration of refractive error**						
9.1	0-6 months	2	13.33	-	-		
9.2	6-12 months	2	13.33	-	-	Fisher's exact test	0.18
9.3	2-5 years	2	13.33	4	26.67		NS
9.4	Above 5 years	9	60	11	73.33		

NS – Not significant at 0.05 level, p>0.05 level

Table – 3: Mean, Mean difference, Standard Deviation, Standard Error and 't' value of pre – test and post – test left eye vision (logMAR) scores in the experimental and control group. $n_1 + n_2 = 30$

Group	Mean	M D	SD	SE	't' value
Experimental Group					
Pre – test	0.39	0.09	0.16	0.04	0.4
Post –test	0.30		0.11	0.02	
Control Group					
Pre – test	0.39	0.04	0.16	0.04	0.17
Post – test	0.35		0.15	0.03	

't' (14) = 2.15, Non significant at 0.05 level of significance

The mean pre – test left eye vision score (0.39) was higher than the mean post – test left eye vision score (0.30) with a mean difference of 0.09 in the experimental group. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 0.4 which is less than the table value of 2.15 at 0.05 level of significance.

Table 4: Mean, Mean difference, Standard Deviation, Standard Error and 't' value of post – test left eye vision (logMAR) scores in the experimental and control group $n_1 + n_2 = 30$

Group	Mean	M D	SD	SE	't' value
Experimental Group					
Post –test	0.30	0.05	0.11	0.02	0.65
Control Group					
Post – test	0.35		0.15	0.03	

't' (14) = 2.15, Not significant at 0.05 level of significance

In the control group the mean pre – test vision score (0.39) was higher than the mean post – test vision score (0.35) with a mean difference of 0.04. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 0.17 which is less than the table value of 2.15 at 0.05 level of significance.

The mean post-test left eye vision score in the experimental group (0.30) was lower than the mean post-test left eye vision score (0.35) in the control group with a mean difference of 0.05. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 0.65 less than the table value of 2.15. This indicates that there was no significant difference in vision among experimental and control group after the intervention.

Table – 5 : Mean, Mean difference, Standard Deviation, Standard Error and 't' value of pre – test and post – test right eye vision (logMAR) scores in the experimental and control group. $n_1 + n_2 = 30$

Group	Mean	M D	SD	SE	't' value
Experimental Group					
Pre – test	0.36	0.1	0.15	0.04	1.9
Post –test	0.26		0.11	0.03	
Control Group					
Pre – test	0.40	0.01	0.13	0.03	0.25
Post – test	0.39		0.14	0.04	

t' (14) = 2.15, Not significant at 0.05 level of significance

The mean pre – test right eye vision score (0.36) was higher than the mean post

– test right eye vision score (0.26) with a mean difference of 0.1 in the experimental group. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 1.9 which is less than the table value of 2.15 at 0.05 level of significance. In the control group the mean pre – test right eye vision score (0.40) was higher than the mean post – test right eye vision score (0.30) with a mean difference of 0.01. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 0.25 which is less than the table value of 2.15 at 0.05 level of significance.

Table – 6: Mean, Mean difference, Standard Deviation, Standard Error and 't' value of post – test right eye vision (logMAR) scores in the experimental and control group $n_1 + n_2 = 30$

Group	Mean	M D	SD	SE	't' value
Experimental Group					
Post –test	0.26	0.13	0.11	0.03	1.25
Control Group					
Post – test	0.39		0.14	0.04	

't' (14) = 2.15, Not significant at 0.05 level of significance

The mean post-test right eye vision score in the experimental group (0.26) was lower than the mean post-test left eye vision score (0.39) in the control group with a mean difference of 0.05. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 1.25 less than the table value of 2.15. This indicates that there was no significant difference in right eye vision among experimental and control group after the intervention.

Table – 7: Mean, Mean difference, Standard Deviation, Standard Error and 't' value of pre – test and post – test aesthenopia scores in the experimental and control group. $n_1 + n_2 = 30$

Group	Mean	MD	SD	SE	't' value
Experimental Group					
Pre – test	10.73	3.13	2.31	0.59	**6.87
Post –test	7.6		2.23	0.57	
Control Group					
Pre – test	11.13	0.33	2.09	0.54	1.47
Post – test	10.8		2.36	0.60	

't'(14) = 2.15, **significant at 0.05 level of significance

The mean post – test aesthenopia score (7.6) was lower than the mean pre – test aesthenopia score (10.73) in the experimental group with a mean difference of 3.13. The obtained mean difference was found to be statistically significant as evident from the calculated 't' value of 6.87 which is greater than the table value of 2.15 at 0.05 level of significance. This shows that the obtained mean difference between the pre – test and post – test aesthenopia scores in the experimental group was a true difference and not by chance. In the control group the mean post- test aesthenopia score (10.8) was lower than the mean pre – test aesthenopia score (11.13) with a mean difference of 0.33. The obtained mean difference was not statistically significant as evident from the calculated 't' value of 1.47 which is lower than the table value of 2.15 at 0.05 level of significance.

Table 8: Mean, Mean difference, Standard Deviation, Standard Error and 't' value of post – test aesthenopia scores in the experimental and control group. $n_1 + n_2 = 30$

Group	Mean	MD	SD	SE	't' value
Experimental Group					
Post–test aesthenopia score	7.6	3.2	2.23	0.57	**7.34
Control Group					
Post – test aesthenopia score	10.8		2.36	0.6	

't'(14) = 2.15, **significant at 0.05 level of significance

The mean post – test aesthenopia score (7.6) was lower in the experimental group than the mean post – test aesthenopia score (10.8) in the control group. The obtained mean difference was statistically significant as evident from the calculated 't' value of 7.34 more than the tabulated 't' value of 2.15 at 0.05 level of significance. This indicates that there was significant difference in aesthenopia in the experimental group and control group after the intervention.

DISCUSSION

Eye exercise and Trataka yoga kriya, the basic concepts behind these are relaxation techniques. Relaxation of mind and eyes improves the vision. Eye exercises have a great role for play in aesthenopic features. The practice of Trataka is based on the scientific fact, that the movement of the

eyeballs can reflect our thinking process. When we concentrate, our thoughts are focused on a particular subject due to which, the stray thoughts become less or may even vanish. At the same time the eyeballs become steadier. [8]

In this era of changed life style and increased pace, it is the primary duty of Ayurvedic community to educate the society regarding the healthy use of eye. A regular schedule in this regard for the prompt relaxation of eye is not only beneficial to such refractive problems but also can prevent many degenerative conditions. The agenda behind this particular study was to popularize trataka exercise, a simple technique which can contribute to mankind in prevention of many eye diseases and provide relief to too many visual problems/aesthenopic symptoms.

The present study concluded that trataka exercise was effective in reducing aesthenopic symptoms in the experimental group.

These findings have been supported by the findings by G. Gopinathan, Kartar Singh Dhiman and R. Manjusha to evaluate the efficacy of trataka yoga kriya in the management of timira (Ammetropia and Presbyopia).The study showed that none of the patient's aesthenopic symptoms were cured and markedly improved in eye exercises group. In Trataka group, moderate improvement was observed in one patient, mild improvement was observed in 20 patients and no improvement was observed in 10 patients of timira. In Snellen's chart reading one line improvement was noted. There was moderate improvement in clarity of vision, contrast sensitivity, and fineness of objects. Though the degree of this improvement was almost similar in both the groups, a better relief was appreciated by patients of Trataka Yoga Kriya group. [9]

Another study was conducted by Lolage and Jadhav on effects of yogic exercise and myopia of high school girls. The purpose of the study was to measure the effect of Yogic exercise on Myopia of high school girls. This experiment therefore included thirty (N=30) high school girls age ranged from 11-15 from Guajarati Kanyaprashala gulmandi Aurangabad. The subjects were divided in to two groups i.e. control group (n=15) and experimental group (n=15) Initial test of Myopia was conducted to all subjects. In training of Yogic Exercise, which included OM stawan, Anulom-vilom, Kapalbhati, Bhramari, Ujjayi Pranayama, OM recitation, eye exercise tratak, palming and Yoganidra. After one month, training of Yogic exercise final test was conducted for the entire subjects. The obtained data would statistically analyzed by using T ratio. It was found that the practice of Yogic Exercise was improved the Eyesight of high school girls. [10]

Limitation

The limitations of the study were:

The study was confined to only 15 samples in each group and to only one institute that limits generalization of findings.

Recommendations

On the basis of the findings, the following recommendations were made for the future research:

- The study can be replicated on a larger sample to validate the findings and make generalizations.
- A comparative study can be done to assess the effectiveness of other non pharmacological methods in the correction of refractive errors.
- A study can be replicated on larger samples of patients in clinical settings.
- A study can be conducted to assess the effectiveness of trataka on improving cognitive functions.

CONCLUSION

Trataka exercise was an effective method for the management of aesthenopia among student nurses with refractive error.

IMPLICATIONS OF THE STUDY

The findings of the study have implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

- Knowledge about trataka exercise will enable the nurse to teach the same to patients with refractive problems.
- They can also contribute towards minimizing the health care expenditure of the patients by encouraging them to implement non pharmacological low cost relaxation techniques such as trataka that can significantly improve occular health.

Nursing Education

- In modern health care systems ophthalmic nurses are well recognized in the management of medical and emergency conditions and they could spend more time with ophthalmic patients than others.
- Nurses with higher education and up to date knowledge will deliver cost effective and quality care. Therefore to ensure nurses to manage ophthalmic conditions of the patients they should be provided with adequate knowledge about the treatment strategies.

Nursing Administration

- Nurse administrators should encourage more nurses to participate actively in creating awareness about the benefits of yoga eye exercises in preventing refractive errors.
- Nurse administrators in collaboration with ophthalmologist can emphasize on the use of non pharmacologic methods in the treatment of visual disorders**.**

Nursing Research

- Different specialized areas invite the researcher's to find new ways to manage patient care.
- This study calls in for more researches in this area to identify cost – effective strategies to curb the rising phenomenon of refractive errors in students.

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