International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

A Study to Evaluate the Effectiveness of Ophthalmic Exercises on Visual Discomfort Related to Use of Electronic Gadgets Among Under Graduate Students At Selected Colleges, Coimbatore.

J.R. Rani[1], S. Kanmani[2], Dr. T . Nirmala[3]

[1]M.Sc Nursing Student, College of Nursing, SRIPMS, Coimbatore.
[2]Assistant Professor, College of Nursing, SRIPMS, Coimbatore.
[3]Principal, College of Nursing, SRIPMS, Coimbatore.

ABSTRACT

An Experimental pretest posttest control group design was adopted in this study. By using Random sampling technique, (Lottery method),60 samples were selected. 30 in experimental and 30 in control group. The demographic variables, clinical profile of the samples was collected, the level of visual discomfort was assessed by structured questionnaire in both experimental and control group. Intervention ophthalmic exercises was given to experimental group and no intervention was given to control group. It was identified that the mean level of visual discomfort among undergraduate students in the experimental and control group was 20.70 and 26.17 respectively with mean difference of 5.47. Likewise the standard deviation of the experimental and control group was 7.86 and 10.84 respectively. The calculated 't' value 2.23 was greater than the table value of 1.96 at 0.05 level of significance. Hence, it was concluded that ophthalmic exercises was an effective method to reduce the visual discomfort related to use of electronic gadgets among under graduate students.

Keywords: Ophthalmic exercises, Visual discomfort, Electronic gadgets, Under graduate students.

Introduction:

Eyes are vital organs in an individual's daily lives. Except during sleep, an immense variety of visual information is perceived by us through eyes both, at work and at home. Most users of visual displays have reported sorts of visual discomfort like tired eyes, dry eyes, eye strain, eye irritation, poor visual acuity, burning sensations, redness, and diplopia. Nowadays, University students are readily exposed to accelerated environmental eye fatigue as frequent users of electronic gadget screens. Generally, eye fatigue can be influenced by factors such as artificial or insufficient lighting, prolonged watching of visual displays, poor diet, eye muscle inefficiency due to prolonged hours, academic studies, psychosocial and emotional tension. (Kim, 2016)

Vision may be a complex perceptual process that's often mistakenly believed to be purely mechanical. The complexity of human vision means almost a fifth of the brain is dedicated to visual processing cells. Eye

discomfort may be a common ill health experienced by electronic gadget users. Often, people are unaware of existing visual problems which will only come to light once they begin using computers, laptops, smart phones because the demand on the sensory system of this work are often very high. (Bhuvaneshwari ,2020)
The eyes are the pair of sensory organs responsible for sight, a crucial role in all living systems and an invaluable gift to human kind. It is thus of utmost importance, to take good care of these delicate body parts from a young age, to maintain optimal vision particularly in the current challenging circumstances of lockdown and continuous online course. Some simple and effective eye exercises can manage vision ailed disorder and condition and foster augmented eye sight. (Times of India, 2020)
When the visual system is required to operate close for a prolonged period, people may operate less efficiently, often with signs and symptoms of discomfort. Typical signs are red, itchy or watering eyes. Typical symptoms include pain in and around the eyes, headache, nausea and fatigue, such signs and symptoms can be produced by many factors, both physiological and psychological, so care has to be taken when identifying the cause of any discomfort. (Wikin ,2017)

Need for the study:

Twenty first century is a period of equipment, and every now and then, more stat to the art electronic devices are brought into the market. The relative time spent on computers and diverse gadgets has extended rapidly. Prolonged usage of electronic gadgets leads to significant dependence and this may leads to new different restorative physical and mental issues. Computer vision issue results from the deferred use of computer. Transcendence of computer vision syndrome ranges from 64% to 90% among computer customers. It is described as a group of vision related problems and the level of discomfort may increase with time expenditure on the gadgets. In order to avoid computer vision syndrome, everyone should be educated on ophthalmic exercises and to know how to overcome digital eye strain. (Devi, 2019)
Online learning may appear to be the only option in corona times, but long screen times and sitting before devices would result in permanent headache and health problems would arise if this continues for long said high scores of examination. Online classes are affecting the eye and health of school toppers. Long online classes are causing pain and swelling in eyes which are glued to screen for five-six hours continuously. Eye dryness, irritation and health issues like back pain take the front seat during online classes (Times of India, 2021).

Literature review

Abudawood and et al., (2020) conducted a cross-sectional descriptive study among 651 under graduate medical students in king Abdulaziz university, Saudi Arabia to determine the prevalence of computer vision syndrome and its associated risk factors and to assess the awareness and proper practice of using computers for studying. An electronic survey was conducted to collect the data. High prevalence of computer vision syndrome was observed, in which 95% (558) reported at least one symptom during studies using computers. The most significant risk factors related to the daily usage of computer were longer duration of studying, short distance from the screen, and high brightness of the screen. The most significant preventive measure taken to relieve the symptoms was applying the 20-20-20 rule, and concluded that computer vision syndrome is common among medical students and significant risk factors need to be addressed to reduce the symptom and to ensure a better productivity of work.
Kulkarni &Bhore (2019) conducted a cross sectional survey to assess the effects of electronic gadgets (television, mobile phone and computer) on health status among secondary school students in the selected

districts of Maharashtra. Non-probability, convenient sampling was used to select 36 secondary school students. Assessment tools (hearing, body weight, digestion, sleep, emotional status, fingertip ulcer, vision, bowel movement and comfort) were used to collect the data. Result revealed that 72% had hearing problem, 79% respondents had headache and 60% respondents had sleep problem, 45 % respondent had impact on thinking and memory, 85 % respondent had problem of depression, 69 % respondent had impact on mental stability, and 68 respondent had impact on level of consciousness who had used the gadgets more than 6 hours per day.

Bhuvaneshwari & Bernard (2020) conducted a quantitative true experimental study to assess the effectiveness of ophthalmic exercises on visual discomfort among 50 computer workers in Star Travel Company, Chennai. Purposive sampling technique and self-administered structured questionnaires were used. The ophthalmic exercises were taught to the company workers and they were asked to perform the exercise every day for 1 week. After a week, the visual discomfort was reassessed. The study had shown that the computer worker had significant reduction in visual discomfort 't' value 3.85 statistically significant $P \leq 0.05$ level after ophthalmic exercises. This study indicates that the eye exercise reduces the eye disease helps in good vision.

Statement of the problem

A Study to Evaluate the Effectiveness of Ophthalmic Exercises on Visual Discomfort Related to Use of Electronic Gadgets among Undergraduate Students.

Objectives of the study

1. To assess the level of visual discomfort related to use of electronic gadgets among the under graduate students.
2. To evaluate the effectiveness of ophthalmic exercises on visual discomfort related to use of electronic gadgets among under graduate students.
3. To find out the association between the level of visual discomfort related to use of electronic gadgets with selected variables among under graduate students.

Operational definitions

Effectiveness

It refers to the outcome or changes in the visual discomfort after practicing the ophthalmic exercises.

Ophthalmic exercises

It refers to palming exercise, slow blinking, squeeze blinking, rotation of the eye ball, at all directions to relieve visual discomfort. It will be practiced for 30 minutes twice a day for four weeks.

Visual discomfort

It refers to the presence of eye strain, itching of eyes, dryness of eyes, blinking, and double vision. It is measured by visual discomfort structured questionnaire.

Electronic gadget

The term electronic gadget refers to use of electronic screens such as mobile phone, computer, laptops etc.,

Undergraduate students

It refers to the final year of Nursing and Physiotherapy students in selected colleges.

Hypothesis

H_1 - There is a significant difference in the level of visual discomfort related to use of electronic gadgets among under graduate students before and after practicing ophthalmic exercises in experimental group.

H_2 - There is a significant difference in the level of visual discomfort related to use of electronic gadgets among under graduate students before and after ophthalmic exercises between experimental and control group.

H_3 - There is a significant association between visual discomfort related to use of electronic gadgets and selected variables among under graduate students in experimental and control group.

Assumption

Ophthalmic exercises will reduce visual discomfort related to use of electronic gadgets among under graduate students.

Conceptual Framework

Conceptual framework of this study was based on Ernestine Wiedenbach Helping Art of Clinical Nursing Theory in 1964.

Methodology:

Research approach:

Quantitative experimental research approach design was adopted for this study

Research setting:

The study was conducted at College of Nursing and College of Physiotherapy of Sri Ramakrishna Institute of Paramedical Sciences

Population:

Target population: Under graduate students who are under-going online classes at Coimbatore.

Accessible Population **:** Under graduate students of Sri Ramakrishna Institute of Paramedical Sciences.

Sampling technique : Random sampling (Lottery method)

Sample size:

Total 60 undergraduate students were selected for this study.

Data collection instruments:

The tool consists of:

Section A: Demographic Data

A questionnaire was designed to collect the demographic data related to age, gender, religion, occupation of parents, dietary pattern.

Section B: Questionnaire on clinical profile of visual discomfort

Clinical profile includes watery eyes, itching of eyes, use of contact lens, type of visual media, duration of visual media usage per day, use of corrective spectacles, , level of display screen. duration of sleep per day.

Section C: Structured questionnaire on level of visual discomfort

A structured questionnaire was prepared based on the past experience of the researcher, the literature and

the opinions of the subject's experts. The questionnaire consisted of 20 statements related to visual discomfort complaints. The response was recorded in a five point likert scale.

Procedure for Data Collection

The main study was initiated after the expert guidance and acceptance after the pilot study. The validated tool was used for data collection and the main study was conducted over a period of four weeks. The study was conducted at Sri Ramakrishna Institute of Paramedical Sciences Coimbatore. Pretest was conducted by using structured questionnaire for both experimental and control group. Ophthalmic exercises was demonstrated through video and made them to practice for half an hour twice a day for four weeks for experimental group. The level of visual discomfort was reassessed after four weeks. Posttest was done for both experimental and control group using the same questionnaire.

Data analysis

Descriptive and Inferential statistical methods (Paired't' test, unpaired' test and Chi square test) were used for data analysis. Descriptive statistical method was applied for the analysis of demographic variables and the clinical profile of the sample. Inferential statistical methods were used to identify the efficacy of ophthalmic exercises on visual discomfort and association with demographic variables.

ORGANIZATION OF THE FINDINGS

Data obtained from the students receiving ophthalmic exercises were organized, analyzed and presented under the following sections.

Section I

Demographic variables of students with visual discomfort related to use of electronic gadgets.

Section II

Clinical profile among students with visual discomfort related to use of electronic gadgets.

Section III

Level of visual discomfort related to use of electronic gadgets among undergraduate students.

Section IV

Analysis on the effectiveness of ophthalmic exercises on visual discomfort in pretest and posttest among students in experimental group.

Analysis on the effectiveness of ophthalmic exercises on visual discomfort in pretest and posttest among students in control group

Section V

Analysis on the effectiveness of ophthalmic exercises on visual discomfort in pretest and posttest among students in experimental and control group.

Section VI

Association between the level of visual discomfort with selected variables among students receiving ophthalmic exercises.

Table 1: Demographic variables of the sample

S. No	Demographic variables	No. of students (n=60)			
		Experimental group(n=30)		Control group(n=30)	
		Frequency	Percentage%	Frequency	Percentage%
1	**Age in years**				
	19-22	26	87	26	87
	23-25	4	13	4	13
2	**Gender**				
	Male	4	13	10	33
	Female	26	87	20	67
3	**Religion**				
	Hindu	25	83	26	86
	Christian	5	17	2	7
	Muslim	-	-	2	7
4	**Occupation of parents**				
	Government	6	20	5	17
	Private	4	13	11	37
	Daily wages	3	10	4	13
	Agriculture	17	57	10	33
5	**Dietary pattern**				
	Vegeterian	5	17	8	27
	Non vegeterian	25	83	22	73
6	**Watery eyes**				
	Present	6	20	3	10
	Absent	24	80	27	90
7	**Itching of eyes**				
	Present	5	17	4	13
	Absent	25	83	26	87
8	**Use of contact lens**				
	Yes	2	8	8	27
	No	28	92	22	83
9	**Type of visual media**				
	Mobile	28	93	27	90
	Laptops and mobiles	2	7	3	10
10	**Duration of usage of visual media**				
	2 – 3 hours	9	30	12	40
	4 – 6 hours	17	57	15	50

	6 hours & above	4	13	3	10

S. No	Demographic variables	No. of students (n=60)			
		Experimental group(n=30)		Control group(n=30)	
		Frequency	Percentage%	Frequency	Percentage%
11	**Use of corrective spectacles**				
	Yes	9	30	9	27
	No	21	70	21	73
12	**Level of visual screen**				
	Above the eye level	6	20	6	20
	At the eye level	20	67	11	37
	Below the eye level	4	13	13	43
13	**Duration of sleep**				
	6 – 7 hours	21	70	20	67
	7 – 8 hours	7	23	7	23
	More than 8 hours	2	7	3	10

Clinical Profile of the Sample

Majority of the students with visual discomfort in the experimental group 26(87%) belonged to the age group of 19-22 years and in control group 26 (87%) students belonged to the age group of 19-22 years.

Majority of the students were females in both experimental and control group. 26(87%) students from experimental group were females and in control group 20 (67%) of them were females.

Majority of the students with visual discomfort was Hindu in both experimental and control group. In experimental group 25 (83 %) students belonged to Hindu religion and in control group 26 (86 %) of them belonged to Hindu religion.

The occupational status of students' parents in the experimental group showed that 17 (57%) students' parents were doing agriculture and in control group 11 (37%) students' parents were in private jobs.

Majority of students with visual discomfort were non vegetarian in both experimental and control group. In experimental group 25 (83 %) students were non vegetarian and in control group 22 (73 %) of them were non- vegetarian.

In experimental group 6(20%) of them had watery eyes and 3(10%) of them had eye in control group.

In experimental group 5(17%) had itching of eyes and in control group 4(10%) of them had itching of eyes.

In experimental group 2(8%) of them were using contact lens and in Control group 4(27%) of them were using contact lens Majority of the students use mobile as visual media in both experimental group and control group. In experimental group 28(93%) of them were using mobile and in control group 27(90 %) students were using mobile. 2(7%) in experimental group and 3(10%) in control group uses both mobile and laptops.

The duration of usage of visual media by the students were 4-6 hours in both experimental and control group. 17(57 %) students from experimental group and 15 (50%) from control group were using visual

media for 4-6 hours. 4(13%) in experimental group and 2 (10%) in control group used for more than 6 hours.

In experimental group 9(30%) of the students were using corrective spectacles and in control group 8(27%) were using corrective spectacles.

More than half of the students 20(67%) in experimental group and 13(43%) students from control group use the visual display screen at eye level.

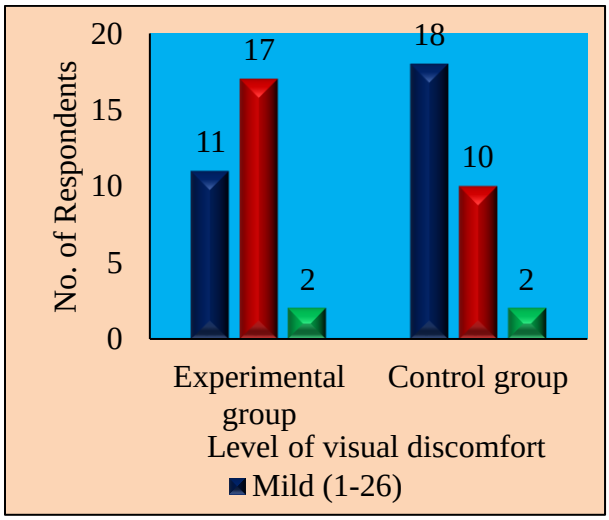
Majority 21(70%) of the students in experimental group and 20(67%) from control group were used to sleep for 6-7 hours per day

Table 1 Assessment of visual discomfort among experimental and control group before ophthalmic exercises

S. No	Level of visual discomfort	No of students			
		Experimental group (n=30)		Control group (n=30)	
		Frequency	Percentage%	Frequency	Percentage%
1	Mild (1-26)	11	36	18	60
2	Moderate (27-54)	17	50	10	34
3	Severe (55-80)	2	14	2	6

The above table 1 showed the pretest level of visual discomfort among students in the experimental and control group. In experimental group 11(36%) students had mild level of visual discomfort, 17(50 %) had moderate level of visual discomfort and 2(14%) of them had severe level of visual discomfort.

In control group 18 (60%) students had mild level of visual discomfort, 10(34 %) had moderate level of visual discomfort and 2(7%) of them had severe level of visual discomfort related to electronic gadgets.

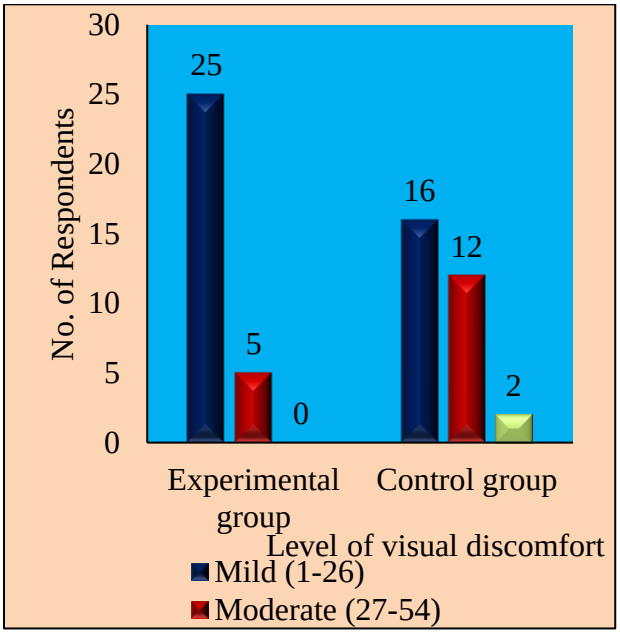


Assessment of visual discomfort among experimental and control group before ophthalmic exercises

Table 2: Assessment of visual discomfort among experimental and control group after ophthalmic exercises

S. No	Level of visual discomfort	No of students			
		Experimental group (n=30)		Control group (n=30)	
		Frequency	Percentage %	Frequency	Percentage %
1	Mild (1-26)	25	83	16	53
2	Moderate (27-54)	5	17	12	40
3	Severe (55-80)	-	-	2	7

The above table 2. showed the posttest level of visual discomfort among students in the experimental and control group. In experimental group 25(83%) students had mild level of visual discomfort, 5(17 %) had moderate level of visual discomfort and none (o%) of them had severe level of visual discomfort. The posttest assessment of control group showed 16(53%) students had mild level of visual discomfort, 12(40 %) had moderate level of visual discomfort and 2 (7%) of students were in severe level of visual discomfort.



Posttest level of visual discomfort among students

The effect of ophthalmic exercises on visual discomfort among students in posttest in experimental and control group.

S. No	Study group	Mean	SD	Mean differences	't' value	Table Value
1 2	Experimental group Control group test	20.70 26.17	7.86 10.84	5.47	2.23*	1.96

*Significant at 0.05 level

The above table showed the effect of ophthalmic exercises on visual discomfort among under graduate students in posttest in experimental and control group. It was identified that the mean level of visual discomfort among undergraduate students in experimental and control group was 20.70 and 26.17 respectively with a mean difference of 5.47. Likewise, the standard deviation of the experimental and control group was 7.86 and 10.84 respectively. The calculated 't' value 2.23 was greater than the table value of 1.96 at 0.05 level of significance. Hence the stated hypothesis. **H2** is accepted "There is a significant difference in the post test level of visual discomfort among under graduate students between experimental group and control group" was accepted. This study findings reveals that ophthalmic exercises will reduce the visual discomfort related to use of electronic gadgets among under graduate students.

A study was conducted by Petrisia (2012) experimental research study to assess effectiveness of ophthalmic exercises on visual discomfort among 60 computer workers in selected company, Bangalore The computer workers in experiment group had reduction in visual discomfort score after ophthalmic exercises

There is no significant association between the pretest scores and selected variables such as age, gender, occupation of parents, dietary pattern, watery eyes, Itching of eyes, use of contact lens, type of visual media, duration of usage of visual media, use of corrective spectacles, sleep duration of visual discomfort among undergraduate students.

Conclusion:

The study thus indicate that the students had reduction in visual discomfort score after practicing ophthalmic exercises and it is also an effective method to prevent further complication related to vision, although visual discomfort is not considered as a disease, it has a potential effect on the eye. Ophthalmic exercises is a simple, cost effective ocular muscle stimulating exercise to reduce the visual discomfort related to use of electronic gadgets and to promote the wellbeing among students. Hence, the researcher concluded that ophthalmic exercises are an effective method to reduce the visual discomfort related to use of electronic gadgets.

References

1. Abudawood, G.A.,Ashi, H.M., Almarzouki, N .K.(2020). Computer vision syndrome among undergraduate medical students in King Abdulaziz University, Jeddah, Saudi Arabia. Journal of Ophthalmology. Volume 2020 |Article ID 2789376 | doi.org/10.1155/2020/2789376 .
2. Bhuvaneshwari, G. (2020). A study to assess the effectiveness of ophthalmic exercises on visual discomfort among computer workers, Drug Invention Today,Vol 13, Issue 10.
3. Devi, C .B P., Samreen, S., Vaishnavi, B., Navitha, D., Kumari, N .K., Sharma, J.V.C & Sirisha, P. (2019). A study on impact of electronic devices on youngsters, Pharma Innovation 2019;8(5):283-292
4. Kim, S. D. (2016). Effects of yogic eye exercises on eye fatigue in undergraduate nursing students. Journal of physical therapy science, 28(6), 1813- 1815. doi: 10.1589/jpts.28.1813
5. Kulkarni, S .M.,Bhore, N. R . (2019). Assess the Effects of Electronic Gadgets (Television, Mobile Phone and Computer) on Health Status among Secondary School Students in the Selected Districts of Maharashtra International Journal of Health Sciences & Research (www.ijhsr.org) 149 Vol.9; Issue: 4. ISSN: 2249-957.

6. Times of India, (2021). Low-on line class affecting eyes, health toppers TNN/ updated: July 17, 2020, 09:55.
7. Wilkins, J.A. (2017).Visual discomfort indoors, Lighting Research and Technology in press (1) DOI:10.1177/1477153517736467