A Study to Assess the Effectiveness of Empowerment Strategy on Level of Knowledge on Computer Vision Syndrome among IT Employees in Selected IT Companies, Puducherry

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Abstract: *Computer Vision Syndrome is common ailment in majority of people who continuously use laptops, mobile internet and other technology gadgets that strain the eye. Over 75% of young software professionals and college students in Bangalore, India which is the IT Capital reportedly face the vision disorder called Computer Vision Syndrome. In the world, it has been estimated that nearly 60 million people experience vision problems as a result of computer use. Computer related ocular condition is called Computer Vision Syndrome (CVS) (Bhootra AK, 2014). Millions of new cases of CVS occur each year. Many individuals experience eye discomfort and vision problems when viewing digital screens for extended periods. It is essential to maintain proper body mechanics, minimize the screen exposure by following 20-20-20 rule along with eye exercises which will reduce the risk of computer vision syndrome. <u>Aim:</u> The present pilot study aims to assess the effectiveness of empowerment strategy on level of knowledge on computer vision syndrome among IT employees in selected IT companies, Puducherry. <u>Materials and Methods:</u> Quasi experimental study with one group pre and post test design was employed; the intervention was conducted among 20 computer workers using non-probability convenience sampling technique. Self administered structured questionnaires were used to collect demographic data and pretest knowledge on computer vision syndrome. Empowerment strategy included education regarding computer ergonomics, causes, management and prevention of computer vision syndrome. This was administered to the sample and after a week the posttest knowledge level was assessed. <u>Result:</u> The mean knowledge score in pretest was 3.9 and 19.9 in posttest which revealed that there is a significant difference between pretest and posttest knowledge after administration of empowerment strategy at p <0.001. <u>Conclusion:</u> The present pilot study findings infers that the knowledge on computer vision syndrome level improved among the computer workers after empowerment strategy, hence can be used for larger segment of IT population.*

Keywords: Vision Problem, Computer Ergonomics, Empowerment Strategy

1. Introduction

Many individuals experience eye discomfort and vision problems when viewing digital screens for extended periods. The level of discomfort appears to increase with the amount of digital screen use. There are several contributory factors for Computer Vision Syndrome to develop which includes uncorrected spectacle power, inappropriate glasses for computer use, difficulty in eye coordination at near work, strain on the muscles of the eye due to work style, decreased blink rate or tear function, glare and reflections from the monitor and surroundings, poor work station setup or improper use of workstation and job nature and stress **(Klamm, J & Tarnow, KG 2015).** According to American Optometrist Association, Computer Vision Syndrome, also referred to as Digital Eye Strain, describes a group of eye and vision-related problems that result from prolonged computer, tablet, e-reader and cell phone use **(AOA, 2013).** Investigator has his own experience, by the contact of people who are working in software companies, who work in front of computer for long hours. People with good eye sight were also becoming weaker with their vision, mainly due to restless work in front of computer, and the investigator has identified that it was due to CVS. As a nurse, the investigator felt that creating awareness among people who are at risk for developing Computer Vision Syndrome is essential and the investigator believed that the present intervention will be a stepping stone in this direction.

2. Methodology

2.1 Statement of the problem:

A study to assess the effectiveness of **Empowerment strategy** on level of knowledge on computer vision syndrome among IT employees in selected IT companies, Puducherry.

2.2 Objectives

1) Assess the level of knowledge on CVS among IT employees with computer vision syndrome in the intervention group and in the control group in pretest.
2) Evaluate the effectiveness of empowerment strategy on level of knowledge on computer vision syndrome among the IT employees with computer vision syndrome in the intervention group in the post test.
3) Compare the effectiveness of empowerment strategy on level of knowledge on computer vision syndrome among the IT employees with computer vision syndrome between the intervention group and control group in the post test.

2.3 Methods and design

Quasi-experimental design was used to evaluate the effectiveness of empowerment strategy on level of knowledge on computer vision syndrome. 20 samples were selected using a convenience sampling technique. Demographic data were collected and knowledge on computer vision syndrome was assessed using knowledge questionnaire followed by administration of empowerment strategy which includes health education on computer vision syndrome using power point presentation, post test was conducted at the end of 7 days. Control group did not receive the empowerment strategy. At the end, Statistical tests were used to determine the results of the data collected.

3. Results

The present study findings revealed that in pretest both the intervention and control group had (100%) inadequate knowledge on CVS whereas in posttest intervention group gained (100%) adequate knowledge and control group had (80%) inadequate knowledge and (20%) had moderately adequate knowledge on CVS.

The study finding revealed that the mean knowledge score in pretest was 3.9 and 19.9 in posttest which revealed that there is a significant difference between pretest and posttest knowledge after administration of empowerment strategy at $p < 0.001$

Table 1: Frequency and Percentage wise Distribution of demographic variables among the IT employees (N=20)

S. No	Demographic Variables	Intervention Group		Control Group		Statistical Significance X^2 P value
		No.	%	No.	%	
1	Age					$X^2 =0.000$ df =2 p-value =1.000
	21-25 years	-	-	-	-	
	26-30 years	2	20	2	20	
	31-35years	4	40	4	40	
	35 years and above	4	40	4	40	
2	Gender					$X^2 =0.000$ df =1 p-value =1.000
	Male	7	70	7	70	
	Female	3	30	3	30	
3	Year of experience					$X^2 =0.000$ df =3 p-value =1.000
	a)1-5	1	10	1	10	
	b)6-10	4	40	4	40	
	c) 11-15	3	30	3	30	
	above 15	2	20	2	20	
5	Hours of Daily Exposure to Computer Monitor					$X^2 =0.000$ df =2 p-value =1.000
	a) Less than 5 hrs/day,					
	b) 5-7.5 hrs/day	3	30	3	30	
	c) 7.5-10 hrs/day	5	50	5	50	
	d)More than 10 hrs/day	2	20	2	20	
6	Nature of Work,					$X^2 =2.476$ df =3 p-value =0. 480
	a) Computer Aided Design	2	20	1	10	
	b) E-publishing	4	40	4	40	
	c) Software Professional	4	40	3	30	
	d) Graphic Designers	0	0	2	20	
7	Type of Computer Used:					$X^2 =3.943^a$ df =2 p-value =0. 139
	a) Desktop Computer	4	40	1	10	
	(b) Laptop Computer	4	40	3	30	
	c)both	2	20	6	60	
8	Visual acuity					$X^2 =0.254$ df =2 p-value =0.881
	20/20-normal vision	5	50	4	40	
	20/30-20/60-near normal vision	3	30	4	40	
	20/70-20/160-moderate low vision	2	20	2	20	
	20/200-20/400-severe low vision	0	0	0	0	

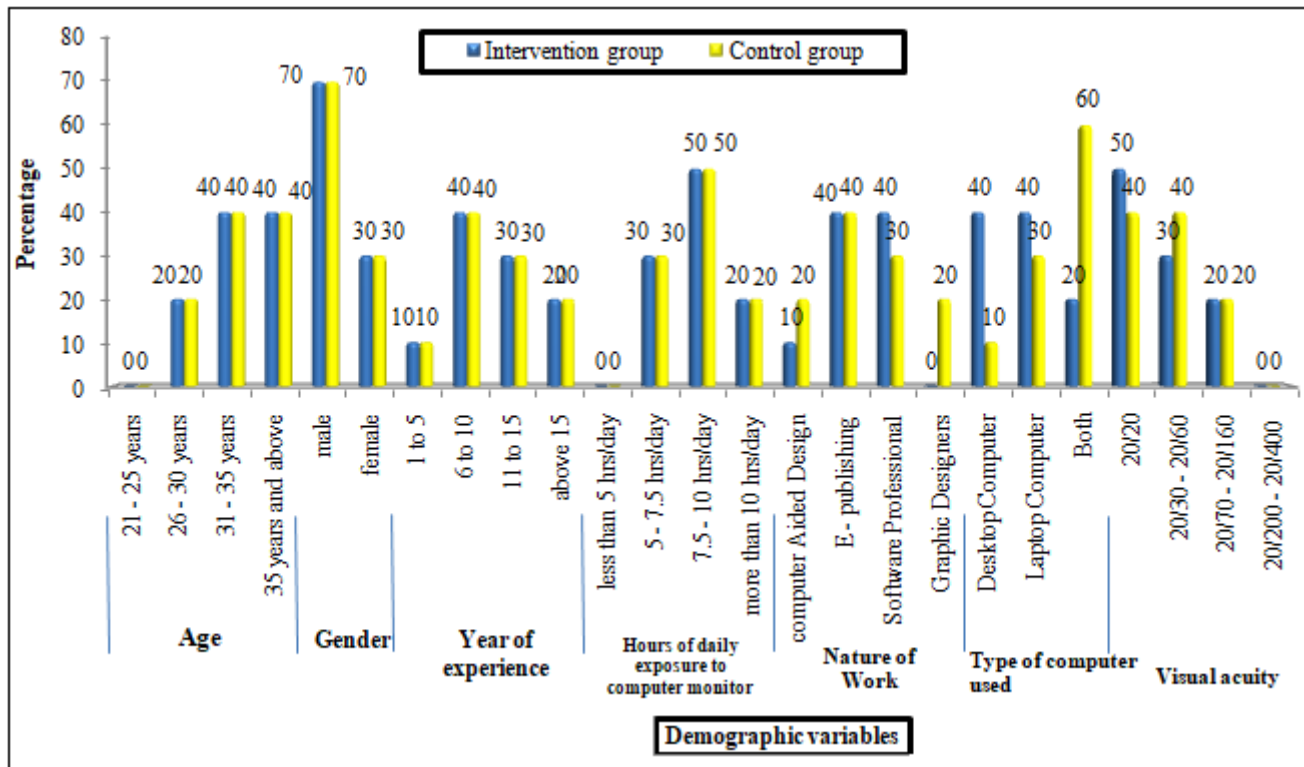***S-Highly significant at p<0.001 significant

Figure 1: Frequency and Percentage wise Distribution of demographic variables among the IT employees

Table 1 & Figure 1shows Frequency and percentage distribution of demographic variables of the IT Employees. In both the intervention group and in the control group 4 (40%) were in the age group between 31-35 years and above, majority 7 (70%) were male, nearly 4 (40%) had 6-10 years of experience in computer field and half of them 5 (50%) had the daily exposure to computer monitor of about 7.5-10 hrs/day. Both the intervention 4 (40%) and control 4 (40%) group were doing E-publishing works and software professionals. Regarding the type of computer used, in intervention Group, 4 (40%) were used Desktop Computer and laptop whereas in control group 6 (60%) were using both the computers.

Table 2: Percentage distribution of level of knowledge on computer vision syndrome among IT employees between the Intervention group and control group in pretest, (N=20)

Level of knowledge	Pre test				X^2	P value
	Experimental group (n-10)		Control group (n=10)			
	No.	%	No.	%		
Inadequate	10	100	9	90		
Moderate	0	0	1	10	6.43	0.984 (NS)
Adequate	0	0	0	0		

NS -Non Significant

Table 2 exhibits the percentage distribution of level of knowledge on computer vision syndrome among IT employees between the intervention group and control group in pretest.

Regarding the knowledge level of CVS, all (100.0%) the IT employees had inadequate level of knowledge in intervention group and in control group 9 (90%) had inadequate level of knowledge and 1 (10%) had moderate level of knowledge.

Table 2: Percentage distribution of level of knowledge on computer vision syndrome among IT employees between the intervention group and control group in posttest, (N=20)

Level of knowledge	Experimental group (n=10)		Control group (n=10)		X^2 value	P value
	N	%	N	%		
Inadequate	0	0	8	80		
Moderate	0	0	2	20	6.43	0.001 ***S
Adequate	10	100	0	0		

***S-Highly significant at p<0.001 significant

Table 2 exhibits the percentage distribution of level of knowledge on computer vision syndrome among IT employees between the intervention group and control group in posttest.

Regarding the knowledge level of CVS, all the IT employees 10 (100.0%) had adequate level of knowledge in intervention group and in control group 8 (80%) had inadequate level of knowledge and 2 (20%) had moderate level of knowledge.
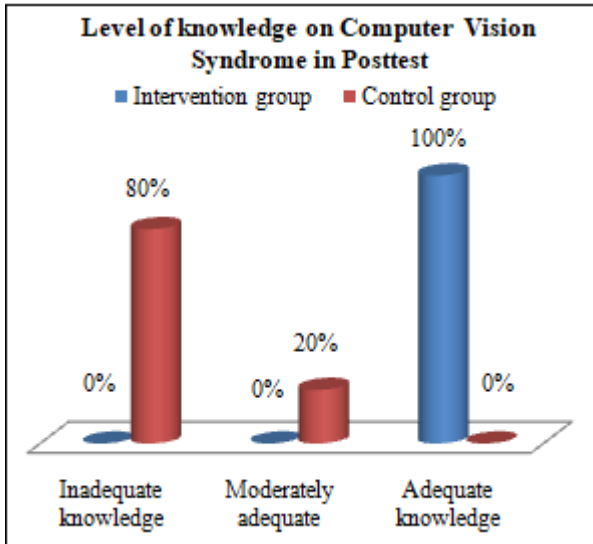

Figure 2: Percentage distribution of level of knowledge on computer vision syndrome among IT employees between the intervention group and control group in posttest

Figure 2 revealed that, regarding the knowledge level of CVS, all the IT employees 10 (100.0%) had adequate level of knowledge in intervention group and in control group 8 (80%) had inadequate level of knowledge and 2 (20%) had moderate level of knowledge in posttest.

Table 3: Effectiveness of empowerment strategy on level of knowledge on CVS between Pretest and Posttest for Intervention group, (N=20)

Assessment	Max score	Knowledge		Mean Difference	Paired T value	p value
		Mean	SD			
Pretest	20	3.7	1.63	**16.20**	21.90	0.001 ***S
Posttest	20	19.9	1.72			

***S-Highly significant at p<0.001 significant

Table 3 illustrates the **level of knowledge on computer vision syndrome among IT employees**.

The mean knowledge score in pretest was 3.9 and 19.9 in posttest which revealed that there was a significant difference between pretest and posttest knowledge after administration of empowerment strategy at p <0.001.

4. Discussion

The present study findings revealed that in pretest both the intervention and control group had inadequate knowledge on CVS whereas in posttest Intervention group gained 100% adequate knowledge and control group had 80% inadequate knowledge and 20% had moderately adequate knowledge on CVS. The study finding revealed that empowerment strategies had improved the knowledge on computer vision syndrome among IT employees in the intervention group as the mean knowledge score improved from pretest 3.7 to posttest 19.9 significantly (p< 0.001). There is a statistically significance in knowledge attainment on prevention of computer vision syndrome shows effectiveness of structured teaching programme.

This study findings was supported by the descriptive cross-sectional study conducted by **Samreen Arif, Jyoti Tulsani, SajidNaqvi and Kavita Sharma, (2020)** on computer vision syndrome among computer operators working at a tertiary care hospital, Madhya Pradesh. The findings revealed that 34.4% computer operators had little knowledge of or awareness of workstation ergonomics and computer vision syndrome. After receiving education onCVS and computer ergonomics, the knowledge level was increased to 64.66% which showed the increased effectiveness of education programme.

5. Conclusion

The result of the study shows that structured teaching programme on computer vision syndrome was effective in improving knowledge regarding computer vision syndrome among IT employees. Thus employees who gained increased knowledge on workplace ergonomics and prevention of computer vision syndrome will have reduce syndrome risk. The study recommends that education can be spread through emails, digital medias so as to have a awareness about prevention of computer vision syndrome.

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