(RESEARCH ARTICLE)

Effectiveness of educational pamphlet on knowledge regarding computer vision syndrome among higher primary children in a selected urban school Mangalore

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Abstract

In the 21st century the use of computers increased tremendously. Computer plays a valuable role in increasing the efficiency and accuracy of several works. But excessive use of computers has brought several risks, especially eye diseases. Children are not exception to the context. They have the nature of adopting the things what they see. Therefore kids show equal interest in TV and computers. Hence in the present scenario children are equally being affected with computer vision syndrome. Education is a strong building block in building a stronger and healthier community. The importance of school education lies in the fact that the children of today will become adult citizens of tomorrow.

Aim: The overall aim of the study was to assess the effectiveness of educational pamphlet on computer vision syndrome among higher primary school children.

Method: One group pre-test post-test design was adopted in the present study to accomplish the objectives. The researcher herself developed the self-structured knowledge questionnaire to assess the knowledge of the higher primary school children on computer vision syndrome followed by educational pamphlet. The reliability of the tool was tested using Split-half method. The tool was found reliable (r=0.857; p<0.05). Non-probability purposive sampling technique was used to select asample of 120 higher primary school children from urban area.

Results: The findings of the study revealed that majority (55%) of the higher primary school children gained moderately adequate knowledge and 33% of the higher primary school children gained adequate knowledge regarding computer vision syndrome.The post-test knowledge score (14.24± 5.19) was higher than the pre-test knowledge score (6.68±3.35). Paired 't' test was used to find the effectiveness educational pamphlet on CVS. The calculated 't' value in knowledge (10.13, p<0.05) was greater than the table value (t_{120}=1.98) at 0.05 level of significance. This showed that the gain in knowledge was significant after administering educational pamphlet Association between pre-test knowledge score with demographic variables revealed that there was significant association between the pre-existing knowledge scores with the selected demographic variables on computer vision syndrome.

Interpretation and conclusion: The present study revealed that the higher primary school children lacked knowledge on computer vision syndrome and the overall findings of the study proved that there was highly significant increase in the knowledge of higher primary school children on CVS following the administration of the educational pamphlet. Therefore,it was concluded that the educational pamphlet on CVS was highly effective inimproving the knowledge of higher primary school children on computer visionsyndrome.

Keywords: Effectiveness knowledge; Computer vision syndrome; Educational pamphlet; Higher primary school children`

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1. Introduction

Children are the ones who are very vital in deciding how the world is goingto be after some years. So if one can do some good in the life of a child then therecan be change – at least a slight change – in the world to come. In today's competitive world, education is necessity for all. Education is the solution to any problem; education promotes good habits, values and awareness towards anything[1]. Children usually have smooth and strong motor skills. However, their coordination, endurance, balance, and physical abilities vary. The school-age child ismore socially involved with age-mates than ever before, and the peer group provides support that was formerly offered only within the family. Play is the most important activity in the lives of children[2]. Kids and computers are nearly inseparable these days. Electronic games (e- games) are widely used by children, often for substantial durations[3]. Nearly 60 million school-age children will use a computer or digital device for hours a day, and that doesn't include time spent in front of the TV or gaming system at home. This increased exposure puts them at greater risk for computer vision syndrome or CVS[4]. Computers are now part of that mix, and concerns have been raised that children who form "electronic friendships" instead of human friendships might be hindered in developing interpersonal skills. Such concerns are heightened by reports that among children ages 8 to 16, some 20% have computers—and 11% have Internet access, which suggests that a sizable number of children may use computers in social isolation[5]. Similarly, in the school setting, although group use of computers is more common, concerns have been raised about the possibility that computers may be used to replace, rather than augment, child-to-child and child-to-teacher relationships[6].

2. Material and methods

2.1. Research approach

In view of the nature of the problem under study and to accomplish theobjectives of the study an evaluative approach was found to be appropriate to describe the effectiveness of educational pamphlet on knowledge regarding computer vision syndrome among higher primary children.

2.2. Research design

Pre-experimental research design that is one group pre-test post-test design is the researcher's overall plan for obtaining answers to research questions or for testing the research hypothesis

2.3. Setting

Setting is a physical location in which data collection takes place. This study will be conducted in selected urban school of Mangalore within the geographical boundaries.

2.4. Population

In this study, population includes the higher primary school children studyingin 5th t to 7th standards in selected urban school at Mangalore.

2.5. Sample

The sample for this study is 120 higher primary school children of a selectedurban school who meet the sampling criteria.

2.6. Sampling technique

In this study, non-proportionate stratified random sampling method is used for selecting a higher primary school, and non- proportionate stratified random sampling technique is used to select 120 childrenfrom selected higher primary urban school, Mangalore.

2.7. Sampling criteria

2.7.1. Inclusion criteria

Higher primary school children, who are,

- Willing to participate in the study.
- Available during the time of data collection.

2.7.2. Exclusion criteria

- The students who have attended training on computer vision syndrome.

2.8. Data collection technique

2.8.1. Selection and development of the tool

Data collection tools are the instruments, i.e., the written devices that a researcher uses to collect data, e. g., questionnaires, tests, or observation schedules. An instrument is a device used to measure the concept of interest in a research project. In this study the researcher used a self-structured knowledge questionnaire to assess the knowledge level of the higher primary school children on computer vision syndrome.

2.9. Description of the tool

The tool (Self-structured knowledge questionnaire) was designed to collect relevant information from higher primary school children in selected urban school regarding their knowledge on CVS and to assess the effectiveness of educational pamphlet on CVS.

The tool is divided into two parts:

- Part I: Demographic Proforma designed to elicit the demographic information from respondents consisting of 12 items.
- Part II: Self-structured knowledge questionnaire designed to elicit the knowledge of higher primary school children regarding CVS. The respondents were instructed to select the best possible option and tick (☑) the for the most appropriate answer. Each item has a score of one for the best answer and zero for the wrong answer. Thus altogether there were 25 items with a maximum total score of 25.

3. Results and discussion

3.1. Data collection procedure

Data collection is the process of selecting subjects and gathering data from the subjects.

Prior permission was obtained from the concerned authorities of selected higher primary school Mangalore (Annexure 2). The data was collected after getting permission from the concerned Authorities of selected urban area of Mangalore. The objectives of the study will be explained and their written consent will be taken from, block education officer and school head mistress.

- The study population consisted of 120 higher primary school children from the selected urban school, Mangalore.
- For maximum co-operation, the investigator introduced her to the respondents.
- On Day 1, pre-test was conducted by using self-structured knowledge questionnaire regarding computer vision syndrome.
- The educational pamphlet regarding CVS was distributed for all respondents followed by knowledge questionnaire.
- On the fifth day, post-test was conducted for the respective samples using the same self-structured knowledge questionnaire.
- The data collection period was from 7-12-2015 to 14-12-2015.
- The data was collected systematically on each item and was organised in a way that facilitated computer entry.

3.2. Plan for data analysis

Descriptive statistics are useful for summarizing empirical information. Inferential statistics which is based on laws of probability provide a means for drawing conclusions about the population from which data is obtained for sample. The collected data will be analysed by using descriptive and inferential statistics.

Data will be analysed by the following steps:

- Organising the data in master sheet.

- Frequency and percentage of data will be calculated to describe demographic variables.
- Mean, mean percentage and standard deviations of knowledge scores would be used to determine the effectiveness of the educational pamphlet on CVS.
- The statistical significance of the effectiveness of the programme would be analysed using paired 't' test.
- Association between pre-test knowledge scores and demographic variables will be analysed using chi-square test.
- Data will be presented in tables, graphs and diagrams.

3.3. Organization of the findings

The results have been organised and presented in 3 parts:

- Part I: Description of the demographic characteristics of the higher primary children of urban school at Mangalore.
- Part II: Assessment of knowledge of students regarding computer vision syndrome.
  - **Section A**: Assessment of the level of existing knowledge.
- Part III: Effectiveness of the educational pamphlet on computer vision syndrome.
  - Section A: Comparison of the level of the knowledge in pre-test with the post- test and effectiveness of the study.
  - Section B: Mean, SD and mean percentage of pre-test and post-test.
- Part IV: Association between pre-test knowledge scores of students regarding computer vision syndrome and selected baseline variables.

3.3.1. Part I: Description of the demographic characteristics of the higher primarychildren of urban schools at Mangalore

This part deals with distribution of participants according to their demographiccharacteristics. Data is analysed using descriptive statistics and are summarized in terms of percentage.

Table 1 Frequency and percentage distribution of samples according to demographic characteristics

No	Demographic variables	Frequency	Percentage
1.	Class of study		
	5th	40	33.33
	6th	40	33.33
	7th	40	33.33
2.	Gender		
	Male	66	55.00
	Female	54	45.00
3.	Religion		
	Hindu	69	58.00
	Muslim	42	35.00
	Christian	9	7.00
4.	Living with		
	Parents	109	91.00
	Grand parents	11	9.00
5.	Education of father		
	No formal education	0	0.00
	Primary education	56	47.00
	Secondary education and above	64	53.00

6.	Education of mother		
	No formal education	14	11.00
	Primary education	20	17.00
	Secondary education and above	86	72.00
7.	Father occupation		
	Government employee	29	24.00
	Private sector employee	36	30.00
	Self-employed	55	46.00
	Home maker	0	0.00
8.	Mother occupation		
	Government employee	21	18.00
	Private sector employee	15	13.00
	Self-employed	32	26.00
	Home maker	52	43.00
9.	Whether they are using computers?		
	Yes	77	64.00
	No	43	36.00
10.	Hours spent in front of computer		
	1 hour	66	86.00
	More than 1 hour	11	14.00
11.	Experience of eye related problemswhile using computers		
	Yes	77	100.00
	No	0	0.00
12.	Symptoms experienced while usingcomputer		
	Headache	34	44.00
	Eye strain	8	10.00
	Double vision	0	0.00
	Redness	12	16.00
	Watery eyes	23	30.00
13.	Do have any information about CVS?		
	Yes	15	14.00
	No	105	86.00
14.	Source of information about CVS		
	Teachers	0	0.00
	Parents	15	100.00
	Health worker	0	0.00
	Mass media	0	0.00

3.3.2. Part II: Assessment of knowledge of students regarding computer vision syndrome

This part deals with assessment of the existing knowledge of the higher primary school children regarding computer vision syndrome.

Section A: Assessment of the level of existing knowledge

This part deals with distribution of the level of the knowledge of higher primary school children of urban schools regarding computer vision syndrome in percentage.

Table 2 Percentage distribution of the pre-test level of knowledge of the higher primary school children of urban schools regarding computer vision syndrome

Range of score	Level of knowledge	Frequency	Percentage
0-8	In adequate	85	71
9-17	Moderately adequate	35	29
18-25	Adequate	0	0
Total		120	100

3.3.3. Part III: Effectiveness of the educational pamphlet on computer vision syndrome

This part deals with mean, SD and mean percentage of the pre-test and post- test knowledge scores and comparison of the level of knowledge and effectiveness in the pre-test with the post-test.

Section A: Comparison of the level of the knowledge in pre-test with the post-testand effectiveness of the study

This part deals with the comparison of level of knowledge and effectiveness inpre-test with post-test and effectiveness of the study. To find the effectiveness of the educational pamphlet on CVS, the following null hypothesis was formulated:

H_01: There is no significant difference between the pre-test and the post-test level of knowledge of the higher primary school children regarding CVS.

Table 3 Comparison of level of knowledge and effectiveness in pre-test with post-test and effectiveness of the study N=120

		Pre-test			Post-test	
Level of knowledge	f		%	f		%
Inadequate	85		71	15		12
Moderately adequate	35		29	66		55
Adequate	0		0	39		33

Section B: Mean, SD and mean percentage of pre-test and post-test

This part deals with mean, SD and mean percentage of the pre-test and the post-test knowledge scores.

Table 4 Mean, SD and mean percentage of pre-test and post-test N=120

Level of knowledge	f	%	Pre-test (A) Mean±SD	Mean %	f	%	Post-test(B) Mean±SD	Mean %	Effectiveness (B-A) Mean±SD	Mean %	't' value
Inadequate	85	71	6.68⬚3.35	27.2	15	12	14.24±5.19	56.96	7.56±1.84	29.76	
Moderately adequate	35	29			66	55					10.13*
Adequate	0	0			39	33					

p<0.05   * Significant

The data presented in Table 5 shows that the total mean knowledge increased by 29.76% with mean±SD of 7.56±1.84 after the distribution of educational pamphlet on CVS.

Comparison of the mean and SD of the knowledge scores showed that the effectiveness of educational pamphlet regarding CVS had 56.96% increase in post-test with the mean and SD of 14.24±5.19. The mean percentage of pre-test was 27.2% with the mean and SD of 6.68±3.35. The calculated 't' value (10.13, p < 0.05) in knowledge aspect was greater than table value (t_{120}=1.98) at 0.05 level of significance The results revealed that overall knowledge was inadequate and moderately adequate in pre-test as the post-test knowledge scores comes under moderately adequate and adequate knowledge level.

3.3.4. Part IV: Association between pre-test knowledge scores of students regarding computer vision syndrome and selected baseline variables

Chi square test was computed to determine the association of level of knowledge of the mothers with selected demographic variables. The following null hypothesis was stated.

$H_0$2: There is no significant association between the level of knowledge on CVS of the higher primary school children and selected demographic variables.

Table 5 Association between pre-test knowledge scores of higher primary school children on computer vision syndrome with selected demographic variables N=120

Demographic variables	χ^2 value	df	p value	c value	Inference
Class of study	13.14	4	0.05	9.49	S
Gender	1.66	1	0.05	3.84	NS
Religion	3.58	4	0.05	9.49	NS
Living with	0.036	1	0.05	3.84	NS
Education of father	0.158	4	0.05	9.49	NS
Education of mother	14.71	4	0.05	9.49	S
Occupation of father	6.05	4	0.05	9.49	NS
Occupation of mother	4.49	6	0.05	12.59	NS
Use of computers and mobiles	0.77	1	0.05	3.84	NS
Hours of usage	16.35	1	0.05	3.84	S
Symptoms experienced	7.32	6	0.05	12.59	NS
Previous information	21.21	1	0.05	3.84	S

NS = Not significant; S = Significant

Data presented in Table 6 reveals that the calculated Chi-square value of class of study, educational qualification of mother, hours of computer usage and previous information on are greater than that of table value at 0.05 level of significance, hence the null hypotheses can be rejected and concluded that there is a significant association between the pre-existing knowledge with the selected demographic variable on computer vision syndrome.

4. Conclusion

Conclusions based on the study Demographic characteristics of the study

- Majority (33%) of students were selected from each classes.
- Majority (55%) of the students were males.
- Majority (58%) belonged to Hindu religion
- Highest (91%) of the samples were living with their parents.

- Majority (53%) of the samples' fathers had secondary school education.
- Most (72%) of the samples' mothers had secondary school education.
- Majority (46%) of the fathers were self-employed.
- Majority (43%) of the mothers were homemakers.
- Most (64%) of students were using mobiles, computer at home or school
  - Most (86%) of samples were using these for one hour.
  - All (100%) students experienced eye problems while using computers and mobiles.
- Majority (44%) students experienced headache, most (30%) students experienced watery eye, 16% experienced redness and 10% students experienced eyestrain symptom while using computers and mobiles.
- Most (86%) students were not having any previous information about CVS.

4.1. Level of Knowledge of the higher primary school children regarding CVS

- Most (85%) of the higher primary school children had inadequate knowledge and majority (35%) of the higher primary school children had moderate knowledge regarding CVS in the pre-test.
- Highest (55%) of the higher primary school children gained adequate knowledge and 33% gained moderate knowledge regarding CVS in Post-test knowledge scores.

4.2. Effectiveness of educational pamphlet regarding computer vision syndrome

After administration of educational pamphlet on CVS, most (55%) of the higher primary school children had moderately adequate knowledge and 33% had adequate knowledge regarding CVS.

- The findings revealed that the mean post-test score (14.24±5.19) was significantly higher than their mean pre-test score (6.58±3.35).
- The value of 't' was calculated to analyse the difference in knowledge score of the higher primary school children (N=120) of urban school in pre-test and post-test. The calculated 't' value (t=10.13, p<0.05) in knowledge aspect was greater than the table value (t119=1.98) at 0.05 level of significance. Therefore, the null hypothesis was rejected and the research hypothesis was accepted indicating the gain in knowledge was not by chance.

4.3. Association between Pre-test knowledge scores of the higher primary school children on CVS with selected demographic variables

There was a significant association between the level of knowledge of the higher primary school children and the selected demographic variables like class of study, education of mother, hours of usage, previous information. Date represents in the Table 2 shows that equal percentage (33%) of students were selected from each class. Majority (55%) of the students were males. Majority (58%) belonged to Hindu religion. Highest (91%) percentage of the samples were living with their parents. Majority (53%) of the samples' fathers had secondary school education. Most (72%) of the samples' mothers had secondary school education. Majority (46%) of the fathers were self-employed. Majority (43%) of the mothers were homemakers. Most (64%) of students were using mobiles and computerat home or school. Most (86%) of samples were using these for one hour. All (100%) of students experienced eye problems while using computers and mobiles. Majority (44%) students experienced headache, 30% students experienced watery eyes, 16% experienced redness, and 10% students experienced eyestrain while using computers and mobiles. Majority (86%) students were not having any previous information about CVS.

Compliance with ethical standards

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1]   Tutor Time Early Childhood Education Centre, Bambino Preschool and International Children's Academy. [online]. Available from: URL:www.expat.or.id

[2]   Thompson NA. Information on the importance of early childhood education for the development and future success of children. [online]. [Cited on Jun 10, 2015]. Available from: URL:staff@latinpost.com.

[3]   Larry K, Wan, D. Children and computer vision syndrome. [online]. Available from: URL:www.allaboutvision.com/cvs/children-computer-vision- syndrome.htm. [Cited on Jun 11, 2015]

[4]   Heiting G. Computers and computer vision, [Cited on Mar 1, 2011]. Available from: URL:www.allaboutvision.com

[5]   https://www.princeton.edu/futureofchildren/publications/journals/article/index .xml?journalid=45andarticleid=200andsectionid=1303. [Cited on Feb 15, 2016].

[6]   https://www.princeton.edu/futureofchildren/publications/docs/10_02_05.pdf , [Cited on Feb 18, 2016].