An Analysis on the Effect of Medical Information Application to Prevent Visual Degeneration through Overuse

Seong-Ran Lee

Abstract : The paper is to identify the analysis on the effect of medical information application to prevent visual degeneration through overuse of information communication technology such as smartphone, internet etc. Data were surveyed using interview and questionnaires by 134 patients who visited an ophthalmology of a general hospital located in K area. The data were collected by interview and questionnaires from January 22 to April 6, 2018. The results of this study are as follows. Firstly, 76.1% of the experimental group showed a significant rate than 19.4% of the control group when subjects spent the smartphone for more than five hours(X^2=3.48, p<.01). Secondly, eye fatigue was decreased significantly by 27.92 points on average after application of medical information than 41.35 points on average before application of medical information(t=.47, p=.000). Thirdly, the experimental group has steadily increased the persistence of recovery against decreased vision since the 11 days than the control group. Fourthly, the experimental group in good posture steadily increased from 11 days than before the application. However, it decreased from 31 days to 41 days. For this purpose, medical information system will contribute to the recovery of visual degeneration caused by overuse of the internet and smartphone.

***Index Terms*: Medical information, Application, Visual degeneration, Overuse, Technology.**

I. INTRODUCTION

Recently, **addiction has spread to behavioral addiction, ranging from internet, games and smartphones. A**dvanced technology such as the internet, smartphone and netbook became a part of everyday life. The Internet and smart phone are always around when you buy things or do banking[1],[2],[3].

Up until now, the development of this field of Korea has been remarkably successful Korea is the world's largest country, and as the computer environment evolves, the game industry around the world is also leading[4],[5],[6].

However, the high accessibility to the Internet and the rapid deployment of smartphones are causing serious problems in the vulnerable. This information communication along with convenience has side effects such as impaired vision or tear loss and mental disorders. Game addiction among teenagers and adults is leading to murder. Smartphone addiction is coming to a bad environment that can easily cause eye strain[7],[8],[9],[10].

Especially, more than 10 percent of people in their teens and 20s, who are the main users **of smartphones, are overusing them.** For this reason, 50.2 percent of high school students and 70.6 percent of college students have poor eyesight. It is reported to have increased by about 10 percent from 10 years ago[11],[12].

We need to find a way to recover from visual degeneration by overuse of information communication technology. So in order to achieve this, the medical information was applied to restore vision through this study[13],[14].

Therefore, the paper is to identify the effect of medical information application for the recovery of visual reduction through information communication overuse. Through this study, we can prevent visual loss by overuse of information communication technology and improve quality of life with healthy eyes.

II. MATERIAL AND METHODS

A. Strategy of medical information for recovery of visual reduction

The strategy of information system for recovery of visual reduction shows in Figure 1. It is classified into four categories. That is, research plan, data analysis, applying information system, extracting and evaluating results. The details are as follows. 1) Plan : plan of medical information application, effective measures of medical information. 2) Analysis : analysis of collected data, analyzing problems in study subjects, and identification of medical information effects 3) Application : application on the effect of medical information, experiment on the effectiveness of medical information 4) Extraction and evaluation : extracting effects for improving vision, evaluation of the effect of medical information application.

B. Materials

Data were surveyed using interview and questionnaires by 134 patients who visited an ophthalmology of a general hospital located in K area.

The data were collected by interview and questionnaires from January 22 to April 6, 2018.

Subjects were divided into experimental and control group. Experimental group of 67 patients which was assigned as group with intervention of medical information, while the control group of 67 patients was assigned as group without intervention of medical information.

The subjects were compared to visual changes in application that affect medical information. In order to verify the efficiency of medical information, study subjects analyzed over time after applying medical information : 11, 21, 31, 41, 51, 61 days. lt analyzed the trend of visual change in experimental and control group.

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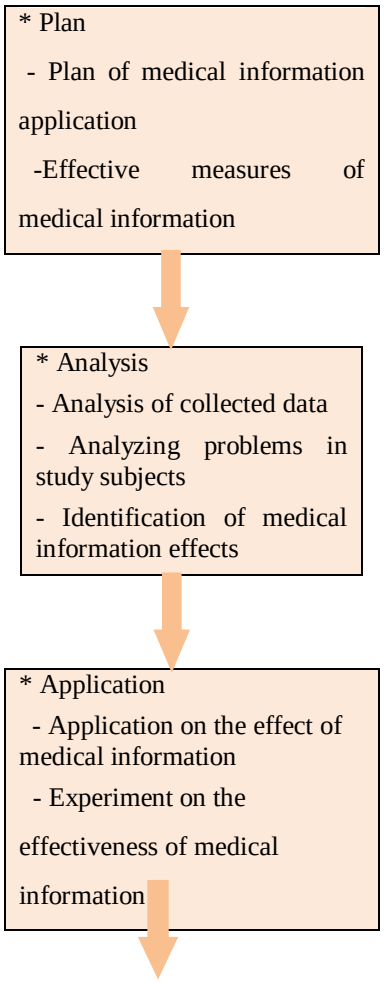
C. Materials

The general characteristics of the study participants were carried out with X^2-test. The general characteristics of the study participants were calculated from means and percentages. We obtained the change of eye status after applying medical information by t-test. The t-test was conducted to compare the eye conditions before and after application of medical information.

This survey was conducted on a five-point scale. Missing or poor data from the survey were excluded. The experimental and control group were composed of the same requirements. This research method was carried out by the SPSS win 17.0 program.



III. RESULTS

A. General characteristics of subjects

General characteristics of subjects indicate Table 1. In men, 52.2 % of the experimental group was higher than 46.3 % of the control group. For daily smartphone usage time, 76.1% of the experimental group showed a significant rate than 19.4% of the control group when subjects spent the smartphone for more than five hours(X^2=3.48, p<.01).

On the other hand, for daily computer usage time, the experimental group showed a significant rate than control group over five time(X^2=5.16, p<.01). For quality of sleep, 26.9% of the experimental group was significantly higher than 61.2% of the control group(X^2=1.57, p<.05).

Table 1 General Characteristic of Subjects

Variables	Experimental group N(%)	Control group. N(%)	X^2
Gender			
Men	35(52.2)	31(46.3)	8.19
Women	32(47.8)	36(53.7)	
Age/years			
<20	11(16.4)	9(13.4)	13.47
20-29	18(26.9)	14(20.9)	
30-39	15(22.4)	18(26.9)	
≥40	23(34.3)	26(38.8)	
Daily smart usage time/hrs.			
≥5	51(76.1)	13(19.4)	3.48**
≤4	16(23.9)	54(80.6)	
Daily computer usage time/hrs.			
≥5	53(79.1)	16(23.9)	5.16**
≤4	14(20.9)	51(76.1)	
BMl			
<18.5	17(25.4)	20(29.9)	9.72
18.5-24.9	11(16.4)	15(22.4)	
≥25	39(58.2)	32(47.8)	
Family living status			
Living with family	41(61.2)	52(77.6)	3.183.18 3.18*
Alone	26(38.8)	15(22.4)	
Stress status			
Strong	26(38.8)	17(25.4)	6.49*
Weak	41(61.2)	50(74.6)	
Quality of sleep			
Good	18(26.9)	41(61.2)	1.57**
Bad	49(73.1)	26(38.8)	
Total	67(100.0)	67(100.0)	

*P<.05

B. Comparison of eye status before and after application of medical information

Table 2 shows the comparison of eye conditions before and after application of medical information. It was found that visual conditions were significantly better after application than before medical information was applied(t=-3.28, p=.000).

Epiphora decreased 32.58 points on average after application of medical information system than 35.91 points on average before medical information application. In addition, eye fatigue was decreased significantly by 27.92 points on average after application of medical information than 41.35 points on average before application of medical information(t=.47, p=.000).

Table 2 Comparision of Eye Status Before and After Application of Medical Information

Ltems /	Before	After		

intervention	Mean±S.D	Mean±S.D	t	P
Visual condition	25.26±2.47	39.41±0.05	-3.28	.000
Epiphora	35.91±5.22	32.58±3.16	1.94	.162
Eye fatigue	41.35±1.85	27.92±1.42	0.47	.000
Carrot intake	29.51±0.46	46.37±0.59	5.83	.000
Eating spinach	26.07±2.59	42.16±2.37	-2.41	.000
Peripheral pressure	18.46±4.27	45.82±5.41	-5.26	.000
Eye blinking	31.94±2.59	42.16±2.37	-1.38	.000
Seeing far from high	25.05±0.61	40.49±0.64	-0.74	.000
F Movement of finger	13.73±0.24	37.56±3.78	-2.95	.000
G Quality of sleep	23.07±1.92	31.28±1.52	-0.93	.061

C. Persistence of recovery against decreased vision

Fig. 2 shows the persistence of recovery against decreased vision between two groups. The experimental group has steadily increased the persistence of recovery against decreased vision since the 11 days than the control group. The experimental group's condition decreased after 31 days and then recovered a little after 41 days.

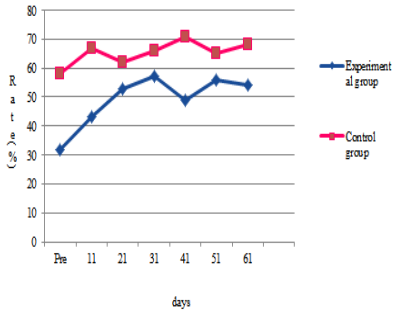


Fig. 2 Persistence of recovery against decreased vision

D. Persistence of eye recovery methods

Fig. 3 shows the persistence of eye recovery methods. The experimental group in good posture steadily increased from 11 days than before the application. However, it decreased from 31 days to 41 days.

In addition, carrot-eating groups increased steadily from 11 days than before the application of medical information. But it decreas ed briefly on 41 days. Acupressure increased steadily from 11days before the application but slightly decreased on 31days.

IV. DISCUSSION

The paper is to identify the effect of medical information application on the recovery of visual reduction due to the overuse of information communication. As a result of this study, the state of vision was significantly improved after the intervention than before the intervention of medical information. The finding was similar with the previous studies on the glaucoma[15],[16],[17]. It suggests that information and communication addicts such as internet and smartphones should be managed.

Based on the results obtained by the study, it is anticipated that this may be used an effective data for developing and applying the information system. In addition, large application studies should be established in order to identify findings of this study.

The vision has improved from 35.1% to 42.7% due to mediation of medical information system. In particular, it was confirmed that eating spinach and carrots are effective in improving vision. The findings from the study confirm that this information system is effective. It is important to prevent excessive use of information and communication from making their eyes worse. It encourages people to do other healthy activities instead of overuse of smartphones.

Living a regular life such as exercise, jogging, correct posture and good sleep can improve people's health and recover people's eyesight. After people see a smartphone, they should often blink. In case of it, they can help eye with the cycle of tears. It can be restored by using smartphones overuse.

For this purpose, medical information system is expected to contribute to the recovery of vision degradation caused by overuse of the internet and smartphone.

V. CONCLUSION

The paper is to identify the analysis on the effect of medical information application to prevent visual degeneration through overuse of information communication technology.

The results of this study are as follows. Firstly, 76.1% of the experimental group showed a significant rate than 19.4% of the control group when people spent the smartphone for more than five hours(X2=3.48, <.01). Secondly, eye fatigue was decreased significantly by 27.92 points on average after application of medical information than 41.35 points on average before application of medical information(t=0.47, p=.000). Thirdly, the experimental group has steadily increased the persistence of recovery against decreased vision since the 11 days than the control group.

For this purpose, medical information system is expected to contribute to the recovery of visual degradation caused by overuse of the internet and smartphone.

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