

Study On Technology Based Home Vision Screening And Creating Awareness On Eye Health

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ABSTRACT: Introduction: Technology is one of most important factor in today's life. IPAD is leading as people can make use of technology by just pressing buttons. Networking, technology and education makes communication easier and helps people in easy education and awareness. **Aim & objectives:** The main aim of the study is to educate and aware among people regarding eye health and the check the visual function of their eye by using Apple I pad. **Material and Methodology:** The following study is a home based vision screening program [using IPAD] which uses the basic tests like visual acuity, color vision, contrast sensitivity and amsler tests for checking the basic functions of the eye. The study was performed in many societies moving from one place to another using IPAD as a tool. Reliability of ipad was checked, a pilot study on 25 subjects visual acuity, colour vision and contrast sensitivity was taken on both ipad and Original chart like snellen , ishihara and pelliobson and compared in which the results and the accuracy were same. The study also contains questionnaire on the awareness and education about eye health. The subjects included in the study were an age group of 10 to 70. Subjects like infants and blind were not included in the study. **Results:** During the study it was observed that there is no significant difference in testing of visual acuity between ipad and Snellen standard chart. The subjects responded actively towards screening and that home vision screening can be possible. During the study it was found that 40 subjects out of 100 needed further detailed check-up and were referred in Rotary eye hospital hospital but only 3 out of 40 came for it. This shows that they are less aware and education about their eye health. Software used in IPAD were visual acuity, color vision, contrast sensitivity and amsler tests A questionnaire was also asked which indicated less awareness among the common people. **Conclusion:** We examined with just an ipad and not an expensive piece of clinical equipment. Extremely simple to use not very expensive and freely available everywhere. The technology is within the reach for everyone and can be personalised differently for everyone to suit their specific needs. Technology and education always move hand in hand for best and easiest learning education system. We can conclude that it is very valuable for patients who are bedridden, very old age and young child can be tested at home with this technology.

Index Terms: Technology, Vision, Screening, Awareness, Eye Health, Ipad, Home

1. INTRODUCTION

An imaginative mind is always open to new technologies and innovation. Such a new innovation and technology is ipad. The ipad is a 1.5lb touch screen tablet computer with a 9.7 inch display.It can run thousands of applications a growing handful of which are geared towards healthcare practice such as optometry. "It's an apple of our eyes" [1]. Optometry is branch that has already been heavily dependent on gadgetry. Our tools for visualizing, diagnosing and analyzing have undergone massive advancements. There are many doctors who go for a screening of their patient at home. The same can be done with the help of an Ipad. In India the most common cause of blindness is uncorrected refractive error. Many of the people go to the primary care physician for annual physical examination or the dentist atleast twice a year to ensure the health of the teeth. 80% of all the sensory information our brain receives comes from our eyes. Therefore the importance of our eyes to the quality of our life cannot be stressed enough especially those who are unaware and those who lead a busy lifestyle. Awareness of common eye disease and their treatment can play an important role in encouraging people to seek timely eye care and can therefore help in reducing the burden of visual impairment.

2. AIM AND OBJECTIVES

Aim: The main aim of the study is to create awareness among people regarding eye health and check the status of their eye.

Objectives:

- Assessing the visual functions
- Creating awareness
- Referring them to get their eye checked

3. METHOD AND METHODOLOGY

The study we conducted was a home based vision screening with an ipad.

Participants:

Total 100 patients were included in the study for the screening. As it was home based vision screening all patients were included except the blind and infants.

Duration of the study:

The duration of the study was from September 2011 to April 2012.The study we did can be divided into three stages:

Stage 1: Development and evaluation of the applications.

The ipad is a device which runs applications. Three applications were selected for the study from Apps store.

1. Eye tests 2. Eye care HD 3.My own survey

For the evaluation of the applications a pilot study was conducted in the Rotary Eye hospital. The ipad application and the standard Snellen chart were compared. The same was done with the contrast sensitivity and Ishihara colour

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vision test. For the study 30 subjects were included. The following tests were performed on ipad as well as Snellen, Ishihara and Pelli Robson charts.

Stage 2: Development of the questionnaire

To know how much awareness is there among common people and that to create awareness among them.

Stage 3: The use of apps for the screening and its procedure

Step 1: Setup

The set up of the room where the patient is to be tested is more important. The visual acuity chart should be placed at proper place and under proper illumination.

Step 2: Tests and tests distance

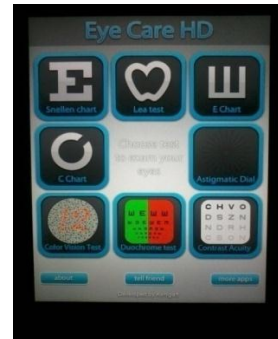
This research was on home based vision screening on an Ipad therefore first with the help of the measuring tape the testing distance was measured in Rotary Eye Institute and then the same distance was measured at the patients home for the testing of visual acuity. The applications used for the study were:

Eye tests app.

The following application was used for testing visual acuity and macular function with the help of in built Amsler chart. It's an easy way of testing Visual Acuity, Near Vision

reading, Macular Function and Colour Vision. It consists of portable eye charts for distance and near, Amsler grid, Colour testing plates, and Astigmatic testing chart.

(1) Eye care HD 8 in 1

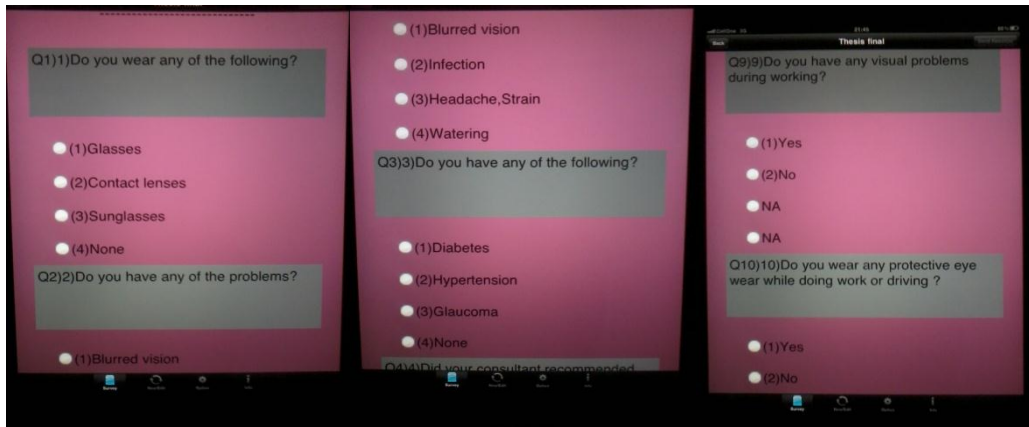


Step 3: Referring the patients

Step 4: Spreading awareness

It's important for common people to know about the importance of common eye disease and its cure.

Step 5: The questionnaire



4. RESULTS:

STATISTICAL ANALYSIS

F-test for the equality of two variances (Variance ratio test):

FOR DISTANCE

Table 1:

H₀: There is no significant difference In Right Eye with (Ipad) and Right Eye with (Snellen Chart).

	OD (I)	OD(S)
Mean	0.7656	0.7216
Variance	0.079834	0.133389
Observation	25	25
Df	24	24
F _{cal}	1.67	
F _{tab}	1.98	

$$F_{cal} < F_{tab} 1.67 < 1.98$$

Conclusion: H_0 is accepted. There is no significant difference between Right Eye with (Ipad) and Right eye with (Snellen chart).

FOR NEAR

Table 2:

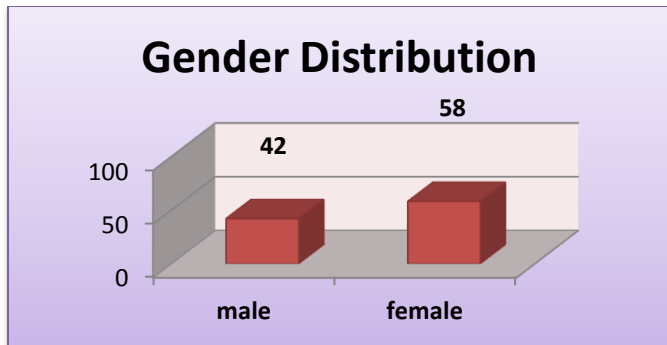
H_0 : There is no significant difference between Right Eye with(Ipad) and Right Eye with (Standard Near Chart).

	OD (I)	OD(S)
Mean	0.6108	0.5744
Variance	0.044366	0.070573
Observation	25	25
Df	24	24
F_{cal}	1.79	
F_{tab}	1.98	

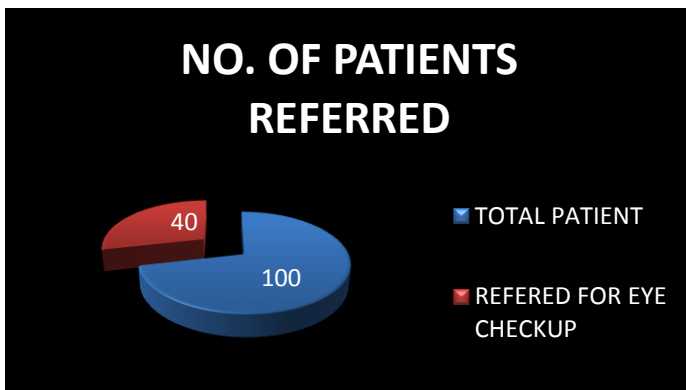
$$F_{cal} < F_{tab} 1.79 < 1.98$$

Conclusion: H_0 is accepted. There is no significant difference between Right Eye (Ipad) and Right Eye (Standard Near Chart).

Graph 1:



Graph 2:



Graph 3:

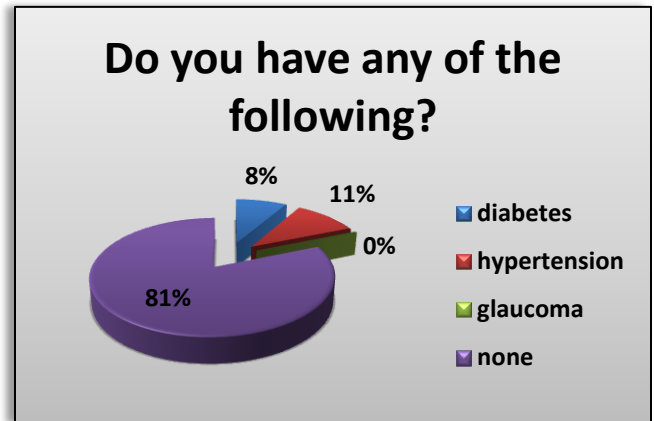


Table 3:-

REFERRED	40
CAME FOR CHECK UP	3
DIDN'T CAME	37

5. Discussion

Ivana V. OBRADOVIC, Rena Cappelli, Joshua C. Priluck, K V. Chalam, Sandeep Grover. Ophthalmology, University of Florida College of Medicine, Jacksonville, FL conducted study on Comparison of Color Vision Testing By Standard Ishihara Color Plates Versus iPad Version. Color vision was tested by both methods in 40 subjects. Five subjects had poor vision in one eye. In our study we found that there is no significant difference between the tests and that on that device it is easy to use. The results were the same.

6. Conclusion

We examined with just an Ipad and not an expensive piece of clinical equipment. Extremely simple to use not very expensive and freely available everywhere. We can conclude with findings with Standard Snellen chart and Ipad application Snellen chart has found no significant different in visual acuity measurement for distance as well as for Near in both eyes. We can conclude that it is very valuable for patients who are bedridden, very old age and young child can be tested at home with this technology. Some Basic Questionnaire can be added in Ipad in own survey design. Baseline data of the patient can be analysed easily with Ipad. It is Very useful tool in spreading awareness; response of patient can be noted on Ipad on just a simple touch. Patients were more responsive towards the Ipad and were happy with vision screening at home.

7. References

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