



## **Is Online Medical Information an Option to Effective Patient Counselling?**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author MS did the concept and design. Author Shreya Shah did the admin support and manuscript writing. Author Saurabh Shah did the data collection and manuscript editing searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Aim:** To assess the effects of internet search on patient knowledge regarding ocular conditions, its effectiveness comparable to counselling which considered to be gold standard.

**Methods:** We enrolled consecutive patients freshly diagnosed for glaucoma and diabetic retinopathy. We randomized all patients in two groups Internet and Counselling Groups. The patients were asked to fill in a pre- tested questionnaire. One group was given pre-tested keywords for search on Internet and other group was counselled. On next visit, the patients were asked to fill the same questionnaire. All answers were documented in the form of numerical score and studied stastically. Data was analysed using frequency and cross tabulation p value <0.05 considered as significant.

**Results:** We enrolled 123 individuals including 84(68.3%) males, 39 (31%) females having mean age 58+/-13.3. When we compared pre- and post-intervention scores we found significant difference in total as well as in individual groups. (p=0.040) When we compared we did not find any stastically significant difference amongst two groups (p=0.341).

**Conclusion:** Internet Search is effective tool for public health education. It is as effective as counselling for this purpose.

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**Keywords:** Counselling; Google search; search engine results.

**1. INTRODUCTION**

Public health education is important tool to influence behavioural changes towards health [1,2]. Counselling is very successful method to educate person regarding his/her diseases its effects and benefits by adopting particular behavior [3,4] Counselling has helped to improve behaviour towards various dis orders in various parts of world [3-7].

It is an undeniable fact that both computers and the Internet have become one of the most important achievements of modern society. They bring their own revolution in human daily life (science, education, information, entertainment etc.) eliminating the distances and offering immediate and easily access to information and communication [8].

Today's technology provides new ways in health care. The Internet, especially the World Wide Web, has a wealth of health-related information easily accessible to patients and families. GOOGLE™ search engine listed more than 90% of all web-pages available online on the web. Its popularity has increased, and it has now become a source of patient education and information, although it is unregulated for the quality of its search results [9].

Our objective is to study influence of internet search public health knowledge compare its effect with counselling.

**2. METHODS**

The study was approved by the hospital ethics committee. This study was conducted at a tertiary care eye hospital located at central western India named Drashti Netralaya-Dahod. This was a randomised controlled study. (<https://www.google.co.in/maps/place/Drashti+Netralaya+Eye+Hospital/@22.8468593,74.2631484,17z/data=!3m1!4b1!4m5!3m4!1s0x39611db494564f49:0xf5b35bdecff62a50!8m2!3d22.8468544!4d74.2653371?hl=en>).

We have included patients freshly diagnosed with glaucoma and diabetic retinopathy.

A pre-tested questionnaire was filled by all patients, and they were divided in to two groups by double blind randomization- Counselling and Internet Search (Google search). This is base

score suggesting patient initial knowledge about their medical condition. A qualified counsellor educated the Counselling Group using different graphics and for the Internet Search group various keywords were provided leading to reliable information. After being educated with either of activities, similar questionnaire was filled by the patients, and the forms were evaluated for score and entered in Excel sheet which was exported in to SPSS 22 and analysed using student t-test and cross tabulation. We compared pre- and post-intervention scores for all patients, Counselling Group and Internet Search group.

**3. RESULTS**

We enrolled 123 person with mean age 58+/-13.3, out of which 84(68.3%) male and 39 (31%) female, 73(59.3%) enrolled in counselling group and 53(43%) enrolled in Google group (Table 1).

**Table 1. Age and sex distribution**

Age	Gender		Total
	Female	Male	
10 to 20	0	3	3
21 to 30	1	2	3
31 to 40	3	6	9
41 to 50	4	7	11
51 to 60	8	26	34
61 to 70	19	27	46
>70	4	13	17
Total	39	84	123

We studied pre- and post-intervention score and found stastically significant difference (p=0.000, Table 2).

We studied pre- and post-intervention score in the Counselling and Internet Search group and found significant difference (Tables 3, 4).

We compared post intervention score between Counselling, and Internet Search group and did not find any difference explaining that both groups are equally effective (Table 5, p=0.341).

When we studied post-intervention score with basic education variables we found significant difference (Table 6 p=0.040).

We studied other variables such as gender, age, religion, socioeconomic aspects and did not find any significant difference (p=0.505, 0.435, 0.566 and 0.640).

**Table 2. Comparative study of pre and post intervention score**

Total score Post_Test	Total score Pre_Test									Total
	1	2	3	4	5	6	7	8	9	
6	2	2	1	2	0	0	0	0	0	7
7	0	2	1	0	1	3	2	0	0	9
8	0	2	2	2	5	4	0	0	0	15
9	2	4	4	12	7	21	1	2	1	54
10	0	7	5	5	10	7	4	0	0	38
Total	4	17	13	21	23	35	7	2	1	123

*P=0.040*

**Table 3. Comparative study of pre and post intervention score in counselling group**

Total score Post_Test	Total score Pre_Test									Total
	1	2	3	4	5	6	7	8	9	
6	0	1	1	1	0	0	0	0	0	3
7	0	2	1	0	1	3	0	0	0	7
8	0	1	1	1	1	4	0	0	0	8
9	1	3	3	2	3	12	0	2	1	27
10	0	5	4	3	8	3	2	0	0	25
Total	1	12	10	7	13	22	2	2	1	70

*P=0.000*

**Table 4. Comparative study of pre post intervention in internet search group**

Total score Post_Test	Total score Pre_Test							Total
	1	2	3	4	5	6	7	
6	2	1	0	1	0	0	0	4
7	0	0	0	0	0	0	2	2
8	0	1	1	1	4	0	0	7
9	1	1	1	10	4	9	1	27
10	0	2	1	2	2	4	2	13
Total	3	5	3	14	10	13	5	53

*P=0.001*

**Table 5. Comparative study of post intervention score amongst groups**

Total score Post_Test	Method		Total
	Counselled	Google	
6	3	4	7
7	7	2	9
8	8	7	15
9	27	27	54
10	25	13	38
Total	70	53	123

*P=0.341*

**Table 6. Comparative study of post intervention score with basic education**

Total score Post_Test	Education					Total
	Graduate	Illiterate	Matric	Post graduate	Up to 5 STD	
6	0	1	2	1	3	7
7	2	5	1	0	1	9
8	0	4	5	0	6	15
9	10	9	18	4	13	54
10	11	1	18	3	5	38
Total	23	20	44	8	28	123

*P=0.01*

**Mark (√) in appropriate box**

	QUESTIONNAIRE	Yes	No	Can't say
1	Is it vision threatening condition?			
2	Glaucoma is same as cataract?			
3	Glaucoma results from (a) Maturity of cataract <input type="checkbox"/> (b) uncontrolled sugar level <input type="checkbox"/> (c) high <u>intraocular pressure</u> (IOP) and Pressure damage to nerve of vision <input type="checkbox"/> (d) its age related things <input type="checkbox"/>			
4	Risk factors of glaucoma <input type="checkbox"/> Obesity <input type="checkbox"/> Steroids <input type="checkbox"/> Chronic Smoking and Alcohol intake <input type="checkbox"/> Family history			
5	Glaucoma has familial predisposition?			
6	What defect it can have if not treated? <input type="checkbox"/> None <input type="checkbox"/> gradual vision diminution < nothing to worry about> <input type="checkbox"/> vision loss <complete blindness> <input type="checkbox"/> acute red painful blind eye < a dreadful eye condition> <input type="checkbox"/> vit haemorrhage/retinal detachment <problems to retina>			
7	Is blindness (vision loss) can be prevented? Is treatment required?			
8	Is Treatment possible? Is it treatable?			
9	TREATMENT OPTION AVAILABLE: (a) glasses <input type="checkbox"/> (b) topical eye drops <input type="checkbox"/> (c) surgical procedure <input type="checkbox"/> (d) nothing can treat IT <input type="checkbox"/>			
10	Do you know your condition needs frequent follow up visits / lifelong medication?			

**Fig. 1. Questionnaire**

Example => "key-words" & google results...

**Glaucoma national eye institute – Glaucoma nei**

**Glaucoma rnib**

**Glaucoma guide rnib**

**Glaucoma rnib hindi**

**Healthinfotranslations glaucoma hindi**

**Fig. 2. Recommended web sites and key words**

#### 4. DISCUSSION

Patient education is a process of influencing behaviour rather than only giving information [10, 11,12].

Patient education may be done using various methods but counselling has been found to have desirable impact for various conditions and various parts of world [3-7].

As we have discussed Internet-based search is also a method for public education, which will cause self-learning and behavioural changes in society, which is also evident in our study [8,9].

An Internet-Google educational intervention is presented here as an alternative to the gold-standard counsellor-patient education as we found internet based education and counselling did not make any significant difference in current

study (0.341). The primary reason being, it would decrease workload of counsellors, provide patients and their caretaker/relatives with increased access to information (Table 3).

Hoffman et al. [8] reported overhydration advice on internet.

We have provided guided key words for internet search for proper information which will ensure quality of information. Other studies reflected concerns regarding quality and reliability of information [9].

We used only Google search engine for this study but Liupu Wang et al. [12] has compared various search engines like Google, Bing, Ask and Yahoo for their study without any significant difference.

Marianna Diomidous et al. [7] reported various social and psychological ill effects of internet use like cyberbullying, cyber suicide, online grooming, internet addiction and scams.

Counselling need lots of resources like trained human resources and time to have one-to-one discussion internet based information may save this resources and cover larger population

Internet use for medical information can influence patient's treatment decision, anxiety level, and understanding of their disease. Caregivers must recognize the growing trend of Internet use and should counsel and educate their patients appropriately based on what they have read to help them accurately appreciate the nature of their disease [13].

The increased use of medical websites by patients raises important issues regarding the need for quality control, and impacts significantly upon the doctor-patient relationship, there is different physical and psychological adverse effect of internet usage [8].

## 5. CONCLUSION

Internet-based online public health education can be an effective method with guided search and proper quality control of accessible data.

## CONSENT

All authors declare that written informed consent was obtained from the patient (or other approved parties) for publication of this paper and accompanying images.

## ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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