

## An Observational Study of Diabetes Patients' Awareness and Understanding of Diabetic Retinopathy

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### Abstract

**Aim:** The aim of the present study was to assess the awareness and knowledge of Diabetic retinopathy among Diabetic patients. **Methods:** This was a descriptive, cross sectional, non-randomized, questionnaire-based study conducted in the Department of Ophthalmology, King George's Medical University (KGMC), Lucknow, UP, India, for 1 year. A knowledge attitude practice questionnaire was prepared and pretested in a sample group of representative population. The response was analyzed as to whether the questions were understood or not. Resident doctors were trained in administering questionnaire. Diabetic patients were given questionnaires at retina clinic and filled in the presence of residents. **Results:** Out of the 150 patients, 82(54.67%) had no knowledge of diabetic retinopathy compared to 68 (45.33%) who had knowledge. This was statistically significant with p value <0.001. Knowledge was more in age group less than 25 years (66.67%) and least in 35 to 45 age group (47.83%) which was statistically significant with p value <0.001. Patients in the upper socioeconomic group had more knowledge about diabetic retinopathy (57.14%) which was statistically significant with a p value of 0.001. About 73.53 % of individuals in knowledge group had right attitude which was significantly higher than non-knowledge group (57.32%) with a p value <0.001. Regarding source of information, 50% of patients in knowledge group got information about diabetic retinopathy from physicians, 12% from eye specialists, 10.67% from reading books, 10.67% from various media and 26.67% from other sources like family and friends. About 20.59% in knowledge group had practice of visiting ophthalmologist for eye check-up which was significantly higher than non-knowledge group with a p value <0.001. **Conclusion:** we concluded that the Increasing knowledge about diabetic retinopathy through awareness campaigns can improve attitude & practice. Early detection & timely intervention can help in preventing sight threatening complications.

**Key Words:** Attitude, Diabetic retinopathy, Knowledge, Practice, Primary health centre.

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### Introduction

Diabetes mellitus (DM) can lead to microvascular complications such as retinopathy, nephropathy, and peripheral neuropathy, in addition to macrovascular complications that include cardiovascular disease, cerebrovascular disease, and peripheral vascular disease[1]. DM has caused 5 million deaths in 2015. The prevalence of DM is increasing worldwide. It is estimated that by 2030 there would be rise in people with DM to nearly 552 million[2]. It is predicted that in developing countries, there will be a humongous rise in DM patients, as the majority of their patient population is aged between 45 and 64 years[3]. DM can result in many complications such as nephropathy, cardiovascular, neurologic and ocular complications[4], with diabetic retinopathy (DR) being the most common micro vascular ocular complication of DM[5]. DR is defined as a disorder of the retinal circulation that compromises the delivery of oxygen and nutrients to the retina, thus being unable to meet the requirements of its high metabolic demands[6]. Therefore, defects in retinal circulation may affect normal vision, which is considered a leading cause of vision impairment and blindness worldwide[1,4,7].

Wisconsin Epidemiological study has proved that micro vascular complications such as diabetic retinopathy[8] are linked to duration of diabetes. Routine dilated fundus examination is recommended at the time of diagnosis of diabetes and then yearly review is required in all patients having type 2 diabetes mellitus. Awareness of importance of routine check-up for the screening of diabetic retinopathy is poor even in developed countries and the situation is much worse in a developing country like India. Previous studies have shown that 63% of the rural diabetic population has not had an eye examination[9]. Magnitude of blindness caused by diabetic retinopathy is increasing. Lack of awareness about diabetic retinopathy and the preventable

complications associated with it worsens the situation. Early detection of diabetic retinopathy and its appropriate management is very important to prevent irreversible visual loss. This can only be achieved with better knowledge and awareness among patients. There have been many studies done in other states in India to assess the knowledge and awareness on diabetes and diabetic retinopathy among patients with diabetic retinopathy, however very few studies assessed knowledge, awareness and practices amongst patients with diabetic retinopathy[10-13]. The objective of the study was to assess the knowledge, attitudes and practices about diabetes and diabetic retinopathy among patients diagnosed with diabetic retinopathy.

### Material and Methods

This was a descriptive, cross sectional, non-randomized, questionnaire-based study conducted in the Department of Ophthalmology, King George's Medical University (KGMC), Lucknow, UP, India, for 1 year. After taking the approval of the protocol review committee and institutional ethics committee. A detailed search in literature was done to create the knowledge attitude and practice questionnaire which was prepared in English and the local language. Questionnaire was tested in a sample group of representative population. The response was analysed as to whether the questions were understood or not. Residents were trained in administering the questionnaire. They were given the questionnaire and filled in presence of the residents after obtaining informed consent. Diabetic patients of age less than 18 years, mentally challenged patients who were not able to give informed consent and patients who were not able to understand and respond to the questions administered were excluded from the study.

Questionnaire consisted of three parts, first part contained the patient profile which included name, gender, occupation,

socioeconomic status, educational status and their consent for the study. Second part included details of diabetes mellitus like duration, family history of diabetes and any eye complaints if present. Third part of the questionnaire contained the following questions.

1. Do you know that diabetes can affect many organs in the body?
2. Do you know whether diabetes can affect vision?
3. Do you know whether there is any relation between duration of diabetes mellitus and visual problems?
4. Do you feel eye check-ups are necessary in diabetes?
5. Do you know the frequency of eye checkup needed; if yes how frequently is it needed?
6. Do you know about the complications of diabetic eye disease?
7. Have you ever done an eye check up to know whether diabetes has affected your eye?

Knowledge group included participants who responded “yes” to above questions 1,2,3,4 and those who responded “no” to

these questions were grouped under non knowledge group.

Attitude was assessed by question number 5 and 6. Practice was assessed by question number 7.

Determinants of knowledge on diabetes and diabetic retinopathy such as age, gender, language, literacy and socioeconomic status were analysed between the groups using univariate analysis. The association of knowledge of diabetic retinopathy with attitude and practices was evaluated between the groups using univariate analysis (chi square test). A two tailed P value <0.05 was considered statistically significant.

### Results

The demographic characteristics of the 150 patients recruited into the study are given in Table 1. Out of the 150 patients, 82(54.67%) had no knowledge of diabetic retinopathy compared to 68 (45.33%) who had knowledge. This was statistically significant with p value

<0.001.

**Table 1: Demographic characteristics of the study population**

Age	Number=150	Percentage
Below 25	18	12
25-35	37	24.67
35-45	46	30.67
45-55	29	19.33
Above 55	20	13.33
<b>Gender</b>		
Male	45	30
Female	105	70
<b>Educational status</b>		
Uneducated	39	26
class 1-12	94	62.67
college level	17	11.33
<b>Socio economic status</b>		
Lower	80	53.33
Middle	42	28
Upper	28	18.67

**Table 2: Association of age and knowledge of diabetic retinopathy (DR).**

	Knowledge of DR			P- value
	Knowledge group	Non knowledge group	Total	
Below 25	12	6	18	
25-35	12	25	37	
35-45	22	24	46	0.00
45-55	13	16	29	01
Above 55	9	11	20	
Total	68	82	150	

Knowledge was more in age group less than 25 years (66.67%) and least in 35 to 45 age group (47.83%) which was statistically significant with p value <0.001 (Table 2). Knowledge was more among females than males which was not

significant statistically. Knowledge was found to be high among participants with higher educational status than in those who had college level education (58.82%) which was statistically significant with p value <0.001 (Table 3).

**Table 3: Association of educational status and knowledge of DR**

Educational status	Knowledge of DR			P- value
	Knowledge group	Non knowledge group	Total	
No education	18	21	39	
Class 1-12	40	54	94	0.00
College	10	7	17	01
Total	68	82	150	

Patients in the upper socioeconomic group had more knowledge about diabetic retinopathy (57.14%) which was

statistically significant with a p value of 0.001 (Table 4).

**Table 4: Association of socioeconomic status and knowledge of DR**

Income Level (monthly income in rupees)	Knowledge of DR		Total	P- Value
	Knowledge group	Non knowledge group		
Lower (200-500)	32	48	80	
Middle (501-2000)	20	22	42	0.0001
Upper (>2000)	16	12	28	
Total	68	82	150	

There was no significant association between duration of diabetes and knowledge of diabetic retinopathy. About 73.53 % of individuals in knowledge

group had right attitude which was significantly higher than non knowledge group (57.32%) with a p value <0.001. (Table 5).

**Table 5: Association of knowledge of DR with attitude towards DR.**

Attitude	Knowledge of DR		Total	P - Value
	Knowledge group	Non knowledge group		
Yes	50	47	97	
No	18	35	53	0.0001
Total	68	82	150	

Regarding source of information, 50% of patients in knowledge group got information about diabetic retinopathy from physicians, 12% from eye specialists,

10.67% from reading books, 10.67% from various media and 26.67% from other sources like family and friends (table 6)

**Table 6: Source of information about diabetic retinopathy**

Physicians	50%
Eye Specialists	12%
Reading Books	10.67%
Various Media	10.67%
Family and Friends	26.67%

**Table 7: Association of knowledge of DR with practice regarding DR**

Practice	Knowledge of DR		Total	P value
	Knowledgeable	Non knowledgeable		
Yes	14	15	29	0.001
No	54	67	121	
Total	68	82	150	

About 20.59% in knowledge group had practice of visiting ophthalmologist for eye check-up which was significantly higher than non-knowledge group with a p value <0.001 (Table 7)

### Discussion

The lack of awareness about diabetic retinopathy in diabetic patients is considered as a major cause of diabetic blindness in our community. The main objective of this study was to ascertain the awareness level and the practice patterns adopted by diabetic patients in the community.

Diabetic retinopathy is an upcoming cause of visual impairment and prevalence of diabetic retinopathy is more in developing countries. Even though health education statistics and literacy rate in Uttar Pradesh is superior than national average and close to that of developed countries, diabetes

related ocular complications are on the rise. The facilities in tertiary care centres which are provided free of cost are not utilized properly and this is reflected in the results of our study.

In this study Out of the 150 patients, 82(54.67%) had no knowledge of diabetic retinopathy compared to 68 (45.33%) who had knowledge. This was statistically significant with p value <0.001. Results were similar to study by Rani et al in which knowledge about diabetic retinopathy was noted as 37.1% and Dandonna et al who reported it as 27% [14,15]. In a population-based awareness study in a sub urban area by Hussain R et al, among diabetic patients only 40.7% had knowledge about diabetic retinopathy [16]

In this study, Patients in the upper socioeconomic group had more knowledge about diabetic retinopathy (57.14%) which

was statistically significant with a p value of 0.001. Literacy and its influence on knowledge about diabetes was studied in other studies also[17,18]. All these studies support the fact that providing education can increase awareness and knowledge about diabetic retinopathy. Dandona et al, also reported increased awareness among subjects older than 30 years or more and those with any level of education and among those belonging to upper and middle socio-economic strata in their study in urban population in India[15]. Al Zarea in Saudi Arabia reported that knowledge regarding ocular complications in diabetes was 75.62% which was an urban study[19].

About 73.53 % of individuals in knowledge group had right attitude which was significantly higher than non knowledge group (57.32%) with a p value <0.001. In the study by Rani et al attitude among knowledge group about diabetic retinopathy was 93.3% and this was 53.8% in the study by Hussain et al.[14,16] Rani et al, noted that 36.5% with knowledge about diabetic retinopathy thought that there was no need to consult an ophthalmologist if their blood sugar was under control and this was 38.49% in Saudi Arabia study[14,19].

In this study, 20.59% in knowledge group had practice of going for eye check-up which was statistically significant. Oveneri-Ogbomo et al, also reported that knowledge of diabetic retinopathy was significantly related to practice of undertaking eye examinations[20]. Mwangi et al, reported that 50% of the participants in their study went for eye check-up[21]. Hussain et al, reported that practice was present in 57.6%[16]. In the study by Al Zarea practice was reported to be 95% which was an urban study[19]. Mahesh G et al and Srinivasan N K et al, also found a statistically significant association between awareness of diabetic retinopathy and good practice patterns regarding retinopathy in their studies[22,23].

In primary and tertiary health care centres, physicians can play a major role in creating awareness and imparting knowledge about diabetic retinopathy. Data from our study also reflects this. Regarding source of information, 50% of patients in knowledge group got information about diabetic retinopathy from physicians, 12% from eye specialists, 10.67% from reading books, 10.67% from various media and 26.67% from other sources like family and friends. Srinivasan NK et al, also reported that doctors (both physicians and ophthalmologists) constituted the most important source of information in 71.4 % in knowledge group in their study[23]. About 66.4 % obtained their knowledge from general practitioners and nurses in the study by Oveneri-Ogbomo et al[20].

Knowledge about diabetes and diabetic retinopathy help patients in developing good practice patterns which can prevent sight threatening complications. Strategies to educate diabetic patients about this potentially blinding disease should be evolved. Health education measures should be implemented at primary, secondary and tertiary levels.

At the primary level, this can be done through regular awareness campaigns, posters, pamphlets, diabetic retinopathy screening camps and through community-based education strategies. Hospital based patient education can be done by involving general practitioners, physicians and endocrinologists in addition to ophthalmologists. Data about source of information in our study also correlates with this.

### Conclusion

There is a difference in the level of knowledge about diabetes mellitus among patients, the patients were more familiar with general than specific information about diabetes retinopathy, this leads to gaps between knowing and acting, the current study concludes that more awareness campaigns need to be

conducted to target DM complications and the appropriate attitude towards this disease, the information must be more inclusive & easy for the general public to understand and include it in the importance topics that doctors must inform DM patients about, It can also be included in the high school activities, hanging awareness posters with the main information in the waiting areas of all hospitals and health care centres. More research needs to be conducted about the awareness levels & the appropriate ways to deliver this information.

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