



E-ISSN: 2663-8274  
P-ISSN: 2663-8266  
[www.opthalmoljournal.com](http://www.opthalmoljournal.com)  
IJMO 2022; 4(1): 89-92  
Received: 08-01-2022  
Accepted: 15-02-2022

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## Diabetic retinopathy awareness in urban and rural population: A structured interview

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**DOI:** <https://doi.org/10.33545/26638266.2022.v4.i1b.117>

### Abstract

Diabetes has been termed one of the largest health emergencies of the 21<sup>st</sup> century. The Diabetic Retinopathy is a leading cause of blindness that affects 34 million worldwide. Diabetic retinopathy is caused when high blood sugar damages blood vessels in the retina. Damaged blood vessels can swell & leak, causing blurry vision or stopping blood flow. Sometimes new blood vessels grow but they are not normal and can cause further vision problems. Diabetic retinopathy usually affects both eyes. The blindness as a result of diabetic retinopathy can be prevented by early detection and management. For this, patients need to be screened as per guidelines recommended by International Diabetes Federation. Patient awareness to Diabetic retinopathy is the key to early detection, prevention and further improvements in Diabetic retinopathy management as patients play an important role in their glycemic control and eye care. Managing diabetes by patient himself and getting regular eye examinations can help prevent vision problem and stop them from getting worse.

The primary goal of this study is to assess the awareness about diabetic retinopathy in Indian urban and rural population. The present study was conducted on 451 subjects out of which 62.08% and 47.67% had knowledge of diabetes and Diabetic retinopathy respectively. Knowledge about Diabetes mellitus & Diabetic retinopathy was more in urban population as compared to rural. Compared with those who had no knowledge of Diabetic retinopathy, significant percentage of individuals with knowledge had the right attitude to go for regular eye examination and good practices for control of the disease.

**Keywords:** Awareness, diabetic retinopathy, rural and urban population

### Introduction

Diabetes has been termed one of the largest health emergencies of the 21<sup>st</sup> century <sup>[1]</sup>. It can result in long term damage due to dysfunction of various organs especially eyes, kidneys, nerves, heart and blood vessels. The Diabetic Retinopathy (DR) is a leading cause of blindness that affects 34 million worldwide; it was estimated that it is accounting 4% of blindness cases <sup>[2]</sup>. India is already home to 69.2 million people with diabetes, and it is estimated that 123.5 million people will have diabetes in India by the year 2040 <sup>[1]</sup>. There are several factors increase the risk of DR, the long duration of the disease, glycemic control, hypertension, hyperlipidemia, renal failure, anemia, age, puberty and pregnancy.

About 50-73% of those with visual impairment or blindness as a result of DR can be prevented by early detection and treatment of risk factors, and by photocoagulation <sup>[3, 4]</sup>. Therefore, the International Diabetes Federation guidelines recommend early detection of DR by means of DR screening <sup>[5]</sup>.

Diabetic retinopathy can be minimized with a combination of strict blood sugar control and routine screening with eye exams - though even with optimal medical care, it is not always possible to prevent or slow retinal damage. Studies have shown that maintaining near-normal blood sugar can decrease your chance of developing retinopathy and can help keep existing retinopathy from getting worse <sup>[6]</sup>. The most important risk factor for diabetic retinopathy is the duration of diabetes. More than 80% of the diabetic patients develop retinopathy in 15 years. After 15 years, about 2% of persons with diabetes become blind, and about 10% develop severe visual loss. After 20 years, more than 75% of patients will have some form of diabetic retinopathy Well conducted clinical trials have shown that good control of diabetes and hypertension significantly reduces the risk for diabetic retinopathy, and there is evidence from studies spanning more than 35 studies that treatment of established retinopathy can reduce the risk for visual loss <sup>[7, 8]</sup>.

For eye care programs to be effective, they require that persons with diabetes are aware of the sight-threatening potential of diabetes and the need for regular eye examinations.

Appropriate eye health education may encourage people at risk to seek timely and appropriate care. This will require developing educational materials that are regionally and culturally appropriate, and an understanding of current knowledge, attitudes and practices in the community<sup>[9]</sup>.

The primary goal of this study is to assess the knowledge about diabetic retinopathy as patient awareness to DR will be the key to further improvements in DR management and prevention. Patients should be informed that they play an integral role in their glycaemic control and eye care.

### Materials and Methods

This is a hospital based randomized qualitative study done at Sankara eye hospital, a tertiary eye care center at Ludhiana, Punjab, India, over a 3-month period from July 2021 to September 2021 with the help of structured interviews. This study included both diabetics and non-diabetics in urban and rural population. It included patients coming to the outpatient clinic or present in In-patient wards at our hospital. The patients were assessed using a structured interview-based questionnaire which had 22 questions and was administered verbally or in writing on a semi filled questionnaire.

Individuals with age less than 18 years, mentally challenged patients who were unable to give informed consent or respond meaningfully to the question administered, were excluded from the study.

The questionnaire was designed to capture important aspects of KAP among the population studied. This includes respondents' attitude, knowledge about diabetes and related complications, risk factors, treatment of diabetes, monitoring of the disease and the usual practices in daily life that affect the course of disease. Most of the questions in the knowledge and practice sections of the questionnaire were constructed as open-ended questions. The questions in the attitude section were framed as statements, and the patient was asked whether he or she agreed or disagreed with the statement, or was undecided. A final 45-point questionnaire was thus formulated, with 13 questions in the knowledge section, 8 questions in the attitude section, and 24 questions in the practice section. This questionnaire (in English, Punjabi or Hindi) was verbally administered to the patient to assess his or her knowledge, attitude and practice patterns regarding diabetes and diabetic retinopathy.

The answers to the questions were scored. The total score achieved by the patient in each section was calculated.

Depending on their answers patients were placed in different categories such as 'good/poor' in knowledge and practice, positive/negative in attitude. On the basis of the number of correct responses to 'must know' questions in the knowledge section of the questionnaire and 'must do' questions in the practice section, each patient in the study was categorized as having 'good' or 'poor' knowledge, and 'good' or 'poor' practice pattern. In the attitude section of the questionnaire, the responses best indicative of a positive attitude were scored. The association between them in rural and urban population and with diabetic retinopathy was studied.

### Statistical analysis

Data were analyzed using windows excel

### Results

A total of 451 subjects were included in the study, of whom 191 were from an urban background and 260 were from a

rural background. The mean age of the population studied was 57 years with a range of 21 to 85 years. (Table 1).

A total of 84.8% in urban population were educated and had qualifications above high school and it was about 58.8% in rural population in our study. (Table 2).

The number of diabetics in the study population were 277 (61.41%) of which 63.6% of patients in urban population were diabetic as compared to 60% in rural population in our study. (Table 3)

Out of all diabetic patients, 71.2% in urban population had awareness of diabetic retinopathy as compared to only 30.38% in rural population (Table 4).

KAP score percentage was better in urban population as compared to rural with 76%, 63%, 65% score in knowledge, attitude and practices respectively towards diabetic retinopathy and diabetes in general as compared to rural population which had a score of 39%,37%,31% respectively. (Table 5).

### Discussion

Of 451 individuals, 62.08% had knowledge of DM and 47.67% had knowledge of DR. Knowledge about DM was more in urban population as compared to rural and in those who spoke the English language. Compared with those who had no knowledge of DR, significant percentages of individuals with knowledge had the right attitude to go for regular eye examinations. Regarding practice patterns, only 32.7% of individuals with knowledge about DR believed that if they controlled their blood sugar, they could avoid a visit to an ophthalmologist.

The total diabetics in our study were 61.4% out of which 63.6% were diabetics in urban population as compared to 60% in rural population. We found that the knowledge of diabetes was comparatively poor in the rural population as compared to the urban population who had better knowledge of diabetes and diabetic retinopathy as compared to the rural population.

Individuals having better knowledge of diabetic retinopathy and its disadvantages have shown positive attitude towards the disease and most of them have good practices for control of the disease.

This is clearly seen in the KAP questionnaire results of urban population where 76% have good knowledge of which 63% have good attitude and 65% have good practice towards treatment and prevention of the disease as compared to the rural population where 39%, have knowledge of disease, 37% had good attitude of which 31% have good practice regarding the disease.

Similar results were seen in studies by Nithin et al.<sup>[10]</sup>, Wael et al.<sup>[11]</sup>, Sen et al.<sup>[12]</sup> showing the presence of good knowledge to be a factor of good practices and attitude towards the disease.

Most of the rural population was unaware of diabetes and its significance on the eyes. of those diabetics who were aware, many were unable to come for periodic checkup due to either distance issue, family issue or personal reasons.

### Limitation

Most of the questions in the questionnaire were constructed as open-ended questions to minimize bias due to 'leading' questions. However, we could not avoid a few closed-ended questions. These may have been 'leading,' which may have resulted in falsely high scores in certain sections of the questionnaire

**Conclusion**

Awareness of diabetic retinopathy was poor in patients especially in the rural population. Lack of knowledge for screening for diabetic retinopathy was seen as a major hurdle among the patients. Good knowledge of diabetes was seen to be associated with good practice patterns and a positive attitude towards retinopathy from the patients. Therefore, there is an urgent need to increase awareness and educate patients on diabetes and its related complications especially in the rural population.

**Table 1:** Age distribution

	21-45	46-65	66 and above
Urban	43	91	57
Rural	37	106	117

**Table 2:** Education qualifications

	Graduate	High school certificate	Middle school or lower qualification
Urban	144	18	29
Rural	72	81	54

**Table 3:** Diabetics in study

	Number of diabetics	
	Yes	No
Urban	63.60%	36.64%
Rural	60%	40%

**Table 4:** Awareness of diabetic retinopathy in diabetic patients

	Yes	No
Urban	71.20%	28.80%
Rural	30.38%	69.62%

**Table 5:** KAP score

	Knowledge		Attitude		Practice	
	Good	Poor	Positive	Negative	Good	Poor
Urban	76%	24%	63%	37%	65%	35%
Rural	39%	61%	37%	63%	31%	69%

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**Appendix-1  
Questionnaire  
Key**

The questionnaire will be administered to the patient by the investigator, who had been trained to administer the questionnaire in a standard manner. The questionnaire will not be shown to the patient. The patient will not be given the answer options or prompted regarding the options. Correct answers in knowledge and practice sections are highlighted  
In the Attitude section, the responses best indicative of positive attitude are highlighted  
Some questions in knowledge and practice sections may have more than one correct answer.  
Each correct response is given a score of one.

**Knowledge**

These questions are asked purely to test knowledge about diabetes

1. Do you have diabetes  
a) Yes, b) no, c) Don’t know
2. Does diabetes affect eye vision or cause blindness?  
a) Yes, b) no, c) Don’t know
3. Does diabetes affect kidneys and feet?  
a) Yes, b) no, c) Don’t know

4. Do you know that more the year's patient has diabetes more is the chance of his eyes getting affected?  
a) Yes, b) no, c) Don't know
5. Do you know that more you have uncontrolled diabetes more are the chances of the eye getting affected?  
a) Yes, b) no, c) Don't know
6. Can a person have normal vision even when diabetes has affected his eyes?  
a) Yes, b) no, c) Don't know
7. Can timely treatment of diabetic retinopathy delay or prevent damage in eye?  
a) Yes, b) no, c) Don't know
8. Are you aware that diabetes eye examination has to be done after instillation of eye drops in the hospital?  
a) Yes, b) no, c) Don't know

### **Attitude**

These are some statements regarding your thoughts, feelings and opinions regarding diabetes and its complications. Please indicate whether you 'agree' or 'disagree' with these statements, or whether you are 'undecided'.

1. Is regular check up with diabetologist important in patients with diabetes
2. Is regular eye checkup important in patients with diabetes?
3. Are dietary control and life style modifications important
4. Do you know that controlling blood sugar is a way to control diabetic eye disease?
5. Lifelong regular medicines are required to keep diabetes under control.

### **Practice**

A few questions to find out what you actually do regarding treatment and control of diabetes and its complications.

1. Do you yourself increase or decrease the dose of diabetic medication if required
2. Is it ok if a diabetic forgets to take his medicines sometimes
3. Diabetic patient can eat sweets
4. Do you do regular exercise
5. If your sugar is under control you don't need to visit your diabetic and eye doctor
6. If you have diabetes when did you last got your eyes examined:
7. If you are not regular with your follow up with your diabetic and eye doctor, reason is: (don't think its important / cant afford / family doesn't support / don't know regular checkup is necessary / don't have time)
8. How many years after detection with diabetes did you find out that diabetes can affect eyes:
9. How frequently should a diabetic get his eyes examined: yearly / 2 yearly/ every 6 months/ when vision is affected