

**KAP study about diabetic retinopathy among diabetic patients: a questionnaire survey**Umesh Kumar<sup>1\*</sup>, Nawin Kumar Sharma<sup>2</sup><sup>1</sup>Senior Resident, Department of Ophthalmology, Darbhanga Medical College and Hospital, Lasheriasarai, Darbhanga, Bihar, India<sup>2</sup>Associate Professor, Department of Ophthalmology, Darbhanga Medical College and Hospital, Lasheriasarai, Darbhanga, Bihar, India

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**Abstract**

**Aim:** To evaluate the awareness and practice about diabetic retinopathy among diabetic patients. **Method:** The present observational survey was Department of Ophthalmology, Darbhanga, Medical College and Hospital, Lasheriasarai, Darbhanga, Bihar, India from one 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. Social workers were trained in administering questionnaire. Diabetic patients were given questionnaires at primary health centre and filled in the presence of social workers. **Results:** Out of 400 patients 60% had no knowledge of diabetic retinopathy compared to 40% who had knowledge ( $p < 0.001$ ). Knowledge was more in age group less than 30 years (84.61%) and least in 40 to 50 age group (32.20%) which was statistically significant with  $p$  value  $< 0.001$ . Knowledge was found to be high among participants with higher educational status than in those who had college level education (79.31%) which was statistically significant with  $p$  value  $< 0.001$ . Patients in the upper socioeconomic group had more knowledge about diabetic retinopathy (84.38%) which was statistically significant with a  $p$  value of  $< 0.001$ . There was no significant association between duration of diabetes and knowledge of diabetic retinopathy. About 76.25 % of individuals in knowledge group had right attitude which was significantly higher than non knowledge group (45%) with a  $p$  value  $< 0.001$ . **Conclusions:** The attitude and practice of diabetic retinopathy was statistically significant in knowledge group compared to those who had no knowledge of diabetic retinopathy. Improving knowledge about diabetic retinopathy through awareness campaigns can increase attitude and practice. Early detection can help in preventing sight threatening complications of diabetic retinopathy.

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

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**Introduction**

It has been estimated that there are about 69.2 million Indians suffering from diabetes.<sup>1</sup> The increasing prevalence of diabetes and the increased life expectancy; raises the time period for which patients have been suffering from diabetes; this increases the risk of long term complications of diabetes, a very important one being diabetic retinopathy. The overall global prevalence of diabetic retinopathy is 34.6% and it accounts for 4.8% of blindness in the world.<sup>2,3</sup>

The prevalence of diabetic retinopathy in India from various studies range from 7.3% to 20%.<sup>4-7</sup> Wisconsin Epidemiological study has proved that micro vascular complications such as diabetic retinopathy are linked to duration of diabetes.<sup>8</sup> 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.<sup>9</sup> Magnitude of blindness caused by diabetic retinopathy is increasing. Lack of awareness about diabetic retinopathy and the

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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.<sup>10-13</sup> The aim 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

A cross sectional study was conducted in the Department of Ophthalmology, Darbhanga, Medical College and Hospital, Lasheriesarai, Darbhanga, Bihar, India from one year.

### Methodology

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. Social workers were trained in administering the questionnaire. They were given the questionnaire and filled in presence of the social workers 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 details

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 check up 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?

**Statistical Analysis:** The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages. The applied for the analysis were chi-square test.

### Results

The demographic characteristics of the 400 patients recruited into the study are given in Table 1. Out of the 400 patients, 240 (60%) had no knowledge of diabetic retinopathy compared to 160 (40%) who had knowledge. This was statistically significant with p value < 0.001.

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

Age	Number	Percentage
Below 30	39	9.75%
30-40	108	27%
40-50	118	29.5%
50-60	82	20.5%
Above 60	53	13.25%
Gender		
Male	106	26.5%
Female	294	73.5%
Educational status		
Uneducated	118	29.5%
class 1-12	224	56%
college level	58	14.5 %

Socio economic status		
Lower	226	56.5%
Middle	110	27.5%
Upper	64	16%

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

	Knowledge of DR		Total	P-value
	Knowledge group	Non knowledge group		
Below 30	33	6	39	
30-40	37	71	108	
40-50	38	80	118	0.00
50-60	31	51	82	01
Above 60	21	32	53	
Total	160	240	400	

Knowledge was more in age group less than 30 years (84.61%) and least in 40 to 50 age group (32.20%) 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 (79.31%) 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		Total	P-value
	Knowledge group	Non knowledge group		
No education	44	74	118	
Class 1-12	70	154	224	0.00
College	46	12	58	01
Total	160	240	400	

Patients in the upper socioeconomic group had more knowledge about diabetic retinopathy (84.38%) which was statistically significant with a p value of 0.001 (Table 4).

**Table 4: Association of socio economic 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)	58	168	226	
Middle (501-2000)	48	62	110	0.0001
Upper (>2000)	54	10	64	
Total	160	240	400	

There was no significant association between duration of diabetes and knowledge of diabetic retinopathy. About 76.25 % of individuals in knowledge group had right attitude which was significantly higher than non knowledge group (45%) 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	122	108	230	
No	38	132	170	0.0001
Total	160	240	400	

Regarding source of information, 50% of patients in knowledge group got information about diabetic retinopathy from physicians, 12% from eye specialists, 8% from reading books, 8% from various media and 22% from other sources like family and friends (table 6)

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

Physicians	50%
Eye Specialists	12
Reading Books	8
Various Media	8%
Family and Friends	22%

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

Practice	Knowledge of DR		Total	P value
	Knowledgeable	Non knowledgeable		
Yes	64	34	98	0.001
No	96	206	302	
Total	160	240	400	

About 40% in knowledge group had practice of visiting ophthalmologist for eye checkup which was significantly higher than non knowledge group with a p value <0.001 (Table 7).

### Discussion

Diabetic retinopathy is an upcoming cause of visual impairment and prevalence of diabetic retinopathy is more in developing countries. The facilities in primary health centres which are provided free of cost are not utilized properly and this is reflected in the results of our study.

In this study more than half of the respondents (60%) had no knowledge of diabetic retinopathy. Knowledge was present in 40%. 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%.<sup>14,15</sup> 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.<sup>16</sup>

In this study, knowledge was significantly more in those with higher education and among upper socioeconomic group. Literacy and its influence on knowledge about diabetes was studied in other studies also.<sup>17,18</sup> 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.<sup>15</sup> Al Zarea in Saudi Arabia reported that knowledge regarding ocular

complications in diabetes was 75.62% which was an urban study.<sup>19</sup>

In this study, 76.25% in knowledge group had right attitude which was statistically significant. 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.<sup>14,16</sup> 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.<sup>14,19</sup>

In this study, 40% in knowledge group had practice of going for eye check-up which was statistically significant. Ovenseri-Ogbomo et al, also reported that knowledge of diabetic retinopathy was significantly related to practice of undertaking eye examinations.<sup>20</sup> Mwangi et al, reported that 50% of the participants in their study went for eye check-up.<sup>21</sup> Hussain et al, reported that practice was present in 57.6%.<sup>16</sup> In the study by Al Zarea practice was reported to be 95% which was an urban study.<sup>19</sup> 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.<sup>22,23</sup>

In primary health centres, physicians can play a major role in creating awareness and imparting knowledge about diabetic retinopathy. Data from our study also reflects this. About 50 % of patients in knowledge

group in our study got information about diabetic retinopathy from physicians and 12 % from eye specialists. 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.<sup>23</sup> About 66.4 % obtained their knowledge from general practitioners and nurses in the study by Ovenseri-Ogbomo et al.<sup>20</sup> 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.

Majority of the participants were in low and middle socio-economic status and those from high socioeconomic status were less. A population- based study would have correctly reflected the level of knowledge, attitude and practice in the non urban area. Knowledge, attitude and practice patterns regarding association of good control of diabetes mellitus and retinopathy and regarding available treatment modalities for diabetic retinopathy were not included in our study.

### Conclusion

The attitude and practice pattern of diabetic retinopathy was statistically significant in knowledge group compared to those who had no knowledge of diabetic retinopathy. Increasing knowledge about diabetic retinopathy through awareness campaigns can improve attitude and practice. Early detection and timely intervention can help in preventing sight threatening complications of diabetic retinopathy.

### References

1. International Diabetes Federation. IDF Diabetes Atlas. 7th edn. Brussels, Belgium: International Diabetes Federation; 2015
2. Yau JWY, Rogers SL, Kawasaki R, Lamoureux EL, Kowalski JW, Bek T, et al. Global prevalence and major risk factors of diabetic retinopathy. *Diabetes Care*. 2012;35(3):556-64.
3. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegaram R, Pokharel GP, et al. Global data on visual impairment in the year 2002. *Bull World Health Organ*. 2004;82(11):844-51.
4. Rema M, Deepa R, Mohan V. Prevalence of retinopathy at diagnosis among type 2 diabetic patients attending a diabetic centre in South India. *Br J Ophthalmol*. 2000;84:1058-60.
5. Rema M, Premkumar S, Anitha B, Deepa R, Pradeepa R, Mohan V. Prevalence of diabetic retinopathy in urban India: The Chennai Urban Rural Epidemiology Study (CURES) eye study, I. *Invest Ophthalmol Vis Sci*. 2005;46:2328-33.
6. Raman R, Rani PK, Reddi Racheppalle S, Gnanamoorthy P, Uthra S, Kumaramanickavel G, et al. Prevalence of diabetic retinopathy in India: Sankara Nethralaya diabetic retinopathy epidemiology and molecular genetics study report 2. *Ophthalmology*. 2009;116:311-18.
7. Jonas JB, Nangia V, Khare A, Matin A, Bhojwani K, Kulkarni M, et al. Prevalence and associated factors of diabetic retinopathy in rural central India. *Diabetes Care*. 2013;36:e69.
8. Klein R, Klein B, Moss S. The Wisconsin Epidemiological Study of Diabetic Retinopathy: a review. *Diabetes Meta Review*. 1989;5:5559-5570.
9. Padmaja KR, Rajiv R, Pradeep GP, Swati A, Kumaramanickavel G, Sharma T. Use of eye care services by people with diabetes-South India experience. *British J Ophthalmology*. 2005
10. Srinivasan NK, John D, Rebekah G, Kujur ES, Paul P, John SS. Diabetes and diabetic retinopathy: KAP among diabetes patients in a tertiary care centre. *J Clin Diag Res*. 2017; 11(7):1-7.
11. Hussain R, Rajesh B, Giridhar A, Gopalakrishnan M, Sadasivan S, James J, et al. Knowledge and attitudes about diabetes and diabetic retinopathy in suburban population of a South Indian state and its practice among patients with diabetes mellitus: A population based study. *Indian J Ophthalmol*. 2016;64(4):272-6.
12. Rani PK, Raman R, Subramani S, Perumal G, Kumaramanickavel G, Sharma T. Knowledge of diabetes and diabetic retinopathy among rural population in India and its influence on knowledge of diabetic retinopathy on attitude

- and practice. Rural and remote health. 2008;8(3):838.
13. Koshy J, Varghese DL, Mathew T, Kaur G, Thomas S, Bhatti SM. Study on KAP of ocular complications due to diabetes among type 2 diabetes visiting a tertiary teaching hospital. Indian J Community health. 2012;24:27-31.
  14. Rani PK, Raman R, Subramani S, Perumal G, Kumaramanickavel G, Sharma T. Knowledge of diabetes and diabetic retinopathy among rural population in India and the influence of knowledge of diabetic retinopathy on attitude and practice. Rural Remote Health. 2008;8(3):838.
  15. Dandona R, Dandona L, John RK, McCarty CA, Rao GN. Awareness of eye diseases in an urban population in Southern India. Bull World Health Organ. 2001;79(2):96-102
  16. Hussain R, Rajesh B, Giridhar A, Gopalakrishnan M, Sadasivan S, James J, et al. Knowledge and awareness about diabetes mellitus and diabetic retinopathy in suburban population of a South Indian state and its practice among the patients with diabetes mellitus: A population-based study. Indian J Ophthalmol. 2016;64(4):272-6.
  17. Williams MV, Baker DW, Parker RM, Nurss JR. Relationship of functional health literacy to patients' knowledge of their chronic disease. A study of patients with hypertension and diabetes. Archives Inter Med. 1998;158:166-172.
  18. Rothman RL, Malone R, Bryant B. The spoken knowledge in low literacy in diabetes scale. The Diabetes Educator. 2005;31:215-224.
  19. Al Zarea BK. Knowledge, attitude and practice of diabetic retinopathy amongst the diabetic patients of Aljouf and hail province of Saudi Arabia. JCDR. 2016;10(5):NC05-NC08.
  20. Oveneri-Ogbomo GO, Abokyi S, Koffuor GA, Abokyi E. Knowledge of diabetes and its associated ocular manifestations by diabetic patients: A study at Korle-Bu Teaching Hospital, Ghana. Niger Med J. 2013;54(4):217-23.
  21. Mwangi MW, Githinji GG, Githinji FW. Knowledge and awareness of diabetic retinopathy amongst diabetic patients in Kenyatta national hospital, Kenya. Int J Humanit Soc Sci. 2011;1(21):140-46.
  22. Mahesh G, Elias A, Sandhya N, Giridhar A, Saikumar SJ, Sankaranarayanan, et al. Chengamanad diabetic retinopathy awareness study (CDRAS) Kerala J Ophthalmol. 2006;28:14-21.
  23. Srinivasan NK, John D, Rebekah G, Kujur ES, Paul P, John SS. Diabetes and diabetic retinopathy: knowledge, attitude, practice (KAP) among diabetic patients in a tertiary eye care centre. J Clin Diagn Res. 2017 Jul;11(7):NC01-NC07.

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