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**RESEARCH ARTICLE**

## **Knowledge, attitude and practice of Diabetic Retinopathy among type II diabetic patients of South Indian population**

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**ABSTRACT:**

**Introduction:** Diabetes Mellitus (DM) can be characterized as a metabolic disorder, which results in the increase of blood sugar level in the body which might lead to macrovascular and microvascular complication. It is a non-communicable disease. Diabetes Mellitus has also become a major concern in public health and also has imposed an economic burden on the society.

**Aim:** The aim of the study is to assess the knowledge, attitude and practice of Diabetic Retinopathy in patients with Diabetes Mellitus of the south Indian population.

**Materials and Methods:** Patients who were diagnosed with Diabetes Mellitus admitted in a tertiary care government hospital located in Chennai was included in this study. A questionnaire (Bandar Krayem Al Zarea et al) was provided to the patient to analyze their knowledge, attitude and practices about Diabetic Retinopathy among patients diagnosed with Diabetes Mellitus. The data collected were coded and entered into SPSS (Statistical Package for the Social Science) version 20 and statistical analysis was done.

**Result:** This study incorporated 230 diabetic individuals out of which 112 (48.7%) were male patients and 118 (51.3%) were females. The majority of the diabetic patients 146 (63.5%) were aware that Diabetes can cause eye disorders, 127 (55.2%) of patients replied that diabetic individuals should go for regular eye checkups and 141 (61.3%) of patients were aware that they should visit an ophthalmologist in the event of eye problem. Out of 230 diabetic 174 patients 174 (75.7%) were aware that timely treatment can prevent or delay damage of eyes in diabetic patients and about 82% of all the participants went for regular ocular examinations.

**Conclusion:** The majority of the patient diagnosed with Diabetes Mellitus had knowledge about Diabetes can cause eye disease and it is essential for all patients diagnosed with Diabetes Mellitus to take the regular ocular examination.

**KEYWORDS:** Awareness, ocular disorder, eye problem.

**INTRODUCTION:**

Diabetes Mellitus (DM) can be characterized as a metabolic disorder, which results in the increase of blood sugar level in the body which might lead to macrovascular and microvascular complication. It is a non-communicable disease. Diabetes Mellitus has also become a major concern for public health and also has imposed an economic burden on the society.

Globally about 415 million people are affected by Diabetes Mellitus in 2015 and is expected to be at 642 million in 2040. According to the international Diabetes foundation, India is considered to be more diabetic compared to other countries in the world. In India, about 62 million are affected by Diabetes Mellitus which is more than 7.1% of the adult population. The average age of onset of Diabetes Mellitus in Indian population is 42.5 years. Research indicates that 1 million Indians die due to Diabetes every year [22]. Diabetes Mellitus both type 1 and type 2 can lead to complication. Complications of Diabetes Mellitus can be classified as Microvascular and

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macrovascular complication. Microvascular complication (due to damage to small blood vessels) include damage to eyes (Diabetic Retinopathy) leading to blindness, to kidneys (Diabetic nephropathy) leading to renal failure and to nerves (Diabetic neuropathy) leading to impotence and diabetic foot disorders (which include severe infections leading to amputation) and macrovascular complication (due to damage to larger blood vessels) include cardiovascular diseases such as heart attacks, strokes and insufficiency in blood flow to legs.

Diabetic Retinopathy being the leading cause of blindness. Patients awareness on Diabetic Retinopathy will lead to timely screening and management, which in turn delays the onset of the disease. Knowledge refers to the understanding of Diabetic Retinopathy, attitude refers to their preconceived ideas they may have about Diabetic Retinopathy and practice refers to the use of service regarding the eye disorder.

Various studies have been conducted to assess the awareness of Diabetic Retinopathy among diabetic patients in different countries. To the best of our knowledge, no studies have been conducted on south Indian population. So this study was carried out to evaluate knowledge, attitude and practice of Diabetic Retinopathy among south Indian population.

**MATERIALS AND METHODS:**

A prospective study was conducted on patients diagnosed with Diabetes Mellitus visiting a government tertiary care hospital situated in Chennai was enrolled in this study. Prior permission was obtained from the institutional ethics committee. The sample size was calculated based on the population size. Informed consent form was obtained from all the individuals who participated in this study.

The patients were requested to fill the self-administered questionnaires (Bandar Krayem Al Zarea et al) [20]. The questionnaire was prepared in English and was given to the participants in this study population. The questionnaire contained information regarding Gender, Age, Educational qualification, economic status and duration of Diabetes. The economic status of the participants was calculated using the scale created by Rathod et al [13]. The questionnaire also contained different questions to measure the level of knowledge, attitude and practice regarding Diabetic Retinopathy. The data collected were entered in SPSS version 20.00 (SPSS Inc., Chicago, USA). Statistical analysis was done applying Chi-square and z- proportionality tests.

**RESULTS:**

[Table 1] shows that, out of 230 samples, 112 (48.7%) were males and 118 (51.3%) were females, 42 (18.3%) patients belonged to 40 and below age group, 122 (53%) patients were in 41 -60 and 66 (28.07%) patients were in the age group of 60 above. Further, a maximum of 101 (43.9%) of samples had duration of Diabetes since 6-10 years, 60 (26.1%) of sample had Diabetes for the duration of 11 – 15 years, 25 (10.9%) of sample had Diabetes for the duration of 1 – 5 years, followed by 24 (10.4%) of sample had Diabetes for the duration of more than 16 years and 20 (8.7%) of the study sample were newly diagnosed with Diabetes Mellitus. A maximum of 157(68.3%) patients belonged to low economic status, 67 (29.1%) belonged to medium economic status and 4 (1.7%) of patients were from high economic status. Regarding education level, 113 (49.1%) of individuals were educated up to primary level, 96 (41.7%) were educated up to secondary level and 21 (9.1%) were graduates. A statistically significant difference was observed among all these variables significant (p<0.05).

**Table 1: Demographic Characteristics of the study sample.**

Variable		Male		Female		Total		P-Value
		n = 112	% = 49	n = 118	% = 51	n = 230	% = 100	
Age (Years) Mean±SD = 54.056±10.420	40	16	07	26	11.3	42	18.3	0.015*
	41 – 60	59	25.7	63	27.4	122	53	
	>60	37	16.1	29	12.6	66	28.7	
Duration	<1	08	3.5	12	5.2	20	8.7	0.0001*
	1 -5	16	7.0	09	3.9	25	10.9	
	6 – 10	48	20.9	53	23	101	43.9	
	11 – 15	24	10.4	36	15.7	60	26.1	
	> 16	16	7.0	08	3.5	24	10.4	
Economic Status	Low	73	31.7	84	36.5	157	68.3	0.0001*
	Medium	35	15.2	32	13.9	67	29.1	
	High	04	1.7	02	0.9	06	2.6	
Educational Level	Primary	66	28.7	47	20.4	113	49.1	0.0001*
	Secondary	32	13.9	64	27.8	96	41.7	
	Graduate	14	6.1	07	03	21	9.1	

Sample Size: n= 230.

The result is highly significant at p < 0.01

[Table 2] represents the association of knowledge of Diabetic Retinopathy regarding attitude and practice. Out of 230 patients, 146 (63.5 %) were aware that Diabetes can cause eye disease, 127 (55.2 %) answered that persons with Diabetes should go for regular eye examinations and 167 (72.6 %) patients did not agree,

that there was no need to visit ophthalmologist if a person has having Diabetes under control. Most of the individuals 174 (75.7 %) agree that timely treatment can prevent or delay eye damage in diabetic individuals. The results were highly significant at  $p < 0.01$

**Table 2: Knowledge and attitude regarding Diabetic Retinopathy**

Questions	Yes		No		P-Value
	n	%	N	%	
<b>Knowledge</b>					
<b>Do you know that Diabetes can cause eye disease?</b>	146	63.5	84	36.5	0.0001*
<b>Attitude</b>					
<b>Should person with Diabetes go for regular eye check up?</b>	127	55.2	103	44.8	0.0001*
<b>There is no need to visit ophthalmologist if a person has having Diabetes under control?</b>	63	27.4	167	72.6	0.0001*
<b>Timely treatment can prevent/ delay damage due to Diabetes in eyes?</b>	174	75.7	56	24.3	0.0001*

The result is highly significant at  $p < 0.01$

[Table 3] represents the choice of healthcare professional in the event of eye problem. Out of total 230 samples, 141 (61.3%) of patients replied that an ophthalmologist should be consulted, 61 (26.5%) of patients replied that any specialist (Non-ophthalmologist) can be consulted, 97 (42.2%) of patients replied that an optometrist and 101 (43.9%) of patients replies that a general practitioner can be consulted in an event of eye problem. The difference was found to be statistically significant (Chi-square= 56.8277,  $p = 0.0001$ ). Further, the difference between

ophthalmologist and non-ophthalmologist (Chi-square= 56.4894,  $p = 0.0001$ ), ophthalmologist and optometrist (Chi-square= 16.8552,  $p = 0.0004$ ), ophthalmologist and general practitioner (Chi-square= 13.951,  $p = 0.0001$ ), non-ophthalmologist and optometrist (Chi-square= 12.4939,  $p = 0.0040$ ) and non-ophthalmologist and general practitioner (Chi-square= 15.2457,  $p = 0.0009$ ) was observed at 5% level of significance. Whereas the statistical significance between optometrist and general practitioner (Chi-square= 0.1419,  $p = 0.7064$ ) the result is not significant at  $p < 0.05$

**Table 3: Knowledge regarding choice of healthcare professional in the event of eye problem**

Healthcare Professional	Yes		No	
	n	%	n	%
<b>Ophthalmologist</b>	141	61.3	89	38.7
<b>Any specialist (Non-ophthalmologist)</b>	61	26.5	169	73.5
<b>Optometrist</b>	97	42.2	133	57.8
<b>General practitioner</b>	101	43.9	129	56.1
Between all professionals, Chi-square= 56.8277, $p = 0.0001$ * The result is significant at $p < 0.05$				
Between <b>Ophthalmologist vs Non-ophthalmologist</b> , Chi-square= 56.4894, $p = 0.0001$ *. The result is significant at $p < 0.05$				
Between <b>Ophthalmologist vs Optometrist</b> , Chi-square= 16.8552, $p = 0.0004$ * The result is significant at $p < 0.05$				
Between <b>Ophthalmologist vs General practitioner</b> , Chi-square= 13.951, $p = 0.0001$ * The result is significant at $p < 0.05$				
Between <b>Non-ophthalmologist vs Optometrist</b> , Chi-square= 12.4939 $p = 0.0040$ * The result is significant at $p < 0.05$				
Between <b>Non-ophthalmologist vs General practitioner</b> , Chi-square= 15.2457, $p = 0.0009$ * The result is significant at $p < 0.05$				
Between <b>Optometrist vs General practitioner</b> , Chi-square= 0.1419, $p = 0.7064$ The result is not significant at $p < 0.05$				

**Table 4: Knowledge of available treatment for Diabetic Retinopathy**

Treatment options	Yes		No		P-Value
	n	%	N	%	
<b>No treatment available</b>	126	54.8	104	45.2	0.0001*
<b>Modification of life style</b>	78	33.9	152	66.1	0.0001*
<b>Control of Diabetes</b>	167	72.6	63	27.4	0.0001*
<b>Surgical Procedure</b>	147	63.9	83	36.1	0.0001*
<b>Only medication</b>	42	18.3	188	81.7	0.0001*
<b>Alternative medical therapies</b>	33	14.3	197	85.7	0.0001*

Chi-square = 278.599,  $p = 0.0001$ \*

**[Table 4]** Represents the knowledge of available treatment for Diabetic Retinopathy. Out of 230 samples, only 104 (45.2%) of patients had no knowledge of treatment available. Regarding treatment of DR, 78 (33.9 %) responded that it can be treated by modification of lifestyle, 167 (72.6%) answered that control of Diabetes, 147 (63.9 %) believed that surgeries and 42 (18.3%) replied that only medications can treat DR. The differences in answers was found to statistically significant (Chi-square=278.599, p = 0.0001). Statistical differences between samples with and without knowledge of each treatment options (p<0.05)

**[Table 5]** About 82% of all the participants went for regular ocular examinations, and 18.3% answered that was their first visit, 5.2 % of the individuals visited monthly, 42.6 % went once in six months and 33.9 % of them went for yearly ocular examination.

**Table 5: Frequency of eye examination**

How often you go for eye examination	N	Percentage %
Monthly	12	5.2
Once in six months	98	42.6
Yearly	42	33.9
This is the first time	78	18.3

Sample Size: n= 230.

**DISCUSSION:**

Diabetes Mellitus is a chronic illness which can be characterized by the increase in blood sugar level in the body. Due to the different level of complication due to Diabetes Mellitus self-care knowledge and management is required. Extensive knowledge, attitude and good practice could be the means to control and prevent Diabetes-related consequences and to decrease the economic burden on the society[18]. Our study indicated that moderate level of knowledge was seen about Diabetic Retinopathy being a complication of Diabetes Mellitus, The findings were similar to that of a previously conducted study in Saudi Arabia (Bandar Krayem Al Zarea et al.).

Other studies conducted in urban area of south India and UAE reported similar finding that positive and good level of attitude among diabetic patients [14,12]

In this study, Female patients with Diabetes Mellitus were more compared with male patients [21, 10]. Patients between the age group of 41 – 60 were more compared to another age group, the findings were similar to that of the previous studies [19,20]. The duration of Diabetes of patients participated in this study was more between 6 – 10 years followed by 11 to 15 years [16]. About 68.3% of the patients included in this study was from a low economic class, 29.1% from medium economic status since the study was itself conducted in a government hospital. Most of the patient from the

hospital had low educational level 90.8%. The knowledge, attitude, and practice of the individual had a significant relation between the economic status and educational level.

**Knowledge of Diabetic Retinopathy in diabetic patients:**

In this study, the knowledge regarding ocular complications resulting from Diabetes Mellitus was 63.5% which was lower than that of the study conducted in Saudi Arabia (75.62%)[20], USA (52%)[6], Oman (72%)[10], Japan (98%)[2] and in Australia (96%)[1]. In the present study (55.2%) of individuals were known to have positive attitude for eye checkup which is less than that of Australians (75%)<sup>[1]</sup>.

**Attitude of Diabetic Retinopathy in diabetic patients:**

In this present study, about 72.6% of patients believed that there is no need to visit ophthalmologist if a person is having Diabetes under control. Rani et al., in their study noted that 36.5% of individual with knowledge about Diabetic Retinopathy replied that if their blood sugar is under control then there is no need to consult an ophthalmologist [9]. In their studies, the authors also noticed that about 60% of participants in their study were not aware that surgery, is one of the treatment options, this value was very high in contrast to our observations, where only 36.1 % of patients were not aware, our value was more compared to the study conducted in Saudi Arabian population.[20] The study also reported that about 61.3 % recognized the role of an ophthalmologist in screening for Diabetic Retinopathy. The findings were more compared to the previous study conducted by E. O. Achigbu et al. [19] The ophthalmologists have a role to play in education and enlightenment of the general public and people living with Diabetes Mellitus about Diabetes, its complications, management and about the importance of screening. This can be achieved in collaboration with the physicians and the ministry of health.

**Diabetic patients practices towards eye examination:**

In this research study, 82% of all the participants went for regular ocular examinations. Other studies shows that 12.07% of the individuals went monthly, 33.94% went once in six months and 48.97% of them went for yearly examination according to the study conducted in Saudi Arabia [20], according to Mwangi et al., who reported that only 50% of the participants went for ocular examinations and 27% of them went yearly, 10% went once in six months 17% of them went for monthly check-ups [11], whereas Oveneri-Ogbomo et al., reported that 34.6% of their patients never had their eyes examined and only 19.5% of subjects undergone eye check up within one year [15]. In a study conducted in South Africa, it was observed that 48% of the diabetic

individuals had undergone eye examination over one and half year ago [11]. In a study assessing diabetic patient's compliance regarding care of the eyes, it was found that 28.8% of the participants had received ocular examination within the past year [5]. In a study conducted in Kenya 27% went once in a year, 10% twice a year and 17% monthly [11]

#### LIMITATION:

Patients attending only one government tertiary care hospital in Chennai were included in the study. It was not possible for us to conduct the study in other provinces. A large community-based study of south Indian population is recommended.

#### CONCLUSION:

Diabetic Retinopathy being the most common complication due to Diabetes Mellitus, the study was conducted to measure the awareness among people of south Indian population diagnosed with Diabetes Mellitus. The result of the present study revealed that more than half of the patients know that Diabetic Retinopathy is one of the complications of Diabetes Mellitus. Moderate knowledge about eye complication was seen in the diabetic individual.

There is was also a poor attitude and practice to the uptake of eye care in spite of the knowledge of Diabetes as a cause of blindness.

#### COMPETING INTERESTS:

The authors declare no competing interests.

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