Original Article

Awareness and Practices of Diabetic Retinopathy among Diabetic Patients Attending Non-Communicable Disease Clinic at Tertiary Health Care Centre: A Facility Based Cross Sectional Study

D. Lakshmi[1], D. Sivakumar[2], G.Venkatesh[3], S. Nithiya[4]

[1]Assistant Professor, Department of Community Medicine, Government Villupuram Medical College, Villupuram, Tamilnadu, India, [2]Associate Professor, Department of Community Medicine, Government Vellore Medical College, Vellore, Tamilnadu, India, [3]Associate Professor, Department of Community Medicine, Government Thiruvannamalai Medical College, Thiruvannamalai, Tamilnadu, India.

How to cite this article: D. Lakshmi, D. Sivakumar, G.Venkatesh et. al. Awareness and Practices of Diabetic Retinopathy among Diabetic Patients Attending Non-Communicable Disease Clinic at Tertiary Health Care Centre: A Facility Based Cross Sectional Study. Indian Journal of Public Health Research and Development / Vol. 15 No. 4, October-December 2024.

Abstract

Context/Background: Diabetes Mellitus causes a global burden due to its systemic complications that affect different parts of the body especially eye. DR is a common micro vascular complication of DM, and which causes significant visual impairment and blindness worldwide. Hence, regular screening of the eye is mandatory to prevent visual impairment and blindness due to Diabetic Retinopathy

Aims/Objectives: The Objective of the study is to assess the level of awareness and practices among the study participants attending Non Communicable Disease OPD at Tertiary Care centre.

Methodology: The study period was six months from January 2021 to June 2021 with a sample size was 300. The study tool was Semi- structured Questionnaire to assess the level of awareness and practices among the study participants attending Non Communicable Disease OPD at Tertiary Care centre. Chi-square test was used for statistical analysis. p value Less than 0.05 was fixed as significant value.

Results: A total of 300 participants 136 (45.3%) females and 164 (54.7%) males with Type 2 diabetes were interviewed. 281(93.7%) of the study participants knew that diabetes can have an impact on the eyes, and 207(69%), said that diabetic retinopathy can result in blindness. 231(77%) of the study population are well aware that the good diabetic control prevent diabetic retinopathy. 106 (35.3%) of the population visit for an annual eye checkups. Very minimal population 25(8.3%) undergoes eye check-up when newly diagnosed as DM.

Conclusion: Preventive measures should be taken to create awareness among diabetic patients and also the general population

Key words: Diabetes mellitus, Diabetic retinopathy, Awareness, Macular edema.

Corresponding Author: S. Nithiya, Assistant Professor, Department of Community Medicine, Government Thiruvannamalai Medical College, Thiruvannamalai, Tamilnadu, India.

E-mail: siva86683@gmail.com

Submission date: Jan 5, 2024 **Revision date:** Feb 19, 2024 **Published date: September 20 , 2024**

Introduction

Globally, diabetes is a significant public health issue[1]. In people in the United States between the ages of 20 and 64, diabetes mellitus is the most common cause of blindness[1]. In the United States, there are around 30 million individuals with diabetes, of whom 28.5% have diabetic retinopathy (DR) and 4.4% have potentially dangerous retinopathy[2]. According to 2019 studies, 463 million people worldwide are anticipated to have diabetes, and by 2045, that number is expected to climb to 700 million.

Globally, the prevalence of DR was 22.27%, VTDR (vision-threatening DR) was 6.17%, and CSME (clinically significant macular oedema) was 4.07% among diabetics. According to estimates from the International Diabetes Federation[3], there were 77 million diabetics in India in 2019; by 2045, that number is predicted to rise to 134 million. The most prevalent retinal vascular disease is chronic diabetes mellitus (DM), which can lead to diabetic retinopathy (DR), a micro vascular consequence. The underlying patho physiology of diabetic retinopathy is Diabetes mellitus impairs vascular auto regulation, which damages the micro vascular system, particularly in the retina and optic nerve[4]. Diabetic retinopathy can manifest in three different ways: proliferative diabetic retinopathy (PDR), non-proliferative diabetic retinopathy (NPDR), or diabetic macular edema[5]. After 15 years of developing the condition, DR affects three out of every four diabetics[6,5]. A defect in the retina's vascularity known as diabetic retinopathy (DR) makes it difficult for the retina to fulfill its high metabolic needs because it disrupts the supply of oxygen and nutrients to the retina. As a result, retinal circulation impairs normal vision, which causes blindness and vision impairment globally[7].

Uncontrolled diabetes, chronic diabetes, and the existence of additional systemic disorders like hypertension are risk factors for diabetic retinopathy (DR). The following nations have different prevalence rates of DR: USA (28.5%), UK (30.3%), Australia (32.2%), Japan (39.6%), Middle East countries (64%) and Malaysia (39.3%)[7]. In India, reports of DR and other visual problems range from 16.1% to 71.3%[3]. In contrast, 37% of patients in Australia and 65% of patients in the USA were aware of the ocular consequences of diabetes mellitus (DM)[7]. It is critical to diagnose DR as soon as possible to prevent visual impairment. Patients with diabetes should be educated on the value of routine eye exams. When it comes to DR screening, community knowledge is the most crucial component. The knowledge of diabetic patients, both in developed and developing countries, regarding DR are still lacking[5].The purpose of the current study is to ascertain whether diabetic patients undergoing NCD OPD at Thiruvannamalai Medical College Hospital are aware of diabetic retinopathy.

Methodology

The study's objective was to determine diabetes mellitus patients' awareness of DR when they visited the NCD OPD. This is a cross-sectional based study conducted among Patients with diabetes who attends the NCD OPD at Thiruvannamalai Medical College Hospital are the study participants. The study was conducted from January 2021–June 2021, six-month study period. Taking the prevalence , awareness of Diabetic retinopathy among diabetic Population study conducted by Abdullah Hisham Al-Mulla etal of 30.6%[10] precision to be5.3%. Using the formula $4pq/d^2$ the sample size was 293. The total sample size was taken as 300. There were 300 people in the sample.

The study was carried out by interview using pre-tested, semi-structured questionnaire. The questionnaire consists of questions about sociodemographic information, knowledge, Awareness, Practice of the impact of diabetes on the eyes, and other areas.

The purpose of the study was explained and informed consent and confidentiality was explained to the participants. Diabetes type II patients visiting the NCD OPD, individuals who consent to taking part in the research were participated in study. Individuals with congenital eye conditions, eye trauma in the past, Individuals who have corneal opacity or cataracts, study participants' refusal to provide consent were excluded from study.

Then sample was taken using simple random sampling. P value ≤ 0.05 was considered as the level of significance for the statistical tests. The data was entered in MS EXCEL and analysed using SPSS (16). Central tendency and dispersion was calculated for

continuous variables and proportions were calculated for categorical variables. Univariate analysis using chi square tests was conducted to check for association.

Results

The sociodemographic characteristics of the study participants were shown in Table 1. Interviews were conducted with 300 individuals 136 (45.3%) females and 164 (54.7%) males who had type 2 Diabetes. The majority of people live in rural areas 242 (80.7%) and 169 people (56.3%) belongs to lower socioeconomic status. The study population's mean age±SD was 54.51±10.28 years. For 95 (31.7%) of the NCD patients, there was a family history of diabetes.

Table 1: Socio- Demographic Characteristics of Study participants(n=300)

Socio-Demographic Characteristics	Frequency N(%)
Sex	
Male	164(54.7%)
Female	136(45.3%)
Age group in years	
<25	19(6.3%)
25-50	131(43.7%)
>50	150(50%)
Residence	
Rural	242(80.7%)
Urban	58(19.3%)
Education	
Illiterate and Primary	101(33.7%)
Middle and High School	125(41.7%)
Higher Secondary and Graduates	74(24.7%)
Socioeconomic Status	
Upper	15(5%)
Middle	116(38.7%)
Lower	169(56.3%)
Family H/o DM	
Present	95(31.7%)
Absent	205(68.3%)

Distribution according to answer to awareness of the study participants were shown in Table 2. Most people were aware of the complications associated with diabetes 292 (97.3%) and 281 (93.6%) were aware of the problems in the eyes linked to diabetes. Of the study population, 207 people (69%) were aware of the symptoms of diabetic eye complications. Out of the study population, only 109 people (36.3%) were aware of the investigation test used to diagnose diabetic retinopathy. Of the study group, only 133 (44.3%) were aware of the available treatment options for diabetic retinopathy. Of the group, 212 (70.7%) were aware of whom to contact in the event of any complications related to Diabetes eye. Out of the study group, only 144 people (48%) were aware of how often Diabetes Eye complications should be screened.

Table 2: Distribution according to answer to awareness of Diabetic Retinopathy

Awareness of Diabetic Retinopathy	Correct answer	
	N=300	%
Do you know that there are complications associated with diabetes?	292	97.3
Do you know that there are eye complications associated with diabetes?	281	93.7
Which Part of eye is affected by Diabetes?	223	74.3
What are the symptoms of Diabetic eye complications?	207	69
What is the test used for Diabetic retinopathy	109	36.3
What are the treatment options	133	44.3
Whom to visit for DM eye complications	212	70.7
How frequently DM patients screen for DM eye complications	144	48

Distribution according to answer to attitude of study participants were shown in Table 3. About 106 (35.3%) of the study group said that diabetic retinopathy can also presented with good vision. Many people 170(56.7%) knew about the necessity of regular eye checkups even though diabetes was under control. Majority of the study group 231(77%) of the study population were well aware that the good diabetic control prevent diabetic retinopathy. 222 (74%) of the group said that the treatment to diabetic retinopathy was always painful.

Table 3: Distribution according to answer to attitude of study participants

Attitude of study participants	Correct answer	
	N=300	%
Can Diabetic retinopathy present with Good vision	106	35.3
It is necessary to do eye checkups regularly even though diabetes is in control	170	56.7
Good diabetic control prevents diabetic retinopathy	231	77
Is treatment for Diabetic retinopathy always painful	222	74

Distribution according to answer to practice of the study participants is shown in Table 4. Majority of the study population 259(86.3%) regularly took medicines as advised by doctor but only 245(81.7%) come for regular follow up. 218 (72.6%) people had their blood sugar levels under control. 96 (32%) of the study group had vision problems. Only minority of the group 70 (23.3%) visited eye surgeon. 106 (35.3%) of the population visit for an annual eye checkups and only 80(26.7%) of the study members had undergone dilated eye check-up. Very minimal population 25(8.3%) underwent eye check-up when newly diagnosed as DM.

Table 4: Distribution according to answer to practice of Diabetic Retinopathy

Practice of Diabetic Retinopathy	Yes No	
	N=300	%
Do you take medication regularly as advised by doctor?	259	86.3
Do you come for follow up regularly ?	245	81.7
Is your Blood sugar under control?	218	72.7
Do you have Vision Problems?	96	32
Do you visit eye surgeon ?	70	23.3
Do you go for annual eye checkup?	106	35.3
Do you undergone dilated eye checkup?	80	26.7
Do you undergone any treatment for Diabetic retinopathy ?	36	12
During diagnosed as DM did you underwent Eye checkup?	25	8.3

It is noted from below analysis that patient education positively influenced their awareness about symptoms of diabetic retinopathy though statistically not significant. The analysis shown that patient education positively associated with awareness about diagnosis and treatment and annual checkups practices for DR. However awareness of diagnosis and treatment for DR found statistically significant ($p<0.05$).

Table 5: Patients Education and Its association With Awareness and Practice

Awareness & Practices of DR	Patients Education			
Awareness Of Symptoms Of DR:				
	Illiterates No.(%) n=101	Mid School No. (%) n=125	Higher secondary & Graduates No.(%) n=74	P-Value
Yes	65(32.1)	87(34.8)	55(37.1)	0.36
No	36(17.8)	38(15.2)	19(12.8)	
Awareness Of Diagnosis Of DR:				
Yes	23(11)	47(18)	39(26)	0.01*
No	78(38)	78(31.2)	35(23.6)	
Awareness Of Treatment For DR:				
Yes	31(15)	53(21.2)	49(32.4)	0.01*
No	70(34.6)	72(28.7)	25(16.8)	
Practices Of Annual checkup for DR:				
Yes	33(16.3)	48(18.8)	25(16.8)	0.63
No	68(33.6)	77(30.8)	49(32.4)	

Discussion

Diabetic retinopathy is a common micro vascular complication causing visual impairment and blindness Research conducted in 2021 by Faryal Farooq et al. in Pakistan reported 66.7%[10], Abdulla Hisham et al. in Saudi Arabia 2017 reported 70.6%[11], and Pallavi Sharma et al. in Jammu and Kashmir 2020 reported 71.6%[13] have knowledge of the eye complications (Diabetic retinopathy) of DM. These findings are consistent with our own research. The study by Chinmay Jani et al. (Gujarat 2020) revealed low awareness of eye complications of diabetes mellitus (46.2%), which is in contrast to our findings[12]. According to Joel Bambamba (Mozambique 2022), 78.7% of people are aware that DR can result in blindness[14]. In contrast to our findings, studies conducted in Jammu and Kashmir in 2020 by Pallavi Sharma Etal reported 24.1%[13], Gujarat in 2020 by Chinmayi Jani reported 19.8%[12], and Mozambique in 2022 by Joel Bambamba reported 70.5%[14] have knowledge of available treatment options for DR. In contrast to our results, a study conducted in Jammu and Kashmir in 2020 by Pallavi Sharma revealed that only 63.3% of participants knew who to contact in the event that their DM eye complications worsened[13].

Our results were found to be in contradiction with a study conducted in 2021 by Faryal Farooq et al. in Pakistan (55.6%)[10], Abdulla Hisham al-mulla in Saudi Arabia (83.7%)[11], and Joel Bambamba in Mozambique (2022) (42.3%)[14] which all reported awareness that screening is still necessary even for people with good vision. Our results are consistent with a study by Joel Bambamba (Mozambique 2022), which found that (54.4%) [14] of participants were aware of the need for routine eye exams even in cases of controlled diabetes. Pallavi Sharma's 2020 study on Jammu and Kashmir, in contrast, found that 40% of people had low awareness[13]. Similar results to ours were reported by Joel Bambamba (Mozambique 2022) in (70.5%) [14] and Pallavi Sharma (Jammu and Kashmir 2020) in (79.3%) [13]. Both authors noted that people with diabetes are aware that controlling their condition can prevent diabetic retinopathy.

The study by Joel Bambamba (Mozambique 2022) revealed (70.1%) [14] vision problems, which is in contrast to our findings. According to a 2017 study by Abdulla Hisham (Saudi Arabia), (61.4%) [11] had DR screening every year. According to studies by Pallavi Sharma (Jammu and Kashmir 2020), Joel Bambamba (Mozambique 2022) and Abdulla Hisham (Saudi Arabia 2017), (28.67%) [13],(17.7%) [14], and (81%) [11] of respondents, respectively, get yearly eye checkups. Faryal Farooq (Pakistan 2021) reported that, in contrast to our study, (55.6%) [10] of people get regular follow-ups for DM.

Conclusion

Both the general public and diabetic patients should be made aware of preventive measures. In addition to providing health education about diabetes and its complications, particularly diabetic retinopathy, medical professionals should refer patients for screening for the condition. Programmes to raise people's awareness of diabetes and expand their understanding of its complications should be broadcast on mass media platforms such as radio, TV, and social media. Since DR is one of the leading causes of blindness and visual impairment worldwide, the studies' significance will be helpful in community health planning programmes.

Conflicts of Interest: None declared

Funding: No funding sources

Ethical Approval: The study was approved by Institutional Ethics Committee - EC Reg.No.ECR/520/Inst./TN/2020/RR 30 Dated 17/11/2020.

Acknowledgement: We are thankful to the Department of Community Medicine and Non communicable Diabetes clinic, Thiruvannamalai Medical College for all the help in carrying out the study. Finally I am thankful to all the Study Participants for giving the support and study related information .

References

1. Umaefulam, V., & Premkumar, K. Diabetic retinopathy awareness and eye care behaviour of indigenous women in Saskatoon, Canada. International Journal of Circumpolar Health, 2021, January 1, 80(1),1-9
2. Qaseem, Y., Samra, S., German, O., Gray, E., & Gill, M. K.. Self-Reported Awareness of Retinopathy Severity in Diabetic Patients. Clinical Ophthalmology, 2020, September Volume 14, 2855–2863.

3. Faizi, N., & Kazmi, S. . Universal health coverage - There is more to it than meets the eye. Journal of Family Medicine and Primary Care,2017: 6(1), 169-170
4. Yin, L., Zhang, D., Ren, Q., Su, X., & Sun, Z. . Prevalence and risk factors of diabetic retinopathy in diabetic patients. Medicine, 2020, February 99(9), 1-6.
5. Hamzeh A, Almhanni G, Alijaber Y, Alhasan R, Alsamman MI, et al. Awareness of diabetes and diabetic retinopathy among a group of diabetic patients in main public hospitals in Damascus, syria during the syrian crisis. BMC Health services Research, 2019;19(1), 4-13.
6. Fung, T. H., Patel, B., Wilmot, E. G., & Amoaku, W. M.. Diabetic retinopathy for the non-ophthalmologist. Clinical Medicine, 2022, March, 22(2), 112–116.
7. Bakkar, M., Haddad, M., & Gammoh, Y. . Awareness of diabetic retinopathy among patients with type 2 diabetes mellitus in Jordan. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 2017, October, Volume 10, 435–441.
8. Mersha GA, Alimaw YA, Woredekal AT, Assaye AK, Zeleke TC. Awareness and knowledge of diabetic retinopathy in diabetic patients at a General Hospital in Northwest Ethiopia. SAGE Open Med. 2021;9.1-7
9. Owusu-Afriyie, B., Caleb, A., Kube, L., & Gende, T. (2022, June 1). Knowledge and Awareness of Diabetes and Diabetic Retinopathy among Patients Seeking Eye Care Services in Madang Province, Papua New Guinea. Journal of Ophthalmology, 2022, 1–10.
10. Faryal Farooq, Shahid Hussain Bapar. Knowlwdge, Attitude and Practices of Diabetic Retinopathy in diagnosed Diabetic patients, Saudi journal of medical and pharmaceutical sciences Jan 2021;7(1):15-19
11. Abdullah Hisham Al-Mulla, Abulaziz Khalid Al-Thafar, Maruran Abdul rahman Al Shaikh hussain, Sayed Ibrahim Ali, Saif khuzaim Al-Dossary. Knowledge, attitude and practice toward Diabetic Retinopathy and Retinal examination among Diabetic population in Al-Hasa region, Saudi Arabia. A cross sectional study. International Journey of Scientific Study July 2017;5(4):165-169
12. Chinmay Jani, Tejas Desai, Fatema Kapadia, Harsh Dave, Arth shah, Vaishnavi Patel, Astha Patel, Ruchi Jani, Darshil shah, Jinal Pandya. Knowledge, attitude and practice of diabetic retionpathy. International Surgery Journal January 2021;8(1);54-62
13. Pallavi Sharma, Bhavani Raina, Anuradha Bharti. Knowledge, attitude and practice of diabetic retinopathy amongst diabetic patients in a tertiary care hospital of Jammu. International Journal of research in medical sciences March 2020;8(3):836-840
14. Joel Bambamba, Momade Fumo, Angula Bambamba, Joao Mazalo, Paulo Pires, Bulande Matsinhe. Knowledge, Attitude and Practice about Diabetic retinopathy among diabetic patients attending the department of endocrinology at Nampula Central Hospital in Mozambique during 2022. Modern Research in vision and opthalmology 2022;1(1):1-6