

Evaluation of Diabetic Patients' Awareness of Diabetic Retinopathy Risk in Telafer City: A Cross-Sectional Study

Mohammed Qassim Baktash, PhD¹, Iman Mohammed Saeed, Ph. D.^{2*}, Ali Ismael Sulaiman, M.Sc.³

¹ Department of Clinical Science Nursing, Faculty of Nursing, University of Telafer. Iraq

² Department of Basic Science Nursing, Faculty of Nursing, University of Telafer. Iraq

³ Department of Clinical Science Nursing, Faculty of Nursing, University of Telafer. Iraq

ABSTRACT

Background: Diabetic retinopathy (DR) is a significant long-term complication of diabetes mellitus, often resulting from poor glycemic control. It is a leading cause of visual impairment and blindness, with nearly all patients with insulin-dependent diabetes and over 60% of those with non-insulin-dependent diabetes developing DR within the first two decades of the disease. **Aim:** This study aimed to assess the knowledge of diabetic patients in Telafer City regarding the risk factors, symptoms, and management of diabetic retinopathy. **Methods:** A descriptive cross-sectional study was conducted to evaluate the awareness of diabetic patients attending Telafer Hospital and primary healthcare centers in Telafer City. The study took place in Iraq's Nineveh Governorate, Telafer City, from September 25, 2022, to May 1, 2023. A total of 178 diabetic patients were selected using a purposive convenience sampling method. Data were collected through a structured questionnaire covering symptoms, complications, and preventive measures for DR. **Results:** The findings revealed that 42.1% of participants had an average level of knowledge about the symptoms and complications of DR. In comparison, 42.1% demonstrated moderate knowledge in eye care practices and treatment of DR. Overall, the general knowledge of diabetic patients about DR was moderate. **Conclusion and Recommendations:** The majority of study participants were male, married, and aged 40–49 years. Their general knowledge about diabetic retinopathy was moderate to poor. This highlights the urgent need for targeted health education programs to improve awareness among diabetic patients and the general population about diabetes management, as well as the prevention and treatment of diabetic retinopathy (DR).

Keywords: Knowledge, Diabetic Patients, Retinopathy

INTRODUCTION

Diabetic retinopathy (DR) resulting from diabetes mellitus complications causes the blockage of the retina's small blood vessels, which affects the transportation of nutrients and oxygen to parts of the retina, causing impaired vision. abnormal weak blood vessels can grow on the surface of the retina, causing liquid leakages and an increased probability of damage and bleeding [1].

That hyperglycemia is usually associated with increased progression of diabetic retinopathy in people with type 1 and type 2 diabetes, affects both eyes and causes vision blurring. In an advanced diabetic retinopathy stage, the vision may be lost completely. [2]. DR plays a vital role in vision impairment and blindness in the working-class population (aged 25–60 years) worldwide. [3]. Globally, approximately ninety-five million (35.6%) diabetic patients have diabetic retinopathy, of which a third have vision-threatening Diabetic retinopathy (DR) [4, 5]. Good control of blood sugar significantly reduces the progression of diabetic DR and subsequent progression. Especially if the patient has non-proliferative diabetic retinopathy, no treatment is needed [6, 7]. This laser treatment (photocoagulation) can stop or slow the blood and fluid leakage in the eye. This treatment is typically performed in an eye doctor's office or a hospital. During the photocoagulation, leaks from abnormal blood vessels are treated with laser burns [8]. New techniques made it possible for eye surgeons to remove the vitreous gel and operate in the posterior aspect of the eye.

Using fine instruments inserted in the eye at the pars plana, surgeons can cut the vitreous, suction the gel, and replace it with aqueous fluid. They then remove fibrous tissue and areas of retinal

detachment, flattening the retinal tissue. This type of surgery, called vitrectomy, dramatically improves the vision of severe vitreous haemorrhage cases [1, 9]. Anti-vascular endothelial growth factor type of drug reduces the formation of retinal neovascularisation mainly by inhibiting VEGF. Intravitreal injection is generally used to prevent the formation of proliferative tissues and to elevate drug concentration in the eye [10]. The anti-VEGF drugs which commonly used in Diabetic Retinopathy include bevacizumab, ranibizumab, and infliximab. In severe DR cases, infliximab shows better visual recovery efficacy than other options [11].

Methodology

A descriptive study employed a cross-sectional approach to assess diabetic patients' knowledge at Telafer Hospital and Primary Care Centres in Telafer City regarding diabetic retinopathy (DR). Ethical approval for conducting the study was obtained from Telafer Hospital and Primary Care Centres in Telafer City. This study was carried out in Iraq, specifically in Nineveh Governorate, Telafer City, from September 25, 2022, to May 1, 2023. The study sample consists of 178 diabetic patients in Telafer city.

A Purposive convenience sampling method was selected for present study. To achieve the ultimate study goal, a questionnaire was used to collect data for the study project. The data were collected from people at Telafer Primary Care Centres using a questionnaire from September 25, 2022, to May 1, 2023. The data were analysed using the Statistical Package for the Social Sciences (SPSS) version 22.

Result

Table 1: Demographical Characteristics of the Study Participants (n=178)

Characteristics	Items	Frequency	%
Age	>30	9	5.1
	30-<40	32	18.0
	40-<50	49	27.5
	50-<60	40	22.5
	60<	48	27.0
Gender	Male	102	57.3
	Female	76	42.7
Marital Status	Single	9	5.1
	Married	169	94.9
Economic Situation	Low-income people	27	15.2
	Middle-income people	73	41.0
	High-income people	78	43.8
Educational Background	Illiteracy	43	24.2
	Elementary school	53	29.8
	Intermediate school	48	27.0
	High school	16	9.0
	Graduated	18	10.1
Duration of the Disease	> 5	71	39.9
	5-10	47	26.4
	10 <	60	33.7

F: Frequency; %: percentage

Table 2: Level of Knowledge About diabetic retinopathy Among Study Participant (n=178)

Domain	Level of Knowledge					
	Low		Moderate		High	
	F	%	F	%	F	%
General	26	14.6	90	50.6	62	34.8
Symptoms and Complication	60	33.7	66	37.1	52	29.2
Eye Care Practices and Treatment	68	38.2	75	42.1	35	19.7

F: Frequency, %: Percentage Level of knowledge cut-off points:

cut-off points	General	Symptoms and complication	eye care practices and treatment
Low	(0-1)	(0-1)	(0-1)
Moderate	(2-3)	(2-3)	(2-3)
High	(4-5)	(4-5)	(4-6)

Table 3: General knowledge of diabetic patients about diabetic retinopathy

Item	Correct		Incorrect	
Questions	F	%	F	%
Diabetes Affects the Retina of the Eye	68	37.8	110	61.1
Diabetes is one of the Causes of Your Vision Impairment.	167	92.8	11	6.1
If blood sugar levels are consistently high, It Can Lead to Diabetic Retinopathy.	77	42.8	101	56.1
Eye Problems are more Common in People with Diabetes than in non-diabetics	71	39.9	107	60.1
Diabetics Should see an Ophthalmologist only when they have Eye Problems	53	29.8	125	70.2

F: Frequency; %: percentage

Table 4: Diabetic patients' knowledge about the symptoms and complication of diabetic retinopathy

Item	Correct		Incorrect	
Questions	F	%	F	%
Floating Black Dots in the Field of Vision	70	39.3	108	60.7
Dark Or Empty Spaces in the Field of Vision	50	28.1	128	71.9
Blurred Vision and Double Vision	104	58.4	74	41.6
From Complications Diabetic Retinopathy Vascular Damage, and Vitreous Hemorrhage.	71	39.9	107	60.1
Diabetic Retinopathy Leads to Blindness	134	75.3	44	24.7

F: Frequency; %: percentage

Table 5: Diabetic patients' knowledge about eye care practices and treatment of diabetic retinopathy

Item	Correct		Incorrect	
Questions	F	%	F	%
Diet Control and Lifestyle Changes Modifications are Important	75	42.1	103	57.9
Diabetics Should See an Ophthalmologist Every Six Months	66	37.1	112	62.9
Regularly Taking Diabetes Medications Prevents Diabetic Retinopathy	51	28.7	127	71.3
Early Diagnosis of Diabetic Retinopathy Prevents Blindness	110	61.8	68	38.2
Diabetic Retinopathy Can Be Treated with Laser	61	34.3	117	65.7
Diabetic Retinopathy Can Be Treated with Eye Injections	65	36.5	113	63.5

F: Frequency; %: percentage

Table (1) indicates that most of the patients participating in the study are in the age group (40-<50) years 94 patients (27.5%), followed by those who are in the age group (60-over) years 48 patients (27.0 %). Regarding other demographic characteristics, the table shows that most patients participating (102, 57.3%) are male, and the majority of patients participating are married (169, 94.9%). Regarding the economic situation, the majority are those with high incomes, 78 patients (43.8%), followed by those with middle incomes, 73 (41.0%), and most of the patients completed primary school, 53 (29.8%), followed by those completing intermediate school, 48 (27%). Finally, 71 (39.9%) patients participating were diagnosed with diabetic mellitus from less than 5 years. This results are agreed with the results of study Aly et al., 2022 show that the majority of participate were between age group (40-50) years about 40.55% and 57.05% of them were male but the level education of them is secondary school about 40.05% , As for the duration of diabetes, the result obtained in this study is consistent with the result of Gupta et al., [12] showing that most patients had diabetes for less than 5 years, Also, most of the participants in the current study are married, and this is consistent with the study of Alzahrani et al.,[13] where they indicated that most of the participants are married 98% , but 38.5% of them are of low income, while 43.8% of the participants in the current study were of high income. The level of general knowledge of diabetic patients about diabetic retinopathy is moderate about 50.6%, as shown in Table (2).

This is evident in the data of Table (3) that among the 178 participants, 110 (61.1%) of them were unaware that diabetes affects the retina. And 101 (56.1%) of the participants do not agree that a persistently high blood sugar level may cause diabetic retinopathy. And 71 (39.9%) of the participants believed that eye problems are more common in people with diabetes than in those without diabetes. when patients were asked about an eye examination, 125 (70.2%) of the participants thought that diabetics should only go to an ophthalmologist when they have eye problems. In comparison, 167 (92.8%) of them answered correctly when asked if diabetes is one of the causes of their visual impairment. The results of the current study agree with Shah et al.,[14] who stated that the most patients were unaware of the fact that diabetes affects the retina around 3780 (63%), as indicated by Venugopal et al.,[15] among the respondents 282 (78.8%) were aware of the fact that diabetes can affect vision. As for Hussain et al.,[16] they noted that most participants had moderate knowledge about whether individuals with diabetes were more likely to develop eye problems than those without diabetes. While the knowledge was weak among the participants in the current study, Foster et al. [17] indicated that most participants in their study agreed that persistently high blood sugar causes diabetic retinopathy. However, 50% of these subjects were unaware that the patient should see an ophthalmologist before being referred. Most of the participants had an average level of knowledge about the symptoms and complications of diabetic retinopathy about 42.1% presented in Table (2). This is evident in the data of Table (4), which shows that the majority of participants, about 134 (75.3%) out of 178, believe that

diabetic retinopathy leads to blindness, and (58.4%) 104 believe that blurred vision and double vision of the symptoms and complications of Diabetic retinopathy. While Participants were not aware that floating black dots and dark or blank areas in the field of vision were symptoms of diabetic retinopathy respectively 108 (60.7%), 128 (71.9%), Also, most of the participants about 107 (60.1%) did not know the fact that vascular damage and vitreous hemorrhage are complications of diabetic retinopathy. These agree with Gupta et al.,[12] who stated that diabetes patients were not aware of the floating black dots or lines, dark or empty spaces in the visual field, and Double vision as symptoms of diabetic retinopathy. In contrast, most patients were aware that diabetic retinopathy can cause blurred vision and Blindness. The Seneviratne and Partha pan [3] indicated that most patients not know the DR causes vascular damage, and vitreous hemorrhage. The level of knowledge of participants of diabetic patients in the field of eye care practices and treatment of diabetic retinopathy is moderate about 42.1% presents that in Table (2), This is evident in the data of Table (5), which shows the 103 (55.9%) participants were unaware that Diet control and lifestyle changes modifications are important for control diabetes , and 127 (71.3%) unaware that Regularly taking diabetes medications prevents diabetic retinopathy , when patients were asked about eyes examine every six months only 66 (37.1%) answered correctly . The data obtained showed that out of 110 (61.8%), 61.8% were aware that early diagnosis of diabetic retinopathy prevents blindness. Most of the patients had no knowledge treated of diabetic retinopathy, about 117 (63.5%) and 117 (65.7%), answered incorrectly about the possibility of treatment by laser or eye injections respectively. This result is not consistent with Gupta et al.,[12] who indicated that most of the participants in their study were aware that controlled diet and lifestyle modifications are important for controlling diabetes. They agree with the current study in that 67.68% did not realise that eye problems can be controlled or avoided through regular medication and control of diabetes. Seneviratne and Pratapa [3] they indicated that only 78 (39%) of the patients believed it is necessary to see an ophthalmologist every 6 months, and that early diagnosis of retinopathy prevents blindness, which is consistent with the results of the current study. The results of the current study agree with what was mentioned by Hamzeh et al.,[18] About the possibility of treating diabetic retinopathy. The respondents (148, 56.9%) reported that they were unfamiliar with any of the treatment methods. At the same time, 111 (42.7%) answered that it can be treated in one of these ways (laser, surgery, or injections in the eye).

CONCLUSION AND RECOMMENDATIONS

Most of the patients participating in the study are male married the age group (40-<50) years. The majority of the participating patients had a moderate to poor level of general knowledge about DR, as well as possible symptoms and complications of DR, eye care, and treatment of DR. According to these results, the study recommends holding health Education programs among Diabetic patients and the general population about diabetes disease and diabetic retinopathy.

REFERENCES

- [1] T. Sharma, A. Fong, T. Y. Lai, V. Lee, S. Das, and D. Lam, "Surgical treatment for diabetic vitreoretinal diseases: a review," *Clinical & experimental ophthalmology*, vol. 44, no. 4, pp. 340-354, 2016.
- [2] W. L. Alyoubi, M. F. Bulbkhair, and W. M. Shalash, "Diabetic retinopathy fundus image classification and lesions localization system using deep learning," *Sensors*, vol. 21, no. 11, p. 3704, 2021.
- [3] B. Seneviratne and S. Prathapan, "Knowledge on diabetic retinopathy among diabetes mellitus patients attending the Colombo South Teaching Hospital, Sri Lanka," 2016.

- [4] R. Lee, T. Y. Wong, and C. Sabanayagam, "Epidemiology of diabetic retinopathy, diabetic macular edema and related vision loss," *Eye and vision*, vol. 2, pp. 1-25, 2015.
- [5] N. Hanchi, J. Kirigia, and K. Claude, "IDF Diabetes Atlas. Vol. 8," *International Diabetes Federation*, pp. 1-150, 2017.
- [6] D. Y. Shu and F. J. Lovicu, "Myofibroblast transdifferentiation: The dark force in ocular wound healing and fibrosis," *Progress in retinal and eye research*, vol. 60, pp. 44-65, 2017.
- [7] C. Agurto, "Detection and classification of Diabetic retinopathy pathologies in fundus images," The University of New Mexico, 2012.
- [8] A. S. Neubauer and M. W. Ulbig, "Laser treatment in diabetic retinopathy," *Ophthalmologica*, vol. 221, no. 2, pp. 95-102, 2007.
- [9] D. S. W. Ting, G. C. M. Cheung, and T. Y. Wong, "Diabetic retinopathy: global prevalence, major risk factors, screening practices and public health challenges: a review," *Clinical & experimental ophthalmology*, vol. 44, no. 4, pp. 260-277, 2016.
- [10] S. Y. Wang, C. A. Andrews, W. H. Herman, T. W. Gardner, and J. D. Stein, "Incidence and risk factors for developing diabetic retinopathy among youths with type 1 or type 2 diabetes throughout the United States," *Ophthalmology*, vol. 124, no. 4, pp. 424-430, 2017.
- [11] W. Wang and A. C. Lo, "Diabetic retinopathy: pathophysiology and treatments," *International journal of molecular sciences*, vol. 19, no. 6, p. 1816, 2018.
- [12] S. Gupta, I. Gupta, and S. Kalra, "Study of awareness of diabetic retinopathy among the patients of type 2 diabetes mellitus: A prospective study," *Indian Journal of Clinical and Experimental Ophthalmology*, vol. 4, no. 4, pp. 483-486, 2018.
- [13] S. H. Alzahrani *et al.*, "Awareness of diabetic retinopathy among people with diabetes in Jeddah, Saudi Arabia," *Therapeutic advances in endocrinology and metabolism*, vol. 9, no. 4, pp. 103-112, 2018.
- [14] K. Shah, A. Gandhi, and S. Natarajan, "Diabetic retinopathy awareness and associations with multiple comorbidities: Insights from DIAMOND study," *Indian journal of endocrinology and metabolism*, vol. 22, no. 1, pp. 30-35, 2018.
- [15] D. Venugopal, B. Lal, S. Fernandes, and D. Gavde, "Awareness and knowledge of diabetic retinopathy and associated factors in Goa: A hospital-based cross-sectional study," *Indian journal of ophthalmology*, vol. 68, no. 2, pp. 383-390, 2020.
- [16] R. Hussain *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 journal of ophthalmology*, vol. 64, no. 4, pp. 272-276, 2016.
- [17] T. Foster, L. Mowatt, and J. Mullings, "Knowledge, beliefs and practices of patients with diabetic retinopathy at the University Hospital of the West Indies, Jamaica," *Journal of Community Health*, vol. 41, pp. 584-592, 2016.
- [18] A. Hamzeh *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*, vol. 19, pp. 1-10, 2019.



This is an open-access article distributed under the terms of the Creative Commons Attribution License.