RESEARCH ARTICLE

Assessment Knowledge of Diabetic Patients about Preventive Measures for Retinopathy in AL-Nasiriya City

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ABSTRACT

This descriptive, evaluative study aimed to assess the knowledge of diabetic patients about preventive measures for diabetic retinopathy in the Diabetic and Endocrine Centre in Al-Nasiriya City, covering the period from 9 March 2022 to 1 December 2022. The study employed a constructed questionnaire based on an extensive literature review and guidance from the supervisor. The questionnaire was divided into three parts, covering socio-demographic characteristics, clinical information, and an assessment of diabetic patients' knowledge of retinopathy prevention. Data was collected using interviews, and descriptive and inferential statistical analyses were conducted. The results revealed that most study samples were males (68.3%), and most patients were 50 years and above (41.7%).

Regarding education, the majority were high school or high institute graduates (25.0%), and a significant proportion were government employees (46.7%). The duration of diabetes for most patients ranged from 6 to 10 years (38.3%), and approximately 30.0% did not have any diabetes-related complications. Visual impairment due to diabetic eye problems was reported by 48.3% of the patients. Monitoring blood glucose weekly was the most common practice among the study participants (58.3%), and the majority (73.3%) did not have a history of hypertension. Furthermore, 55.0% of the patients had a history of dyslipidemia. The study revealed a mean knowledge score of 0.238 (SD=0.0672) out of a maximum possible score of 0.46, indicating a poor to intermediate overall level of knowledge regarding preventive measures for diabetic retinopathy among diabetic patients. However, no significant relationships were found between patients' knowledge and age, gender, education, diabetes duration, history of hypertension, or history of dyslipidemia. In conclusion, the study highlighted that diabetic patients had poor knowledge regarding diabetic retinopathy despite being aware of its impact on eye health. The study recommends implementing an intensive and comprehensive national-level educational program targeting a large population of diabetes mellitus patients to improve their knowledge about preventive measures for diabetic retinopathy. Health professionals, mass media, and illustrated posters in diabetic clinics and hospitals could play an effective role in this educational initiative.

Keywords: Assessment, diabetic Patients', Preventive Measures, Retinopathy

INTRODUCTION

Diabetes mellitus (DM) is regarded as a major medical issue worldwide. Diabetes causes several long-term complications that significantly impact the patient, family, and society, as the disease disrupts people during their most productive years (Elshemy et al., 2018). Diabetes will affect 642 million adults by 2040, with approximately 75% living in low- and middle-income countries. Jasim and A. H. (2022) mention that, if left unchecked over time, insulin deficiency can cause harm to various organs of the body, leading to devastating and life-threatening prosperity complications such as cardiovascular diseases (CVD), nerve harm (neuropathy), kidney harm (nephropathy), and eye disease (driving to retinopathy, visual incident and undoubtedly visual impedance). However, diabetic retinopathy (DR) affects one out of every three diabetic patients and is the leading cause of blindness in adults. (Wong & Sabanayagam, 2020). According to the WHO (2021), the number of people affected by diabetes increased from 108 million in 1980 to 422 million in 2014. Majid (2017) The prevalence has risen faster in low- and middle-income countries than in high-income countries.

In recent years, it has been assumed that the successful implementation of public health programs in developed countries will improve and modify the current state of public health methods such as risk factor control, screening, and care for DR. (Lin et al., 2016) DR is the most common microvascular complication of diabetes and the leading cause of visual deficiency and blindness in these patients. Nonetheless, research on the factors contributing to DR is limited (Skid et al., 2021; Hosseini et al., 2021).

Furthermore, identifying the impediment in various country income settings may hasten the development of a successful DR screening program (Piyasena et al., 2019). The long duration of the disease, glycemic control, hypertension, hyperlipidemia, smoking, anaemia, age, puberty, and pregnancy are all risk factors for DR. Furthermore, some patients did not go to the ophthalmologist for their annual eye exam the previous year. This will increase the demand for improved diabetes education to make DM patients more aware of their conditions and associated complications (Almalki et al., 2018).

Patient education about DR will be essential for further DR management and prevention advancements. Patients should be informed that they are important in their diabetes management and eye care. In Iraq, studies to assess the level of knowledge about DR among DM patients and identify associated factors with low DR awareness are lacking. As a result, establishing preventive efforts requires obtaining knowledge about the awareness of people at risk in order to develop preventive strategies.

METHOD

Study Design:

A descriptive, evaluative study design was utilized to assess the knowledge of diabetic patients regarding preventive measures for retinopathy at the Diabetic and Endocrine Center in Al-Nasiriya City.

Sampling Method:

A non-probability purposive sampling method was employed to select a representative and accurate sample of diabetic patients. The study included 60 diabetic patients recruited from the centre's outpatient department. Patients were referred from primary healthcare centres or had scheduled appointments/consultations at the department.

Data Collection Period:

Data collection took place from 9th March 2022 to 1st December 2022.

Study Instrument:

A questionnaire was developed for data collection based on guidance from the supervisor and an intensive review of relevant literature and studies. The questionnaire consisted of three parts:

Part I - Socio-Demographic Characteristics:

This section aimed to gather patient demographic data through an interview questionnaire. Information such as age, gender, education level, occupation, household monthly income, residential area, smoking status, and alcohol consumption was collected.

Part II - Clinical Characteristics:

The second part aimed to collect clinical information from the patients using an interview questionnaire. This information included the duration of diabetes, complications due to diabetes, diabetic eye problems, frequency of blood glucose monitoring, history of hypertension, duration of hypertension, history of dyslipidemia, previous eye surgeries, medical treatment for diabetes, adherence to medication, and visits to an eye specialist.

Part III - Assessment of Diabetic Patients' Knowledge:

This section was designed to assess the patients' knowledge about preventive measures for retinopathy. It consisted of 24 questions about general information about diabetic retinopathy and specific preventive measures, such as blood glucose control, blood pressure control, blood lipids control, smoking cessation, regular eye screening, and follow-up.

Data Collection Method:

Data was collected using face-to-face interviews with diabetic patients at the Diabetic and Endocrine Center in Al-Nasiriya City.

Data Analysis:

The collected data were compiled and analyzed using descriptive statistics, such as percentages, mean, and median. The Chi-square test was used to assess relationships between certain variables. Statistical analysis was conducted using the software SPSS version 26, and a significance level of 0.05 (p < 0.05) was considered for the statistical tests.

RESULTS

Table 1 presents the demographic characteristics of the study participants. Most participants were male, accounting for 68.3% of the sample. Additionally, 41.7% of the patients were aged 50 years and above. Regarding education, 25.0% of the patients were high school graduates or had completed a high institute program. Moreover, 46.7% of the participants were government employees. Most patients (33.3%) reported a monthly household income of 601,000 to 900,000 or 901,000 to 1,200,000 units. Furthermore, 90.0% of the participants lived in urban areas, and 80.0% were ex-smokers.

Table 2 provides insights into the clinical characteristics of the study participants. A significant proportion (38.3%) of the patients had been living with diabetes for 6 to 10 years. Notably, 30.0% of the patients did not have any diabetic complications. Diabetic eye problems, specifically visual impairment, were reported by 48.3% of the patients. Regarding blood glucose monitoring, the majority (58.3%) monitored their blood glucose weekly. Furthermore, 73.3% of the patients did not have a history of hypertension, and 55.0% had a history of dyslipidemia. Notably, all participants (100%) reported no history of eye surgery, and 63.3% had not undergone any other surgery. Most patients (70.0%) were on oral antidiabetic medication, and 56.7% reported irregular adherence to their medication. The majority (83.3%) had never visited an eye specialist. Moreover, 46.7% of the patients were classified as overweight (BMI 25-29.9).

Table 3 displays the knowledge scores of the study participants regarding preventive measures for retinopathy. The mean knowledge score was 0.238 (SD=0.0672) out of a maximum possible score of 0.46. Notably, all answers to the knowledge assessment questions were incorrect, indicating a poor to intermediate level of knowledge among diabetic patients concerning preventive measures for retinopathy.

Table 4 analyses the relationships between patients' knowledge and various demographic and clinical factors. The results revealed no significant relationship between patients' knowledge and age, gender, education level, diabetes duration, history of hypertension, or history of dyslipidemia (p-value > 0.05). These findings suggest that these demographic and clinical factors did not significantly influence the participants' knowledge levels.

Table 1. Distribution of the sample by socio-demographic characteristics (n= 60 patients)

Characteristic	Groups	Freq.	%
Age Groups	30-35 years	5	8.3
	36-40 years	9	15.0
	41-45 years	10	16.7
	46-50 years	11	18.3
	50 years and more	25	41.7
	Total	60	100.0
Gender	Male	41	68.3
	Female	19	31.7
	Total	60	100.0
level of education	Read & write	4	6.7
	Primary school graduate	7	11.7
	Intermediate school graduate	10	16.7
	High school graduated	15	25.0
	High Institute graduate	15	25.0
	University graduate	9	15.0
	Total	60	100.0
Occupation	Un employed	6	10.0
	Government employee	28	46.7
	Self-employee	3	5.0
	Housewife	12	20.0
	Retired	11	18.3
	Total	60	100.0
Household monthly income	Less than 300,000	12	20.0
	300,000-600,000	12	20.0
	601.000-900.000	20	33.3
	901.000-1.200.000	15	25.0
	1.201.000-1.500.000	1	1.7
	1,501.000 or more	0	0
	Total	60	100.0
Residential area	Urban	54	90.0
	Rural	6	10.0
	Total	60	100.0
Smoking status	Smoker	12	20.0
	Ex-smoker	48	80.0
	Total	60	100.0

Table 2. Distribution of the sample according to their clinical characteristics (n= 60 patients)

Var.	Groups	Freq.	%
Diabetes duration	1-5 years	21	35.0
	6-10 years	23	38.3
	11-15 years	10	16.7
	16-20 years	4	6.7
	21 years and more	2	3.3
Complications due to diabetes	Arteriosclerosis	9	15.0
	kidney problems	2	3.3
	sexual problems	1	1.7
	peripheral neuropathy	13	21.7
	foot problems	17	28.3
	None	18	30.0
Diabetic Eye problems	visual impairment	29	48.3
	None	16	26.7
	Other	15	25.0
	Total	60	100.0%
Monitor blood glucose	Daily	25	41.7
	Weekly	35	58.3
	Total	60	100.0%
History of hypertension	Yes	16	26.7
	No	44	73.3
History of dyslipidemia	Yes	33	55.0
	No	27	45.0
	Total	60	100.0%
Eye surgery	cataract surgery	0	0
	Other	0	0
	None	60	100
Medical Treatment for Diabetic	Oral antidiabetic	42	70.0
	Injection Insulin	18	30.0
Adherence to medication	Regular	26	43.3
	Irregular	34	56.7
Visiting an eye specialist	Every 1 year	10	16.7
	never	50	83.3

Table 3. Overall assessment of patient's knowledge about preventive measures for retinopathy

	Questions	Responses			
	General information about diabetic retinopathy	Correct		Incorrect	
		Freq.	%	Freq.	%
Q1	What is diabetic retinopathy?	13	21.7	47	78.3
Q2	The most important signs and symptoms of diabetes retinopathy	20	33.3	40	66.7
Q3	What are the factors that cause the progression/worsening of diabetic retinopathy?	39	65.0	21	35.0
Q4	Diabetic retinopathy is diagnosed by using one of the following tests?	15	25.0	45	75.0
Q5	What are the treatment options available for diabetic retinopathy?	2	3.3	58	96.7
	Preventive Measures for Retinopathy	Freq.	%	Freq.	%
Q6	BMI values between 18.5 and 24.99 are indicative of weight	11	18.3	49	81.7
Q7	Patients with diabetes are advised to eat saturated fat less than	12	20.0	48	80.0
Q8	Patients with Diabetics are advised to engage in regular sports such as aerobic exercises and walking for 30 minutes three days a week / helps the patient in	5	8.3	55	91.7
Q9	The doctor advises the patient to monitor the blood sugar level regularly	9	15.0	51	85.0
Q10	Adherence to treatment helps	21	35.0	39	65.0
Q11	The goal for most people with diabetes is less blood pressure than	8	13.3	52	86.7
Q12	People with high blood pressure should take their drug	16	26.7	44	73.3
Q13	How often do you check your Blood Pressure	4	6.7	56	93.3
Q14	The American Hypertensive Care Association recommends a healthy diet consisting of	37	61.7	23	38.3
Q15	A diabetic patient is advised to have the following examinations annually	35	58.3	25	41.7
Q16	A diet that helps keep blood cholesterol levels in check includes	6	10.0	54	90.0
Q17	How is high cholesterol treated?	10	16.7	50	83.3
Q18	Acceptable levels of lipids in the blood are lower in people with chronic disease should be	8	13.3	52	86.7
Q19	Quit smoking cause	23	38.3	37	61.7
Q20	From the triggers of smoking to avoid	12	20.0	48	80.0
Q21	One of the treatments that are used as a substitute for nicotine to quit smoking is	16	26.7	44	73.3
Q22	How do you know DM had affected eyes?	8	13.3	52	86.7
Q23	Frequency of eye examinations for patients with diabetes should be done	6	10.0	54	90.0
Q24	Regular eye examinations should be done by	8	13.3	52	86.7
	MINIMUM =0.08 MAXIMUM= 0.46 MEAN= 0.238 SD= 0.0672				

Table 4. Correlation between diabetic patient's knowledge scores regarding preventive measures for retinopathy and their clinical and socio-demographic characteristics

Age group	n	Total Mean	SD	F	P
30-35 years	5	0.2583	0.05433		
36-40 years	9	0.2361	0.09317		
41-45 years	10	0.2708	0.07670	0.921	0.459
46-50 years	11	0.2235	0.03371		
50 years and more	25	0.2300	0.06601		
Gender	**n**	**Total Mean**	**SD**	**t**	**P**
Male	41	0.2449	0.06731	1.020	0.312
Female	19	0.2259	0.06706		
Education	**n**	**Total Mean**	**SD**	**F**	**P**
read & write	4	0.2396	0.06250		
primary school graduate	7	0.1845	0.04725		
intermediate school graduate	10	0.2375	0.08345	1.240	0.303
high school graduated	15	0.2583	0.04777		
high institute graduate	15	0.2389	0.06582		
university graduate and more	9	0.2500	0.08590		
Diabetes duration	**n**	**Total Mean**	**SD**	**F**	**P**
1-5 years	21	0.2440	0.08046		
6-10 years	23	0.2464	0.05317		
11-15 years	10	0.2042	0.07204	1.507	0.213
16-20 years	4	0.2188	0.02083		
21 years and more	2	0.3125	0.02946		
History of hypertension	**n**	**Total Mean**	**SD**	**t**	**P**
Yes	16	0.2318	0.05264	-0.491-	0.625
No	44	0.2415	0.07221		
History of dyslipidemia	**n**	**Total Mean**	**SD**	**t**	**P**
yes	33	0.2462	0.06618	0.931	0.356
No	27	0.2299	0.06873		

DISCUSSION

Results in this table revealed that (68.3%) are male, (41.7%) of patients are within the age group (50 years and more). Concerning the educational level, most patients in the study (25.0%) are high school graduates and high institute graduates. Related to occupation status (46.7%), patients in the study are Government employees. The study presented that most patients' household monthly income of the study sample salary (601.000-900.000,901.000-1.200.000) equal percent are (33. 3%). (90.0%) of patients in the study they live in Urban areas. Smoking status (80.0%) of patients in the study are ex-smokers.

The current study backs up Tripathi et al. (2022). The study included 272 patients with diabetes mellitus (44.4% females and 55.5% males). The study population's average age was 53.4 10 years. These findings are consistent with the findings of Mafwiri et al. (2016), who found that half of the patients (212, 51.5%) were between the ages of 41 and 60, with 133 (32.3%) being under the age of 40. The researcher believed that diabetic mellitus affects a population of (18-58 and older) years, with males constituting the majority of patients.

This was demonstrated in the study conducted by Banerjee et al. (2021). Furthermore, housewives (41.22%) were the most common group of patients, followed by service (19.85%), business (13.74%), agriculture (12.21%), and others (12.98%). Approximately 63.36% of the patients enrolled in the study were illiterate, while 36.64% were literate. Among the literate patients, 19.85% had completed the school level, 9.92% had completed the intermediate level, 3.82% had completed the bachelor level, and 3.05% had completed the master's level.

According to Lubna et al. (2017), 56.5 percent of patients were illiterate but did not achieve matriculation, while 42 percent had qualified for matriculation or higher educational levels. Moreover, Salil et al. (2018) reported that 39.41% of patients in the studies were self-employed, and Wakyusa et al. (2017) One-third (158, 38.2%) were self-employed, 71 (17.2%) were retired, and 97 (23.5%) did not work. Before retirement, more than a third (102, 35.4%) were professionals, while another third (100, 34.7%) were peasants. The researcher confirmed that the patients with low literacy have poor knowledge about their disease and may have difficulties learning the advanced Preventive Measures for Retinopathy needed to improve diabetic patients' self-care, and the majority of patients with diabetes in the study were self-employed or retired.

The current study is consistent with the findings of Sami et al. (2018), who found that nearly 80% of patients had a monthly income of less than 10,000 Saudi Riyals. According to Assem et al. (2020), in the study Knowledge about Diabetic Retinopathy, Eye Check-up Practice, and associated factors among adult patients with diabetes mellitus attending Debark Hospital, Northwest Ethiopia, 230 patients participated, yielding a 96.68% response rate. The participants' average age was 49(17.6) years. The median monthly income was 850 ETB [IQR 500-3500ETB], and 123% of the population lived in cities. According to the researcher, most DM patients are from the middle socioeconomic class.

According to Alswaina N. F. (2021), the current study included 307 patients with type 2 diabetes, 37 active smokers and 227 (73.9%) who did not exercise regularly. Liu et al. (2021) published a study titled Association between smoking history and optical coherence tomography angiography findings in diabetic patients without diabetic retinopathy. This study included 1099 eyes from 1099 diabetic patients with DM, with 750 nonsmokers and 349 smokers.

According to previous studies and the research findings, we discovered that people with diabetes have a small number of smokers, but it may interfere with the complications of diabetes in the eye, as we discovered in previous studies.

Results in this table revealed that (38.3%) of patients with diabetes had diabetes durations from (6-10 years) in the study. The results indicated that most (30.0%) from the study do not have diabetic complications. Diabetic Eye problems, the results showed that (48.3%) of patients from a study have visual impairment. Monitor blood glucose, the highest percentage (58.3%) of study patients who monitor blood glucose weekly.

The current study is consistent with Raza et al. (2019), who published a study of diabetic retinopathy - knowledge, attitude, and practices in diabetic patients admitted to tertiary care centres and reported that 66% of the sample had diabetes for the last 10 years, 22.7% had diabetes for 11 to 20 years, and 11.1% had diabetes for more than 20 years. According to Bahaeddin et al. (2017), the patient's diabetes duration was less than 5 years (N=47), 5-10 years (N=21), and more than 10 years (N=47). Van et al. (2015) reported that the years of DM from initial diagnosis were 5 (38.1%), 5-10 (30.3%), and > 10 (31.6%).

The reason for the comparatively better knowledge among patients with 6-10 years' duration is probably because the former has had more time to learn about diabetes and its ocular manifestations from various sources, including medical officers and other diabetic patients.

According to Alwazae et al. (2019), in terms of non-ocular complications of diabetes, cardiac complications ranked first (27.7%), followed by neuropathy (16.1%), and foot ulcer (11.4%); nephropathy (9.2%) was the least-reported complication. One or more diabetic ocular complications (46.8%) were self-reported, including cataracts in 31.2%, DR in 20%, glaucoma in 6.2%, and macular oedema in only 2.5%. Notably, 53.2% reported no diabetes-related ocular complications. This result differs from the findings of a search conducted by Achigbu et al. (2016), who published a study on the Knowledge, Attitude, and Practice of Diabetes Patients Regarding Eye Care. Diabetes can affect the eyes, as 72 (69.9%) of respondents correctly stated. However, only 42 (40.77%) of those polled mentioned diabetes complications. 12 (11.65%) respondents mentioned cataracts, and blindness was mentioned by 30 (29.12%). This could be because the occurrence of diabetic eye complications is unpreventable, but the complications causing visual impairment were the main reason given by patients for not getting an early diabetic eye screening, such as diabetic retinopathy.

The current study aligns with Raiturcar et al. (2019) found that 41% of diabetic retinopathy patients checked their blood sugar levels daily. Mansy et al. (2022) also reported weekly blood glucose and blood pressure monitoring. The researcher confirmed that most diabetic patients monitor their blood sugar levels weekly. This reflects the patients' lack of knowledge about blood sugar control, which is one of the risk factors for retinopathy.

73.3 percent of patients in the study group did not have a history of hypertension. According to the table, 55.0 percent of the patients in the study have a history of dyslipidemia. In eye surgery, the results showed that (100%) of patients in the study did not have any eye surgery or other surgery in their body. The results showed that (63.3%) of the study's patients had no surgery.

According to the table above, most patients in the study (70.0%) take oral diabetes medications. Most patients in the study (56.7%) have irregular medication adherence. They visited an eye specialist for the study's (83.3%) patients who never visited an eye specialist. According to the above table, most patients in the study (46.7%) were overweight (25-29.9).

According to Das et al. (2016), one or more comorbidities were present in 172 (71.66%) patients, with hypertension being the most common (detected in 126 (52.5%) patients. Dahal (2017) reported that 53.44% of patients had concomitant hypertension, and 9.16% had nephropathy in addition to new diabetic cases. According to Lee et al. (2020), we studied 563 patients with type 2 diabetes who had hypertension (83.66%) and dyslipidemia (73.36%).

This finding may be related to hypertension, which was found in most of these patients and was the only significant comorbidity possibly contributing to vision-threatening diabetic eye disease such as retinopathy. Despite these facts, there was a general lack of understanding of diabetic eye disease, particularly the lifestyle changes required to reduce the risk of diabetic

eye disease and the risk factors for developing eye complications.

The current study is consistent with the findings of Zhou et al. (2018), who reported that six studies examined the differences in TC levels between patients with and without DR (487 DR patients and 3545 controls). The random-effects model revealed no significantly higher levels in DR cases (MD 3.77 mg/dL, 95% CI: -2.45 to 9.98, P =.24, I2 = 41%, P-heterogeneity =.13). Furthermore, Cardoza et al. (2021) discovered that the prevalence of dyslipidemia in our study was 75.50%. (151 patients). The mean SD of LDL(mg/dL) in diabetic retinopathy was 118.86 40.58mg/dl and 103.97 36.34mg/dl in nondiabetic retinopathy patients. The researcher confirmed that the finding could be linked to dyslipidemia. The only significant risk factor possibly contributing to retinopathy was detected in most of these patients. Despite these facts, there was a general lack of understanding of diabetic eye disease, particularly the lifestyle changes required to reduce the risk of diabetic eye disease and the risk factors for developing eye complications.

The current study supports what Konstantinidis et al. (2017) discovered about Awareness and practices regarding eye diseases among diabetic patients. Whereas the vast majority (83.3%) had type 2 diabetes, 57.5% were on insulin or other antidiabetic injections. According to Alzahrani et al. (2018), approximately 60% of the patients were being treated with OHD or a combination of diet, exercise, and OHD, and either general or family physicians treated most of them. The study found that most patients used oral diabetes medications to treat their diabetes.

According to Rajesh et al. (2016), 3604 (58.02%) had previously sought eye consultations, with 3264 (52.5%) of them wearing spectacles. According to Ahmed et al. (2017), only 8% of eye-care patients monitored their blood sugar daily, 10% checked their blood pressure daily, and 43% always took medications as prescribed by their doctors. Approximately 37% saw an eye specialist once a year to prevent vision loss and other diabetes-related eye complications. This could be because the majority of patients did not have regular eye exams and did not visit an eye specialist. This could be done due to insufficient patient education, as previously discussed, a lack of health insurance, cultural and other barriers, and so on.

The current study is in line with According to Takele et al. (2022), the average BMI of study participants was 22.9 kg/m2 (SD 2:1). And, according to Foster et al. (2015), the majority of patients (61.4%) were overweight with a BMI greater than 25 kg/m2. Males' BMI ranged from 17.9 to 31.1 kg/m2 (mean 24.5 6.6). Females' BMI ranged from 17.7 to 34.1 (mean 25.9 8.2). We discovered a high percentage of overweight participants in the study due to diabetics' lack of knowledge about maintaining an ideal weight, which poses a risk of increasing the incidence of retinopathy.

The present study revealed that the mean (+SD) knowledge score of study participants about preventive measures for retinopathy was mean 0.238 SD= 0.0672 with a maximum possible score of 0.46, and all answers to questions are incorrect, indicating a poor to intermediate overall level of knowledge regarding preventive measures for retinopathy among DM patients. According to Assem et al. (2020b), the average (+SD) knowledge score of study participants about DR was 5.55 (4.66), with a maximum possible score of 14. One hundred twenty-one (52.6%)] participants had poor knowledge about diabetic retinopathy. Chintala et al. (2019) also reported that among the 108 diabetic patients, 12 (11.11%) had poor knowledge of diabetic retinopathy, 53 (49.07%) had average knowledge, and 43 (39.81%) had good knowledge. Forty patients (37.04%) knew that diabetes could affect the eye, 64.81% were unaware that frequent screenings for diabetic retinopathy are required, and 15.79% had never been screened.

Patients lack information regarding preventive measures for retinopathy. Poor information may be due to their limited knowledge about diabetes self-management, which may be attributed to the unavailability of educational programs for Iraqi diabetic patients. Thus, most patients received their education about diabetes self-management from other patients or Internet sites.

The present study revealed no significant relationship between patients' knowledge and their (age, gender, education, diabetes duration, history of hypertension, and history of dyslipidemia) among the study sample, evidenced by insignificant differences at p-value ≤ 0.05. According to Bakkar et al. (2017), Univariate analysis revealed that awareness of DR was not significantly associated with patients' gender (p=0.479), age (p=0.78), or family history of DM (p=0.177). However, a study conducted in Egypt by Aly et al. (2022) found a significant positive correlation between diabetic patients' knowledge scores regarding the prevention of retinopathy and all items of their socio-demographic characteristics with p=0.001 (0.001).

CONCLUSIONS

Diabetic patients, aware of the fact that diabetes affects the eye, have poor knowledge about diabetic retinopathy, and the study presented no significant relationship between patients' knowledge with their (age, gender, education, diabetes duration, history of hypertension, medical treatment for diabetic, history of dyslipidemia) among study sample evidenced by insignificant differences at p-value ≤ 0.05.

Based on the study conclusions, the study recommends that an intensive, comprehensive, large population-based (national level) educational program be conducted to improve diabetes mellitus patients' knowledge of Preventive Measures for Retinopathy. The

following measures can play an effective role: prompt counselling by health professionals, mass media, and illustrated posters in the diabetic clinics of public and hospitals.

Ethical Approval Statement

This research study, titled "**Assessment Knowledge of Diabetic Patients about Preventive Measures for Retinopathy in AL-Nasiriya City**" conducted by [**Abbas Fadel Najee, Rajaa Ibrahim Abed**], has received ethical approval from the [nursing college ethical committee] at [**University of Baghdad**].

AUTHOR'S CONTRIBUTIONS
All authors contributed equally to the conception and design of the study, data collection, and analysis, and drafted the initial manuscript. All authors critically reviewed and edited the manuscript. All authors approved the final version of the manuscript for submission.

DISCLOSURE STATEMENT:
The authors report no conflict of interest.

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