Derna University Journal of Medical Sciences (DUJMS)

UNIVERSITY OF DERNA

Volume 2 | Issue 2 | 2024 | Pages 103-112
ISSN: 2789-7389 (Online) | **DOI:** https://doi.org/10.58987/4xw34k88

Original Research

Estimation the Awareness of Diabetic Retinopathy among the Diabetic Patients Attending the Diabetes and Endocrinology Center at Tobruk City

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Received: 20 October 2024 **Accepted:** 26 December 2024 **Published:** 30 December 2024

ABSTRACT:

The present study is to assess the diabetic retinopathy (DR) knowledge among diabetic patients and the need to do a routine screening and checkup at the diabetes and endocrinology center at Tobruk city. This is a cross-sectional study of diabetic patients who had a routine visit to the diabetes and endocrinology center at Tobruk city were administered a questionnaire that was used in previously published studies to assess the DR knowledge. The results: A100 patients enrolled; were males 38 and 62 were females. The patients in the study were convinced that diabetes could have an impact on their eyes (N=100, 100.0%), maintaining proper blood sugar levels can contribute to preserving their eyesight (N=100, 100.0%), and that diabetes has the potential to cause blindness (N=98, 98.0%). Although regarding to the questions assessing patient's awareness of DR and annual eye examinations the majority of subjects (N=97, 97.0 %) answered yes. The minority of the patients get their eyes a routine screening and checkup (N=23, 23.0%). When questioned about the obstacles that hinder them from undergoing eye screening, the findings revealed; lack of knowledge about diabetic retinopathy (N=22, 22.0%), cost/ insurance (N=2, 2.0%), fear of discovery (N=2, 2.0%),

two or more of the factors mentioned above (N=43,43.0%), other (N=8, 8.0%). This study revealed a concerning discrepancy: while most understood diabetic retinopathy (DR) and its risks, a striking minority underwent annual eye exams. This highlights the urgent need to translate DR awareness into preventative action through patient education, and integrating eye exams into routine diabetes management.

KEYWORDS: Diabetic Retinopathy, Awareness, Eye Exams.

INTRODUCTION

The number of people with diabetic retinopathy will increase from 126.6 million in 2010 to 191 million in 2030, and the number of people with vision-threatening diabetic retinopathy (VTDR) will increase from 37.3 million to 56.3 million if immediate action is not taken.(Zheng, He, and Congdon 2012)

Diabetes mellitus (DM) is a serious health problem that affects over 350 million individuals worldwide. Diabetic retinopathy, which is the most common microvascular complication of diabetes, is the leading cause of new cases of blindness in working-aged populations. Diabetic macular edema (DME) is an advanced, vision-limiting complication of DR that affects nearly 30% of patients who have had diabetes for at least 20 years and is responsible for much of the vision loss due to DR (Boyer et al. 2013).

Diabetic retinopathy (DR) is a microvascular disorder caused by the long-term effects of diabetes. Diabetic retinopathy can cause vision-threatening damage to the retina that can eventually lead to blindness. (Fong et al. 2003). In the early stages of metabolic abnormalities and in the early stages of DR, a patient's vision is often unaffected. During the duration of diabetes and in advanced DR, visual acuity is reduced by the presence of diabetic macular edema (DME) and proliferative retinal complications. (Barth and Helbig 2021). Diabetic retinopathy is characterized by neurovascular degeneration due to chronic hyperglycemia. Proliferative diabetic retinopathy (PDR) is the most severe complication of diabetic retinopathy, leading to loss of total vision (central and peripheral) PDR is characterized by the presence of abnormal neovascular vessels, so-called “neovessels” in the optic disc (NVD) or elsewhere in the retina (NVE) PDR has high-risk characteristics (HRC) PDR (HRC-PDR), which may progress to PDR, defined by the presence of vitreous or preretinal hemorrhages in addition to NVDs one-quarter to one-third or more of the size of the disc area, or by vitreous or preretinal hemorrhages masking one or more disc areas. In severe cases, fibrovascular membranes may grow on the retinal surface

and cause tractional retinal detachment with visual loss despite treatment. (Perais et al. 2023). It is not a preventable disease but its sight-threatening complications can be reduced by regular eye screening and treatment, several studies refer to the lack of awareness of DM complications (Gale et al. 2017).

MATERIALS AND METHODS

This cross-sectional study used an interview-based questionnaire used in previously published studies. The questionnaire was administered to diabetic patients attending the Diabetes and Endocrine Center in Tobruk to assess their knowledge of diabetic retinopathy and the need for annual screening and follow-up care for this disease. Inclusion Criteria Diabetic patients aged 18 years or older, type 1 and type 2 diabetes. Exclusion criteria Patients diagnosed with diabetic retinopathy and/or previously treated by an ophthalmologist. Diabetic Retinopathy Awareness Questionnaire was administered by physicians to patients who requested to share in the study. The questionnaire was also translated into Arabic. The Arabic version of the questionnaire was used to remove language barriers and increase understanding among patients. The questionnaire on diabetic retinopathy consisted of 14 questions and 4 parts (Table 1) selected questions used in a previously published Jordan study (El Khatib, Al Hawari, and Al Bdour 2017).

Table (1): Diabetic Retinopathy Awareness Survey

S. No	Details	Survey Report
1	Name	
2	Age	
3	Sex	Male/Female
4	Occupation	
5	Level of Education	
6	Are you diabetic ?	Yes/No
7	Date of diagnosis	
8	Do you believe that Diabetes can affect your eyes?	Yes/No
9	Do you believe that controlling your blood sugar can help preserve your vision?	Yes/No
10	Do you believe that Diabetes can lead to blindness?	Yes/No
11	Do you know what diabetic retinopathy is?	Yes/No
	a. If you answered yes to the previous question, how did you become familiar with diabetic retinopathy?	Media/Doctor/Eye Doctor/Reading/Other
12	Do you have diabetic retinopathy?	Yes/No/ Not sure
13	Do you think it is important for a diabetic to check their eyes annually?	Yes/No
14	Do you check your eyes annually?	Yes/No
15	What do you think was the biggest	Lack of knowledge about

	barrier for not getting eye screening?	diabetic retinopathy Lack of access to eye care Cost/Insurance Fear of discovery

The first part of the questionnaire included questions regarding patient demographics such as age, gender, education level, and duration of DM. The second part of the questionnaire consisted of questions assessing the patient's awareness about diabetes and eyesight. Do you think diabetes affects your eyes? Do you think controlling blood glucose levels helps preserve vision? Do you think diabetes can lead to blindness?

The third part of the questionnaire included questions assessing patients' knowledge of diabetes and regular eye exams. Do you know about diabetic retinopathy? How did you learn about diabetic retinopathy? Do you think it is important for diabetic patients to have an eye exam every year? Do you think it is important for a diabetic patient to have their eyes checked annually? Do you exam your eyes annually?

Final part of the questionnaire inquired what they thought the biggest obstacle was for preventing them from getting their eyes screened.

Data analysis: All data were collected from questionnaires and presented as percentages.

RESULTS

There were 100 patients enrolled, 38 (38%) male and 62 (62%) female. Age groups were divided into three categories: 18-40 years (N=4 patients), 41-60 years (N=62 patients), and 60+ years (N=34 patients). The highest education level of the patients was also divided into three categories: elementary or preparatory school (N=58), secondary school or community college (N=30), and college graduate or higher (N=12). The duration of diabetes was less than 5 years (N=23), 5-10 years (N=29), and more than 10 years (N=48).

Table (2): Patient Attributes Regarding Age, Gender, Education level, and Duration of Diabetes Mellitus.

Age		**Number**	**%**
	18 to 40 years old	4	4.0
	41 to 60years old	62	62.0
	>60years old	34	34.0
	Total	100	100.0
Sex		**Number**	**%**
	Male	38	38.0
	Female	62	62.0
	Total	100	100.0
Level of Education		**Frequency**	**%**
	Elementary and preparatory	58	58.0
	Secondary and community college	30	30.0

	University degree and higher	12	12.0
	Total	100	100.0
Duration of Disease		**Frequency**	**%**
	<5 years	23	23.0
	5-10 years	29	29.0
	>10 years	48	48.0
	Total	100	100.0

Table 3 below assesses the patients' awareness of the association between diabetes and eyesight. Diabetes affects the eyes (N=100, 100.0%), controlling blood glucose levels can conserve vision (N=100, 100.0%), and diabetes leads to sightlessness (N=98, 98.0%).

Table (3): Questions Assessing Patient's Awareness of the Association Between Diabetes and Sightlessness.

	N=100	**%**
Do you believe that diabetes can affect your eyes? Yes No	100 0	100.0 0
Do you believe that controlling your blood sugar can help preserve your vision? Yes No	100 0	100.0 0
Do you believe that diabetes can lead to blindness? Yes No None	98 1 1	98.0 1.0 1.0

The questions were related to patients' awareness of diabetic retinopathy and annual eye examinations. Are you aware of diabetic retinopathy? 99.0% of subjects answered "yes." The following sources were used to learn about diabetic retinopathy: media (N=11, 11.0%), primary care physician or endocrinologist (N=12, 12.0%), ophthalmologist (N=1, 1.0%), reading education (N=2, 2.0%), two or more of the above (N=54, 54.0%), other (N=19, 19. 0%) (see Table 4).

Table (4): Questions Assessing how Patients Became Acquainted with Diabetic Retinopathy**.**

		N	**%**
	Media	11	11.0
	Endocrinologist	12	12.0
	Ophthalmologists	1	1.0
	Self-reading	2	2.0
	Other	19	19.0

	Two or more of the methods mentioned above	54	54.0
	Total	100	100.0

Do you have diabetic retinopathy? the majority answered “don't know” (N=80, 80.0%). When asked if diabetic patients should have a fundus examination every year, the majority answered “yes” (N=97, 97.0%). Fewer than half of the respondents (N=23, 23.0%) had a fundus examination every year. Refereeing to the barriers that prevented them from receiving eye exams, the lack of the knowledge about diabetic retinopathy was cited (N=22, 22.0%), cost/insurance (N=2, 2.0%), fear of detection (N=2, 2.0%), two or more of the above factors (N=43, 43.0%) and others (N=8, 8.0%) (Table 5) (Figure 1).

Table (5): Question About Obstacles Preventing them from Getting Eye Screening.

		N	%
	Lack of knowledge about diabetic retinopathy	22	22.0
	Cost/ Insurance	2	2.0
	Fear of discovery	2	2.0
	Two or more of the factors mentioned above	43	43.0
	Others	8	8.0
	None	23	23.0
	Total	100	100.0

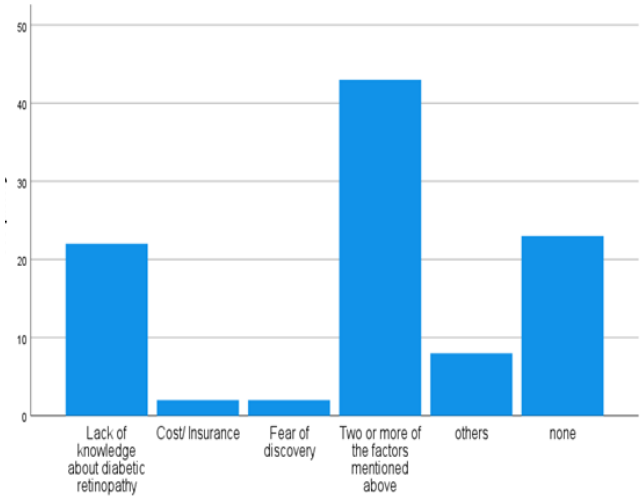

Figure (1): The Biggest Barrier for not Getting Eye Screening.

Discussion

According to WHO, the number of diabetics in Libya in 2000 was estimated at 88,000. This prevalence is estimated to reach 245,000 by 2030 (Roaed 1999). This indicates a significant and disturbing increase in the prevalence of diabetes in Libya. In recent decades, the prevalence of diabetes has increased dramatically in many countries of the

International Diabetes Federation's (IDF) Middle-East and North Africa (MENA) Region. Currently, the number of adults with diabetes is estimated to be about 9.2% in 2013 (Majeed et al. 2014).

Multiple studies have shown that the prevalence of diabetes is increasing worldwide, as are cases of diabetic retinopathy. In a new study published in 2024, the prevalence of diabetic retinopathy in patients with T2DM was 58.7%. (Hasan and Gibril 2024), which is higher than in previous studies conducted in Libya, The prevalence of DR in Benghazi was 30.6%(Roaeid, Kadiki, and Kadiki 2011), and in Misurata 16.2% (Elhwuegi et al. 2012).

Diabetic retinopathy is one of the major complications of diabetes and a well-known cause of blindness. Increased awareness of these complications among diabetic patients would help in prevention and early diagnosis. (Alswaina 2021).

The survey showed that most diabetic patients were aware of the disease's impact on vision and the possibility of blindness (98%), and that controlling blood glucose levels helps preserve vision (100%). It should be noted that 100% of the patients thought it was important for diabetic patients to have an annual eye exam, but unfortunately, only a small number (23.0%) were engaged in regular visits to an ophthalmologist and retinal examinations.

In contrast to the study by AlHargan MH et al. in Riyadh, patient response to awareness of DR was good. 88% of the respondents were aware that diabetes affects the retina. On the other hand, 76% were aware that blood glucose control reduces the risk of DR and 66% were aware that DR can lead to blindness, only 48% of the participants had an annual eye exam (AlHargan et al. 2019).

Similarly, in a study conducted in Jordan by El Khatib et al. only 38.3% of diabetic patients had been examined by an ophthalmologist for an eye exam, even though 90.4% of them thought they should have regular eye exams (El Khatib et al. 2017). Likewise, a study by Muecke et al. in Myanmar found that 86% of diabetic patients were aware that diabetes could impair vision; 92% were aware that they should see an eye doctor regularly, but only 57% had annual eye exams. (Muecke et al. 2008).

When patients were asked about obstacles that prevented them from receiving annual eye exams, 22% said they were unaware of possible eye complications due to diabetes. Similarly, a study conducted in Jordan by El Khatib et al. found that the main barrier to diabetic patients receiving appropriate eye

examinations was lack of knowledge about the need for eye examinations in 33.9% of cases (El Khatib et al. 2017).

The majority of patients who develop DR have no symptoms until the very late stages by which time it may be too late for effective treatment (Almalki, Almalki, and Alswat 2018).

CONCLUSION

This study revealed a concerning discrepancy: among diabetic patients in Tobruk, while most understood diabetic retinopathy (DR), its risks, and a striking minority underwent annual eye exams. This highlights the urgent need to translate DR awareness into preventative action through patient education, improved access to ophthalmologic care, and integrating eye exams into routine diabetes management, ultimately protecting patients from preventable vision loss.

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الملخص

تهدف الدراسة الحالية إلى تقييم معرفة اعتلال الشبكية السكري بين مرضى السكري والحاجة إلى إجراء فحص روتيني في مركز السكري والغدد الصماء في مدينة طبرق. هذه دراسة مقطعية لمرضى السكري الذين قاموا بزيارة روتينية لمركز السكري والغدد الصماء في مدينة طبرق وتم إعطاؤهم استبيانًا تم استخدامه في دراسات منشورة سابقًا لتقييم معرفة اعتلال الشبكية السكري. النتائج: تم تسجيل 100 مريض؛ من الذكور 38 و 62 من الإناث. كان المرضى في الدراسة مقتنعين بأن مرض السكري يمكن أن يكون له تأثير على أعينهم (ع = 100، 100.0٪)، وأن الحفاظ على مستويات السكر في الدم المناسبة يمكن أن يساهم في الحفاظ على بصرهم (ع = 100، 100.0٪)، وأن مرض السكري لديه القدرة على التسبب في العمى (ع = 98، 98.0٪). وعلى الرغم من أن غالبية المشاركين (ع = 97، 97.0٪) أجابوا بنعم فيما يتعلق بالأسئلة التي تقيم وعي المريض باعتلال الشبكية السكري وفحوصات العين السنوية. ويخضع أقلية من المرضى لفحص روتيني لأعينهم (ع = 23، 23.0٪). وعند سؤالهم عن العوائق التي تمنعهم من الخضوع لفحص العين، كشفت النتائج عن؛ نقص المعرفة حول اعتلال الشبكية السكري (ع = 22، 22.0٪)، والتكلفة / التأمين (ع = 2، 2.0٪)، والخوف من الاكتشاف (ع = 2، 2.0٪)، واثنان أو أكثر من العوامل المذكورة أعلاه (ع = 43، 43.0٪)، وغيرها (ع = 8، 8.0٪). كشفت هذه الدراسة عن تناقض مقلق: بينما فهم معظم المشاركين اعتلال الشبكية السكري ومخاطره، خضعت أقلية مذهلة لفحوصات العين السنوية. وهذا يسلط الضوء على الحاجة الملحة لترجمة الوعي باعتلال الشبكية السكري إلى إجراءات وقائية من خلال تثقيف المرضى، ودمج فحوصات العين في إدارة مرض السكري الروتينية.

الكلمات المفتاحية: اعتلال الشبكية السكري، التوعية، فحوصات العين.