

## A study on awareness and practices of physicians about diabetic retinopathy in primary-care centers Hail, Saudi Arabia

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### ABSTRACT

The present study was aimed to assess the level of awareness of knowledge, awareness and practices of physicians in Primary-Care Centers Hail, Saudi Arabia. Cross-sectional and descriptive responses were obtained by using a semi-structured multi-point questionnaire that was prepared in English as well as in Arabic. It consisted of open and closed-ended questions. The data were analyzed using SPSS tool. A total of 62 subjects were included in the study. More than one third of subjects were <40 years of age with mean age of  $44.26 \pm 11.00$  ranging from 26-72 years. Majority viewed that diabetic type 1 patient should visit an ophthalmologist after diagnosis (82.3%). Retinal vascular disease was reported as the most common eye disease associated with diabetic retinopathy (66.1%). About one third of the subjects adapted direct (hand-held) ophthalmoscope and a dilated fundus exam for evaluating diabetic retinopathy each constituting 33.9% and 32.3% respectively. Journals were the main source of knowledge about diabetic retinopathy (72.6%). This study displays the need for hands on training of physicians about detection of diabetic retinopathy by direct use of ophthalmoscopes. Barriers for ophthalmoscope examination as perceived need to be further addressed and evaluated.

**KEY WORDS:** DIABETIC RETINOPATHY, KNOWLEDGE, AWARENESS, PRACTICES, PHYSICIANS

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## INTRODUCTION

The prevalence of diabetes mellitus (DM) is increasing globally in both developed and developing countries (Rani *et al.*, 2008). It is estimated that the number of patients with DM will be doubled by 2025 (Rathmann and Giani, 2004). It has been reported that Saudi Arabia with a high prevalence of 24% was ranked 7<sup>th</sup> out of the top 10 countries for the prevalence of DM among people aged 20–79 years. Worldwide, DM being a leading cause of blindness due to its ocular complications (Sami *et al.*, 2018). Diabetic retinopathy (DR) is the most common microvascular complication of diabetes. It is the foremost cause of blindness in working aged people as well as patients aged 55 years or older (Bunce and Wormald, 2006). DR is considered a significant blinding disease. It is included in the disease control strategy of the VISION 2020 initiative. It has been estimated that 84.5% of people with DM who have had the disease for >20 years will develop DR (UKPDS, 1998; Fong *et al.*, 2004). In a national study in Saudi Arabia, the prevalence of DR was found to be 19.7%, whereas other studies suggested a prevalence ranging from 16.7% to 31%. Both type 1 and type 2 DM can lead to DR. DR is classified into two types: nonproliferative and proliferative. The former type may cause impaired vision if the macula is affected. Proliferative DR can also result in blindness, and it is more serious (Sami *et al.*, 2018).

Knowledge about DM and DR along with their health impacts and treatments may be considered vital in motivating people to pursue appropriate eye care. Therefore, it may assist in dealing with visual impairment (Huang *et al.*, 2013; Wang *et al.*, 2008; Muecke *et al.*, 2008). Despite the well-documented importance and magnitude of the issue in the literature, limited studies have explored the knowledge about DR among the patients with DM. Worldwide, studies have focused on prevalence, screening and the effects of DR. DM and DR are continuously growing problems in the Saudi population and cause socioeconomic burdens for the healthcare system (Çetin *et al.*, 2013; Seneviratne and Prathapan, 2016).

The health burden due to DM in Saudi Arabia is predicted to rise to catastrophic levels, unless a wide-ranging epidemic control program/multidisciplinary approach is incorporated, with great emphasis laid on advocating a healthy diet, including exercise and active lifestyles, and weight control. To properly manage DM in Saudi Arabia, a multidisciplinary approach is required in which the general health practitioners play an important role (Al Ghamdi *et al.*, 2017). The present study was aimed to assess the level of awareness of knowledge, awareness and practices of physicians in Primary-Care Centers Hail, Saudi Arabia.

## MATERIAL AND METHODS

The study was a cross-sectional and descriptive. This study was conducted to assess the KAP of practitioners toward DR in Primary-Care Centers Hail, Saudi Arabia. Responses were obtained by using a semi-structured multi-point questionnaire that was prepared in English and Arabic. It consisted of open and closed-ended questions. To ensure clarity of the final questionnaire, a pilot study was conducted. The final questionnaires consisted demographic data and general questions about the respondents as well as questions on knowledge & awareness levels. It did not include personal details of the respondent. The written consent from respondent is taken before handover the survey questionnaire. Also an ethical committee approval was taken from the ethical committee of the institute before starting this work. The collected data were coded and entered on a spreadsheet. Statistical analysis was performed using version 16.0 version (SPSS Inc., Chicago) statistical software.

## RESULTS

A total of 62 subjects were included in the study. More than one third of subjects were <40 years of age with mean age of  $44.26 \pm 11.00$  ranging from 26–72 years. About half of the subjects were males (51.6%). More than half of the subjects were Sudanese (54.8%). Majority of the subjects were general practitioner (72.6%). More than one third of subjects were practicing for 10–20 years (46.8%) (Table 1).

Table 2 depicts the distribution of subjects according to knowledge about diabetic retinopathy. Majority viewed that diabetic type 1 patient should visit an ophthalmologist after diagnosis (82.3%). About one third of the subjects opined that patient should visit an ophthalmologist immediately after diagnosis and every year (33.9%). Majority of the subjects viewed that type 2 patient should visit an ophthalmologist following diagnosis (98.4%). Majority of the subjects also viewed that after type 2 diabetes diagnosis, patient should visit an ophthalmologist immediately after diagnosis (79%). More than half of subjects viewed that type 2 diabetic patient should visit an ophthalmologist every one year (58.1%).

Retinal vascular disease was reported as the most common eye disease associated with diabetic retinopathy (66.1%). Cataract was reported as the second most common eye disease associated with diabetic retinopathy (53.2%). Retinal detachment was reported as the third most common eye disease associated with diabetic retinopathy (45.2%). Uncontrolled diabetes was reported as the most common risk for diabetic retinopathy (58.1%). Long duration of diabetes was reported as the second most

Demographic profile	No. (n=62)	%
Age in years		
<40	24	38.7
41-50	19	30.6
>50	19	30.6
Mean±SD (Range)	44.26±11.00 (26-72)	
Gender		
Male	32	51.6
Female	30	48.4
Nationality		
Saudi	4	6.5
Egyptian	13	21.0
Sudanese	34	54.8
Syrian	4	6.5
Jordanian	1	1.6
Indian	2	3.2
Pakistani	4	6.5
Medical specialty		
Family medicine	15	24.2
General Practitioner	45	72.6
Others	2	3.2
Experience in years		
<10	17	27.4
10-20	29	46.8
21-30	10	16.1
>30	6	9.7
Mean ±SD (Median)	15.84±9.68 (15.00)	

common risk for diabetic retinopathy (43.5%). Diabetic with HTN was reported as the third most common risk for diabetic retinopathy (37.1%). Decrease visual acuity was the most common symptom of diabetic retinopathy (62.9%) (Table 3). About one third of the subjects adapted direct (hand-held) ophthalmoscope and a dilated fundus exam for evaluating diabetic retinopathy each constituting 33.9% and 32.3% respectively. The percentage of the other methods was less than 10% (Fig. 1).

Table 4 shows the distribution of subjects according to signs and treatment of retinopathy. Neovascularization was reported as the most common early signs of diabetic retinopathy (41.9%). Micro-aneurysms was reported as the second most common early signs of diabetic retinopathy (19.4%). Intra vitreous anti-VEGF (37.1%) was the most common treatment choice among the subjects. More than half of subjects referred both people who were asymptomatic and only if they reported symptoms of vision loss (62.9%) (Table 4).

Majority of the subjects had knowledge about using ophthalmoscope (77.4%) and 46.8% did eye examina-

Knowledge about	No. (n=62)	%
Diabetic type 1 patient should visit an ophthalmologist after diagnosis		
Yes	51	82.3
No	9	14.5
Do not know	2	3.2
How soon after type 1 diabetes diagnosis should a patient visit an ophthalmologist?		
Immediately after diagnosis	21	33.9
One year after diagnosis	15	24.2
Two years after diagnosis	2	3.2
Five years after diagnosis	20	32.3
Do not know	4	6.5
How regular should a type 1 diabetic patient visit an ophthalmologist?		
Every 5 years	15	24.2
Every 2 years	4	6.5
Every year	21	33.9
Based on ophthalmologist screening assessment	20	32.3
Do not know	2	3.2
Should a diabetic type 2 patient visit an ophthalmologist following diagnosis		
Yes	61	98.4
No	1	1.6
How soon after type 2 diabetes diagnosis should a patient visit an ophthalmologist?		
Immediately after diagnosis	49	79.0
One year after diagnosis	8	12.9
Two years after diagnosis	2	3.2
Five years after diagnosis	2	3.2
Do not know	1	1.6
How regular should a type 2 diabetic patient visit an ophthalmologist		
Every 5 years	4	6.5
Every 2 years	1	1.6
Every 1 year	36	58.1
Based on ophthalmologist screening assessment	20	32.3
Do not know	1	1.6

tion to a diabetic patient. Majority of subjects referred all diabetic patients to an ophthalmologist (75.8%). More than half of subjects followed-up referred patients (64.5%). More than one third of patients were involved in the diabetic retinopathy public awareness programs to educate the public in the past one-year (40.3%)

Table 3. Distribution of subjects according to knowledge about eye diseases associated with Diabetic Retinopathy		
	No. (n=62)	%
Knowledge about eye diseases associated with Diabetic Retinopathy*		
Pterygium	9	14.5
Glaucoma	15	24.2
Retinal vascular disease	41	66.1
Cataract	33	53.2
Macular degeneration	25	40.3
Trachoma	2	3.2
Vitreous hemorrhage	18	29.0
Conjunctivitis	6	9.7
Retinal detachment	28	45.2
Macular edema	16	25.8
All the above	9	14.5
None of the above	0	0.0
Don't know	0	0.0
Which of the following increase risk for Diabetic Retinopathy?*		
Pregnancy	2	3.2
Uncontrolled diabetes	36	58.1
Long duration of diabetes	27	43.5
Hyperthyroidism	3	4.8
Diabetics with HTN	23	37.1
All the above	23	37.1
None of the above	0	0.0
Don't know	0	0.0
Which of the following is early symptom of diabetic retinopathy?*		
Pain	5	8.1
Photosensitivity	8	12.9
Decrease visual acuity	39	62.9
Blindness	2	3.2
All the above	12	19.4
No symptoms	8	12.9
Don't know	2	3.2
*Multiple responses		

(Table-5). Journals was the main source of knowledge about diabetic retinopathy (72.6%) followed by Radio/ TV (40.3%), Seminars, meetings, symposiums (38.7%), senior medical personal (12.9%), books (11.3%) and newspaper & internet (8.1%) (Fig.2).

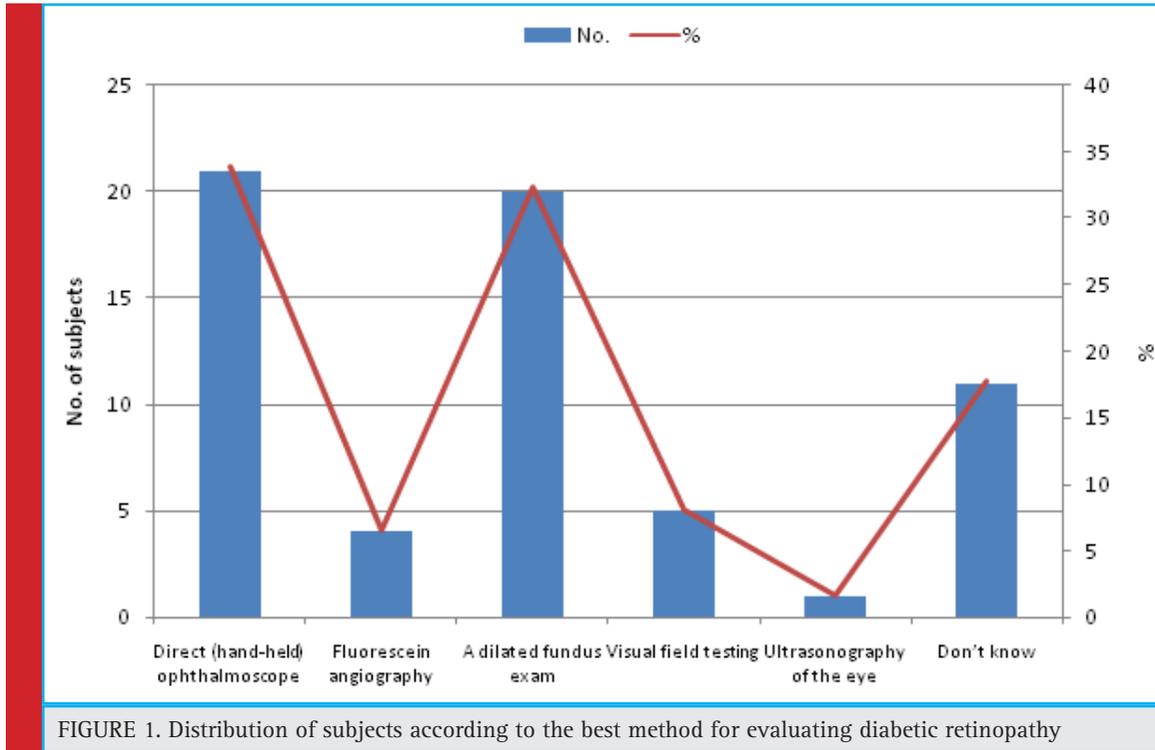
## DISCUSSION

Geographically, Hail is considered to be a broad health area compared to other areas in Saudi Arabia with

Table 4. Distribution of subjects according to signs and treatment of retinopathy		
	No. (n=62)	%
Which of the following is early signs of diabetic retinopathy?*		
Neovascularization	26	41.9
Retinal swelling	4	6.5
Vitreous hemorrhage	2	3.2
Fatty exudates	8	12.9
Micro-aneurysms	12	19.4
Papilloedema	7	11.3
All the above	18	29.0
None of the above	0	0.0
Don't know	4	6.5
Treatment choice for patients with Diabetic Retinopathy?*		
LASIK	10	16.1
Vitrectomy	2	3.2
Laser photocoagulation	23	37.1
Intravitreal anti-VEGF	12	19.4
Intravitreal corticosteroids	2	3.2
All the above	10	16.1
None of the above	0	0.0
Don't know	14	22.6
Routinely referred for eye examinations?*		
Referral of people who were asymptomatic	13	21.0
Only if they report symptoms of vision loss	7	11.3
All the above	39	62.9
None of the above .	5	8.1
Don't know	1	1.6
*Multiple response		

almost equal practice for rural and urban situations which makes it a good representative of the Saudi community. In the present study, more than one third of subjects were <40 years of age with mean age of 44.26±11.00 ranging from 26-72 years. About half of the subjects were males (51.6%). More than half of the subjects were Sudanese (54.8%). Majority of the subjects were general practitioner (72.6%). More than one third of subjects were practicing for 10-20 years (46.8%).

Majority of the subjects were general practitioner (72.6%) and more than one third of subjects were practicing for 10-20 years (46.8%) in this study. Al Ghamdi et al (2017) reported that most of the physician had short periods of practice and were more specialized in discipline rather than family medicine and only one third had special training in diabetes and DR management.



The majority of the physicians had adequate knowledge about DR and followed national and international guidelines for its management. Most of the physician were well aware about consequences of DR. They knew that the ideal method of examination was ophthalmoscopy.

However, this was not practiced by many. Here, there was a disparity between knowledge level and practice pattern. The gap between knowledge and practice in DR screening has been reported (Sparrow et al, 1993). This study neither elucidated the barriers that block the phy-

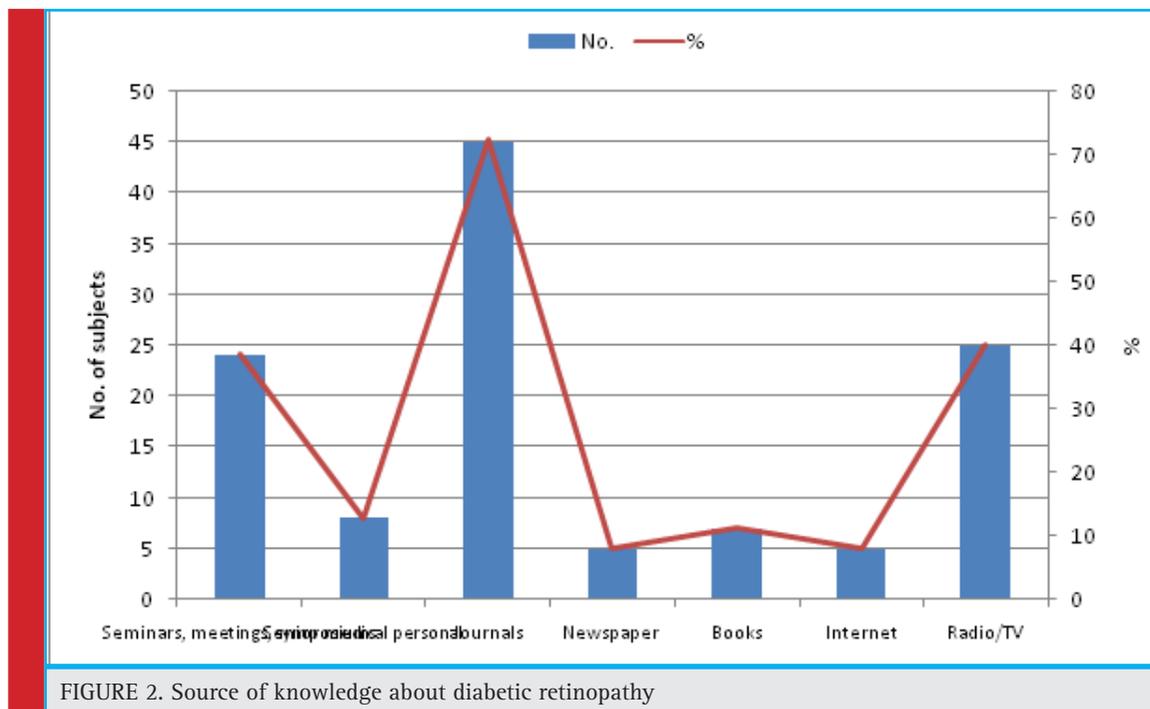


Table 5. Distribution of subjects according to practices of retinopathy patients		
	No. (n=62)	%
Knowledge about how to use the ophthalmoscope?		
Yes	48	77.4
No	14	22.6
Did eye examination to a diabetic patient?		
Yes	29	46.8
No	33	53.2
Type of diabetic patients referred to an ophthalmologist?		
Type 1	5	8.1
Type 2	2	3.2
Long duration diabetics	5	8.1
All diabetics	47	75.8
If they develop any eye problem	3	4.8
Followed-up the patients referred to the specialists?		
Yes	40	64.5
No	22	35.5
Involved in diabetic retinopathy public awareness programs to educate the public in the past one-year?		
Yes	25	40.3
No	37	59.7

sician from putting their knowledge into practice, or the ways to close this evidence-practice gap.

Although a significant percentage of the physician had limited knowledge about the importance of diabetic retinopathy risk factors. Lack of hands on training courses could be an important reason and that needs to be investigated. Ophthalmoscopes are considered basic equipment that is regularly supplied by the Ministry of Health to primary health care practice. Shortage in ophthalmoscopes in PHCs reflects some lacunae in health care system. Individual practitioners can consider getting their own ophthalmoscope, which will greatly improve the quality of their work. Once the infrastructure is available, it need not be a problem for the physician to put their knowledge into practice.

## CONCLUSION

This study displays the need for hands on training of physician about detection of DR by direct use of ophthalmoscopes. Barriers for ophthalmoscope examination as perceived need to be further addressed and evaluated. Furthermore, It is of great importance to improve the

screening facilities at the primary health care setting. This study also suggested that all stakeholders including policymakers and especially health providers should prioritize building awareness. In addition, all available and feasible resources should be channeled towards reducing the burden of diabetic retinopathy.

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