

# Knowledge, Attitude and Practice toward Diabetic Retinopathy and Retinal Examination among Diabetic Population in Al-Hasa Region, Saudi Arabia: A Cross-sectional Study

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## Abstract

**Introduction:** Diabetic retinopathy (DR) is a major health concern in diabetic patients. It is considered as a silent developing disease that eventually can lead to blindness. Therefore, it is important for diabetic population to be aware of the importance of early detection and timely intervention to avoid visual loss.

**Purpose:** To assess the knowledge, attitude and practice (KAP) toward DR and retinal examination among diabetic population in Al-Hasa region.

**Materials and Methods:** A cross-sectional questionnaire based study was conducted from August 2016 to April 2017. A questionnaire which was prepared based on KAP was distributed among Saudi diabetic patients in Al-Hasa region of Saudi Arabia. The researchers have done the questionnaire on 479 individuals of diabetic patients. Data analysis was performed using SPSS program version 24.

**Results:** The minimum age of the participants was 21 and the maximum age was 65. The number of male participants is 276 (57.6%) and females 203 (42.4%). The mean KAP score was  $7.86 \pm 3.8$ . 224 (46.8%) of the participants in the study were found to have inadequate knowledge about eye complications of diabetes and DR. In addition to that, 101 (21.1%) are not restricting to the guidelines of screening. The assessment of attitude and practice also showed poor results. More than half of the participants, 263 (54.9%), are not following the screening guidelines of DR. Only 232 (48.4%) know the recommended duration interval of eye screening.

**Conclusion:** DR is a common but unrecognized problem among diabetic population in Al-Hasa region. There is a lack of awareness among Saudi diabetic population about this problem. There is a need for educational intervention programs to increase the knowledge level about this disease as well as the necessity of screening and periodic follow-ups.

**Key words:** Attitude, Diabetic retinopathy, Knowledge, Practice, Retinal examination

## INTRODUCTION

Diabetes mellitus (DM) is becoming the main health problem worldwide.<sup>1</sup> In 2014, it is estimated globally that 387 million

suffer from diabetes. This prevalence is expected to increase and reach to 592 million in 2035.<sup>2</sup> In Saudi Arabia, DM is considered as a major health problem in the country. The prevalence in 2015 was 17.6% of the population, and this percentage was the highest in the Middle East.<sup>3</sup>

DM is a chronic disease that can lead to many early and late complications in different body organs such as cardiovascular, neural, renal, and ocular complications.<sup>4</sup>

Diabetic retinopathy (DR) is a well-known complication of diabetes and it is the leading cause of blindness in diabetic

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patients.<sup>5,6</sup> 4.8% of cases of blindness worldwide are due to DR.<sup>7</sup> Studies have shown that among patients with diabetes after 15 years, a proximately 2% of them will be blind.<sup>1</sup>

In Saudi Arabia, many studies in different regions were conducted to show the exact prevalence of DR. The prevalence of DR in Riyadh (Capital of Saudi Arabia) was found to be 31%, in Al-Madinah Al-Munawarah was 36%, and in Al-Hasa (that is the region of our study) was estimated to be 33% of all diabetic patients.<sup>8-10</sup>

DR is considered as a silent developing disease. To avoid blindness in these patients, early detection and timely intervention is an important part in the management.<sup>11</sup> Therefore, it is important for diabetic population to be aware of the annual eye screening from the time of diagnosis in type 2 and after 5 years of diagnosis in type 1.

Previous knowledge, attitude and practice (KAP) studies had been conducted before. Which showed the presence of adequate awareness about regular eye screening in most of the general practitioners and diabetic patients, but less than half of them had been screened.<sup>12</sup>

Unfortunately, there are no data on awareness of eye screening for DR among diabetic population in our region, making it important to do these kinds of studies.

### Aim and Objectives of Study

This study aims to evaluate the level of KAP toward DR and retinal examination among diabetic population in Al-Hasa region. This study was conducted because of two main reasons. First, the higher level of awareness of the disease and regular periodic eye screening can prevent many eye complications in diabetic patients. Second reason, to the best of our knowledge, no study was done before in Al-Hasa region about this specific kind of study.

## MATERIALS AND METHODS

A retrospective cross-sectional questionnaire based study was conducted from August 2016 to April 2017. The authors got the approval from Research Ethical Committee in the college of medicine of King Faisal University. The questionnaire which was prepared based on KAP had been revised by the Ophthalmology Department in the college and then distributed among diabetic patients in Al-Hasa Region. The researchers have done the questionnaire on 479 individuals of diabetic patients. The researchers have collected the demographic characteristics, and 12 questions about DR to evaluate the knowledge and attitude. In addition to that, number and duration of screening intervals and laser treatments were included to evaluate the practice of the patients toward the disease. This study

includes patients who were diagnosed with diabetes either type 1 or type 2. Both genders were included with age range from 21 to 65. The data collection comprised the demographic characteristics of age, gender, marital status, educational level, and the lifestyle of having a healthy diet and regular exercises. Furthermore, the researchers asked the participants whether they have pre-existing eye diseases or present with eye symptoms at the time of collecting the data. Data analysis was performed using SPSS program version 24. Descriptive statistics of all variables were obtained to evaluate the data (by Chi-square test). The value of  $P < 0.05$  was considered a statistically significant. This method of analysis was similar to the other KAP studies in the purpose of comparison.

## RESULTS

A total of 479 individuals with diabetes in Al-Hasa Region were included in our study. The minimum age of the participants was 21 and the maximum age was 65. More than half of them are in the age group (35-60).

The number of male participants is 276 (57.6%) and females 203 (42.4%). Primary educational level was found in 46 (9.6%), 158 (33%) had secondary, and 275 (57.4%) had the academic educational level. The demographic characteristics are shown in Table 1.

Regarding the type of diabetes, 154 (32.1%) of the participants have type 1, 225 (47%) have type 2 diabetes, and 100 (20.9%) of them are not sure about their type. The duration of treatment was  $\leq 5$  years in 225 (47%), 6-10 years in 118 (24.6%), and  $\geq 11$  years in 136 (28.4%) individuals. 241 (50.3%) out of 479 participants are following a healthy lifestyle of regular exercises and healthy diet. In addition to that, 32 (6.7%) of them did not receive any pharmacological treatment.

**Table 1: Biographical data**

Demographic characteristics (N=479)	N (%)
Age	
<35	116 (24.2)
35-60	300 (62.6)
>60	63 (13.2)
Gender	
Male	276 (57.6)
Female	203 (42.4)
Marital status	
Single	96 (20.1)
Married	368 (76.8)
Divorced	15 (3.1)
Educational level	
Primary	46 (9.6)
Secondary	158 (33)
Academic	275 (57.4)

Regarding pre-existing eye disease, 51 (10.6%) of the patients were diagnosed with DR (34 of them received laser treatment), 38 (8%) have cataract, 11 (2.3%) have glaucoma, and the remaining 379 (79.1%) are free of eye diseases.

The mean KAP score was  $7.86 \pm 3.8$ . The level of knowledge is shown in Table 2. 68 (14.2%) of the participants did not hear about DR before. Furthermore, 191 (39.9%) do not know why this condition occurs in diabetes, and less than one-third of the participants, only 129 (26.9%), know how DR is treated.

**Table 2: Frequency and percentage of knowledge level**

Knowledge level	Frequency	Percent (%)	Valid percent	Cumulative percent
Valid				
Inadequate knowledge	224	46.8	46.8	46.8
Adequate knowledge	255	53.2	53.2	100.0
Total	479	100.0	100.0	

**Table 3: Frequency and percentage of attitude and practice toward eye screening**

Following the guideline	Frequency	Percent	Valid percent	Cumulative percent
Valid				
Not following the guidelines	263	54.9	54.9	54.9
Following the guidelines	216	45.1	45.1	100.0
Total	479	100.0	100.0	

**Table 4: The responses of different statements related to the knowledge, attitude and practice of diabetic retinopathy**

Statement	N (%)				
	Fully agree	Agree	Undecided	Disagree	Fully disagree
Diabetic patients are more likely to have eye diseases	335 (70)	87 (18.2)	51 (10.7)	4 (0.9)	1 (0.2)
If diabetes is well managed, there is no need to worry about eye complication	110 (23)	109 (22.7)	99 (20.7)	138 (28.8)	23 (4.8)
Retinal eye diseases only occur in diabetic patients	37 (7.7)	52 (10.8)	147 (30.7)	201 (42)	42 (8.8)
Patients with diabetic retinopathy unable to discover the disease early, because it is asymptomatic	146 (30.5)	95 (19.8)	179 (37.4)	54 (11.3)	5 (1)
Diabetic retinopathy can cause blindness	282 (58.9)	66 (13.8)	124 (25.9)	6 (1.2)	1 (0.2)
The vision of patients with diabetic retinopathy will improve with corrective lenses	104 (21.7)	80 (16.7)	202 (42.2)	77 (16.1)	16 (3.3)
Diabetic patients have to examine the eyes regularly even with no symptoms	401 (83.7)	39 (8.1)	31 (6.5)	7 (1.5)	1 (0.2)
Both type 1 and type 2 diabetic patients have to examine the eye annually	388 (81)	23 (4.8)	64 (13.4)	3 (0.6)	1 (0.2)
If diabetes is well treated there is no need for annual eye screening	37 (7.7)	31 (6.5)	77 (16.1)	265 (55.3)	69 (14.4)
Annual eye screening can prevent the development of diabetic retinopathy	294 (61.4)	97 (20.3)	71 (14.8)	14 (2.9)	3 (0.6)
There is a certain age for screening of diabetic retinopathy	15 (3.1)	31 (6.5)	152 (31.7)	216 (45.1)	65 (13.6)
Annual eye screening is considered a waste of money and efforts, as in most of the time the screening will not reveal the diagnosis	20 (4.2)	10 (2.1)	67 (13.9)	248 (51.8)	134 (28)

224 (46.8%) of the diabetic patients who are included in this study were found to have inadequate knowledge about eye complications of diabetes and DR. In addition to that, 101 (21.1%) out these 224 who have inadequate knowledge are also not restricting to the guidelines of screening. The results of attitude and practice toward the eye screening are shown in Table 3. More than half of the participants, 263 (54.9%), are not following the screening guidelines of DR. Only 232 (48.4%) know the recommended duration interval of eye screening.

The responses of all the participants related to the KAP are shown in Table 4.

**DISCUSSION**

Diabetes is well-known to be the most common metabolic disease among Saudi population according to the last epidemiological studies.<sup>2</sup> DR is the most common ocular complication of diabetes which can be prevented by controlling the blood sugar levels and regular eye screening.<sup>4</sup>

The purpose of this study was to assess the KAP of diabetic patients toward DR and the retinal examination.

Our study found that among diabetic patients in Al-Hasa Region, there is no significant difference between males and females in the level of knowledge, attitude or practice.

Regarding the age variable, the study showed that the age group (35-50) has a better attitude and practice toward DR ( $P = 0.001$ ). We attribute that this age group starts

to have more eye complications than the younger age, so they will receive more eye care. However, no significant difference was found between the age groups in the level of knowledge.

Another major finding of our study was the impact of the educational intervention on the level of knowledge and awareness about the disease, as the study results showed that the participants who have the university and secondary educational levels had the highest scores in the questionnaire.

Furthermore, we concluded from this study that more prolonged course of the disease will increase the level of awareness, as the Chi-square ( $P = 0.000$ ) showed that patients who had a more prolonged duration of the disease ( $\geq 11$  years) have a higher KAP score than the others.

A significant association was found between the higher knowledge and positive attitude toward the disease, which shows the importance of increasing the level of awareness among the diabetic population. This finding is shown clearly in Table 5.

To the best of our knowledge, this is the first KAP study of DR among diabetic patients in the eastern province of Saudi Arabia. Previously, a KAP study was conducted in our region, but it was among medical students.<sup>6</sup>

In 2015 a similar KAP study conducted in Al-Jouf and Hail Province of Saudi Arabia showed 75.62% were aware of DR.<sup>4</sup> In our study, the Knowledge score result was 53.2% which is lower compared to Al-Jouf and Hail Province study. In addition, studies conducted in different countries including Japan (98%),<sup>13</sup> Australia (96%),<sup>14</sup> and Oman (72%)<sup>15</sup> showed higher results. However, our results (53.2%) still is better than that found in India (50%),<sup>16</sup> and USA (52%).<sup>17</sup>

**Table 5: Impact of knowledge level, on the attitude and practice toward eye screening**

Parameter	Knowledge level		Total
	Don't have knowledge	Have knowledge	
Attitude and practice toward eye screening			
Not following the guidelines			
Count	162	101	263
% of total	33.8	21.1	54.9
Following the guidelines			
Count	59	157	216
% of total	12.3	32.8	45.1
Total			
Count	221	258	479
% of total	46.1	53.9	100.0

In regard to the attitude, Al-Zarea in his study noted that 38.49% of patients believed that if the diabetes is under control, there is no need to visit the ophthalmologist, while in our study this percentage was lower than the after mentioned study with only 14.2%.<sup>4</sup>

The practices toward the disease also showed some variations between the results. 45.1% of patients in this study undergone eye screening annually. This result was slightly lower than Al-Zarea's study (48.9%).<sup>4</sup>

We conclude from these findings that our patients had poor attitude and practice compared to the others, which emphasize the needs for educational intervention.

## CONCLUSION

DR is a common but unrecognized problem among diabetic population in Al-Hasa region. There is a lack of awareness among Saudi diabetic population about this problem. There is a need for educational intervention programs to increase the knowledge level about this disease as well as the necessity of screening and periodic follow-ups.

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