Knowledge, Attitude, and Practice (KAP) of Diabetes and Diabetic Retinopathy among Patients with Diabetes in Riyadh City.

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Research article

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Abstract

Objective

To identify the knowledge, attitude, practice (KAP) of diabetes and diabetic retinopathy among Saudi patients with diabetes in Riyadh Saudi Arabia.

Methods

A cross sectional study that was conducted in 50 randomly selected primary care centers and two university hospitals, involving diabetic patients that are 18 years and older during May 2018 and December 2018 in Riyadh, Saudi Arabia, using a validated KAP-45 questionnaire to assess the KAP levels of diabetes and diabetic retinopathy.

Results

A total of 313 participants were enrolled in the study. Most of them 168(59.8%) were males and 38(12.3%) were illiterate and 141(45.4%) had at least a bachelor's degree. Most of them had a family history of DM and long standing history of DM The average knowledge score for diabetes was good and was suboptimal for diabetic retinopathy. While the attitude scores for both diabetes and diabetic retinopathy were suboptimal. Meanwhile the average practice score for diabetes was good and was low for diabetic retinopathy.

Conclusions

Findings observed in our study stress on the importance of improving education and awareness as it's the key for controlling the disease and reducing its complications.

Introduction:

Diabetes mellitus (DM) is a chronic metabolic disease related to insulin and is one of the most significant worldwide health problems. Globally, it is estimated that 382 million people are affected by DM (as of 2013); this number is expected to rise to 592 million by 2035.[1] Alnuzha et al. reported that DM prevalence in Saudi Arabia was 23.7% in 2011, the second highest among Middle Eastern countries and the seventh highest worldwide according to the WHO rankings.[2–3] This number is expected to increase in upcoming years.

Diabetic retinopathy (DR) is one of the many devastating ischemic complications of DM.[4] Researchers view DR as a silent, progressive disease that can lead to irreversible blindness. It is estimated that 2% of diabetic patients will go blind within 15 years of being diagnosed with DM.[5] Nevertheless, the condition is responsible for 4.8% of blindness cases worldwide.[6] DR is common among Saudi diabetics, as it reached 31%, 36%, and 33% in Riyadh, Almadena, and Alhasa, respectively, which are major cities in the center, western, and eastern regions of Saudi Arabia.[7–9] Studies found that high blood sugar, long duration of the disease, and associated high blood pressure are major risk factors for DR. Tight control of the blood sugar is highly effective in delaying the onset of and preventing the progression of the condition. Nevertheless, sudden tight control over blood sugar after poorly controlling it for a long period might worsen DR.[9] Almost all patients are asymptomatic in the early stages of DR, but RCT found that early screening and intervention could prevent visual loss in patients with DR by 57%.[9] Therefore, early detection and treatment are vital to prevent visual loss.[10]

Awareness and proper knowledge of this highly prevalent disease is crucial to enhance early detection and proper intervention.[9] Patients with higher-than-average knowledge of the condition were found to have a positive attitude and good practice patterns, which gave them the advantage of earlier presentation in their course of illness. In addition, patients with a lack of awareness showed poorer control of DR risk factors.[11] Therefore, the aim of this study is to identify the Knowledge, Attitude, and Practice (KAP) of diabetes and diabetic retinopathy among patients with diabetes in Riyadh City, Saudi Arabia.

Materials And Methods:

Study Settings:

Approval from the institutional review board was obtained from King Saud University prior to the start of the study. Consent was received from all patients via a consent form to allow for inclusion of their non-identifiable information in the study. This is a cross sectional study of type 1 and 2 adult diabetic patients, aged 18 years or older, conducted between May 2018 and December 2018 in Riyadh, Saudi Arabia. A list of all 418 primary care centers in the Riyadh region was drawn up from the Ministry of Health website. The list was further filtered to include only centers inside Riyadh City. A random number table was used to select 50 primary care centers from each region of Riyadh City (West, East,

Center, North, South). In addition, two university hospitals in Riyadh; King Khalid University Hospital and King Abdulaziz University Hospital were included

Sample Size and Sampling Technique

The sample size was calculated using Roasoft using the single proportion sample size formulae, where precision is 5%, with a 95% confidence interval and the percentage of diabetic patients with significant knowledge was assumed to be 85%. Participants were selected by the systematic random sampling method. All patients that attended the previously selected centers during the selected period of the study were included.

Questionnaire

The demographic variables included in the study were: gender, age, marital status, educational level, and monthly income. The Knowledge, Attitude, and Practice – 45 points (KAP-45) questionnaire was formulated by Sheeja Susan John et al.[12] Permission to use the KAP-45 questionnaire was granted after communication with its main authors. The KAP-45 questionnaire is divided into: 13 questions in the knowledge section (five to assess patient knowledge of diabetes and eight to assess patient knowledge of diabetic retinopathy), eight questions in the attitude section (four to assess patients' attitude towards diabetes and four to assess patients' attitude towards diabetic retinopathy), and 24 questions in the practice section (six to assess patients' practice patterns regarding diabetes and 18 to assess patients' practice patterns regarding diabetic retinopathy). Some of the questions in the knowledge and practice sections of the questionnaire were constructed as open-ended questions, whereas questions in the attitude section were framed as statements.

Participants were categorized as having "sufficient knowledge" if they answered nine or more of the "must know" questions regarding diabetes and if they answered five or more of the "must know" questions regarding diabetic retinopathy. In addition, participants were categorized as having "good practice" if they answered four or more of the "must do" questions regarding diabetes and if they answered four or more from the "must do" questions regarding diabetic retinopathy. In the attitude section of the questionnaire, participants were categorized as having a "positive attitude" when they scored a three or higher from responses best indicative of a positive attitude statements toward diabetes and diabetic retinopathy.

The KAP-45 questionnaire was validated by a face validity method into Arabic. Two bilingual Arabic-English speakers translated the original English version of the questionnaire into Arabic, then an expert committee was formed to review and culturally adapt the KAP-45 questionnaire. Lastly, feedback from the pilot was taken into consideration to finalize the Arabic version of KAP-45 questionnaire.

Statistical Analysis

The analysis was performed using SPSS version 22.0 software (SPSS Inc., Chicago, IL, U.S.), which helped calculate the demographics and responses to the questionnaire. Categorical data was expressed as frequencies and percentages. Continuous data was expressed using median and interquartile range (IQ) or mean and standard deviation (SD), as appropriate. Chi-Squares and Fischer's exact tests were used to compare between the variables, A P-value of less than 0.05 was considered statistically significant for all analyses.

Result

A total of 313 participants were enrolled in the study. 59.8% (168) were males and 40.2% (125) were females with a median age of 49 ± 24. Among them, 64% (199) were married. Of the 313 recruited, 12.3% (38) were illiterate and 45.4% (141) had at least a bachelor's degree. The median duration for the diagnosis of diabetes was 8 ± 11 years and 78% (244) had a family member with diabetes as well.(table1)

The median knowledge score for diabetes was 10 (good knowledge range 9–17) and 4.5 (good knowledge range 5–11) for diabetic retinopathy. Most of the participants 95.2% (295) knew that high sugar levels could be detected by blood testing. However, only 25.2% (78) knew that high sugar levels could be detected in urine as well. Only half of the participants knew that diabetes could lead to visual problems, 53% (166) of participants knew that the condition affects the retina, and 40.6% (127) knew that it causes cataracts. Only a few patients 10.2% (32) knew that it increases the risk of infections.

Only 237 of the total 313 participants responded to the question regarding the affect of poor glucose control on worsening DR. Only 22.8% (54) believed that poor glucose control is a factor that can worsen diabetic retinopathy, while half of them 54.4% (129) believed that kidney problems could worsen diabetic retinopathy. Out of 305 contributors, 82.6% (252) chose the eye as the first organ that would be affected by DM, followed by the kidneys. Interestingly, 54.9% (134) thought they should examine their fundus once every five years, while only 28.7% (70) believed that doing so once a year is the best choice.

The median attitude score for diabetes was 0 (good attitude range 3–4) and 2 (good attitude range 3–4) for diabetic retinopathy. Surprisingly, out of 279 individuals, 58.1% (162) thought it is fine to eat sweets occasionally, while, out of 280, 23.9% (67) stated that, it is okay if they forget

to take their medications. Meanwhile, 62.9% (175) don't believe it is important to check their eyes regularly, as long as they feel their eyes are okay. However, 75.8% (210) believed that they should follow up with an ophthalmologist even if their blood sugar is under control.

The median practice score for diabetes was 5 (good practice range 4–5) and 3 (good practice range 4–5) for diabetic retinopathy. Most of the participants 60.4% (166) follow up regularly for a fundoscopic screening. However, only 33.1% (92) of the participants continue to follow up despite a normal initial fundoscopic screening. The highest barriers faced by diabetic participants to comply with their regular follow-ups were: "they though it is not important" followed by "lack of family support" 47.1% (107) and 41.4% (94), respectively. Out of the 74 participants diagnosed with diabetic retinopathy, 32.4% (24) did not attend their annual visit because they have good vision and did not feel the need for an annual checkup.

Discussion

Diabetes is a growing burden throughout the world.[2] Numbers suggest that the incidence of diabetic retinopathy is also expected to increase. This risk can be reduced by effective screenings and tight control of blood sugar. (4) Lack of awareness in the community regarding diabetes and diabetic retinopathy greatly impacts delivery of care.[13] In our study, our goal was to identify the Knowledge, Attitude, and Practice (KAP) of diabetes and diabetic retinopathy among patients with diabetes, correlate it with sociodemographic factors, and identify the barriers of poor compliance in both follow up and treatment among Saudi patients with diabetes in Riyadh, Saudi Arabia.

Unfortunately, among our participants, the average KAP scores were suboptimal. The knowledge score of diabetic retinopathy was 4.5, which is slightly lower than the acceptable range (5–11). Similarly, another study done in India, showed poor levels of education and knowledge about DR screenings.[9] Moreover, only a few of our study populations had a positive attitude towards DR screening with an average score of 2 (normal range: 3–4), despite a higher level of knowledge. This finding is similar to a previous study by Memon et al., 2014.[6] The diabetic retinopathy practices score was 3 (normal range: 4–5), a worrisome finding reinforced by the poor knowledge and poor attitude observed. This is in contrast to a previous study, which showed poor practice despite good knowledge and a positive attitude.[9]

Half of our participants knew that DM can affect the retina, however only 28.7% (70) knew that they should have an annual fundus examination. In contrast to this finding, a previous study done in India, found that 75.3% of their participants knew that periodic fundus examinations are essential for diabetic patients. More than half of our sample does not continue to follow up, once their eyes screening is normal. This reflects the people's lack of knowledge about the silent nature of the disease. A high rate of legal blindness among diabetics was reported in the literature.[14–15] One study estimates that legal blindness is 50–80 times higher in people with diabetes.[14] Interestingly, only 48.6% (152) of our participants believe that DR can cause blindness.

The prevalence of DR is dependent on good glycemic control, especially early on.[16–17] Meanwhile, only 22.8% (54) of our study participants, believe that poor glycemic control is an important factor that worsens diabetic retinopathy. This could be one of the reasons that 31% of diabetics in Riyadh are diagnosed with DR.[7] Hypertension is commonly associated with DM as part of a metabolic syndrome. High blood pressure increases the risk of both the development and progression of DR.[18] Studies have shown that tight control of blood pressure in diabetic and hypertensive patients can delay the onset of DR[19] 31.2% (74) of participants in our study knew that uncontrolled blood pressure worsens DR.[20]

We found that the most common justification for avoiding periodic eye examinations was: " I do not know that periodic eye check up should be done" 35.1% (26), followed by "already having good vision" 32.43% (24) as the second most common justification for periodic eye examination. (Fig. 1) Our findings are consistent with the findings in India by Sheeja Susan John et al.[12] This finding emphasizes the importance of educating patients about the nature of the disease, and the need for regular check-ups, because it silently affects the eyes.

Our study does not constitute a representative sample of Saudi Arabia. However, it gives a general picture of the awareness, attitude and practices regarding diabetes and diabetic retinopathy in the country. These findings highlight the importance of diabetic education as awareness is critical for controlling diabetes and reducing the incidence of diabetes related complications.

List Of Abbreviations

DR "diabetic retinopathy" DM "diabetes mellitus" KAP "knowledge attitude and practice" IQ "interquartile range" SD "standard deviation"

Declarations

Ethical approval and consent to participate

Approval from King Saud University institutional board headed by research committee chairman Prof Abu el-asrar prior to the study and all participants were consented.

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

Non

Funding

Non

Author's contribution

Authors worked together throughout the research from IRB, data collection, data analysis and writing the manuscript section by section as a group under supervision of Dr Fadwa Aladel

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Tables

Table 1		
variable		**Frequency(%)**
Age (n=299)		49(24)
Gender (n=311)	**Male**	168(59.8%)
	Female	125(40.2%)
Marital status (n=311)	**Sinlge**	67(21.5%)
	Married	199(64%)
	Widow	32(10.3%)
	Divorced	13(4.2%)
Educational level (n=310)	**Illiterate**	38(12.3%)
	Primary	31(10%)
	Secondary	30(9.7%)
	High school	70(22.6%)
	Collage	104(33.5%)
	Post graduate	37(11.9%)
Family monthly income (n=289)	**<5K**	62(21.5%)
	5-10K	66(22.8%)
	10-15K	76(26.3%)
	15-20K	50(17.3%)
	>20K	35(12.1%)
Family member has DM (n=313)		244(78%)
Duration of DM (n=299)		8(11)

Table2

Diabetes		Knowledge (n=304)		P-value	Attitude (n=277)		P-value	Practice (n=214)		P-value
		Good	Poor		Good	Poor		Good	Poor	
Gender	**Male**	68(56.2%)	53(43.8%)	0.386	0	109(100%)	0.519	29(37.2%)	49(62.8%)	0.108
	Female	92(51.1%)	88(48.9%)		2(1.2%)	163(98.8%)		66(48.5%)	70(51.5%)	
Marital status	**Sinlge**	42(64.6%)	23(35.4%)	0.165	0	61(100%)	0.639	21(38.9.%)	33(61.1%)	0.737
	Married	95(48.7%)	100(51.3%)		3(1.7%)	173(98.3%)		60(47.6%)	66(52.4%)	
	Widow	16(53.3%)	14(46.7%)		0	25(100%)		10(43.5%)	13(56.5%)	
	Divorced	7(58.3%)	5(41.7%)		0	12(100%)		4(50%)	4(50%)	
Educational level	**Illiterate**	12(32.4%)	25(67.6%)	<0.0001	0	32(100%)	0.668	16(57.1%)	12(42.9%)	0.013
	Primary	14(46.7%)	16(53.3%)		1(4%)	24(96%)		10(40%)	15(60%)	
	Secondary	12(40%)	18(60%)		0	28(100%)		10(52.6%)	9(47.4%)	
	High school	30(44.8%)	37(55.2%)		1(1.7%)	58(98.3%)		27(57.4%)	20(42.6%)	
	Collage	62(60.8%)	40(39.2%)		1(1.1%)	93(98.9%)		27(38.6%)	43(61.4%)	
	Post graduate	31(83.8%)	6(16.2%)		0	36(100%)		3(14.3%)	18(85.7%)	
Family monthly income (n=)	**<5K**	20(33.9%)	39(66.1%)	<0.0001	1(1.9%)	51(98.1%)	0.495	19(43.2%)	25(56.8%)	0.065
	5-10K	33(50.8%)	32(49.2%)		0	58(100%)		24(54.5%)	20(45.5%)	
	10-15K	45(60.8%)	29(39.2%)		2(2.8%)	69(97.2%)		28(54.9%)	23(45.1%)	
	15-20K	33(67.3%)	16(32.7%)		0	46(100%)		9(29%)	22(71%)	
	>20K	26(76.5%)	8(23.5%)		0	34(100%)		7(30.4%)	16(69.6%)	
Family member has DM		128(53.8%)	110(46.2%)	0.666	2(0.9%)	218(99.1%)	0.495	71(42%)	98(58%)	0.136
Place of follow up	**university**	53(52%)	49(48%)	0.804	2(2.2%)	91(79.8%)	0.222	24(48%)	26(52%)	0.558
	Primary care	108(53.5%)	94(46.5%)		1(0.5%)	183(99.5%)		71(43.3%)	93(56.7%)	

Table 3

Retinopathy		Knowledge (n=177)		P-value	Attitude (n=277)		P-value	Practice (n=68)		P-value
		Good	Poor		Good	Poor		Good	Poor	
Gender (n=175)	**Male**	36(48.6%)	38(51.4%)	0.711	51(47.2%)	57(52.8%)	<0.025	11(40.7%)	16(59.3%)	0.364
	Female	52(51.5%)	49(48.5%)		56(33.7%)	110(66.3%)		12(30%)	28(70%)	
Marital status (n=)	**Sinlge**	26(60.5%)	17(39.5%)	0.353	17(27.9%)	44(72.1%)	0.095	2(20%)	8(80%)	0.519
	Married	49(45.4%)	59(54.6%)		79(44.9%)	97(55.1%)		19(38%)	31(62%)	
	Widow	8(50%)	8(50%)		8(32%)	17(68%)		1(16.7%)	5(83.3%)	
	Divorced	3(37.5%)	5(62.5%)		4(33.3%)	8(66.7%)		1(50%)	1(50%)	
Educational level (n=)	**Illiterate**	7(36.8%)	12(63.2%)	0.268	11(34.4%)	21(65.6%)	0.847	3(50%)	3(50%)	0.328
	Primary	5(35.7%)	9(64.3%)		8(32%)	17(68%)		1(16.7%)	5(83.3%)	
	Secondary	7(53.8%)	6(46.2%)		12(42.9%)	16(57.1%)		4(57.1%)	3(42.9%)	
	High school	14(41.2%)	20(58.8%)		24(42.1%)	33(57.9%)		2(15.4%)	11(84.6%)	
	Collage	37(54.4%)	31(45.6%)		36(37.1%)	61(62.9%)		8(33.3%)	16(66.7%)	
	Post graduate	18(64.3%)	10(35.7%)		16(45.7%)	19(54.3%)		5(45.5%)	6(54.5%)	
Family monthly income (n=)	**<5K**	12(41.4%)	17(58.6%)	0.015	23(44.2%)	29(55.8%)	0.792	3(23.1%)	10(76.9%)	0.121
	5-10K	14(35.9%)	25(64.1%)		22(37.9%)	36(62.1%)		7(63.6%)	4(36.4%)	
	10-15K	18(40%)	27(60%)		29(40.8%)	42(59.2%)		7(30.4%)	16(69.6%)	
	15-20K	19(67.9%)	9(32.1%)		16(34.8%)	30(65.2%)		1(8.3%)	11(91.7%)	
	>20K	17(68%)	8(32%)		16(47.1%)	18(52.9%)		5(55.6%)	4(44.4%)	
Family member has DM (n=)		74(52.1%)	68(47.9%)	0.252	80(36.5%)	139(63.5%)	0.135	15(28.8%)	37(71.2%)	0.78
Place of follow up	**university**	28(50.9%)	27(49.1%)	0.831	56(61.5%)	35(38.5)	<0.0001	14(34.1%)	27(65.9%)	0.945
	Primary care	60(49.2%)	62(50.8%)		52(28%)	134(72%)		9(33.3%)	18(66.7%)	

Figures

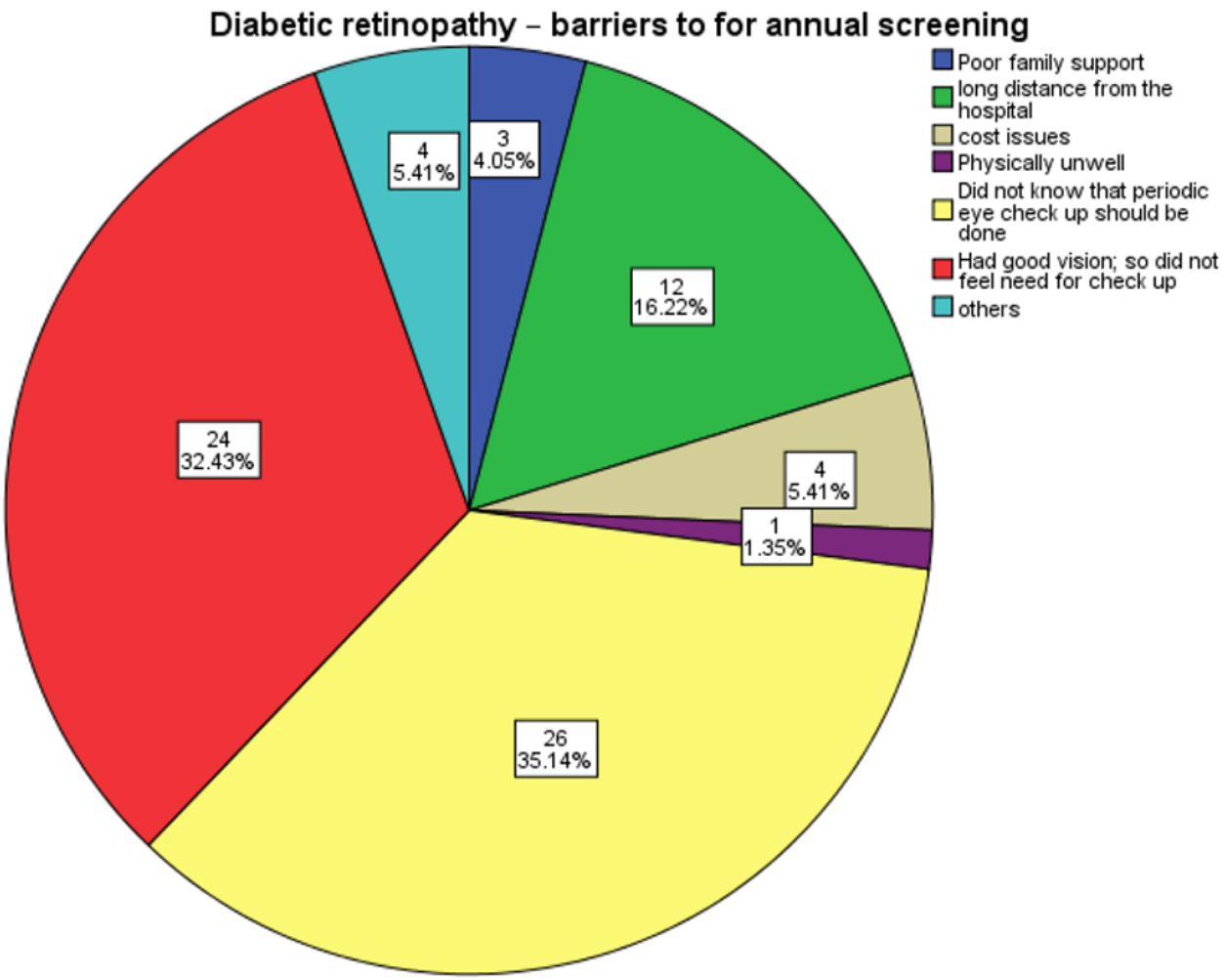

Figure 1

Diabetic retinopathy - barriers for annual screening.