

Knowledge, Attitude and Practice of Diabetic Retinopathy amongst the Diabetic Patients of AlJouf and Hail Province of Saudi Arabia

BANDAR KRAYEM AL ZAREA

ABSTRACT

Introduction: Diabetes Mellitus (DM) is a metabolic disorder which is characterized by elevated blood sugar levels. It is a non-communicable disease and currently, a major disease of concern in terms of public health.

Aim: To assess the knowledge, attitude and practice of diabetic retinopathy amongst the diabetic patients of Saudi Arabia.

Material and Methods: Patients diagnosed with diabetes mellitus visiting to Ministry of Health hospitals were incorporated in this study. Self administered questionnaires were used to assess knowledge, attitude and practice of diabetic retinopathy amongst the diabetic patients. The data collected was entered in a pre-designed proforma and analysed using SPSS version 20.0

Results: This study incorporated 439 diabetic individuals out of which 251 (57.17%) were male patients and 188 (42.82%) were females. Majority of the diabetic patients (75.62%) were aware that diabetes can cause eye disorders, 73.80% of patients replied that diabetic individuals should go for regular eye check-ups and 65.10% of patients were aware that they should visit an ophthalmologist in the event of eye problem. Out of 439 diabetic 302 patients (68.79%) were aware that timely treatment can prevent or delay damage of eyes in diabetic patients and about 95% of all the participants went for regular ocular examinations.

Conclusion: Majority of the diabetes patients were aware that diabetes can cause eye disease and it is necessary for the diabetic individuals to consult the ophthalmologist for the prevention of the same.

Keywords: Awareness, Approach, Methods, Ocular disorders

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder which is characterized by elevated blood sugar levels. It is a non-communicable disease and currently, a major disease of concern in terms of public health. The prevalence of DM is increasing and the number of persons with the disease will bifold by the year 2025. Diabetes mellitus is reported to be affecting a population of more than 170 million globally [1,2]. Apart from carbohydrate metabolism, diabetes mellitus is also related with disorders of protein and lipid metabolism, which later results in chronic intricacies involving, cardiovascular, neural, renal, and other body systems [3]. Diabetes has an abrogating appulse on the patient's well being due to its abounding complications.

Diabetic Retinopathy (DR) could be a well-recognized complication resulting from diabetes mellitus. Among 39 million international sightlessness resulting from different ocular diseases, diabetic retinopathy is known to result blindness in 1.8 million of population [4]. To defer the advancement of ocular complications, moreover to the intermittent eye examination and auspicious intercessions, it is mandatory that the diabetic individuals must regulate their hypertension, blood glucose and lipid levels [5]. Present management options are successful in forestalling as much as 98% of vision misfortune and visual deficiency because of serious retinopathy, if the patients are managed timely and effectively [6].

Among different methodologies, positive consciousness of retinopathy among individuals with diabetes could help in the timely identification, treatment and anticipation of this disorder. To formulate and implement compelling approach for health awareness technique regarding diabetes mellitus, benchmark data about knowledge, attitude and practice among diabetic patients towards ocular complications and care is significant.

Knowledge refers to the understanding of diabetic retinopathy, attitude refers to patient's perception, as well as any preconceived ideas they may have and practice refers to the methods in which patients remonstrate attitudes and practices, that is, use of services regarding eye care.

Studies to assess the knowledge, practice and awareness of diabetic retinopathy among diabetic individuals were previously carried out in India [6], Australia [7], Italy [8] and Oman (In the Middle East Asia) [9]. A scarcity of information is observed in the literature regarding awareness of diabetic retinopathy among the diabetic individuals. To the best of our knowledge; no such study has been undertaken in the Saudi Arabia. So this study was carried out to evaluate knowledge, attitude and practices of diabetic retinopathy among the diabetic patients of Saudi Arabia.

MATERIALS AND METHODS

In this cross-sectional study, patients diagnosed with diabetes mellitus attending the five Ministry of Health hospitals of AlJouf and Hail Province were incorporated. Prior permission was obtained from the ethical clearance committee and consent was taken from all the participants. All consenting patients attending over a period of nine months (January to September 2015) were randomly selected. As the study population was more than 10,000, the sample size was calculated using the formula by Kasiulevicius et al., $n = Z^2P(1-P)/e^2$. Where n stands for the sample size required, Z^2 denotes the standard normal deviate (1 - equals the desired confidence level, e.g., 95%), P is the estimated proportion in the present population, e is the desired level of precision [10].

The patients were requested to fill the self administered questionnaires (Appendix 1). The questionnaire was prepared in English and translated to Arabic. The content validity of the questionnaire was established by submitting the tool to the

experts (Specialists having 10 or more years of experience) in the field of Ophthalmology for content validation along with a pilot study was conducted a representative population who were not included in the study. The questionnaire contained information regarding age, gender, education qualification, economic status, duration of diabetes. Questions were also included to measure the levels of various aspects of knowledge, attitude and practice, regarding retinopathy, choice of healthcare professional, treatment options for diabetic retinopathy. Statistical analysis was carried out using SPSS version 20.00 (SPSS Inc., Chicago, USA), by applying Chi-square and z-proportionality tests.

RESULTS

[Table/Fig-1] shows that, out of 439 samples, 251 (57.17%) were males and 188 (42.82%) were females, 63 (14.35%) patients belonged to 20 and below age group, 86 (19.58%) patients were in 21 -39, 129 (29.38%) in 40-59 and 167 (38.04%) patients were in the age group of 60 and above years. Further, a maximum of 36.90% of samples had duration of diabetes since 6-9 years and a minimum of 13.21% of samples had duration of diabetes since 15 and above years, followed by 29.15% having diabetes since 9-14 years. A maximum of 50.34% of patients belonged to middle economic status, 28.70% were belonged to high economic status and 20.95% of patients were from low economic status. Regarding education level, 33.02 % of individuals were educated up to secondary level, 23.23% were graduated and educated above and 20.95% of patients were studied upto primary level. A statistically significant difference was observed among all these variables significant (p<0.05).

[Table/Fig-2] represents the association of knowledge of diabetic retinopathy regarding attitude and practice. Out of 439 patients

Variables		n	Percentage (%)	Z- test p value
Gender	Male	251	57.17	0.0015*
	Female	188	42.82	
Age range (Years)	20 and below	63	14.35	0.0001*
	21 -39	86	19.58	
	40-59	129	29.38	
	60 and above	167	38.04	
Duration of diabetes (years)	5 and below	91	20.72	0.0001*
	6 - 9	162	36.90	
	9-14	128	29.15	
	15 and above	58	13.21	
Economic status	Low	92	20.95	0.0001*
	Medium	221	50.34	
	High	126	28.70	
Education level	Primary	92	20.95	0.0001*
	Secondary	145	33.02	
	Graduate and higher	102	23.23	

[Table/Fig-1]: Characteristics of the study sample. *p<0.05 (z-proportionality test)

Questions	Yes	No	p-value
Knowledge			
Do you know the that diabetes can cause eye disease	332 (75.62)	107 (24. 37)	0.0001*
Attitude			
Should persons with diabetes go for regular eye examinations?	324 (73.80)	115 (26.19)	0.0001*
There is no need to visit ophthalmologist if a person his having diabetes under control	169 (38.49)	270 (61.50)	0.0001*
Timely treatment can prevent/ delay damage due to diabetes in eyes	302 (68.79)	137 (31.20)	0.0001*

[Table/Fig-2]: Knowledge and attitude regarding diabetic retinopathy.

332 (75.62 %) were aware that diabetes can cause eye disease, 324 (73.80 %) answered that persons with diabetes should go for regular eye examinations and 270 (61.50%) patients did not agreed that there was no the need for need to visit ophthalmologist if a person his having diabetes under control. Most of the individuals (68.79 %) agreed that timely treatment can prevent or delay eye damage in diabetic individuals.

[Table/Fig-3] represents the choice of healthcare professional in the event of eye problem. Out of total 439 samples, 286 (65.10%) of patients replied that an ophthalmologist should be consulted, 189 (43.05%) of patients replied that any specialist (Non-ophthalmologist) can be consulted, 147 (33.48%) of patients replied that an optometrist and 138 (31.43%) of patients replies that a general practitioner can be consulted in an event of eye problem. The difference was found to be statistically significant (Chi-square= 126.9823, p = 0.0001). Further, the difference between ophthalmologist and non-ophthalmologist (Chi-square= 43.1561, p = 0.0001), ophthalmologist and optometrist (Chi-square= 82.7723, p= 0.0001), ophthalmologist and general practitioner (Chi-square= 99.9077, p = 0.0001), non-ophthalmologist and optometrist (Chi-square= 8.5052 p = 0.0040) and non-ophthalmologist and general practitioner (Chi-square= 12.6755, p = 0.0001) was observed at 5% level of significance.

By chi-square test of significance, a significance differences were observed between all categories of healthcare professional (Chi-square= 126.9823, p = 0.0001) at 5% level of significance. Also, all pairs of comparison shows a significant difference except between optometrist versus general practitioner as healthcare profession at 5% level of significance (p<0.05). [Table/Fig-4] represents the knowledge of available treatment for diabetic retinopathy. Out of 439 samples, only 108 (24.60%) of patients had no knowledge of treatment available. Regarding treatment of DR, 327 (74.48%) responded that it can be treated by modification of life style, 312 (71.07%) answered that control of diabetes, 306 (69.70%) believed that surgeries and 162 (36.90%) replied that only medications can treat DR. The differences in answers was found to statistically

Healthcare professional	Yes	No
Ophthalmologist	286 (65.10)	153 (34.85)
Any specialist (Non-ophthalmologist)	189 (43.05)	250 (56.94)
Optometrist	147 (33.48)	292 (66.51)
General practitioner	138 (31.43)	301(68.56)
Between all professionals, Chi-square= 126.9823, p = 0.0001*		
Between Ophthalmologist vs Non-ophthalmologist, Chi-square= 43.1561, p = 0.0001*		
Between Ophthalmologist vs Optometrist, Chi-square= 82.7723, p = 0.0001*		
Between Ophthalmologist vs General practitioner, Chi-square= 99.9077, p = 0.0001*		
Between Non-ophthalmologist vs Optometrist, Chi-square= 8.5052 p = 0.0040*		
Between Non-ophthalmologist vs General practitioner, Chi-square= 12.6755, p = 0.0001*		
Between Optometrist vs General practitioner, Chi-square= 0.4213 p = 0.5172		

[Table/Fig-3]: Knowledge regarding choice of healthcare professional in the event of eye problem. *p<0.05

Treatment Options	Yes	No	p-value
No treatment available	108 (24.60)	331 (75.39)	0.0001*
Modification of life style	327 (74.48)	112 (25.51)	0.0001*
Control of diabetes	312 (71.07)	127 (28.92)	0.0001*
Surgical procedures	306 (69.70)	133 (30.29)	0.0001*
Only medication	162 (36.90)	272 (61.90)	0.0001*
Alternative medical therapies	194 (44.19)	245 (55.80)	0.9924
Chi-square = 386.9283, p = 0.0001*			

[Table/Fig-4]: Knowledge of available treatment for diabetic retinopathy.

significant (Chi-square= 386.9283, $p = 0.0001$). A statistical differences between samples with and without knowledge of each treatment options ($p < 0.05$) except on alternative medical therapies ($p > 0.05$) was observed.

About 95% of all the participants went for regular ocular examinations, and 5% answered that was their first visit, 12.07% of the individuals visited monthly, 33.94% went once in six months and 48.97% of them went for yearly ocular examination [Table/Fig-5].

How often you go for eye examination	n	Percentage (%)
Monthly	53	12.07
Once in six months	149	33.94
Yearly	215	48.97
This is the first time	22	5.01

[Table/Fig-5]: Frequency of eye examination.

DISCUSSION

Diabetes mellitus (DM) is the most widespread public health challenges that we are confronting in the present century [11]. Diabetes and other comparable chronic disorders are as of now taking an enormous toll on human well-being and assets, yet they keep on being dismissed by various nations [12]. Individuals suffering from DM is increasing because of populace development, urbanization and expanding pervasiveness of weight and physical inertia. Individuals with DM may undergo into multiple complications due to lack of the knowledge of their disease. There is expanding measure of affirmation that patient training is the best approach to reduce the complexities resulting from diabetes mellitus [13].

Timely management of diabetic individuals and routine examinations for complications can decrease or postpone the complexities resulting from diabetes by as much as half [14]. Incidence of diabetic retinopathy can be reduced by controlling blood sugar levels, regular ocular examinations. However even with ideal therapeutic consideration, it is not generally conceivable to avert or moderate retinal complications resulting from diabetes mellitus. Making the population aware is a vitally important step in the creation of a successful program to battle against any disease in the community and it particularly holds good for the developing issue of diabetic retinopathy. Without consciousness of the disease it is unimaginable for any person to help the cause of averting visual impairment among diabetic individuals. Keeping in mind the goal of generating cognizance among the population, understanding into the lacunae of knowledge, attitudes and practices with respect to diabetes and visual deficiency in diabetic individuals is imperative. Previously, studies has been carried out in Saudi Arabia to assess the knowledge attitude and practice of general practitioners and the medical students towards diabetes and diabetic retinopathy [2,15]. To the best of the author's knowledge, this is the first study regarding knowledge, attitude, and practice of the diabetes individuals regarding diabetic retinopathy which has been conducted in Saudi Arabia.

Knowledge of diabetic patients

In this study, the knowledge regarding ocular complications resulting from diabetes was 75.62% which was slight higher than that of the study in India (50%) [6], USA (52%) [16] and Oman (72%) [9]. However it was less than that of Japan (98%) [17] and in Australia (96%) [18]. In a study it is observed that only 3.8% of patients in their study were aware of ocular effects of diabetes mellitus, which was very low compared to other studies [19]. This variation may be attributed to the difference in literacy rates among these countries and the health care measures. In the present study 73.80% of individuals were known to have positive attitude for eye checkup which was almost similar to that of the Australians (75%) [18] and this observation was less in Omani population [9].

Attitude of diabetic patients

Rani et al., in their study noted that 36.5% of individual with knowledge about diabetic retinopathy, replied that if their blood sugar is under control than there is no need to consult an ophthalmologist, compared with 55.5% with no knowledge, whereas in the present study 38.49% of patients believed that there is no need to visit ophthalmologist if a person is having diabetes under control. The authors also noticed that about 60% of participants in their study were not aware that surgery, is one of the treatment options, this values was very high in contrast to our observations, where only 30.29 % of patients were not aware [19].

Diabetic patient's practices towards eye examination

In this research around 95% of the individuals went for regular ocular examinations, 12.07% of the individuals went monthly, 33.94% went once in six months and 48.97% of them went for yearly examination, this observation was not in accordance with the results of Mwangi et al., who reported that only 50% of the participants went for ocular examinations and 27% of them went yearly, 10% went once in six months 17% of them went for monthly check ups [20], whereas Oveneri-Ogbomo et al., reported that 34.6% of their patients never had their eyes examined and only 19.5% of subjects undergone eye check up within one year [21]. In a study conducted in South Africa, it was observed that 48% of the diabetic individuals had undergone eye examination over one and half year ago [22]. In a study assessing diabetic patient's compliance regarding care of the eyes, it was found that 28.8% of the participants had received ocular examination within the past year [23].

LIMITATIONS

Patients attending only five peripheral hospitals were incorporated as it was not feasible for us to conduct the study in other provinces.

CONCLUSION

Diabetic retinopathy, notwithstanding its status as one of the best reasons for visual deficiency in all the nations, is for all intents and purposes obscure to a huge dominant part of the populace. The results of the present study revealed that knowledge about eye complications and care is satisfactory among diabetic individuals of Saudi Arabia. This baseline information about knowledge, attitude and practice regarding eye care among persons with diabetes ought to be considerate and concentrated intensely amid implementation of health promotion programmes.

REFERENCES

- [1] Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: Estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004;27:1047-53.
- [2] Al Wadaani FA. The knowledge attitude and practice regarding diabetes and diabetic retinopathy among the final year medical students of King Faisal University Medical College of Al Hasa region of Saudi Arabia: a cross-sectional survey. *Niger J Clin Pract*. 2013;16(2):164-68.
- [3] King H, Aubert Re, Herman Wh. Global Burden of Diabetes, 1995-2025: Prevalence, Numerical Estimates, and Projections. *Diabetes Care*. 1998;21:1414.
- [4] Memon MS, Shaikh SA, Shaikh AR, Fahim MF, Mumtaz SN, Ahmed N. An assessment of knowledge, attitude and practices (KAP) towards diabetes and diabetic retinopathy in a suburban town of Karachi. *Paki J Med Sci*. 2015;31(1):183-88.
- [5] Shah CA. Diabetic retinopathy: A comprehensive review. *Indian J Med Sci*. 2008;62:500-19.
- [6] Namperumalsamy P, Kim R, Kaliaperumal K, Sekar A, Karthika A, Nirmalan PK. A pilot study on awareness of diabetic retinopathy among non-medical persons in South India. The challenge for eye care programmes in the region. *Indian J Ophthalmol*. 2004;52:247-51.
- [7] Schmid KL, Schmid LM, Pedersen C. Knowledge of the ocular effects of diabetes among the general population of Australia and the members of Diabetes Australia. *Clin Exp Optom*. 2003;86:91-103.

[8] Trento M, Bajardi M, Borgo E, Passera P, Maurino M, Gibbins R, et al. Perceptions of diabetic retinopathy and screening procedures among diabetic people. *Diabet Med.* 2002;19:810-13.

[9] Khandekar R, Harby SA, Harthy HA, Lawatti JA. Knowledge, attitude and practice regarding eye complications and care among Omani persons with diabetes - A cross sectional study. *Oman J Ophthalmol.* 2010;3(2):60-5.

[10] Kasiulevicius V, Sapoka V, Filipaviciute R. Sample size calculation in epidemiological studies. *Gerontologija.* 2006;7:225-31.

[11] Tabish SA. Is Diabetes Becoming the Biggest Epidemic of the Twenty-first Century *Int J Health Sci (Qassim).* 2007;1(2):V-VIII.

[12] Jahanlou AS, Alishan Karami N. The effect of literacy level on health related-quality of life, self-efficacy and self-management behaviours in diabetic patients. *Acta Med Iran.* 2011;49(3):153-58.

[13] Shah VN, Kamdar PK, Shah N. Assessing the knowledge, attitudes and practice of type 2 diabetes among patients of saurashtra region, Gujarat. *Int J Diabetes Dev Ctries.* 2009;29:118-22.

[14] Saaristo T, Moilanen L, Korpi-Hyövälti E, et al. Lifestyle intervention for prevention of type 2 diabetes in primary health care: one-year follow-up of the Finnish National Diabetes Prevention Program (FIN-D2D). *Diabetes Care.* 2010;33:2146-51.

[15] Khan AR, Al Abdul Lateef ZN, Khamseen MB, Al Aithan MA, Khan SA, Al Ibrahim I. Knowledge, attitude and practice of ministry of health primary health care physicians in the management of type 2 diabetes mellitus: A cross-sectional study in the Al Hasa District of Saudi Arabia, 2010. *Niger J Clin Pract.* 2011;14:52-59.

[16] Muñoz B, O'Leary M, Fonseca-Becker F, Rosario E, Burgess I, Aguilar M, et al. Knowledge of diabetic eye disease and vision care guidelines among Hispanic individuals in Baltimore with and without diabetes. *Arch Ophthalmol.* 2008;126:968-74.

[17] Funatsu H, Hori S, Shimizu E, Nakamura S. Questionnaire survey on periodic ocular examination in Japanese diabetic patients. *Am J Ophthalmol.* 2003;136:955-57.

[18] Schmid KL, Schmid LM, Pedersen C. Knowledge of the ocular effects of diabetes among the general population of Australia and the members of Diabetes Australia. *Clin Exp Optom.* 2003;86:91-103.

[19] Rani PK, Raman R, Subramani S, Perumal G, Kumaramanickavel G, Sharma T. Knowledge of diabetes and diabetic retinopathy among rural populations in India, and the influence of knowledge of diabetic retinopathy on attitude and practice. *Rural Remote Health.* 2008;8(3):838.

[20] Mwangi MW, Githinji GG, Githinji FW. Knowledge and Awareness of Diabetic Retinopathy amongst Diabetic Patients in Kenyatta National Hospital, Kenya. *Int J Humanit Soc Sci.* 2011;1(21):140-46.

[21] Oveneri-Ogbomo GO, Abokyi S, Koffuor GA, Abokyi E. Knowledge of diabetes and its associated ocular manifestations by diabetic patients: A study at Korle-Bu Teaching Hospital, Ghana. *Niger Med J.* 2013;54(4):217-23.

[22] Mashige KP, Notshweleka A, Moodley S, Rahmtoola FH, Sayed SB, Singh S, et al. An assessment of the level of diabetic patients' knowledge of diabetes mellitus, its complications and management in Durban, South Africa. *S Afr Optom.* 2008;67:95-105.

[23] Mumba M, Hall A, Lewallen S. Compliance with eye screening examinations among diabetic patients at a Tanzanian referral hospital. *Ophthalmic Epidemiol.* 2007;14:306-10.

Questionnaire

<p>Name _____ Gender _____</p> <p>Age _____ Contact details _____</p> <p>Economic status Low Medium High</p> <p>Education level Primary Secondary Graduate and higher</p> <p>Duration of diabetes (years)</p> <p> 5 and below 6 - 9 9-14 15 and above</p> <p>Knowledge and attitude of the patients</p> <ul style="list-style-type: none"> • Do you know the that diabetes can cause eye disease Yes No • Should persons with diabetes go for regular eye examinations? Yes No • There is no need to visit ophthalmologist if a person his having diabetes under control Yes No • Timely treatment can prevent/ delay damage due to diabetes in eyes Yes No <p>Whom do you consult in the event of eye problem? (Knowledge of choice of healthcare professional in the event of eye problem)</p> <ul style="list-style-type: none"> • Ophthalmologist Yes No • Any specialist (Non-ophthalmologist) Yes No • Optometrist Yes No 	<ul style="list-style-type: none"> • General practitioner Yes No <p>Knowledge of available treatment for diabetic retinopathy</p> <ul style="list-style-type: none"> • No treatment available Yes No • Modification of life style Yes No • Control of diabetes Yes No • Surgical procedures Yes No • Only medication Yes No • Alternative medical therapies Yes No <p>How often you go for eye examination (Practice of patients')</p> <ul style="list-style-type: none"> • Monthly • Once in six months • Yearly • This is the first time <p>Any other specific details:</p> <p>Remarks:</p>
---	--

PARTICULARS OF CONTRIBUTORS:

1. Consultant Ophthalmologist, Paediatric Ophthalmologist, Uveitis and Oculoplastic Consultant King Khalid Eye Specialist Hospital, Riyadh, Kingdom of Saudi Arabia.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Bandar Krayem Al Zarea,
Consultant Ophthalmologist, Paediatric Ophthalmologist, Uveitis and Oculoplastic Consultant King Khalid Eye Specialist Hospital,
Riyadh 11462, Kingdom of Saudi Arabia.
E-mail: dr-alzarea@hotmail.com

Date of Submission: **Feb 16, 2016**

Date of Peer Review: **Mar 05, 2016**

Date of Acceptance: **Apr 21, 2016**

Date of Publishing: **May 01, 2016**

FINANCIAL OR OTHER COMPETING INTERESTS: None.