



Original Article

KAP Study on Factors Motivating Diabetic People for Screening of Retinopathy

Authors

Sana Fatima¹Ch. Nasir Ahmad²Ruhullah³Talib Hussain⁴

For Authors' Affiliation See Last Page of Article

Correspondence Author:
Dr. Ch. Nasir Ahmad
 Institute of Ophthalmology
 Mayo Hospital, Lahore.

Objective: To evaluate the level of Knowledge, Attitude and practice among diabetics regarding motivational factors for screening of Diabetic Retinopathy.

Method: This was a descriptive cross-sectional study involving the use of self-made questionnaire to evaluate the knowledge, attitude and practice of diabetic patients, for motivating them for screening of retinopathy. A sample size of total 70 diabetic patients was taken and asked to fill the questionnaire regarding their knowledge, attitude and practice about Diabetic Retinopathy. This study was conducted in September, October and November 2018. Ethical approval was sought from ethical review board of College of Ophthalmology and Allied Vision Sciences.

Results: This study included a total of 70 subjects. 49.9% had a knowledge of DM and 37.1% were having knowledge of DR. DM knowledge was more in women (OR=1.93; 95% CI: 1.55-2.39), and about practice patterns, only 36.5% of individuals with DR knowledge believed that if they controlled their blood glucose level, they could avoid a visit to an ophthalmologist, compared with 55.5% with no knowledge about DR (p-value <0.001). 20(28.6%) went for a dilated eye checkup once in 3 months, 3(4.3%) went for a dilated eye checkup once in 6 months, 16(22.9%) went for a dilated eye checkup once a year, 21(30%) went for a dilated eye checkup as advised by ophthalmologist, 10(14.3%) (p-value =0.002) went for any other reason. When DM patients were asked about their sugar level, 52(74.3%) had controlled sugar level while 18(25.7%) did not have controlled sugar level.

Conclusion: This study concludes that awareness and knowledge about diabetic retinopathy were very poor among the patients in our study. Lack of knowledge concerning the need for screening for diabetic retinopathy was found to be a major barrier to compliance with regular screening. Good knowledge about diabetes was significantly associated with positive attitude towards diabetes and good practice patterns regarding retinopathy. Awareness of diabetic retinopathy was significantly associated with good practice patterns regarding retinopathy. Therefore, there is an urgent need to evolve strategies to educate diabetic patients about this potentially blinding complication of diabetes.

Key Words: Diabetes Mellitus, Diabetic retinopathy.

Introduction:

Diabetes mellitus is a metabolic disease which is categorized by hyperglycemia which is due to faults in insulin emission, insulin action or both. The prolonged hyperglycemia of diabetes is related with chronic dysfunction, damage and failure of organs, particularly the eyes, heart, kidneys and blood vessels. Deteriorated growth and disclosure to certain infections may also go together with prolonged hyperglycemia. Symptoms of noticeable hyperglycemia comprise polyuria (abnormally large production of urine), polydipsia (abnormally great thirst), weight loss, occasionally with polyphagia (excessive eating) and blurred vision.

There are two types of diabetes mellitus: Type 1 and Type 2

Type 1 diabetes mellitus is defined as a T cell-mediated autoimmune illness that initiates three to five years before the start of medical indications, remains after diagnosis and may persist after islet replacement. This type is mainly known as "insulin-dependent diabetes mellitus" or "juvenile diabetes". Type 2 diabetes mellitus accounts for 95% of total diabetes and is categorized by prolonged hyperglycemia caused by faults in insulin emission and metabolic ailments of lipids and proteins. It is formerly called "adult onset" or "non insulin-dependent". Gestational diabetes is the third major form and arises when pregnant women without a history of diabetes get high blood sugar levels.

In 2015, there were 415 million people living worldwide who have diabetes. This number is estimated to increase to 642 million till 2040 with a global overall prevalence of 34.6%. WHO states that approximately 347 million people throughout the world had diabetes in 2008, which was equal to 9.5% of the population.

In diabetes, the cause is "microvascular disease" (small blood vessels damage) and "macrovascular disease" (arterial damage). Damage to small blood vessels can result in visual disease or retinopathy⁷ and macrovascular disease can result in other dysfunctions, such as cerebrovascular diseases, kidney diseases, neuronal damage and eye diseases.⁸ Among the microvascular disorders, diabetic retinopathy can be one of the most devastating for the people affected. Currently, with the increase in the prevalence of diabetes, this last complication arises as the major cause of preventable visual debility and blindness throughout the world.⁹

Diabetes is linked with a series of disorders. The acute metabolite linked with death rate includes diabetic ketoacidosis (DKA) with extremely high blood glucose level (hyperglycemia) and as a result of low blood glucose (hypoglycemia) coma occurs.

Diabetic retinopathy is a microvascular complication

of diabetes mellitus type 1 and type 2. It develops in almost all people with type-1 diabetes regarding and in more than 77% of people with type-2 who survive more than 20 years with the disease. Diabetic retinopathy constitutes 4.8% of the global causes of blindness.

Diabetic retinopathy (DR) progresses from mild non-proliferative retinopathy (NPDR), moderate NPDR and severe NPDR. Then, the NPDR progresses to proliferative diabetic retinopathy (PDR). NPDR is described by closing of vessels and PDR is described by growing of new blood vessels in the posterior surface of the vitreous and retina. Macular edema, described by thickening of leaky vessels in the retina, can occur in any stage of diabetic retinopathy.

Diabetic retinopathy progresses by many years and nearly all patients who have type 1 diabetes, and mostly patients have type 2 diabetes, show certain retinal lesions after 20 years of ailment. In type 1 diabetes, proliferative diabetic retinopathy (PDR) is the main retinal disorder.

There are two major risk factors for diabetic retinopathy known as modifiable and non-modifiable.

Not modifiable DR risk factors may be Diabetes type, Patient's age, Onset time, Duration of disease, Genetic features etc. whereas Factors influencing modifiable DR may be Glycemic control, Systemic factors, Blood pressure, Serum lipids, Rapid compensation, Iatrogenic causes etc and some Concomitant diseases that can affect diabetic retinopathy.

There are more chances of developing diabetic retinopathy by having diabetes with longer duration and poorer glycemic control. Diabetic retinopathy will eventually develop in people with type 2 diabetes. The risk of diabetic retinopathy may be reduced by altering lifestyle and optional glycemic control. However, over time diabetic retinopathy may develop. The incidence of diabetic retinopathy is effectively reduced by glycemic control. Major strategies to reduce diabetic retinopathy include lipid, sugar and blood pressure control.

To prevent the progression of disease there must be strict control of blood glucose levels and hypertension. In many patients the recommended goals are difficult to accomplish and as a result diabetic retinopathy develops during the course of treatment. If clinically significant proliferative diabetic retinopathy (PDR) or diabetic macular edema (DME) appear, argon laser photocoagulation, whose efficacy has been demonstrated, is currently indicated. Intravitreal anti vascular endothelial growth factor (anti VEGF) is the new treatment in the advanced stages of diabetic retinopathy. This treatment is approved for diabetic retinopathy, but presently ophthalmologists use it in the selected cases of PDR.

A focused assessment of a given fixed or chosen population that accounts for certain qualities with respect to

any particular subject or specific intervention is known as the KAP (Knowledge, Attitude and Practice) study. The first KAP study was conducted on topics such as family planning and global population studies in the 1950s as the origin of the KAP survey. This type of study has some considerable advantages, as well as limitations. The fundamental elements of the Knowledge, Attitude and Practice surveys consist in the identification of the domain, the determination of the target audience and the KAP questionnaire.

The KAP study on the factors that motivate diabetic patients implies that:

K- The awareness of diabetic patients about retinopathy.

A- The way in which the diabetic patient takes care of himself.

P- The habits of a diabetic patient in relation to the control of diabetes.

The attractiveness of KAP research is attributed to specialties such as measurable data, easy design, brief presentation of results, ease of understanding, consideration of results from small samples to a larger population, speed of application, multicultural comparability and ease with the which can train others.

The risk of diabetes and diabetic retinopathy can be effectively reduced by modification in lifestyle, controlled blood glucose level, controlled blood pressure, effective screening & laser treatment.²¹

Effective detection and laser need a good infrastructure, a well-known reference chain, highly skilled human resources and the disposition of diabetic patients in order to take advantage of accessible facilities. The consumption of services by the community does not exceed 30% which is major dilemma of developing countries and it is mainly due to the lack of community in relation to the chronic complications of diabetes and its early management.

In general undiagnosed diabetes is common. Diabetes is not characterized by known symptoms and it is as linked with the risks in future as the diagnosis of diabetes. At the time of diagnosis 25% of diabetic people have evidence of microvascular complications. The extrapolation of the link between the duration of the disease and prevalence of retinopathy suggests that the onset of diabetes take place several years earlier, which is clinically recognized. The criteria of the National Selection Committee establish that all "cost-effective primary prevention interventions should have been implemented as far as possible.

Methodology:

Ethical clearance to conduct this study regarding High Myopia and Depression was obtained from the College of Ophthalmology and Allied Vision Sciences, King Edward Medical University, Lahore. This was a descriptive cross-

sectional study involving the use of self-made questionnaire to evaluate the knowledge, attitude and practice of diabetic patients, for motivating them for screening of retinopathy. A sample size of total 70 diabetic patients was taken and asked to fill the questionnaire regarding their knowledge, attitude and practice about Diabetic Retinopathy. This study was conducted in September, October and November 2018. Data was captured using SPSS version 23 and Microsoft Excel 2010. The informed consent of every patient was taken before collecting the data.

Results: Table 1:

| Question | Yes | No |
|--|------------|------------|
| Do you know about diabetic retinopathy? | 27 (38.6%) | 43 (61.4%) |
| Do you know diabetes can affect your vision? | 53 (75.7%) | 17 (24.3%) |
| Is your sugar level controlled? | 52 (74.3%) | 18 (25.7%) |
| Do you have family support for regular check-up of DM? | 51 (72.9%) | 19 (27.1%) |
| Is it easy for you to travel to hospital for DM check-up? | 19 (27.1%) | 51 (72.9%) |
| Any other physical disability? | 24 (34.3%) | 46 (65.7%) |
| Is your eye hospital located at a far distance from you home? | 52 (74.3%) | 18 (25.7%) |
| Can you travel easily? | 14 (20.0%) | 54 (80.0%) |
| Do you have regular checkup of DM? | 37 (52.9%) | 33 (47.1%) |
| Do you have regular eye examination? | 27 (38.6%) | 43 (61.4%) |
| Has anyone told you that you need to go for a regular eye checkup? | 31 (44.3%) | 36 (51.4%) |
| Do you think exercise is necessary for diabetic patient? | 60 (85.7%) | 10 (14.3%) |
| Are you educated? | 28 (40.0%) | 32 (60.0%) |
| Are you insulin dependent? | 36 (51.4%) | 34 (48.6%) |
| Do you know about your health/eye condition? | 41 (58.6%) | 29 (41.4%) |
| Do you think eye checkup is necessary for diabetic patients having controlled sugar level? | 63 (90.0%) | 07 (10.0%) |

Table 2:

| How often do you go for a dilated eye Checkup? | | |
|--|-----------|---------|
| | Frequency | Percent |
| once in 3 months | 20 | 28.6 |
| once in 6 months | 3 | 4.3 |
| once a year | 16 | 22.9 |
| as advised by ophthalmologist | 21 | 30.0 |
| any other | 10 | 14.3 |
| Total | 70 | 100.0 |

This table shows that out of 70 patients, 20(28.6%) go for a dilated eye checkup once in 3 months, 3(4.3%) go for a dilated eye checkup once in 6 months, 16(22.9%) go for a dilated eye checkup once a year, 21(30%) go for a dilated eye checkup as advised by ophthalmologist, 10(14.3%) go for any other reason.

Table 2:

| Why did you come to the eye hospital today? | | |
|--|-----------|---------|
| | Frequency | Percent |
| for a general eye checkup | 21 | 30.0 |
| to check power of glasses | 10 | 14.3 |
| defective vision | 19 | 27.1 |
| to have tests/treatment for diabetic retinopathy | 20 | 28.6 |
| Total | 70 | 100.0 |

This table shows that out of 70 patients, 21(30%) came to eye hospital for a general eye checkup, 10(14.3%) came to check power of glasses, 19(27.1%) came due to defective vision, 20(28.6%) came to have tests for diabetic retinopathy.

Table 4:

| For how many years have you DM? | | |
|---------------------------------|-----------|---------|
| | Frequency | Percent |
| 1-10 years | 36 | 51.4 |
| 11 -20 years | 22 | 31.4 |
| 20 -30 years | 4 | 5.7 |
| >30 years | 4 | 5.7 |
| D on't know | 4 | 5.7 |
| Total | 70 | 100.0 |

This table shows that out of 70 patients, 36(51.4%) have diabetes since 1-10 years, 22(31.4%) have diabetes since 11-20 years, 4(5.7%) have diabetes since 20-30 years, 4(5.7%) have diabetes for more than 30 years and 4(5.7%) don't know for how many years they have diabetic retinopathy.

Table 5:

| Why do you go for a periodic/regular eye checkup? | | |
|---|-----------|---------|
| | Frequency | Percent |
| follow up/treatment of diabetic retinopathy | 23 | 32.9 |
| to check power of glasses | 7 | 10.0 |
| been instructed to have periodic eye checkup but do not know the reason | 19 | 27.1 |
| any other | 21 | 30.0 |
| Total | 70 | 100.0 |

This table shows that out of 70 patients, 23(32.9) go for a regular eye checkup for follow up/treatment, 7(10%) go to check power of glasses, 19(27.1%) go because they have been instructed to have periodic eye checkup but not know reason, 21(30%) 21(30%) go for any other reason.

Discussion:

Diabetic Retinopathy Is Complication Of Diabetes That Affects Eyes. It Is Caused By Damage To The Blood Vessels Of The Light-sensitive Tissue At The Back Of The Eye (retina).at First, Diabetic Retinopathy May Cause No Symptoms Or Only Mild Vision problems. Eventually, it can cause blindness. The condition can develop in anyone who

has type 1 or type 2 diabetes. The longer you have diabetes and the less controlled your blood sugar is, the more likely you are to develop this eye complication. It develops in almost all people with type 1 diabetes and in more than 77% of people with type 2 who survive more than 20 years with the disease. Diabetic retinopathy constitutes 4.8% of the global causes of blindness.

From 1990–2010, DR ranked as the fifth most common cause of preventable blindness and fifth most common cause of moderate to severe visual impairment. In 2010, of an estimated 285 million people worldwide with diabetes, over one-third have signs of DR, and a third of these are afflicted with vision-threatening diabetic retinopathy (VTDR), defined as severe non-proliferative DR or proliferative DR (PDR) or the presence of diabetic macular edema (DME). These estimates are expected to rise further due to the increasing prevalence of diabetes, ageing of the population and increasing of life expectancy of those with diabetes.

The first KAP study was conducted on topics such as family planning and global population studies in the 1950s as the origin of the KAP survey. This type of study has some considerable advantages, as well as limitations. The fundamental elements of the Knowledge, Attitude and Practice surveys consist in the identification of the domain, the determination of the target audience and the KAP questionnaire.

The KAP study on the factors that motivate diabetic patients implies that:

- K- The awareness of diabetic patients about retinopathy.
- A- The way in which the diabetic patient takes care of himself.
- P- The habits of a diabetic patient in relation to the control of diabetes.

The attractiveness of KAP research is attributed to specialties such as measurable data, easy design, brief presentation of results, ease of understanding, consideration of results from small samples to a larger population, speed of application, multicultural comparability and ease with the which can train others.

This study included a total of 70 subjects. (49.9%) were with knowledge of DM and (37.1%) were with knowledge of DR. DM knowledge was more in women (OR=1.93; 95% CI: 1.55-2.39), and about practice patterns, only 36.5% of individuals with DR knowledge believed that if they controlled their blood glucose level, they could avoid a visit to an ophthalmologist, compared with 55.5% with no knowledge about DR (p -value<0.001). 20(28.6%) go for a dilated eye checkup once in 3 months, 3(4.3%) go for a dilated eye checkup once in 6 months, 16(22.9%) go for a dilated eye checkup once a year, 21(30%) go for a dilated eye checkup as advised by ophthalmologist, 10(14.3%) (p -value =0.002) go for any other reason. When DM patients were asked about

their sugar level, 52(74.3%) have controlled sugar level while 18(25.7%) did not have controlled sugar level.

This study on topic "KAP study on factors motivating diabetic people for screening of retinopathy" concludes that awareness and knowledge about diabetic retinopathy were very poor among the patients in our study. Lack of knowledge concerning the need for screening for diabetic retinopathy was found to be a major barrier to compliance with regular screening. Good knowledge about diabetes was significantly associated with positive attitude towards diabetes and good practice patterns regarding retinopathy. Awareness of diabetic retinopathy was significantly associated with good practice patterns regarding retinopathy. Therefore, there is an urgent need to evolve strategies to educate diabetic patients about this potentially blinding complication of diabetes.

In general undiagnosed diabetes is common. Diabetes is not characterized by known symptoms and it is as linked with the risks in future as the diagnosis of diabetes. At the time of diagnosis 25% of diabetic people have evidence of microvascular complications. The extrapolation of the link between the duration of the disease and prevalence of retinopathy suggests that the onset of diabetes take place several years earlier, which is clinically recognized. The criteria of the National Selection Committee establish that all "cost-effective primary prevention interventions should have been implemented as far as possible."

Conclusion:

This study concludes that awareness and knowledge about diabetic retinopathy were very poor among the patients in our study. Lack of knowledge concerning the need for screening for diabetic retinopathy was found to be a major barrier to compliance with regular screening. Good knowledge about diabetes was significantly associated with positive attitude towards diabetes and good practice patterns regarding retinopathy. Awareness of diabetic retinopathy was significantly associated with good practice patterns regarding retinopathy. Therefore, there is an urgent need to evolve strategies to educate diabetic patients about this potentially blinding complication of diabetes.

Recommendations:

It is recommended that: Optimize glycemic control to reduce the risk or slow the progress of diabetic retinopathy; Optimize blood pressure and serum lipid level control to reduce the progress of diabetic retinopathy; Patients of DR should be asked to have regular follow up. There should be public awareness at primary level about diabetic retinopathy. Patients with type 1 diabetes should have an initial dilated and comprehensive eye examination by ophthalmologists or optometrists within 5 years after the onset

of diabetes diagnosis. Patients with type 2 diabetes should have an initial dilated and comprehensive eye examination by ophthalmologists or optometrists at the time of onset of diabetes diagnosis.

References:

1. Association AD. Diagnosis and classification of diabetes mellitus. *Diabetes care*. 2014;37(Supplement 1):S81-S90.
2. Group AliDNT. Should all patients with type 1 diabetes mellitus and microalbuminuria receive angiotensin-converting enzyme inhibitors? AD, aggregate data. 2001.
3. Group UPDS. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes. *BMJ*. 1998;317(7160):703.
4. American Diabetic Association. Gestational diabetes mellitus. *Diabetes care*. 2004;27:S88-90.
5. Srinivasan NK, John D, Rebekah G, Kujur ES, Paul P, John SS. Diabetes and Diabetic Retinopathy: Knowledge, Attitude, Practice (KAP) among Diabetic Patients in A Tertiary Eye Care Centre, *J Clin Diagn Res*. Jul 2017;11(7):NC01-NC07.
6. Danaei G, Finucane MM, Lu Y, Singh GM, Cowan MJ, Paciorek CJ, et al. National, regional, and global trends in fasting plasma glucose and diabetes prevalence since 1980: systematic analysis of health examination surveys and epidemiological studies with 370 country-years and 2.7 million participants. *Lancet*. 2011;378(9785):31-40.
7. Nouwen A, Nefs G, Caramlau I, Connock M, Winkley K, Lloyd CE, et al. Prevalence of depression in individuals with impaired glucose metabolism or undiagnosed diabetes: a systematic review and meta-analysis of the European Depression in Diabetes (EDID) Research Consortium. *Diabetes Care*. 2011;34(3):752-62.
8. Forbes JM, Cooper ME. Mechanisms of diabetic complications. *Physiol Rev*. 2013;93(1):137-88.
9. Konstantinidis L, Carron T, de Ancos E, Chinet L, Hagon-Traub I, Zuercher E, et al. Awareness and practices regarding eye diseases among patients with diabetes: a cross sectional analysis of the CoDiab-VD cohort. *BMC endocrine disorders*. 2017;17(1):56. doi 10.1186/s12902-017-0206-2
10. World Health Organization. Prevention of blindness from diabetes mellitus: report of a WHO consultation in Geneva, Switzerland. *Bull World Health Organ* November 2005:9-11.
11. Fong DS, Aiello L, Gardner TW, King GL, Blankenship G, Cavallerano JD, et al. Retinopathy in diabetes. *Diabetes care*. 2004;27(suppl 1):s84-s7.
12. Hirai FE, Tielsch JM, Klein BE, Klein R. Ten-year change in vision-related quality of life in type 1 diabetes: Wisconsin epidemiologic study of diabetic retinopathy. *J*



- Model Ophthalmol. 2011;118(2):353-8.
13. Kempen JH, O'Colmain BJ, Leske MC, Haffner SM, Klein R, Moss SE, et al. The prevalence of diabetic retinopathy among adults in the United States. *JAMA Ophthalmol* (Chicago, Ill: 1960). 2004;122(4):552-63.
 14. Klein R, Knudtson MD, Lee KE, Gangnon R, Klein BE. The Wisconsin Epidemiologic Study of Diabetic Retinopathy XXII: the twenty-five-year progression of retinopathy in persons with type 1 diabetes. *J Model Ophthalmol*. 2008;115(11):1859-68.
 15. Nentwich MM, Ulbig MW. Diabetic retinopathy-ocular complications of diabetes mellitus. *WorldJ diabetes*. 2015;6(3):489.
 16. Malek M, Khamseh ME, Aghili R, Najafi L. Medical management of diabetic retinopathy: an overview. *ARCH IRAN MED*. 2012;15(10):635.
 17. Mohamed Q, Gillies MC, Wong TY. Management of diabetic retinopathy: a systematic review. *Jama*. 2007;298(8):902-16.
 18. Simó R, Hernandez C. Intravitreal anti-VEGF for diabetic retinopathy: hopes and fears for a new therapeutic strategy. *Diabetologia*. 2008;51(9):1574.
 19. Launiala A. How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi. *Am J Phys Anthropol*. 2009;11(1).
 20. Rani P, 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).
 21. Saaristo T, Moilanen L, Korpi-Hyövälti E, Vanhala M, Saltevo J, Niskanen L, 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.
 22. Li Z, Song Z, Wu S, Xu K, Jin D, Wang H, et al. Outcomes and barriers to uptake of cataract surgery in rural northern China: the Heilongjiang Eye Study. *Ophthalmic epidemiol*. 2014;21(3):161-8.
 23. Photocoagulation treatment of proliferative diabetic retinopathy: clinical application of Diabetic Retinopathy Study (DRS) findings, DRS Report Number 8. *Ophthalmology*. 1981;88(7):583-600.
 24. Nirmalan P, Katz J, Robin A, Krishnadas R, Ramakrishnan R, Thulasiraj R, et al. Utilisation of eye care services in rural south India: the Aravind Comprehensive Eye Survey. *Br J Ophthalmol*. 2004;88(10):1237-41.
 25. Wareham NJ, Griffin SJ. Should we screen for type 2 diabetes? Evaluation against National Screening Committee criteria. *BMJ*. 2001;322(7292):986-8.

A Authors' Affiliation

¹Sana Fatima

College of Ophthalmology & Vision Sciences (COAVS) Lahore.

²Ch Nasir Ahmad,

Institute of Ophthalmology, Mayo Hospital, Lahore.

³Ruhullah

College of Ophthalmology & Vision Sciences (COAVS) Lahore.

⁴Talib Hussain

College of Ophthalmology & Vision Sciences (COAVS) Lahore.