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# Pre-Existing Knowledge and Self-Reported Barriers to uptake Eye Care among Type-1 Diabetic Patients attending a City Diabetic Hospital at Southern Bangladesh

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**ABSTRACT**

**Purpose:** To find out the knowledge about diabetic complication of eye & the barriers to uptake of diabetic eye care among Type-1 diabetic patients.

**Method:** This is a hospital based observational case series of 100 cases of Type-1 Diabetes Mellitus (DM1). Demographic data, knowledge about diabetic complication of eye, self reported barriers to uptake diabetes eye health service were collected by face-to-face interview. Interview was done on a formulated questionnaire including pre-existing knowledge about diabetes related ocular problems and factors act as a barrier to receive eye care.

All DM1 patients attending in a city diabetic hospital during one year (from October 2017 to September 2018) period were included. Written consent was taken. Patients refuse to give consent & aged more than 30 years were excluded.

**Results:** The mean age of participants was (17.09 ± 3.92) years with range 6 to 23 years and 57% of them were female. About 59 % subjects were students. Around 50% of the respondent had knowledge about the adverse effect of diabetes on eyes, among them only 6% had knowledge about retina problems and 3% knew that blindness may happen. Only 32% of study population gave answer about the reason behind not seeking diabetic eye care and the most common (12%) answer was "not feeling necessity of eye care".

**Conclusion:** DM1 patients are more prone to systemic and ocular morbidity. The main reasons for not getting eye care services was lacks of awareness. Increase awareness building program can bring them to the eye health service which will very important to reduce diabetic ocular morbidity of young people who have long life in front of them.

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## Introduction

Diabetes is one of the fastest growing diseases according to Diabetes Atlas of International Diabetic Federation's There were 425 million people lived with diabetes at year 2017 in the world and increased to 463 million by year 2019 that was 01 in 11 adult world-wide. It is predicted that the number will increase to 629 million by 2045 [1-4].

Type 1 diabetes is an autoimmune disease where beta cells in islets of langerhans of pancreas destroyed so insulin could not be produced. As a result, there is absolute or partial deficiency of insulin in the body [1,4]. Children and adolescents are suffering more frequently. Type 1 diabetic patient need injectable insulin daily to maintain glucose metabolism and without insulin would not be able to survive. So, early death may happen. The incidence of type 1 diabetes is increasing worldwide [1].

So, the type 1 DM incidence also increasing day by day worldwide, but there was huge variation in reported incidence of different countries.

The International Diabetic Federation (IDF) Diabetic Atlas provide the estimates of children and adolescents below age 20 with type 1 diabetes has risen to over a million [1]. The number of children and adolescents with type 1 diabetes (<20 years) at 2017 was 1,106,500 (1.1 million) and number of newly diagnosed case each year is (0.13 million) 132,600 [1].

Bangladesh is a highly populated country. In Bangladesh estimated number of DM population in 2019 was 8.4 million which will be estimated 14.9 million in 2045, increase by 79 % [4].

Diabetes Mellitus (DM) is a chronic metabolic disease and is associated with chronic microvascular, macrovascular complications. Diabetic Retinopathy (DR) is one of the common and blinding microvascular complication of diabetes. Several studies suggest the major risk factors for DR are diabetes duration,

uncontrolled HbA1c and blood pressure [5,6].

One third of diabetic people suffering from some degree of diabetic retinopathy and one in ten will develop Vision Threatening Diabetic Retinopathy (VTDR) [3]. According to Vision Loss Expert Group, one million people were blind because of diabetic retinopathy around the world in 2020, and over 3 million people were suffering from moderate to severe visual impairment [3].

Auto immune Type-1 Diabetes is a disease, in which the body's immune system produce auto antibody against insulin-producing beta cells of the pancreas of self and destroy it. Therefore, the affected patient presented with high blood sugars and dependent on external insulin. It was previously called Insulin Dependent Diabetes Mellitus (IDDM) or juvenile onset diabetes. Commonly it strikes in childhood, adolescence or young adulthood but obtain for a lifetime.

So, it is most important to diagnose the diseases and take necessary steps to prevent the negative effect of diabetics on eye or other organ, as it has many systemic and ocular associations which hamper the daily life of the affected persons. Moreover, it is difficult to cope emotionally with their condition by their parents and family. It has also make difficulties in schooling and limits their choice of future career [5].

The eye care facilities for children are very necessary to know their condition. So, it is more important for Type-1 Diabetes patient then the normal children as they have already an abnormality, that other don't have. The main three points for type-1 Diabetic patient are as follows
• Early age,
• Insulin Dependent &
• Life expectancy

So, it needs meticulous treatment to prevent diabetic related irreversible blindness and need appropriate treatment strategy.

There are treatments challenges exist for type 1 DM. Moreover, Diabetic patients develop complications due to poor awareness regarding the disease and inadequate glycemic control. Patient education is the most effective way to lessen the complications of diabetes and its management.

Therefore, the objective of this study was to find out the socio-demographic picture of type-1 diabetic person, their knowledge about diabetic complication of eye and barriers to diabetic related eye care at Chattogram. Another aim was to increase the social awareness about the disease by counseling the patients through the work.

## Methodology
Hospital based observational study of 100 cases of DM type1. Patients were recruited from the Diabetic General Hospital at the centre of Chattogram city, Bangladesh. The study period was 1 year from October, 2017 to September, 2018. Written informed consent was taken. We include all type 1 DM patients attending the hospital with in the mentioned 1-year time period. Non-cooperative patients or the patients who did not give consent, patients aged more than 30 years were excluded from this study.

Demographic data were collected from the patient or guardians of patients (caretaker) byface to face interview. The standard formative data sheet included demographic information, socioeconomic condition, profession, diabetes duration, glycemic condition controlled or uncontrolled& practice of ocular health education, pre-existing knowledge about diabetes related ocular problems and factors act as a barrier to diabetes eye health care service.

A total 100 Patients interviewed. All quantitative data were processed using SPSS -16 statistical package. Data are presented with the help of Microsoft office (excel &word). Graphs, charts and tables were used for easy understanding of the findings

## Result
The mean age of the study population were 17.09 (± 3.92) years with the age range 6 to 23 years. In this study 39% respondent were within 6-16 years and 61% were above 16 years. (Table 1)

**Table 1: Age Group of the Respondent**

| Age group of the respondents | Number (%) | Total |
|---|---|---|
| 6 to 16 years | 39 (39%) | 100 |
| More than 16 years | 61 (61%) | |

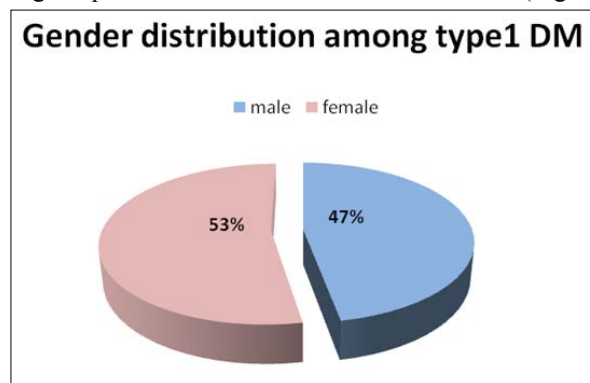Among the patients 47% were male & 53% female. (Figure 1)



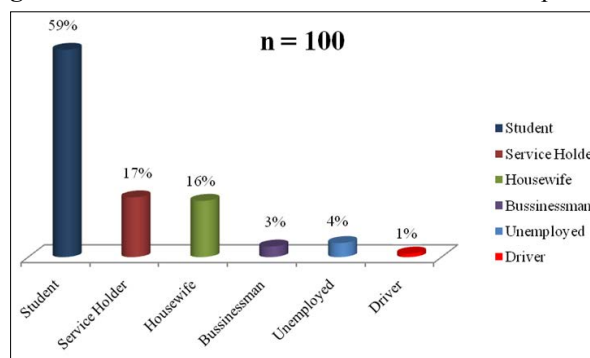**Figure 1:** Percent Distribution of Gender of the Respondent



**Figure 2:** Percentage Distribution of the Occupation of the Respondents

In this study majority of type-1DM patients were student (59%) followed by Service Holder (17%), Businessman (3%), Housewife (16%), Driver (1%) & unemployed (4%) (Figure 2).
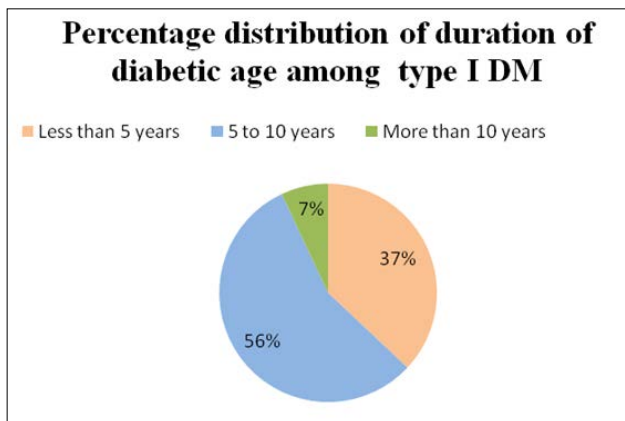
**Figure 3:** Percentage Distribution of Duration of Diabetics of the Respondent

In this study 37% patients had history of diabetes for less than 5 years 56% had history of diabetes between 5 to 10 years and 7% had history of diabetes more than 10 years. (Figure 3) About 48% of the patients' blood sugar level was controlled by Insulin or Insuline+oral anti hyper glycemic while remaining 52% of the patients' blood sugar level was found uncontrolled. (Figure 4)
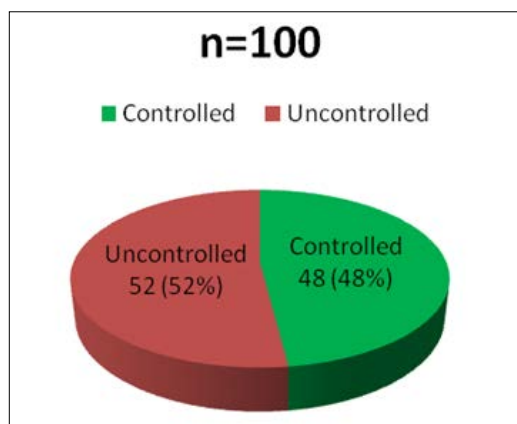


**Figure 4:** Percentage Distribution of the Diabetes Control of the Respondents

About 48% of the patients' blood sugar level was controlled by Insulin or Insuline+oral anti hyper glycemic while remaining 52% of the patients' blood sugar level was found uncontrolled.
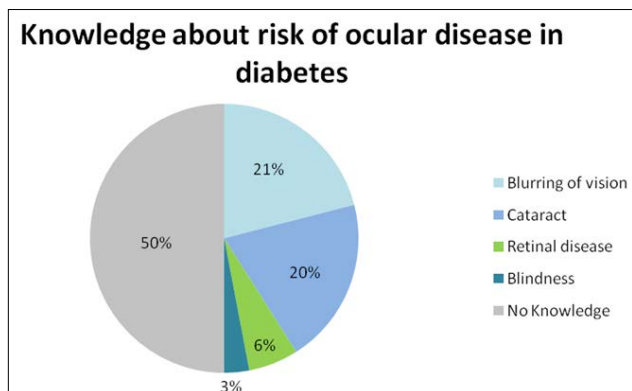


**Figure 5:** Percentage Distribution of Knowledge of the Patient about Consequence of Diabetes on the Eye

Only 50 of 100 patient (50%) had some knowledge about risk of ocular disease in diabetes, among them 20 % had told about

possibility of cataract, 21% told about blurring of vision, 06% told about problem in retina & only 03 % told about blindness. (Figure 5)

**Table 2: Percentage distribution of Barriers to Uptake diabetic care related services**

| Reason behind not seeking treatment | Frequency of patients(n) | Percentage (%) among Total study population | Percentage (%) among response |
|---|---|---|---|
| Did not Feel Necessary | 12 | 12 | 37.5 |
| Financial Insolvency | 10 | 10 | 31.25 |
| Long Distance | 05 | 05 | 15.62 |
| Lack of Escort | 03 | 03 | 9.38 |
| Difficulties in Hospital | 02 | 02 | 6.25 |
| Total | 32 | 32 | 100 |

Only 32 of 100 patients or attendant gave answer about the reason for not seeking the medical help. The main reasons assigned for not going to a doctor were, didn't feel necessary 12 (37.5%), financial constraints10 (31.25), long distance 05 (15.62%), lack of escort 03(9.38%) and difficulties in hospital 02(6.25%). (Table 2)

**Discussion**
Type 1 diabetes is the commonest metabolic and endocrine disease in childhood [2]. Younger working age groups are affected and it causes vision threatening ocular morbidities like diabetic retinopathy, Glaucoma, Cataract etc. In this study we examined /checked the ocular and systemic status of type 1DM children presenting in a city diabetic hospital.

The mean age of this series is 17.09 ±3.92 years with range 6 to 23 years. The age range of Akil H et al study group was 4 to 18, mean age 13.21 ±3.096, nearly similar to this study group [7].

In this series of type 1DM female are predominant (53%) which is similar to the series of Pihoker C et al, they found 55% female intheir series [8]. Roy MS et al also found 58.3% female in their series of type 1DM [9].

Pihoker C et al found 15% of their series were unemployed & 8% were students while in our series participants were different, we get only 4% unemployed & 59% were student [9].

The detection of ocular problems due to microvascular complications needs careful examination of posterior segment of the eye through screening [10].

Access to Health care facilities, use of diabetes care and diabetic eye disease care are not well understood. Knowledge about diabetic eye problems or complication among type 1DM population is very poor. Because of lack of knowledge or confusing knowledge and also ignorance they do not seek for health care facilities.

There is increasing amount of evidence that patient education is the most effective way to lessen the complications of diabetes and its management [10].

Study from South India highlighted the fact that a proper education and awareness program can change the knowledge, attitude,

practice of the patients regarding diabetes. Proper education program to disseminate the knowledge regarding various aspects of healthcare can improve the understanding of patients which in turn improve their health - seeking behavior [10].

Results of this study indicated that patient's knowledge about eye complication was poor only 21% patients knew about blurring of vision due to DM, 20% patients knew about cataract, and most significant is that only 6% patientsknew about retinopathy due to DR and 3% patients told that they know that blindness may happen from diabetes complication.

Due to lack of knowledge about diabetic retinopathy, it was not surprising that patients did not practice adequate eye care. Evidently, most patients had not visited an eye doctor or received a diabetic eye exam. However, it was unclear whether patients had access to eye specialists in the first place, i.e., if such health-seeking behavior was possible or if they simply did not pursue it. In either case, it seemed that diabetic patients were not receiving eye care or eye care counseling from their "diabetes doctor" despite the known relationship between visual impairment and diabetes. Increased knowledge of the relationship between Diabetes care and Diabetic Retinopathy will encourage adherence only if eye healthcare is available and accessible.

In particular, knowledge must be comprehensive but clear and supported with strategies that are practical and feasible for patients to maintain. It is very important in a country like Bangladesh and the healthcare professionals should actively provide education to diabetes patients.

Studies showed that responders with type 1 DM are more to have visit health care facilities than those with type 2 DM. We get in our series of type 1DM 12 % did not feel any necessity of visit to diabetic eye healthcare provider [9].

Valenzuela JM et al revealed in their series that more than 80% of participants reported at least one barrier to care, in their study they showed that 47.5%reported health costs ,43% mentioned about communication and 48.4%mentioned lack of information as a barrier [10].

The results of our survey revealed the barriers to the diabetic care related service; surprisingly 12 % of study population did not feel the necessity of seeking the diabetic eye health care, 10% mentioned their financial insolvency, 05% of participant told about the long distance or difficult communication of health care fascilities, 03% had lack of escort/accompanying person and lastly 02 % informed about difficulties in Hospital.

The extent of barrier to diabetes care exist for Type 1DM are not fully understood. Health care costs is an identified barrier to routine care, other social and structural factors are also included in the barrier list which limit the access to diabetes care giver fascilities [8].

Roy MS et al found that one third of their series had never been examined by an ophthalmologist [11]. They found 23 % of participants mentioned about cost is a barrier to eye care. Large percentage of their series of type1DMdid not take adequet eye care, so the author suggests to improve screening of DR and eye care fascilities.

It is well understood that diabetes management requires patient involvement for a better disease control A Knowledge Attitude and Practice survey was done by Hellenkillar international Bangladesh in August 2010 at four peripheral centers (Feni, Potia, Hatazari, and Cox's Bazaar) of Bangladesh [12]. Survey observation was that most diabetic patients had not visited an eye doctor or received a diabetic eye examination because most of them did not receive eye care counseling from their diabetes doctor.

An integrated network of health service including eye hospitals with well-equipped vitro-retina service, diabetic hospitals should have been established for eye related treatments of younger diabetic patients. Adequate patient care service, maximum awareness regarding diabetic and its complications is essential to get rid from the hazards of diabetic's related complications of eyes.

This study has limitations. Pooling of data from hospital record book, sometimes there was lack of information, and as well small sample size.

## Conclusion

Type 1 diabetic is a kind of disease which obtain for a life time as the patients are usually young. So, its causes severe ocular complications if the patients do not control their diabetes and not seek eye care service. If diabetic retinopathy is detected early and get appropriate treatment they can free from ocular disability. Therefore, to prevent the occurrence of diabetic related ocular morbidity, we should pay more attention on type 1 diabetic patients to improve their knowledge about eye health.

**Conflict of interest Disclosure:** No conflict of interest

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