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# Diabetic Prevalence in Bangladesh: The Role of Some Associated Demographic and Socio-economic Characteristics.

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## ABSTRACT

The study attempts at examining the association of a few selected socio-economic and demographic characteristics on diabetic prevalence. Nationally representative data from BIRDEM 2000 have been used to meet the objectives of the study. Cross tabulation, Chi-square and logistic regression analysis have been used to portray the necessary associations. Chi- square reveals significant relationship between diabetic prevalence and all the selected demographic and socio-economic variables except "education" while logistic regression analysis shows no significant contribution of "age" and "education" in diabetic prevalence. It has to be noted that, this paper dealt with all the three types of diabetes- Type 1, Type 2 and Gestational.

**Keywords**: BIRDEM 2000, All types of Diabetes, Chi- square test, Logistic Regression Analysis.

## 1 INTRODUCTION

In the contemporary world people are suffering from various diseases, among those diabetes, viewed from any angle is the one that is increasing rapidly creating a serious threat not only to health but other related issues of life. Scholars dealing with diabetes and it's impact on various aspects of human life defined and viewed it using their own definition and concepts. Diabetes is a chronic disease, known to some but unknown to many in Bangladesh, that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. Diabetes, often referred to by doctors as diabetes mellitus, describes a group of metabolic diseases in which the person has high blood glucose (blood sugar), either because insulin production is inadequate, or because the body's cells do not respond properly to insulin, or both. Patients with high blood sugar will typically experience polyuria (frequent urination), they will become increasingly thirsty (polydipsia) and hungry (polyphagia) (www.medicalnewstoday.com, 2012). The two major types of diabetes are type 1 (insulin-dependent diabetes mellitus, IDDM) and type 2 (noninsulin-dependent diabetes mellitus, NIDDM) which is the most common form of diabetes. Both type 1 and type 2 diabetes share one central feature: elevated blood sugar levels due to insufficiency of insulin. In some cases, pregnant women develop a form of type 2 diabetes, usually temporary, in their third trimester which is called gestational diabetes. Question arises what is insulin? Insulin is a hormone that produced in the islets of langerhans in pancreas and is the major metabolism and lack of insulin is, may be, the major reason in developing diabetes. Hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.

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But the good thing is diabetes is treatable and diabetic patients can have a normal life under proper medical treatment and proper diet/ regimen. Besides lack of insulin, there are supposed to be some demographic, socio-economic and environmental factors that help in developing diabetes such as age, sex, genetic issue, education, income, occupation, weight, lack of physical work and many more. Diabetic patients often show the symptoms of copious urination, severe thirst, immoderate hunger, weight loss etc. Generally, a glucose tolerance test (GTT) is used to diagnose diabetes. The procedure is to measure the blood glucose after fasting and then at 2 hours interval after a 75gm glucose consumption. Table 1 shows the 2006 WHO recommendations for the diagnostic criteria for diabetes and intermediate hyperglycemia:

Table 1: diagnostic criteria for diabetes and Intermediate hyperglycemia

| Glucose tolerance test | Fasting plasma glucose | 2 hour plasma glucose* |
|---|---|---|
| Impaired Fasting Glucose (IFG) | 6.1 to 6.9mmol/l (110mg/dl to 125mg/dl) | (if measured) <7.8mmol/l (140mg/dl) |
| Impaired Glucose Tolerance (IGT) | <7.0mmol/l (126mg/dl) | ≥7.8 and <11.1mmol/l (140mg/dl and 200mg/dl) |
| Diabetic | ≥7.0mmol/l (126mg/dl) | ≥11.1mmol/l (200mg/dl) |

* Venous plasma glucose 2–h after ingestion of 75g oral glucose load

* If 2–h plasma glucose is not measured, status is uncertain as diabetes

National Institutes of Health considered the followings as major risk factors for diabetes and pre-diabetes:

- Age equal or older than 45.
- Family history of diabetes.
- Overweight and obesity.
- Inactivity (exercise less than 3 times per week).
- African-American, Hispanic/Latin American, American Indian and Alaska Native, Asian-American, or Pacific Islander ethnicity.
- High blood pressure (140/90 mm Hg or higher)
- HDL (High- density lipoprotein) cholesterol less than 35 mg/dL or triglyceride level 250 mg/dL or higher.
- Experienced Gestational diabetes or have given birth to a baby that weighed more than 9 pounds.
- Polycystic ovary syndrome (metabolic disorder that affects female reproductive system).
- Acanthosis nigricans (dark, thickened skin around neck or armpits).
- Disease history of blood vessels to the heart, brain, or legs.
- GTT test history of impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) (The Newyork Times, 2012).

In a study in Bangladesh conduction among the patients attending Rajshahi Diabetes Association revealed that age, controlling diabetic through exercise, controlling diabetic through taking medicine and living house of the respondents are significantly associated with the type 2 diabetes of diabetic patients. It is also identified from logistic model that respondent's age, occupation, controlling diabetic through dieting, controlling diabetic through exercise, controlling diabetic through taking medicine, time spending in walking, calorie intake according to diabetic food table and living house of the respondents have statistically significant effect on type 2 diabetes (Islam and Rahman, 2012). A study from Bangladesh describes an increased prevalence of type 2 diabetes in an affluent population when corrected for other major diabetes risk factors. Seven studies investigating the relation between the incidence of type 1 diabetes and socioeconomic status have generally found little evidence of a relation. That study showed, in either urban or rural areas, the highest prevalence of Non Insulin Dependent Diabetes Mellitus (NIDDM) was observed among the rich, and the lowest

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prevalence was observed among the poor socioeconomic classes. The rural rich had much higher prevalence of Impaired Glucose Tolerance (IGT) than their urban counterpart (16.5 vs. 4.4%, CI 6.8 -17.4). Increased age was an important risk factor for IGT and NIDDM in both rural and urban subjects, whereas the risk related to higher Body Mass Index (BMI) and waist-to-hip ratio (WHR) was less significant in rural than urban subjects. The urban subjects had no excess risk for NIDDM. In contrast, an excess risk for glucose intolerance (2-h BG > or = 7.8 mmol/l) was observed in the rural subjects. Adjusting for age, sex, and social class, the prevalence of NIDDM among urban subjects did not differ significantly from that among rural subjects. Increased age, higher socioeconomic class, and higher WHR were proven to be independent risk factors for glucose intolerance in either area. Women with type 2 diabetes face a higher risk of cardiovascular disease than do men with type 2 diabetes according to Abu et al (1997). Another study from Bangladesh revealed the economic sufferings of the rural women quoting "Diabetes treatment is beyond the reach of many as insulin requirements for people with the condition are relatively high. The cost of insulin per month is on average US$20. This is equivalent to two weeks wages for an agricultural labourer. Those who can afford the cost of travel come to BIRDEM for treatment and a supply of free insulin. Many of them stay on in the city to earn their living. Unaffordable prices also rule out home blood glucose monitoring for most people with diabetes." (H. Mahtad, MP. Chowdhury, 2002). Obesity, physical inactivity, smoking, and low birth weight have all been described as risk factors for type 2 diabetes. In 1994, Health Survey of England pointed that Western societies these factors are associated with low socioeconomic status. Here an attempt has been made to study the association between some background characteristics and prevalence of diabetes of the patients of BIRDEM.

## 2 METHODOLOGY

A set of follow-up data from the register of the year of 2000 of BIRDEM have been utilized for this study. A detailed discussion about the methodology of data collection needs to be mentioned for understanding the whole process. At the registration of patients each one of them was requested to face 149 points in a questionnaire. Then the responses were compiled by the physicians including sex, marital status, BMI, age at diagnosis, pulse, blood pressure, diet, result of GTT, education, occupation, income, living area, full address at first visit etc. Data have been updated at each visit to record the current treatments. A list of patients which included both diabetic and non diabetic patients was generated by computerized searches of diagnostic lists. The individual case records were then analyzed by the researcher to confirm the diagnosis of diabetes and record the patient characteristics. BIRDEM record sheet contains about 89 variables from which we have selected a few variables for our study. However, we are interested in analyzing a few selected demographic variables (age, sex, marital status and family history, BMI) and socio-economic variables (living area, education, annual income, physical exercise) that are associated with the increase of Blood Glucose Level of the patients. A patient whose blood glucose level after 75gm glucose consumption is greater or equal to 11.1mmol/liter is considered as confirmed diabetic and those less than 11.1mmol/liter is considered as controlled diabetic. The demographic variables we considered here are age, sex, marital status and family history. From them, age is the first variable that has been recorded at the first registration. As we know, here it is a continuous variable having two categories- less than 40 years and greater than or equals 40 years and can be used directly in the study. Sex is a dummy variable with two categories- male and female. Marital status is a qualitative variable including the categories- married, unmarried, divorced and separated.

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To see the trend the last three groups are merged into one group named "others". A genetic factor, family history plays an important role to develop diabetes. The BIRDEM data set contains two variables – family history of father and family history of mother. For the convenience of analysis both the variables are merged and named by a new variable "family history of father and mother" having three categories – "either or both the parents were diabetic", "both the parents were non-diabetic" and "unknown". In many studies, BMI is one of the strongest predictors of diabetes, and previous studies have shown that changes in BMI foreshadow changes in diabetes. The measurement used most often to quantify body fat is BMI. It is relatively easy to calculate (weight in kilograms divided by the square of the height in meters); it has defined risk categories (overweight, BMI ≥ 25 kg/m$^2$; and obese, BMI ≥ 30 kg/m$^2$), and it is closely correlated with body fat in most people. It is not a perfect measure, however. BMI does not distinguish between fat mass and lean mass and, therefore, does not provide an accurate indication of body fat in extremely muscular individuals or people who have lost significant muscle mass. In addition, BMI may not be a sensitive indicator of the health risks associated with moderate weight gain (10–20 lb) in individuals that fall within the normal BMI range. Despite these limitations, BMI can be a reliable and valid measure for identifying adults at increased risk of overweight- and obesity-related morbidity and mortality (Cynthia et al, 2004). Here, BMI is divided in to three categories- Lean i.e. BMI < 19.4 kg/m$^2$; Normal i.e. BMI from 19.4 to 24.9 kg/m$^2$; Overweight & Obese i.e. ≥ 25 kg/m$^2$. The socio-economic variables have also been taken into account in our study. The "living area" of the patients is a qualitative variable having three categories: rural, urban and semi-urban from which urban and semi-urban both the categories merged into one category to make "area" a dichotomous variable. Education is one of the socio economic variables which has been categorized into two groups- "Up to secondary" and "Secondary+ ". Income is also a factor in developing diabetes which has three categories – one is of those patients whose income are less than 10,000 Tk, one of those with annual income (10,000-49,999) Tk and the rest belong to the third group. "Physical exercise" is a dummy variable coded as "yes" and "no".15016 persons were registered in the year of 2000 at BIRDEM from which information about 227 were missing and after omission of the missing information finally 14789 persons were included in the study where 11849 (80.12%) persons were identified as Confirmed Diabetic and 2940 (19.88%) persons were at Controlled level. Cross tabulation, Chi square test and Logistic Regression analysis have been employed to examine the effects of the few selected variables on Blood Glucose Level of patients. SPSS 16 (reference) has been used for the analysis.

# 3 RESULTS AND DISCUSSION

In a country like Bangladesh where 51% of the people are unaware that diabetes exits, it is important to fill the immense knowledge gap to increase diabetes awareness in the country for which some selected socio- economic and demographic variables need to be considered seriously. Table 1 presents Blood Glucose Level of patients by different demographic and socio-economic characteristics. The result discloses that diabetic prevalence is higher in the age group >= 40 years which is more than twice as compared to age group < 40 years. "Sex" of the respondents reveals that males are more likely to develop diabetes compared to their female counterparts. But it cannot be said that males tend to develop diabetes more than female as in our country female are usually deprived to proper food, health care education etc and may not register due to socio-economic issues. In our country, women rarely can participate in a decision making part in her family as well as in the society. They are under the dominance of male

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members and major family decision-making power is taken by the male head of the family. In cases of sickness, the decision to visit a doctor or to attend a hospital is also depends on the males of the family. Mostly, a very less importance is given to the health issues of a woman in the family. In conservative families, women are even not allowed to see a male doctor, even in critical health conditions. Study reveals that married persons tend to have diabetes than the others which is quite obvious as we have already seen that people aged at or more than 40 years have the highest frequency of developing diabetes and in our country people get married before middle age generally. Genetic issues have been considered here as a factor and from the table; we found that out of 11849 confirmed diabetic patients, 5.54% belong to the first group i.e. either or both parents diabetic. But it is not wise to say that diabetes occurs among the patients whose parents are non- diabetic though this data indicate the other picture. In fact, many studies revealed that children whose either or both parents are diabetic tend to develop this disease at any time of their life span. Here, we can see that, 23.06% of the total patients are unaware of their parents' diabetic status. Another important factor in developing diabetes may be Body Mass Index (BMI). The number one risk factor for type 2 diabetes is obesity. The National Center for Health Statistics states that 30% of adults are obese (Debra Manzella, R.N, 2010). Not only the demographic variables, but there are also some socio-economic variables that help in developing diabetes. A study revealed that prevalence of type 2 diabetes would be inversely related to socioeconomic status (V Connolly, N Unwin, P Sherriff, R Bilous,W Kelly,2000).In our study, a few variables have been taken into account as living area, education, annual income, physical exercise. Table 1 shows relatively higher proportion of the patients experiencing diabetes reside in the urban areas. The reason for this is manifold which can be related to the total way of life of both rural and urban people. The disease can be related to education, occupation, body mass index, living condition etc including the mental stress. Diabetes prevalence is found to be positively associated with patients' education and relatively pronounced in the respondents with education higher than secondary level. Table 1 reveals a large number of diabetic patients with overweight & obesity comparing with the other two categories. The Surgeon General's Report on Physical Activity and Health (USA, 1996) revealed that "a sedentary lifestyle is damaging to health and bears responsibility for the growing obesity problems". Being inactive helps a person to be obese and obesity as said earlier, is a risk factor of diabetes. Being ambulatory lowers blood sugar levels and helps insulin to be more effective. Contingency chi-squares disclose that each of the selected variables except education has significant relationship with blood glucose level of patients of BIRDEM 2000.

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TABLE 1
Blood Glucose Level of BIRDEM patients by some background socio- demographic characteristics.

| Background Characteristics | Blood Glucose Level after 75gm glucose consumption at registration | | | |
|---|---|---|---|---|
| | Controlled Diabetic ( <11.1 mmol/l) ($N_1$ = 2940) | Confirmed Diabetic ( ≥ 11.1 mmol/l) ($N_2$ = 11849) | Total (N=14789) | $\chi^2$ |
| **Age** | | | | 13.483*** |
| < 40 years | 938 | 3373 | 4311 | |
| ≥40 years | 2002 | 8476 | 10478 | |
| **Sex** | | | | 92.866*** |
| Female | 1054 | 5415 | 6469 | |
| Male | 1886 | 6434 | 8320 | |
| **Marital Status** | | | | |
| Unmarried | 261 | 475 | 736 | |
| Married | 2491 | 10472 | 12963 | 120.50*** |
| Others | 188 | 902 | 1090 | |
| **Family History** | | | | |
| Either or both parents diabetic | 226 | 819 | 1045 | 6.51* |
| Both parents non diabetic | 2083 | 8252 | 10335 | |
| Unknown | 631 | 2778 | 3409 | |
| **Body Mass Index(BMI)** | | | | |
| Lean | 780 | 1715 | 2495 | 269.20*** |
| Normal | 1393 | 5917 | 7310 | |
| Overweight & Obese | 767 | 4217 | 4984 | |
| **Area** | | | | |
| Rural | 1298 | 4046 | 5344 | 102.10*** |
| Urban | 1642 | 7803 | 9445 | |
| **Education** | | | | |
| Up to secondary | 1162 | 4809 | 5971 | 1.103 |
| Secondary + | 1778 | 7040 | 8818 | |
| **Annual Income (in Taka)** | | | | |
| < 10,000 Tk | 373 | 787 | 1160 | |
| 10,000 Tk – 49,999 Tk | 1146 | 4035 | 5181 | 175.70*** |
| ≥ 50,000 Tk | 1421 | 7027 | 8448 | |
| **Physical Exercise** | | | | |
| Yes | 882 | 2621 | 3503 | 80.917*** |
| No | 2058 | 9228 | 11286 | |

Note: Significance level: * P <0.05, ** P < 0.01, *** P <0.001.

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Diabetes poses an emerging threat to Bangladesh. Logistic regression analysis is used to understand properly the significance of the selected variables. The logistic regression model can is utilized not only to identify the factors but also to predict the probability of success. For the analysis purpose SPSS 16 is used the result furnished from SPSS have been explained here.

TABLE 2
Classification Table when only constant is included

| Observed | Predicted | | |
|---|---|---|---|
| | Controlled diabetic | Confirmed diabetic | Percentage correct |
| Controlled diabetic | 00 | 2940 | 0.00 |
| Confirmed diabetic | 00 | 11849 | 100.00 |
| Overall percentage | 80.1 | | |

This table includes the fit of the model when only using the constant. Here the model assigns every individual to a single category of the dependent variable. Table 2 indicates 0.00% accuracy for the persons who were observed not to have diabetes and 100.00% accuracy for those persons observed to have diabetes. The fitted model correctly classifies 80.1% of the patients. The constant value is 1.394. The residual Chi- square is 541.001 which is significant at 0.001 level of significance (P = .000); that means addition of one or more of these variables will significantly contribute to the predictive power of the model.

In SPSS, the independent variables are added in to the model in Step 1.Here, the model uses independent variables to predict whether a person got diabetes applying cross tabulation already shown in Table 1.In case of the predictor variable suppose, "Area", there were 9445 urban patients; the model predicts that these 9445 patients got diabetes as such it is correct 7803 times out of 9445, and incorrect 4046 times out of 9445. Similarly, 5344 patients who resided in the rural areas did not get diabetes as such it is correct 1296 times and incorrect 4046 times. This fact goes true for all the other predictor variables in this study.

TABLE 3
Cross table including the predictor variables

| Observed | Predicted | | |
|---|---|---|---|
| | Controlled diabetic | Confirmed diabetic | Percentage correct |
| Controlled diabetic | 48 | 2892 | 1.6 |
| Confirmed diabetic | 39 | 11810 | 99.7 |
| Overall percentage | 80.2 | | |

After adding the predictor variables, the model now classifies 48 controlled diabetic patients, but misclassifies 39 patients that is correctly classifies 1.6% of the patients. As far as the confirmed diabetic patients are concerned the model classifies 99.7% of the cases correctly. Overall accuracy is 80.2% which is higher from the accuracy when only the constant was included, not the predictors. This kind of analysis can be revealed in the study conducted by Andy Field (Field,2005).

Table 4 represents the logistic regression coefficients and odds ratios for the selected variables associated with diabetic prevalence of the patients so that the objectives of the study can be met accordingly. Here, blood glucose level is considered as the dependent variable which is a dichotomous variable having two categories; 0 (zero) for being controlled diabetic and 1 (one) for being confirmed diabetic.

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TABLE 4
Logistic Regression Coefficients and Odds Ratios for the selected variables effecting Blood Glucose Level of patients

| Independent variables | BIRDEM 2000 | | |
|---|---|---|---|
| | β coefficients | S.E of β | Odds ratio [Exp(β)] |
| **Age** | | | |
| < 40 years | - | - | - |
| ≥40 years | .000 | .050 | .997 |
| **Sex** | | | |
| Female | - | - | - |
| Male | .328*** | .047 | 1.389 |
| **Marital Status** | | | |
| Unmarried | - | - | - |
| Married | .369*** | .092 | 1.446 |
| Others(Separated/Divorced/Widow/Widower) | .366** | .127 | 1.385 |
| **Family History** | | | |
| Either or both parents diabetic | - | - | - |
| Both parents non diabetic | .142 | .081 | 1.153 |
| Unknown of their parents' diabetic status | .287*** | .090 | 1.332 |
| **BMI** | | | |
| Lean | - | - | - |
| Normal | .477*** | .057 | 1.611 |
| Overweight &Obese | .604*** | .066 | 1.829 |
| **Area** | | | |
| Rural | - | - | - |
| Urban | .182*** | .046 | 1.199 |
| **Education** | | | |
| Up to secondary | - | - | - |
| Secondary + | -.049 | .044 | .952 |
| **Annual Income** | | | |
| < 10,000Tk | - | - | - |
| 10,000Tk – 49,999Tk | .437*** | .074 | 1.548 |
| ≥ 50,000Tk | .595*** | .075 | 1.813 |
| **Physical Exercise** | | | |
| Yes | - | - | - |
| No | .353*** | .047 | 1.424 |
| **Constant** | -.494 | .126 | .610 |

Logistic regression estimates from Table 4 reveal that, Males are 1.389 times more likely to develop diabetes as compared to the females. The analysis shows a positive association between marital status and diabetic prevalence and the odds of a married person developing diabetes are 1.446 times higher than an unmarried person. This may be expressed as lower mean age at marriage for all ever married women in Bangladesh. The similar observation was also made by Karim (Karim2004 :35,36) using the 1999-2000 Bangladesh Demographic and Health Survey (BDHS). Living area of the patients is significantly associated with the blood glucose level of the patients. The odds ratio reflects that patients residing in the urban areas are 1.99 times more likely to develop diabetes as compared to their rural counterparts. Urban life is more complicated and stressful when compared with the rural ones. Therefore the urban people with stress, high ambition, competitive life, spatial distribution pattern are all possible dominant ones that can also be treated as causal factors of this disease.

Figures shown in table 4 indicate that there is an increasing likelihood of developing diabetes with the increase in the annual income level. It appears from the table that physical exercise is one of the most important determinants in developing diabetes as it has highly significant effect on blood glucose level of the patients. Genetic issues are known to be the most important factor that has a significant effect in developing diabetes. In our case, we found exceptionally a higher proportion of persons with diabetes belong to the group with no genetic background of diabetes. But it has to be pointed that the value of Exp(B) for the variable "unknown to the diabetic status of parents" is 1.332 which implies an increase in the odds of 33.2% (1.332 - 1.0 = .332) i.e. respondents were 33.2% more likely to develop diabetes as compared to the cases where genetic diabetic issues are confirmed. It is true that, increasing age is a risk factor towards type 2 diabetes. Scientists theorize that the pancreas ages right along with human beings, and doesn't pump insulin as efficiently as it did when people were in their young ages. Also, with the increasing cells' age, they become more resistant to insulin (Debra Manzella, R.N, 2010). The analysis exceptionally shows not so strong association of

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respondents' age and education level with diabetes prevalence i.e. the null hypothesis that the b coefficient for the patients with age less than 40 years and with education less than secondary not tending to develop diabetes is not rejected. This can be interpreted in a sense that, here type 1, type 2 and gestational diabetes has been considered rather than only type 2. As far as the data are concerned, 7% of the diabetic patients are from the age group of less than 25 years i.e. patients developed diabetes at very early age and 19.2% of the diabetic patients developed diabetes after 55 years. In many studies BMI is considered to be a most important factor in diabetes prevalence. From the relative odds of BMI and blood glucose level it can be said overweight and obese patients are 1.829 times more likely to develop diabetes rather than the others.

The overall fit of the model is assessed by log-likelihood statistic, but rather than using log-likelihood itself, the value is multiplied by -2 as -2 log-likelihood is approximately chi-square distributed and thus possible to compare values against those that might be got by chance alone. When only the constant was included in the model, -2 log-likelihood was 14751.417 and after the addition of the predictor variables this value has been reduced to 14242.326 which indicate that predictive power of the model goes better after the addition of the independent variables as larger values of log-likelihood report poorly fitting statistical models. (14751.417 – 14242.326) = 509.091 have a chi square distribution with 8 degrees of freedom.

# 4 CONCLUSION

The study attempts to examine a few selected demographic and socio- economic factors influencing blood glucose level of the patients of BIRDEM 2000, though there may be some other factors that have not been considered here. Figures and facts from Tables 1 and 2 reflect that a higher proportion of patients residing in the urban areas are more likely to develop diabetes due to the nature and place of occupations and also the stress associated with these. Though not strong, but there seems to be a positive effect of education in controlling diabetes. This can be explained mentioning again that 51% of the total population of Bangladesh is unaware that diabetes exists, that means out education system is unable to provide awareness about the severity of diabetes. In this respect the media campaign can highlight awareness regarding this issue. The findings demonstrate a significant association between higher income level and diabetes prevalence. Physical exercise plays a significant role in controlling blood sugar level. A significant association, as far as the result of chi-square is concerned, is found between increasing age and blood glucose level, but in case of the model used here, the same is found insignificant. The most significant effect of sex on diabetic prevalence is undoubtedly undisputed. Males are more likely to develop diabetes, t does not mean that the female counterparts do not suffer from diabetes, but they do not go for the test which may be due to the religious and socio - cultural barriers imposed to women for not being capable of maintaining their health issues properly in Bangladesh; also their functions are mostly confined within the households having no scope for proper physical exercise. As far as family history is concerned, many patients even do not know about their parents' diabetic status. Finally, it can be pointed that every person has the right to meet the basic needs; from them treatment is one. It is the responsibility of health planners, policy makers and healthcare providers to fulfill the basic need of treatment for the people with diabetes. Awareness program, regarding the negative impact of diabetes on health, implemented by the Government may minimize this alarming disease.

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