

Prevalence, Awareness and Risk Factor of Diabetes in the Northern Region of Bangladesh

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Abstract

Background: This survey study was undertaken to investigate the prevalence and awareness of diabetes, and to identify its potential risk factors and complications in five districts of the Northern region of Bangladesh.

Methods: Total 202 diabetes patients were directly interviewed using a standard questionnaire from February, 2016 to January, 2017. The data was analyzed by using Microsoft Excel 2010.

Results: Among the study subjects, 55.45% were males and 44.55% were females. 47.53% of the subjects had the family history of diabetes. 74.26% of the subjects were suffered from type-2 diabetes and 23.76% were suffered from type-1 diabetes. Diabetes patients participated in our research also experienced hypertension (20.79%), kidney complication (8.91%) and vision complication (81.19%).

Conclusion: In the northern region of Bangladesh, diabetes has recently become a major public health issue. Immediate action is required to counter the rise in diabetes through better detection, awareness, prevention and treatment.

Keywords: Diabetes; Prevalence; Awareness; Risk Factors; Northern region of Bangladesh

Introduction

Especially in the developed and developing countries, diabetes poses a major global health threat [1]. It is a principle cause of death and disability worldwide [2,3]. The rising tendency of diabetes is common in the developing nations and most common in Southeast Asian countries [1]. Its worldwide prevalence was about 8% in 2011 and is predicted to increase to 10% by 2030 [3]. In 2010, an approximated 140 million people living in Asia had diabetes and globally 60% of the people with diabetes were of Asian region [4]. Recent epidemiological studies have shown an increased prevalence of DM in Hawaii

(20.4%), India (12.1%), Pakistan (11.1%), Turkey (7.2%) and China (6.1%) [5-9]. It has been suggested that the increase in prevalence of diabetes among Asian Americans is due to ageing of the population, urbanization and increasing prevalence of obesity and physical inactivity [10].

Bangladesh had a population of 149.8 million in 2011 [11]. A current meta-analysis indicated that the prevalence of diabetes among adults had risen substantially, from 4% in 1995 to 2000 and 5% in 2001 to 2005 to 9% in 2006 to 2010 [12]. According to the International Diabetes Federation, the prevalence will be

13% by 2030 [13]. In Bangladesh, it was reported that prevalence of type 2 diabetes is on the rise more in urban areas compared to rural population [14,15]. Bangladesh is one of the developing countries in the world and facing rapid urbanization in current time [16]. The country is also in the phase of demographic transition with an expanding proportion of older population. Urbanization was found to be related with a sedentary lifestyle, higher calorie food intake and stressful condition, which might have contributed to the increasing prevalence of diabetes [1,17].

The literature review has shown that there are no enough reports about the prevalence of diabetes and its risk factor in the northern region of Bangladesh. The overall aim of this paper is to find out a more complete picture of the distribution of diabetes related behavioral

and biological risk factors by social group. We have collected data in order to describe the distribution of diabetes related risk factors in the population of the northern part in Bangladesh by sex, education and occupation.

Materials and Methods

Study Site

This cross-sectional study was carried out using a self-designed standard questionnaire following WHO guidelines from February, 2016 to January, 2017. Five cities from the northern region of Bangladesh namely Rajshahi, Chapainawabganj, Natore, Bogra and Naogaon pointed in the country map (Figure 1) were selected for collecting the data.

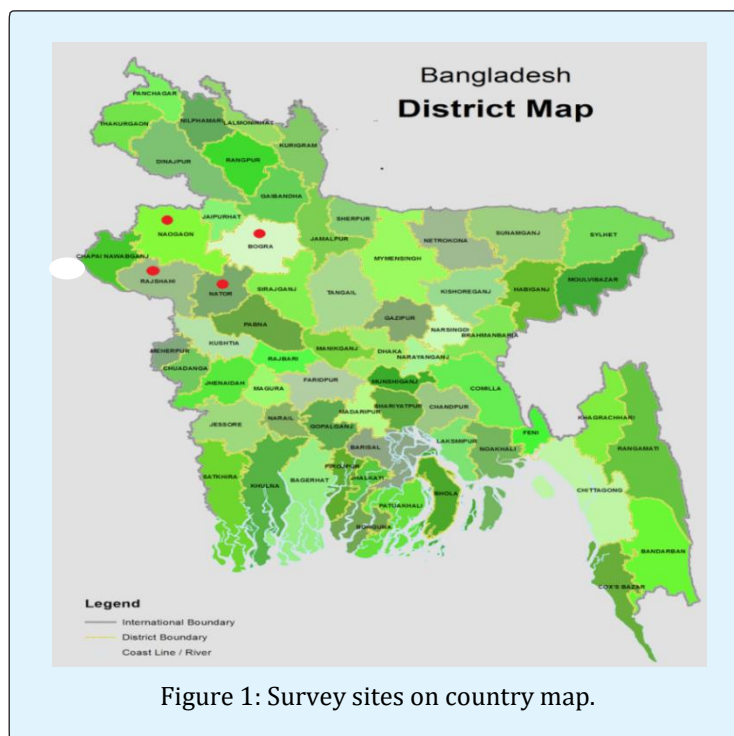


Figure 1: Survey sites on country map.

Data Collection

In this study, we enrolled 202 patients randomly from different diabetes centers who came for the treatment of diabetes and also by home visit. Fourth year pharmacy students of Varendra University were assigned and instructed for conducting the survey. The data was collected from the patients by direct interview and the statistics were made by their answers. The questionnaire was prepared in English which is then translated to Bengali language by the data collectors to the participants

whom mother tongue is Bengali language. The Bengali answers which were given by the participants translated to the English languages in the similar approach by the data collectors. The questionnaire included some basic variables: age, sex, occupation, education level, types of diabetes, types of medication used, family history of diabetes, monitoring of blood pressure and glucose level, diet, physical exercise, complications etc. Informed consent was taken from each patient before carrying out the interviews. No financial or material incentive was offered to the patients.

Data Analysis

Descriptive statistics were applied to analyze the collected data using Microsoft Excel Software 2010. The data was calculated using simple statistical methods. The results were finally expressed in percentages and shown in Column, Line, Bar, Pie chat.

Ethical Statement

This survey based research was conducted following the general guidelines (section 12) of WMA declaration of Helsinki [18] and also logistically supported by the Department of Pharmacy, Varendra University, Bangladesh. The human subjects involved in this research did not use any lethal agents and samples were not taken from them. During the study, the human subjects only participated in the interview. Therefore, for conducting the study, it was not a prerequisite to take any further permission from institutional ethics committee.

Results

Prevalence and Socio-demographic Characteristics

Table 1 shows the prevalence of diabetes and socio-demographic characteristics of the study subjects. Among the 202 study population, 55.45% were males and 44.55% were females. During this study we observed that, the majority of the subjects were of age 51-60 years (24.75%). This is followed by 23.76% in the aged between 41-50 years and 20.8% in the aged group 31-40 years. Regarding marital status most of the participants were married (98.02%) and only a few were unmarried (1.98%). Another surprising fact that most of the patients participated in our study were housewife (42.57%) whereas only 0.99% of the participants were students.

Variables	Feedback	Frequency	Percentage (%)
Sex	Male	112	55.45
	Female	90	44.55
Age	21-30	16	7.92
	31-40	42	20.8
	41-50	48	23.76
	51-60	50	24.75
	61-70	38	18.81
	>70	8	3.96
Marital status	Married	198	98.02
	Unmarried	4	1.98
Occupation	Student	2	0.99
	Businessman	22	10.89
	Govt. job	4	1.98
	Non-govt. job	14	6.93
	Day Laborer	8	3.96
	Shopkeeper	12	5.94
	Retired person	10	4.95
	Teacher	24	11.89
	House wife	86	42.57
	Others	20	9.90

Table 1: Prevalence of Diabetes and Socio-demographic Characteristics of the Study Population (N=202).

Anthropometric and Clinical Variables

Table 2 shows the anthropometric and clinical variables. In this study, only 25.74% of the study population had normal blood pressure. The majority of the populations were with body weight range 61-70 kg (38.62%), on the other hand the minority of the populations were with body weight over 80 kg (2.97%).

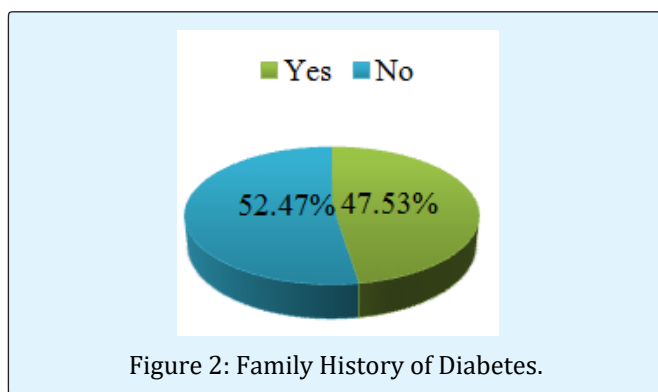
The height of the participants participated in this survey based were ranged between 4.5-6.5 feet. The maximum numbers of the participants were with height ranged between 5.1-5.5 feet (52.48%) whereas the minimum numbers were with height ranged between 6.1-6.5 feet (7.92%).

Variables	Feedback	Frequency	Percentage (%)
Blood pressure	Normal (120/80 mm Hg)	52	25.74
	Systolic high	56	27.72
	Diastolic high	28	13.86
	Systolic low	42	20.8
	Diastolic low	24	11.88
Body weight (Kg)	≤50	22	10.89
	51-60	74	36.63
	61-70	78	38.62
	71-80	22	10.89
	>80	6	2.97
Height (Feet)	4.5-5.0	30	14.85
	5.1-5.5	106	52.48
	5.6-6.0	50	24.75
	6.1-6.5	16	7.92

Table 2: Anthropometric and Clinical Characteristics of the Study Subjects.

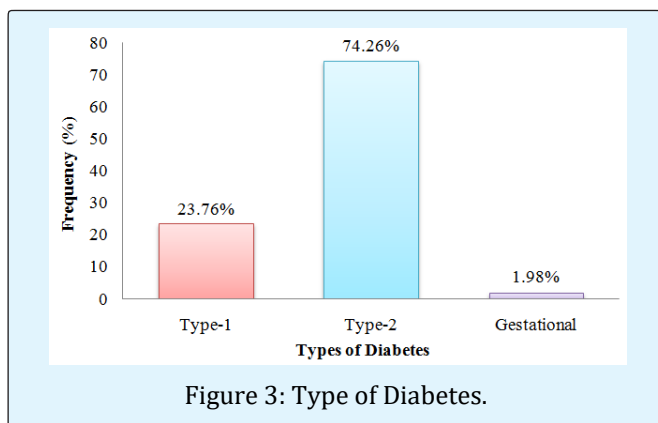
Family History

Among the study subjects, 47.53% had the family history of diabetes (Figure 2).



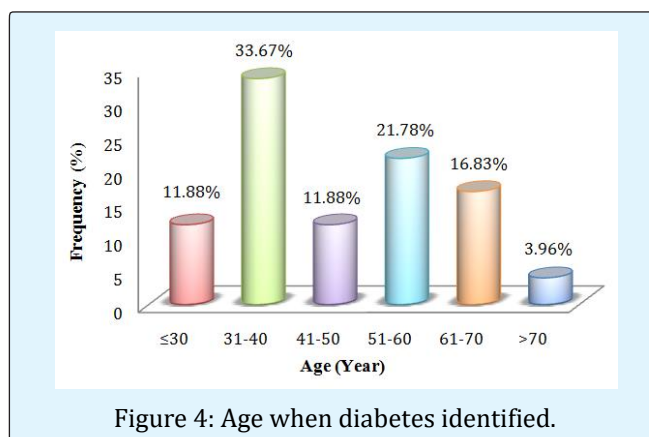
Types of Diabetes

Most of the patients were suffered from type 2 diabetes (74.26%) and only a few were suffered from type 1 diabetes (23.76%), shown in Figure.



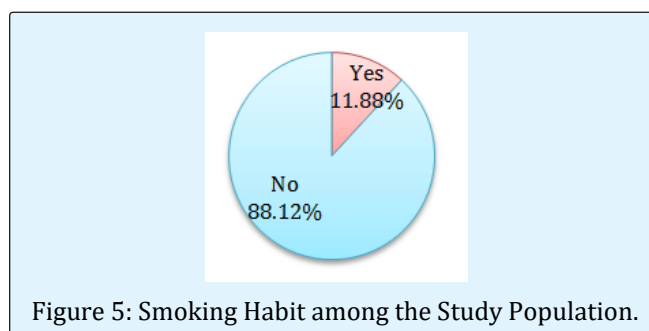
Age when Diabetes Identified

As we found in this study, 33.67% of the patients were experiencing diabetes from the age 31-40 years which followed by 21.78% from the age 51-60 years and 16.83% from the age 61-70 years indicated by Figure.



Life Style

As shown in Figure, 11.88% of the patients were habituated with cigarette smoking and 88.12% of them were non-smoker.



Awareness for Diabetes

Awareness of diabetes includes checking of blood glucose level regularly, taking of physical exercise regularly etc. In our study we observed that 89.11% of the patients checked their blood glucose level regularly. We also observed that 80.2% of the participants in our study

took physical exercise on regular basis. The type physical exercise taken by the participants includes walking, jogging, free hand exercise, instrumental exercise. During this study, 88.89% of the study subjects gave positive answer about the improvement of diabetes by taking physical exercise. Table 3 will show the details.

Variables	Feedback	Frequency	Percentage (%)
Checking of glucose level regularly	Yes	180	89.11
	No	22	10.89
Regular physical exercise	Yes	162	80.2
	No	40	19.8
Type of physical exercise taken by the participants (N=162)	Walking	112	69.14
	Jogging	42	25.93
	Free hand exercise	5	3.08
	Instrumental exercise	3	1.85
Does exercise improve the diabetes? (N=162)	Yes	144	88.89
	No	18	11.11

Table 3: Awareness for Diabetes among the Study Population (N=202).

Risk Factors of Diabetes

Table 4 illustrates our finding about the risk factors of diabetes. Diabetes patients participated in our research also experienced hypertension (20.79%), kidney complication (8.91%) and vision complication (81.19%).

Variables	Feedback	Frequency	Percentage (%)
Hypertension	Yes	42	20.79
	No	160	79.21
Have any kidney complication?	Yes	18	8.91
	No	184	91.09
Have any vision complication?	Yes	164	81.19
	No	38	18.81

Table 4: Risk Factors of Diabetes among the Study Population (N=202).

Discussion

Our study's findings are consistent with the increasing prevalence of diabetes in Bangladesh. Similar figures have been noted recently in most Asian countries: 10% in China, [19] 9% in India, [13] 8% in the Islamic Republic of Iran, [20] 11% in Pakistan⁶ and 8% in the Republic of Korea [21].

The associations we found between diabetes and age and body weight are similar to those observed around the world. However, associations with educational level and household socioeconomic status vary internationally.

In our study, 55.45% of the participants were males. This rate is greater than the result found by a study conducted in Tanzania (25.6%). In case of female patients our finding (44.55%) is less than the same study conducted in Tanzania (74.4%) [22].

We found different risk factors like obesity, physical inactivity, higher socioeconomic status, increased age, hypertension and positive family history. Higher BMI and WHR were also recognized as the independent risk factors for diabetes. Most of the risk factors found in the present study were almost same as reported in the community based study in India [23]. Apart from these conventional risk factors, smoking, short height and literacy were also identified as risk factors.

In our study, 56% of diabetics were not aware they had the disease and only 40% were receiving treatment regularly. Similarly, the International Diabetes Federation reported recently that over 50% of people with diabetes in south Asia were unaware of their condition [13].

The physical activity has important impact on the prevalence of obesity. It is noticed that the people in high socio economic class and sedentary life style are more prone to develop diabetes. Physical inactivity increases the occurrence of diabetes. Contrary to this, the absence of obesity and more physical activity is related to low prevalence of diabetes, 0.95% in the study of Danish, et al. [24]. This scenario also found same with our study.

Although diabetes and other chronic diseases are serious public health problems in Bangladesh, they are given only a low priority by the health-care system.

Conclusion

The prevalence of diabetes has continued to rise in the population of northern region of Bangladesh. The raised prevalence of risk factors for diabetes, among the study populations includes family history, hypertension, overweight etc. Kidney disease, vision problem are common complications of diabetes among study subjects. Management of its modifiable risk factors might help in reducing its incidence in the near future.

Competing Interest

The authors declare that they have no competing interests.

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